AMQ International

Strategic Asset Management

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# If Asset Management is to prevail —it has to go public!

## How Governments are running scared of their community's understanding of asset management – and what it means for future viability.

Queensland has released its Infrastructure Strategy, which sets out a vision for how South East Queensland (SEQ) will develop over the next 20 years and how this development will be serviced.

Everyone in SEQ understands that existing water sources will be exhausted around 2015 and there has been intensive study in the water industry over the past ten years to deal with this, not only as a technical problem but as a social and environmental problem. Many clever strategies have been suggested and some are being implemented, including dual reticulation in greenfield sites and rainwater tanks, together with more aggressive Demand Management through water restrictions.

Did the State Infrastructure Strategy reflect these initiatives? No! The Government's answer to the SEQ water supply problems is …… *a new dam!*

So why has the Government adopted a 19th Century solution to a 21st century problem? Read more on p. **920**

## The AM Industry is searching for answers

In this issue we look at two recent conferences -- on different sides of the Pacific Ocean—that have tackled the issue of asset management within the water and wastewater industry. It is clear that there is a great deal of ability and interest in solving the social, economic and environmental problems of sustainable communities through more effective use of asset management. What do they have in common, how do they differ?, what can we all learn? pp. **921-922**

## And for ways to record what we already know

John Hunter, Redlands Shire Council—the author of the "Lessons Learned" article in the last issue, follow up with some useful information on knowledge management. pp. **923-926**

Enjoy! *Penny Burns*

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## So why has the Queensland Government adopted a 19th Century solution to a 21st century problem?

### Because they do not see that they really have any alternative!

It isn't that they don't know the results of the past ten years of intensive study. It isn't that the alternative strategies are not feasible. It is that, quite simply, they do not know how to sell the results of a management strategy in a way that the community would be able to understand and approve.

Politically, if the government does not go ahead with a dam, the opposition would attack them. It they identified a broader strategy, the opposition would attack them. An attack from your opponents, in itself, may not be a real threat but if the community doesn't understand the issues (or hasn't been engaged on a significant scale) then such risks are politically unacceptable.

In the end, the government's chosen "solution" only defers the inevitable need for changes in the water industry and Australian water culture. However, if we haven't engaged the community to date (and politicians as part of that) then maybe such a delay is necessary to communicate the real issues behind the political headlines? The problem here is that few in the water industry want to engage the community. As a result of this reluctance, the industry is held back through poor political decision-making.

Queensland is not the only state to release infrastructure strategies that avoid the real issues because they think the community would not understand. You will search in vain for genuine strategies to address the infrastructure problems that will be brought about as the population ages and fewer workers are available to maintain the infrastructure. Or as populations decline (within the next several decades for Tasmania, South Australia and Victoria) and there are fewer rate and tax payers to cover future debt burdens being incurred now.

**Unless you want your work in asset management strategy to be over-ruled by governments afraid of their communities, there is a task to be done here**

- **to raise the level of asset management awareness in communities**
- **to generate wider community discussion and debate about alternatives**
- **To encourage both community decision makers and asset specialists to "think *forward*"**

Agree? But don't know what to do about it? (Or, do know what to do but need more hands on resources?) Then become a supporter of **ACORN Inc**. It costs nothing but your time and imagination. Whether you see it as promoting better infrastructure decisions for the community's benefit - or enabling the intelligence of asset specialists to be heard - check out **www.acorninc.org** and **sign up to support asset management**..

# Reaching Out!

**Where is the Australian Water Industry now in terms of Asset Management?**

These thoughtful notes by Chris Adam of Integran from the OzWater 2005 Conference, held this month in Brisbane, suggest that **asset management is reaching a level of business and community maturity**

## OzWater 2005

### 1. Moving Beyond the Engineering:

The Conference ran separate streams on the usual "Systems", "Management" and "Technology". These are a fundamental part of any utilities conference. But what was interesting is that the other streams included "Management", "Sustainability" and even "Social Change". The management sessions were very well attended (in many cases they attracted at least as many delegates as the more technical sessions).

The level of support for the non-technical components of the program suggests that we are moving beyond the technical mindset that has been such a feature of past conferences.

> **Comments from attendees suggest that now that the technical issues are well understood people are becoming more interested in the 'softer' areas.**

The program included well attended papers on climate change, sustainability, and public involvement.

### 2. Politics:

A recurring theme was interaction with policy makers. Several speakers evidenced frustrations at a lack of understanding by the political power brokers but *some conceded that,* ***until we really engaged the community and got them behind us, the industry was unlikely to be able to influence the political agenda***.

