365 AMQ International's STRATEGIC ASSET MANAGEMENT

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Backlog, Capability and Transfer Pricing

What's a MOOC?

Answer: It is a 'massive open online course'.

In 2011 Stanford University launched three free online courses, each of which had an enrolment of about 100,000. This was followed in 2012 by Coursera which has the participation of a large number of bricks and mortar colleges around the world including the University of Melbourne and edX with Harvard and a few other senior American universities. Some of these courses are now attracting enrolments of over 150,000. In addition to videos, readings and problem sets, MOOCs provide interactive student forums and assignments can be peer reviewed. Many of the courses also provide examinations and certificates of achievement. The courses are aimed at traditional university students and the general interested lay person.

What if asset management could reach an annual 150,000 around the world? Imagine how much we could improve our economies, sustainability and community life styles!

Hopefully, the three issues we deal with here could capture the imagination of thousnds and aid in the management of assets world wide. Each of them has appeal not only to engineers and technical folk, but to planners and finance/accounting groups also.

In this issue:

Do enjoy - and your thoughts on how it would be possible for AM to appeal to a mass audience would be much appreciated.

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BACKLOG MAINTENANCE: IS THERE A 'NATURAL LEVEL'?

Is there a 'natural level' of backlog maintenance?

Economists speak of the 'natural level of unemployment', arguing that even in the best run and most vibrant of economies there would still be unemployment. It is called 'frictional' unemployment and refers to those people temporarily 'between' jobs and it is necessary if the economy is to adapt to changing circumstances and opportunities.

Is backlog maintenance similar? Can we say that in the best run of agencies there would still be backlog for 'frictional' reasons? Say, because unexpected breakdowns required parts to be flow in from overseas, or because it was more efficient to deal with a number of related maintenance problems at the same time so that the early ones are held over? Maybe there could be unexpected demands on a system such that it could not be released for overhaul and maintenance?

Backlog maintenance may be the grease that makes the entire maintenance machine run more efficiently, the tolerance we need to get on with the job. The cost of ridding ourselves of this backlog is the cost of large inventories of specialised parts, the cost of inefficient small scale attention, and the cost of duplicate capacity. So maybe some maintenance backlog is desirable. However 'desirable' is generally not the word that most immediately springs to mind when we think about maintenance backlogs.

Instead, we more normally define a maintenance backlog as that maintenance that 'should' have been done but wasn't (generally because of insufficient funding) implying both that it is a problem and the solution is more funding. It is worth asking whether, with this definition we could ever spend enough on maintenance to rid ourselves of a backlog - or whether the 'shoulds' would not automatically increase to fill any potential gap.

How is backlog maintenance measured?

Do you ask the maintenance managers or facility managers to tell you what their backlog is? If so, the chances are that this is interpreted as 'what would you spend more money on if you had it?' If you think that it is not interpreted this way, I urge you to check. Consider, when justifying their maintenance budget, who does not ensure that

there are enough items on it to utilise any potential windfall? How many estimate their likely maintenance requirements to be less than their expected budget allocation? Without a requirement for all items to be cost justified, there is no real upper limit to what is, in effect, a wish list. It is clearly not worth documenting all the things that could be done if the chance of funding them is immeasurably small. For this reason 'same as last year' is always a good bet which may account for some of the constancy observed in practice. If your measurement system is those items scheduled but not carried out, the problem still exists, only now you must ask yourself what justification there was for scheduling it in the first place.

Testing for Credibility

One test of a backlog item is does the scheduled cost of repair or maintenance, or the assessed risk, increase for having been deferred? If not, then it should not be a backlog item - it shouldn't have been on the schedule either!

Cost Justification reduces Backlog

Many backlog lists would fall if the expenditures had to be cost justified, or if those proposing the item had to justify it in terms of its impact on service delivery. One large government department carried extensive backlog lists for years, then it was corporatised. With it new commercial attitudes, the list of backlog items was reconsidered and found to be not needed. What changed? Not the asset, just the management attitude.

Throw it in the bin

Some years ago, I ran a competition in this newsletter to provide an 'operational (i.e. measurable) definition of backlog maintenance. The winner was Brain Gallagher, then with the Northern Territory Department of Transport and Works. He wrote of prioritising maintenance by ranking items by service benefit: cost and doing items in order until the budget ran out. He then advised throwing the list of residual items in the bin! They are not backlog, he said, they are simply items that didn't make this year's cut. Throw them away for next year you will have a new list of items and a new set of priorities and you will need to start the procedure all over again!

