392
June 2
2014

AMQ International's STRATEGIC ASSET MANAGEMENT

TECHNOLOGICAL CHANGE AND ASSET MANAGEMENT

Technological change - a blessing or a curse for asset management?

I started thinking about this issue a couple of months ago and spoke with a number of readers who were kind enough to think it through with me and to make suggestions. My thanks are due to Chris Adam, David Brooker, Gopinath Chattopadhyay, and Aneurin Hughes.

Then, in Canada last week, addressing bright young students at the University of Waterloo, intent on making their own technological changes, and the annual roadshow of the Canadian Association for Trenchless Technology at Niagara Falls, I benefitted from my audiences and from the insight of Leo Gohier and Professor Tom Iseley. All this reminded me that there is no such thing as a 'self made man' (or woman) and that we all owe what we are and what we can do to the cooperation of others.

The history of scientific development and technological change reveals that, despite the difficulties of transport in the 18th, 19th, and even 20th centuries, scientists from different countries worked together to develop their ideas. Today this collaboration is a hundred times easier. It is probably one of the reasons that ideas today are being generated at an ever increasing rate.

Asset management, too, is being accelerated by idea exchange and collaboration, and needs to be, to keep up with the flow of new ideas, techniques, systems and processes. We can be the block to needed change, or we can be its champions. Your reactions to the ideas here are, as always, most welcome.

Whether a blessing or a curse - we live in exciting times!

Enjoy!
Penny

Dr Penny Burns, Editor, AMQ International
08 8359 0559 **www.amqi.com**

- BLESSING OR CURSE?

Technological Change has made our tasks easier

Technology has greatly expanded the capacity of asset managers who are now able to view 'real time' service and asset performance, achieve efficiencies through remote monitoring and control, have ready access to data through GIS, and to very powerful hydraulic modelling software. Customer queries can be responded to more quickly and in the future embedded sensors will better monitor asset condition. It has also increased the both the status and the required level of expertise of asset managers.

But change has come at a cost

These advantages of greater capability and higher status, however, come at a cost. Any time we have a great deal of change in a short period of time, change has a destabilising effect. On everybody. And asset managers are not exempt, for not only CAN we do more, we are EXPECTED to do more.

Although our capability is growing rapidly, it may well be that expectations upon us are growing even faster. Partly this is due to the even more rapid change in communications technology. The growing range of media and especially the internet quickly bring word of new ideas and their success. Our ability to assimilate all these ideas, however, may lag behind. Neurological studies are revealing that our brains are rapidly evolving and that we can now think of and invent new ideas at an incredible rate and there is no sign of this slowing down. But bandwidth, or our ability to give each of these new ideas the attention and evaluation time that they need, has not, nor cannot, increase as fast. Despite the fact that many of us are working much longer hours than we used to, it is still true that we find it impossible to keep up with latest trends as well as we would like to.

Consider the following scenario. Ten new technologies appear on the scene. Let us assume that each is taken up by at least one organisation and the results published. Although each organisation knows only one of these technologies in any detail, you are now expected to know all ten and be able to either make a rational choice between them or to confirm whether the choice made by your executive is right for you.

It is not surprising that we feel overwhelmed by technical change.

Let us distinguish between Invention and Innovation or adoption

Governments today are eager to support innovation which is seen as the key to future economic success. Often they do not make the distinction between invention - or the creation of a new idea - and innovation or adoption - the application of that idea so that it creates community benefit. There are many technological inventions today which are languishing for want of organisations prepared to take up and apply them. A speaker at a recent conference referred to an Executive of the US EPA complaining that she had a 'shedful' of new products awaiting application. Designers of brilliant new models, or clever techniques, are frequently frustrated by what they see as excessive conservatism on the part of organisations, organisations that are not willing or not able to put in the time and resources to apply the new model or new technique.

Ironically, it may well be the rapid rate of increase in INVENTIONS that is slowing down the rate of ADOPTION.

Why might this be so?

1. **The paradox of choice.**

The more that is on offer, the more difficult it is to make a choice. If you have ever had to do the weekly shopping and been faced with a choice of ten different brands of toilet paper or paper tissues, and panicked, thinking 'now which should I get?' you will know what I mean. Most of us default to going with the same brand that we have always bought. Unless, of course, one of them should be an exceptionally good bargain, say half price, and then we might try it. Now choosing toilet paper or paper tissues is a trivial matter. But it illustrates the problem. Making a choice requires information, analysis and assessment, in other words, effort. Economists used to assume that the more choice we have the better, but several books have now been written arguing quite the reverse. Too much choice can be overwhelming. And in these cases we default to sticking with what we already know. Applied to ideas, this means that faced with a great many new ideas, we find the task of choosing too difficult and often don't choose any of them.