### 3. Regulators:

Speakers from NSW and Vic indicated that regulators (IPART and ESC) **were now taking a more holistic view of their role.** The idea that the dollar is the single or even best measure of performance seems to be losing some of its 'appeal'

### 4. Comparison with OS experience:

There seemed to be a general consensus that the Australian Water industry was at the forefront in addressing these issues. Together with the UK and NZ, Australia seems to be moving beyond the engineering mindset, has adjusted to accommodate economic frameworks and is ***now seeking means for adding the broader social and environmental issues into the mi in developing holistic solutions.***

### 5. Governance:

A 3.5 hour workshop on governance which I held on a Sunday afternoon attracted around 10% of the delegates. I can't recall EVER hearing of a governance workshop at one of these conferences before this, and I see this as evidence of the broadening horizons of the industry. We had 6 speakers – 3 of whom were 'practitioners' (i.e. CEO, ex CFO and Gen Manager) and 3 were from a regulatory perspective. The first session (the 'practitioners') explored a whole variety of issues relevant to management of a water business including getting the balance right. The second half (the policy setters) covered similar ground but from a national, policy perspective.

## 6. Outcomes;

Many of the sessions that I saw ***were looking at the outcomes first*** and then working way back up the value chain and THEN making decisions. This is another mindset change from the traditional approach (i.e. rather than asking "tell me what toys I have, what they can do and that sets my service standards", the CEO is now starting to ask ***"what does the end user want, how can I manage/ deliver these outcomes and (as an afterthought), what assets do I have/need to do this".***

Shaun Cox once remarked that the engineer's commitment to traditional solutions could sometimes be a barrier to innovation.

[Ed: Chris agrees but he says that this statement is becoming less true after the Oz water conference.

He adds "of course, this is based on my subjective opinion and you would expect me to interpret events in a manner which support my beliefs (don't we all), so I'm sure that thee findings could be debated at some length but this is what I believe."]

Chris is open for discussion on any of these issues.
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**On the other side of the Pacific, another water asset management meeting was taking place…..**

**In Washington, DC, May 5-6,** Steve Albee of the Environmental Protection Agency organised a

## Collaborative Asset Management Working Session

The intent of this workshop was to decide how to develop a culture and capability in asset management across the water and wastewater industry in the United States.

Participation was by invitation and invitations were so keenly contested that it was difficult to keep the numbers down to 'only' 140. This included water agencies, government bodies and regulators, researchers and educators, and consultants. About one third of the participants were from overseas – Australia and New Zealand, Canada, the UK, The Netherlands, Portugal, Japan, South Africa, Norway and Germany.

The first day started early – 7.00 am for a continental breakfast and registration with the workshop proper starting at 8.00 am. 32 paper presentations, one breakout session and a poster session later we finished at 7.30pm. Three more breakout sessions and reports back by the four session chairmen took up the second day – and resulted in an agenda for utility collaboration, education and training, research and institutional relationships.

**And the outcomes?**

**Education was seen as a key requirement**. There was a perceived need for both practical and academic training. There are no academic courses in asset management in American Universities.

**In the line of practical training**, the following were considered significant enough to be separately delineated:

- Training for small/medium system managers
- Skills for addressing mature infrastructure
- Definition of competency standards for asset managers
- State operator training support
- Skills/gap analysis
- Working with unions and developing a multi skilled workforce

**For academic training**

- To draw on training programs overseas
- The need to attract more students
- Triple bottom line training for the engineering curriculum!Combining students with practitioners and hands on projects for undergraduates

**Public education** was also considered important and the following was suggested, only partially in jest "Water Resources 101 – What happens when you flush"

**Research issues were keenly debated**

A number of the issues raised under the research program would be equally well suited to many other countries. I was particularly taken with the following:

- Develop correlations between asset condition and performance of assets
- How to incorporate life cycle considerations into the public bidding process
- What's working and what's not – develop a clearing house of ideas
- Benefit cost analyses of asset management activities (ie. Business cases)
- Identify drivers for future infrastructure needs (eg climate change)
- Private/public partnership asset management risk analysisHow to develop the culture of asset management in organisations