He is right. Priorities change, opportunities change. The problem with backlog lists is that they build in an undesirable level of inflexibility. It is much easier to ask for more money and to blame lack of funding for not achieving service delivery targets than to put the effort in to finding creative ways of dealing with the service delivery objectives with the amount of funding you have in hand.

The current system rewards inflexibility

Who is most likely to be rewarded? The maintenance supervisor who spends a week gathering material to support a claim for more funding or the maintenance supervisor who spends the same week inventing creative ways to manage with what he has? The answer, as we all know, is that the size of the budget is often considered the mark of the successful maintenance supervisor.

The truth is that we are more likely to reward the person who tells us that there is an unfunded maintenance problem than the one who does something about reducing the

need for extra funds. Unfortunately, given the way that budgets develop and are maintained, the supervisor who complains that his budget is woefully inadequate is more likely to have his budget at least maintained than the supervisor who manages to work within his allocation.

The 'hidden costs' of backlog maintenance thinking

Finance managers know this which is why they rarely provide extra maintenance funding even when the backlog looks to be so substantial. Their reaction may get the agency funding balance 'right' but it generates hidden costs. These costs show up in lack of morale in the maintenance section, lack of incentive to address the issue rather than just measure it and effort wasted in generating lists of 'backlogged' works. They show up in reactions to new policies or practices as revealed by the question 'do I get any extra funding to do this?' rather than in a 'how can I make this work' attitude.

The wrong game

The costs arise because of the unreal situation that has been built up, whereby maintenance/facilities staff think the aim of the game is to generate great walls of backlog maintenance lists and the accounting departments retaliate by treating all maintenance requests as unnecessary. In the meantime the real problem, that of getting maintenance 'right' continues. If you are the Asset Manager how do you keep the maintenance and the finance guys in line yet happy?

Changing the game

Some years ago the Sydney Water Board came up with a good answer. As part of their asset management planning approach, each maintenance supervisor was personally and constructively quizzed by the CEO (an ex-asset manager): "What would happen if we did not fund this item?" and was pshed until the answer was provided in terms of service delivery consequences. Often, during this process, the supervisor himself would discover that the action was not needed or that there was a superior alternative, a more cost effective approach.

This developed a better customer service delivery focus on the part of the engineer/ maintenance supervisor, but more than this, it gave him the ammunition to defend himself against cost cutting accountants and budget planners.

Maintenance/facilities people trained in this way will not have to take refuge behind maintenance backlog lists, they will be able to justify what they do, both to themselves and to others. This improves morale and it avoids the embarrassing position that another water department (then budget funded) experienced some years ago when funding was slightly easier. Backlog funding was the norm in this department. However, this time the treasury officer was new, he was young, and he was eager to learn. He did not 'know' that the department had a large backlog that it was essential to fund. "What would happen if you did not get the money?" he asked. The engineers had not been asked that before (remember this was some years ago!) and they went around scratching their heads for quite some time before they returned and said "The fire hydrants would not get painted!" (True story.)

It is time we all chucked the backlog lists in the bin and started again. It is time to get real.

CAPABILITY INDICATORS: PRINCIPLES, PROBLEMS AND APPLICATION

Would a focus on 'what you have' rather than what you haven't, help you to get more value out of your assets?

A similar problem to the 'backlog maintenance' issue occurred in schools. Every few years a survey would be done to illustrate the woeful under-funding of state schools, and each time, the figure would be larger and more alarming than the one before, with the hope that the size of the 'problem' would result in extra government funding.

Eventually the National Board of Employment, Education and Training, decided to focus not on what the schools did NOT have, but on what they could do with what they DID have - a much more constructive approach.

Flexible planning

Planning for new school buildings means being able to plan several years ahead for enrolment numbers and to develop methods for projecting likely enrolments by subject areas. Enrolment projections depend on demographic studies adjusted for the effects of government policies, and economic and social developments. Demographic information is generally available by area rather than by school and the impact of changing government policies is sometimes difficult to predict so that enrolment projections have proved difficult to do on a school by school basis. Projections of likely enrolment levels in subject areas that have specialist infrastructure requirements have proven even more difficult. This increases the need for measures that allow schools greater flexibility and ability to respond to short term as well as longer term changes, such as can be achieved by increasing a school's ability to identify and increase infrastructure availability and capabilities.