2. **The fear of making mistakes.**

Added to the difficulty of making choices is the fear of making mistakes. If there is only one option, life is easy, but the more options the greater the chance that we will choose the wrong one. So we stick with what we know.

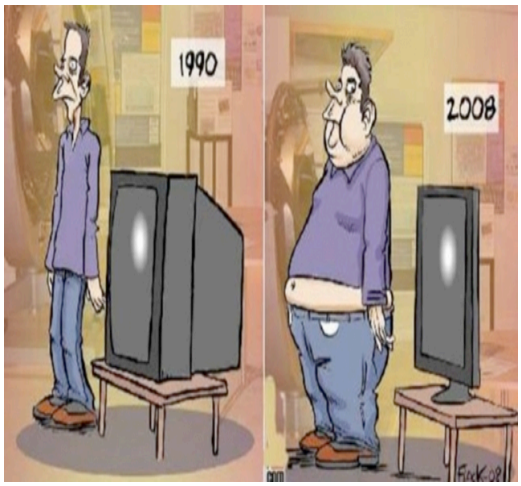
3. **The 'Apple' effect, or something better may be here soon**.

The difficulty of making choices and the fear of making mistakes are a function of the number of choices on offer, the 'Apple' effect is a function of the rate of growth of ideas. If you are in the market for a new iPod, iPhone or iPad, you are unlikely to buy in the first half of the year if you expect the new offerings to come out in the second half. And so it is with ideas. An existing idea may seem attractive to you but you may hesitate to adopt it, in case something better is already in the pipeline.

4. **Other concerns include the inability of practitioners to envision change**. The more unique the new offering, the harder it is for practitioners to conceive (and believe) the benefits.

5. **And of course, there is EGO** - the view that 'we are best practice and know better than others'.

Technological Change is occurring everywhere



Two areas, however, are of especial importance to asset managers - risk management and regulation.

Risk Management

For many that I know, risk management is almost synonymous with asset management. Both fields have grown up together. Risks, of course, can go both ways. We can win as well as lose. Speculators love risk, it gives them the opportunity to make a great deal of money. They always look at the upside as well as the downside. But councils and asset managers tend to see only the problems of the downside. I have even heard an asset manager claim that there is no upside in asset management, which is nonsense, but it reflects the fact that they are generally risk averse. Risk management models and techniques that have been developed for asset management have thus tended to focus on the problems of risk avoidance.

Being risk adverse means

> not taking chances on new technologies, preferring the assumed safety of the status quo, so new ideas tend not to be implemented so readily.
>
> Or making only small changes when larger changes are needed

To take just one example - water!

> Ageing infrastructure and the lack of funding for projects such as pipe rehabilitation and replacement are arguably the biggest problems affecting water and sewer systems across the world. It is these problems that have encouraged the development of new, more efficient, replacement techniques (pipe bursting to slip lining to cured in place pipe , etc.)
>
> But there is an even bigger problem facing us in the not too distant future and its solution will change our perspective on pipe replacement from being more efficient (i.e. replacing pipes more quickly, more cheaply, and with a lower impact on users) to being more effective - doing something completely different.

How will water scarcity affect us?

> Across the world we are running out of water. To survive, we must find ways to use water more effectively and several times before discarding and we must extract re-usable materials from wastewater before returning it to the ecosystem. We have to ask ourselves whether we can afford to construct systems of long pipes that leak up to 30% (and sometimes even more) of the water they carry and long sewers that suffer from inflow and infiltration increasing the treatment task at the end of the line.
>
> New techniques are now being developed by environmental scientists that avoid these problems, but engineers and asset managers in the main do not know of them. In the future we are going to be looking at more decentralised, on-site water and energy provision. We will be extracting heat from sewage and using it to heat our homes, and after basic treatment, feeding it through creek beds where nature will do the cleaning. This is not science fiction. It is already

happening. The use of natural and created creeks for this purpose is improving the environment and increasing land values. We can expect to see much more of it in the future, along with many more water re-use systems. This is the future of water.