**Government/Regulatory Issues**

**The questions asked in this breakout are worth recording:**

- What institutional relationships among the various levels of government (federal, state, local) inhibit the efficient deployment of AM practices?
- What actions, if any, can be taken to support and improve the practice of AM by making innovative adjustments in the institutional relationships among various levels of government?
- How to improve 'bottom up' intergovernmental processes to better define service levels and the impact on cost and risk of providing sustainable services (environmental, social and economic) at the community level

**This session, to my mind, brought forth some of the most interesting suggestions. For example:**

- Create a "blue ribbon" panel to research and evaluate regulatory impacts, costs and burdens and benefits of regulations - and make recommendations
- Get regulators to have outcome measures (triple bottom line) as their goals instead of pure compliance measures.
- Encourage review of efficiency benefits potentially achieved through amalgamation of water and wastewater activities nationally (there are an estimated 53,000 water authorities and another 30,000 wastewater authorities in the USA; some of these are very small and may cater for only about 100 houses.)
- Governments should be encouraged to use life cycle analysis and risk based processes in determining funding priorities.
- Asset management plans and full business cases should be required for any government funding.

**Finally, the Utilities themselves**

**The utilities were asked**

- What specific assistance is most needed to advance AM
- What are the systemic 'inhibitors' to the deployment of AM
- How best to build on the AM processes already underway in various utlitilies
- How best to share data, techniques, examples of 'deliverables', training materials, etc

**Amongst the suggestions were:**

- Succession planning – without it, early AM gains may die when supporters move to other roles
- Seed money and support for AM initiation
- Establish a clear relationship between strategic AM and ongoing AM operations
- Publish an American version of the IIMM
- Develop an ISO standard
- Central help desk/access to expertise

**And the two most common comments throughout the two days from all groups and all breakout sessions?**

Clearer definition of AM and
Develop common standards

# What do we know?

Go back 20-30 years and few agencies were really treating their networks, buildings, plant and equipment as *assets to be managed*. And those that did do so were mostly using ad hoc processes. The systematic and system- wide processes that we use today are a recent development.

If we go forward another 20-30 years, we will no doubt see knowledge itself treated as an asset, and subject to systematic and system-wide processes. But why wait?

In this article, John Hunter, Redlands Shire Council, explores the processes by which you can collect, store, update and retrieve your own knowledge. As a practitioner, John has not only been exploring the 'how to'; *he has been active in applying what he preaches* – and he is more than happy to speak with others either new to the process or with mature ideas to share.

Contact him on <**jhunter@netspace.com.au**>

Does this illustration strike a chord with you? After a male or female ex-employee walks through the door, heading for the wide world, a lot of asset knowledge in their head may also leave the organisation. This person could be a Chief Engineer, Project Manager, Maintenance Manager, QA Manager or Maximo IT specialist. All have a role in asset management.

We are entitled to ask what organisational processes are in place to preserve and to disseminate a lot of that asset knowledge. My question is deeper than if we simply answer "Yes – We took some notes from the ex-employee in the two to four week period between resigning and leaving".

Knowledge management (KM) is not purely about capturing knowledge after a resignation or investing in IT to record data and information and it is a sure way to lose face and money.

KM is actually a misnomer as we are not trying to manage knowledge. As a strategic process, KM involves people and that is why there must be a fundamental shift in the strategic paradigm. KM consists of many arms as follows:

Developing knowledge – There must be processes for acquiring, creating and capturing asset knowledge. Do we inspect assets on site; do we conduct condition assessments; is there a process to benchmark internally or externally; have we developed KPIs; how is this data captured?

Applying knowledge – How do we apply asset knowledge to our advantage; is there appropriate funding; do we have all available tools?

Assessing knowledge – Is there a validation mechanism; can we check data against the OEM criteria or other available criteria?

Preserving knowledge – Do we record it in a log book; embed it in our procedures, record it in Word or in a document retrieval system such as DataWorks?

**Updating knowledge** – Is there a review process; if we are reviewing asset defects, and we determine a defect mechanism (root cause) was incorrect, how do we correct it; how is knowledge refreshed and maintained?

**Transferring knowledge** – How is it the asset knowledge disseminated; is it by memo; are meetings held; how is knowledge communicated upstream and downstream?

**Transforming knowledge** – What processes are there for standardising (conventions used?), formalising and reformatting knowledge for better understanding?

In the prior edition of SAM, I discussed Lessons Learnt which is part of KM and fits well with several of knowledge methodologies above.

It is useful to make distinctions among data, information and knowledge. These terms are ascending in levels of understanding.