Principles of Infrastructure Capability Indicators

1. The indicators need to form part of an educational plan that links school enrolments, curriculum objectives and infrastructure needs.

2. The focus should be on identifying and increasing the availability and capability of existing infrastructure
3. The indicators should enable use of existing asset data as far as possible but allow schools to work around any limitations of existing asset registers.
4. Indicators should be seen primarily as a tool for better resource management by individual schools.
5. The core information used should be common to all schools and capable of being aggregated for school system planning purposes.

The Capability Indicators

Three sets of capability indicators were proposed:

- A proxy for general computing and information technology capability (then in its infancy)
- usage and intensity-of-use indicators, and
- a set of capability alternatives.

Here we will concentrate on the usage and intensity -of- use indicators. These require only that the school be able to lists its rooms or spaces, such as a gymnasium, together with the equipment that is located in those areas. Most school asset register systems provide plot plans, showing building and room layouts and generally a list of rooms, along with their sizes, to help schools in their curriculum planning. This only needed to be supplemented with information on equipment used in the various rooms.

Before schools can determine whether it is possible to use their existing infrastructure differently they need to know how they are currently using it - and to have a set of measures that record current use. For this purpose, two measures were devised, a measure of 'usage' and a measure of 'intensity-of-use'. Taken together these indicators provide a measure of availability that can indicate where and how greater use can be made from existing infrastructure.

Infrastructure availability extends to both building space and equipment. For both aspects the measurement of usage and intensity-of-use requires on-site examination and observation over the period of at least one typical school week. Reference to the school timetable may be adequate for space measures but will not be sufficient for equipment measures.

Space

Rather than define a space in terms of its size, i.e. square metres, the availability approach considers its functional use. A space would be a classroom, science laboratory, workshop, gymnasium, or any other defined area such as an oval. The approach asks how many students the space was designed to accommodate, and then measures actual numbers against the design use. This is accomplished in two steps:

Step 1 *A usage measure:* How many hours per week is the space actually in use for school purposes? This can then be expressed as a proportion of normal school opening hours (say 35 hours a week). The proportion can be greater or less than one.

Step 2 *An intensity-of-use measure*: What is the average occupancy rate of the space whilst it is in use for school purposes? This can be expressed as a proportion of its design size. This, too, can be greater or less than one, but will normally be less than one.

The two measures, taken together, suggest where availability can be increased and how it may be increased.

Equipment

In many cases a space, particularly a specialist space such as a science laboratory or a technical workshop, would have its own equipment. Nevertheless, it is useful to consider the use of the equipment separately from the use of the space, for the simple reason that whenever the space is in use, it is not necessarily the case that all of the equipment is being used.

Spaces have the characteristic of being largely fixed, both in location and in quantity (at least in the short term). Equipment, on the other hand, can be mobile and increased in relatively small increments. It is more useful to define equipment by the number of units in a class, rather than to attempt to measure the utilisation or capability of an individual item. For equipment the two step process (for each classroom of equipment) is:

Step 1 *A usage measure:* On average, for how many hours a week is each unit of equipment actually in use (as distinct, say, from merely being in a room that is in use?) /This can then be expressed as a proportion of the normal school week (say 35 hours). As with space, the proportion can be greater or less than one.

Step 2 *An intensity-of-use measure:* During the period in which the equipment is in use: what proportion of the time is involved in hands-on activity?

The usage and intensity-of-use measures calculated in this way indicate to school management where there is the possibility of increasing usage. They also provide the measures of inputs for the capability scenarios that will be presented in part 2 of this article next week. The scenarios provide a structured means of thinking more broadly about the ways that existing infrastructure can be better used.

Next issue: Discovering Alternative Infrastructure Capabilities.

TRANSFER PRICING

Why use transfer prices?

It is often supposed that the charging of transfer prices is necessary for an agency to know what resources are being used for different projects or purposes. However programme performance budgeting objectives can be met by conventional management accounting methods within branches which need not involve the charging of transfer prices.

The use of transfer prices in recharging becomes necessary only when the agency desires to decentralise its decision-making by allocating responsibilities to each branch together with budgets that are to be utilised efficiently in carrying out these responsibilities.