At the moment these techniques are being applied in a relatively small way. But as the technology grows and demands increase we can expect that cities will see the benefits of using sewage for heat, of extracting re-usable metals, and of recycling water on a larger scale. This will inevitably affect the way we currently operate and bring about even better technologies for renewal of existing systems.

This brings up the question: How can asset management contribute? This is an opportunity for growth and expansion. Engineers and asset managers are needed to ensure the ongoing safety of these new systems.

All new ideas - new inventions - need champions. You can be such a champion. Or you can present a blockage and slow down the rate of adoption of ideas needed to ensure sustainability.

Keep yourself abreast of new developments in your field. Not just the small developments affecting the tools to do the same job as you have always done, but those ideas that will radically change what you do - for the better.

One of the greatest blocks to innovation is Regulation.

Regulation

Regulators and Policy Makers argue that regulation can drive new technology. The argument runs that If for, say, waste management, legal environmental standards are easily met using existing technologies then there is little incentive to develop new waste disposal technologies or production processes to reduce wastes.

Unless being used in this policy sense, in an attempt to drive innovation (adoption) environmental standards are usually based on what can be economically achieved using existing technologies. In this sense environmental reform is almost always limited to what can be achieved by the enforced adoption of readily available technologies that are not too expensive.

It's focus, in other words, is current technology. Regulation is typically designed to counter the perceived detrimental effects of existing technologies.

And, therein lies the problem.

If the focus on existing technologies lends itself to prescriptive regulations - which is often does, because it is easier to prescribe certain actions rather than to define the problem that is to be avoided - then regulations which are designed to work with existing technology and not be too expensive, may end up being prohibitively expensive for new technology.

This may have been enough in the past, but the continued degradation of the environment at both a local and a global level suggests that a new approach is necessary for the future. Standards need to be set which promote research and development in environmentally beneficial directions.

Not the rule, but the INTENT of the rule

There has been a lot of discussion in the literature about the role of regulation in encouraging new technology. It comes down to one simple point - When applying regulation to new technology we need to consider not the rules, but the 'intent of the rules'.

Microsoft, for example, believes that each provision of any proposed legislation should be tested against certain fundamental criteria such as certainty, flexibility – focusing on **accountability and desired outcomes** (for example, on consent), consistency and technology neutrality – avoiding preferences for particular technological solutions.

An article in the Journal of Law and Medical Ethics, looking at what the history of technology regulation can teach us about nano oversight, observes that the following important lessons can be drawn from previous attempts to govern other emerging technologies.

(1) public confidence and trust in a technology and its regulatory oversight is probably the most important factor for the commercial success of a technology;

(2) regulation should avoid discriminating against particular technologies unless there is a scientifically based rationale for the disparate treatment;

(3) regulatory systems need to be flexible and adaptive to rapidly changing technologies;

(4) ethical and social concerns of the public about emerging technologies need to be expressly acknowledged and addressed in regulatory oversight; and

(5) international harmonization of regulation may be beneficial in a rapidly globalizing world

Innovative work in Integrated Resource Management is using the 'Intent' approach

In Vancouver, innovative technologies are being used to combine water, wastewater and energy in cost effective and environmentally beneficial applications on site, that add value to developments, not costs. I had the pleasure of several days of site visits on my recent trip to see first hand Dockside Green, the Olympic Village, False Creek and other environmental improvements.

Two things made these extremely attractive and low cost developments possible. One was recognition by the Provincial Government that environmental damage by developers needed to be paid for, and the other was the fact that the developers, scientists, engineers and planners worked

with the regulator to apply 'the intent of the rule'. In Microsoft's terms - focusing on accountability and desired outcomes.

What does this mean for Australia, New Zealand, the UK and other jurisdictions?

To get better, more useful and constructive regulation, that will help us move the world forward, asset managers and public works engineers in general need to work more closely with public administrators, lawyer, and scientists.

We have not needed to do this in the past. But just as engineers and accountants came together to ensure the first stage of asset management - the recording of what assets we have, now the coalitions need to be widened.

Those asset managers who have an eye on the future and on sustainability, those who are greatly concerned that what we are doing now has to change, will

read widely and take a positive view of possible change
seek collaboration with a wide range of other disciplines
will put their ego aside and not assume that they have all the answers

If you want to block moves to future sustainability just do the reverse!