### Distinctions among Data, Information and Knowledge

**Data** – May consist of measurements, readings, scores, and can be discrete, unstructured or symbols. In a CMMS, it may consist of kilometres travelled (numbers of round trips) for the failures or railway rolling stock wagon bearings. In this sense, data generally has little context and may be presented in no particular order.

**Information** – This is when relationships exist among the data which may be plotted. A bath tub curve may be the result. Typical failure curves may be obtained from other rolling stock work shops, the OEM or other railways. By comparing these results, data is being converted into information.

**Knowledge** – Once the data is analysed, a root cause analysis (RCA) may find:

- The wrong bearings were used
- The wrong packing grease was used
- There was excessive water infiltration
- Preventive maintenance was not undertaken

This becomes valuable knowledge where we can implement an appropriate remedy.
The above represents a simple journey from data through information to knowledge.

### Nonaka Matrix

Nonaka is a Japanese author who has created a matrix model to demonstrate that knowledge goes through a process cycle of knowledge creation and conversion:

- Tacit to tacit knowledge **(socialisation)**
- Tacit to explicit knowledge **(externalisation)**
- Explicit to explicit knowledge **(combination)**
- Explicit to tacit knowledge **(internalisation)**

| | **Tacit** | **Tacit** | |
|---|---|---|---|
| **Tacit** | **1. Socialisation**<br>"Sympathised knowledge": Share experiences to create tacit knowledge. Example: on-the-job training, interacting with customers.<br>**Individual to Individual** | **2. Externalisation**<br>"Conceptual knowledge": Articulate tacit knowledge explicitly: metaphors, concepts, hypotheses, models, writing.<br>**Individual to Group** | **Explicit** |
| **Tacit** | **4. Internalisation**<br>"Operational knowledge": Learning by doing - Developing shared mental models and technical know-how.<br>**Organisation to Individual** | **3. Combination**<br>"Systemic knowledge": Manipulating explicit knowledge by sorting, adding, combining.<br>**Group to Organisation** | **Explicit** |
| | **Explicit** | **Explicit** | |

**Socialisation**

This is tacit knowledge shared among people. e.g. Master / apprentice, meetings or mentoring. It has advantages and is learning by doing. To integrate additional skills to be used by (say) the apprentice, this method should be combined with others so that new technology and other advanced ways of doing things can be integrated. It is characterised by **Individual to Individual** relationship. Knowledge is transferred by imitation, story and practice.

**Externalisation**

This is the method for making tacit knowledge explicit, and is manifested through writings or other data capture mechanisms. It is characterised by **Individual to Group** transfer of knowledge. It may encompass models, metaphors, and the general articulation of tacit knowledge. An example may be the preparation of a CMMS user manual. It is primarily where tacit knowledge is codified through knowledge capture.

**Combination**

This is the sharing of asset knowledge and may be through a document retrieval system such as DataWorks or adding to existing knowledge through tertiary training or via the Intranet. It is the transfer of knowledge from **Group to Organisation** and is systematising explicit concepts into a knowledge system.

**Internalising**

This is taking explicit knowledge and interpreting and incorporating it into the way that things are done. It is the transition from describing and reading into actually doing. It is the transfer from the **Organisation to Individual.**

Nonaka emphasises that KM requires significant human interaction strategies.

An author Karl-Erik Sveiby supports Nonaka, saying that information on its own is a very poor vehicle for transferring knowledge. A better way is to show how to do something (or actually doing it such as Internalisation) or to involve the learner in the exercise. This helps inculcate know how and know why and complements the information presented in the other quadrants of Nonaka's matrix.

**Build KM into Organisation's Strategy**

In the prior edition of SAM, I indicated it is important to review assets on site and it is essential to discuss issues with all stakeholders. Involving people (our greatest assets) will prevent rote learning and reinforce that KM is not as an end in itself, but is an opportunity to apply it for the organisation's benefit.

It is important to build some slack into employee's heavy workloads to enable them to invest time outside their immediate operational issues.

There are huge opportunities to expand asset management through knowledge based strategies by:

- Optimising costs and to allow improved asset efficiencies
- Improving reliability and quality
- Minimising rework

Some of these methods may include:

- Focusing on critical assets
- Identifying knowledge dependent asset business processes
- Identifying where strategic human capital may be best invested to enhance asset management

**Conclusions**

Like Asset Management and Risk Management, KM is a relatively new discipline that is progressively being formally integrated into our management processes. An interim Australian Standard (AS5037 (Intl) on KM has also been prepared.

How we embrace KM into our asset management practices is up to us.