The dangers of transfer pricing

The dangers of transfer prices are (a) that the prices may be set incorrectly and thus give the wrong signals and (b) that the messages given by branches responding to these signals will be ignored by management and the individual branch responsibility for managing its funds will be overlaid by a mandatory requirement to use a certain service, no matter how inefficient it appears to be.

I was once involved with a department that used a 'full cost' transfer system for its maintenance depot. The way this worked was that the full costs of the week's operations were shared between the jobs handled that week. It may have seemed fair but the effect was that whenever there was idle time, the cost per job went up. (whereas correct signalling might suggest that the price go down to encourage more throughput.) When branches saw the costs rising, the reaction was to avoid using the depot, with the result that it experienced even more idle time and costs increased still further. This came to my attention when one of the roller wheels on my office chair broke and I suggested it should go in for repair. "Oh, don't do that, it is cheaper to buy a new chair!"

With greatly reduced use of the maintenance depot, one might suppose that the department would review its pricing system. It didn't. Instead, the finance officer in charge (and the one who had developed the pricing system!) persuaded the Minister to mandate the use of the maintenance depot not only for our department but for several others. Unless there were 'exceptional circumstances' these departments were required to send their repair work to the maintenance depot. This did indeed create much extra work. Little of it however was for the maintenance depot - most of it was for busy clerks in the department who were put to the task of devising 'exceptional circumstances'

Transfer pricing on a marginal cost basis

Eventually they turned to a marginal costing system, with idle time charged to its own account, making costs transparent and increasing patronage of the depot. In the longer term, the question that needed to be resolved was not what prices were to be charged whether an in-house service was justifiable.

Later, I was to find that similar problems beset other government departments and a Harvard Business Review article suggested that private companies were not immune, either. The article described the problems of Bellcore - the research arm of the old AT&T that was formed as a separate company to service the seven regional holding companies.

AT&T set up a number of business units, each of which were to recover their full costs and subsidies were not permitted. The research arm found that certain services, namely word-processing, graphics, technical publications and secretarial services, had prices that seemed high and arbitrary. They stood to save a lot of money by hiring independent contractors to do the work or by doing it themselves.

A majority of Bellcore employees were scientists, engineers and mathematicians, most of whom had advanced degrees and were paid accordingly. As a result of the pricing system many of them were doing their own word processing and graphics (this was before the advance of software that made it so easy that today *everybody* does their own!) Some of them were also negotiating with vendors to do the work. This was hardly ideal: the researchers weren't doing what they were being paid to do, also some of the outside contractors produced low quality work or charged more than their estimates. The research arm were also concerned that by going to outside vendors they risked the security of their research reports and technical requirements documents. At the same time the bypassed business units had their hands tied. Required to pas on full costs, and with a shrinking client base, unit costs (just as with the maintenance depot) were driven up. At one point documents were costing $50 per page.

What was Bellcore's solution?

Doing nothing would not have improved morale in the service centres. Dismantling the four service centres and outsourcing was also not really an option either for it would have required the scientists and engineers to make their own clerical arrangements outside raising both efficiency and risk concerns. In this case mandating the use of the business units was rejected because the technical organisations would not like it and would work actively to undermine it (as they did in the case of the maintenance depot). So what was left?

Charges based on cost drivers.

The solution was to examine the costing and pricing system. They weeded out inefficiencies in operations and closely examined the method of allocating overheads, which, until then, had been purely on the numbers of people employed with no allowance for differential costs. They decided to put effort into determining their true cost drivers and found that space allocated to people-intensive areas was, in fact, less costly space than laboratory and computer-intensive areas and changed the price allocation. They found that services such as library, travel, conference and legal costs, were used only lightly by secretarial staff but much more intensively by technical staff. In fact they found that the cost drivers for a number of the overheads were better described by the proportion of technical to secretarial staff than by pure employment numbers.

They rewrote their cost codes and changed the cost allocations. Costs in some areas, particularly technical, went up. They stood by their guns. "We're committed to our transfer pricing system. We want to preserve it, and that means that we'll occasionally have to tweak it... we'll know when it's time to do fine tuning: when good managers complain loudly or act illogically".

The message:

If you are, or intend to, use transfer pricing, be prepared to put the time into determining your cost drivers - and then watch carefully what the price signals are doing.

Also: think carefully about WHY you are using transfer prices, and WHAT they are intended to achieve.