A personal note: When I was involved, some 20 years ago, in creating a measurement system to meet the South Australian Government's desire to use its 15 year contract for the outsourcing of its water and waste water management to not only manage the assets but to increase the exports of its water industry, I found myself continually up against the desire of the lawyers to develop simple check lists that could be 'ticked off'. But this was not going to work to incentivise the contractors, it needed a completely new approach, one that rewarded the contractor for increased exports. The lawyers were applying the standardised regulatory approach, I wanted a new approach. For weeks I argued with them, tried to show them why the standard approach would not work, and why we needed to build in incentives - and to have independent measures of success. It was frustrating. I arranged independent record keeping by the Australian Bureau of Statistics and continued to argue the case with the lawyers. It seemed fruitless. Then, at the eleventh hour when the final arrangements were being made by the heads of Treasury, State Development and other notables, I was called in to settle a problem. It had taken some time to find me (I was having lunch!) and by the time I got to the meeting I knew that something had changed. It turned out that, in my absence, the lawyers had run out my arguments for me, and done such a great job, that the day was won.

The moral of the story: As frustrating as it will inevitably be for all of us, we have to learn to talk with other disciplines. We must learn to understand and deal with their issues, if we wish them to learn and deal with ours.

What relevance does this have for you in Asset Management?
Let us sum up.

Rapid technological change is affecting asset managers in the following ways:

Asset managers can do more
But more is also expected of us
And we are being overwhelmed by technical change

Ideas are coming thick and fast but adoption is being slowed down by

A bewildering array of choice
A fear of making mistakes
Anticipation that something better is coming soon
An inability to visualise something different
And EGO, thinking that we know best.

Risk Management is focussed on Risk Avoidance

We are placing efficiency (doing it right) before
Effectiveness (doing the right thing)

Regulation is similarly negatively focussed

Avoiding the dangers of current technology
Hampering the development of new technology

Regulation is likely to increase so we need to work with it. We need to

create public confidence and trust in technology
seek not to get regulation in favour of our particular technology
but rather neutral regulation
unless there is scientific reason for the contrary

We also need to

work with regulators to create policies that are
flexible and adaptive
be conscious of the ethical and social concerns of the public

It is affecting Asset Managers (and especially those interested in developing new ways of acting) by creating too much competition for

the attention of senior management and decision makers
lack of time and resources to assess the range of options
a fear of the unknown and making mistakes - safer to stay with the status quo

What can you do?

Create opportunities for safe experimentation

Here are a few great ideas that I gleaned from Dr Tom Iseley, Professor of Construction, Engineering Management Technology, Indiana University, Purdue University, Indianoplis, in the USA.

Living Labs

Tom created a 'Living Lab'. This is not a new idea, but it is a good one. A living lab is an area where new products can be field tested and evaluated. Such a living lab was set up in a small, low income, community of about 2,000 customers with the aim not of developing yet more products but rather pilot testing and demonstrating some of the wealth of new ideas that had yet to be taken up in field. It was also hoped that out of this product testing, new markets and employment opportunities for the community would be generated. And so was created the Riverside Watershed Environmental Living Lab for Sustainability. Tom's University designed a ten stage evaluation procedure which they taught to their students. The students were then paid to carry out the evaluations and to report back. The cost of the evaluation was born by a small charge on the vendors. The students tested out different pipe coatings, processes and techniques for pipe restoration. (But the idea can be applied to anything) It was a most successful two year program. This service is particularly valuable for small councils that would not have the scope or quality of resources to do the job themselves. It is also an extremely valuable learning exercise for the students who will be required to assess new options wherever their future work takes them. A win - win - win situation. Tom is now looking at developing an Institute for Product Validation.

What can you do to encourage experimentation?

It has continually amazed me that we do so little of it. Always the fear is that if something goes wrong, the experimenter will be held accountable. So if you want to test out a new method of road sealing, or whatever, make sure that it is recognised upfront as experimental. Document it superbly well. Share your results with others. Make yourself available for follow up.

This is COLLABORATION within your discipline.

But also consult widely with those who may be affected, or who may affect your progress - planners, lawyers, environmental scientists, and - dare I say it? - economists. Track the comparative costs and benefits.

This is COLLABORATION outside your discipline.

Both are necessary. One may be easier than the other. But the other may be more important for your ultimate success.

As always - your ideas on this important topic are very gratefully received - and shared!