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ASSUMPTIONS AND 'GUT FEEL'

Under-developed tools in the Toolbox

We have come a long way in collecting and using data, but has this led to a number of unintended by-products?

For example, have we tended to denigrate **'gut feel'** as inferior to data analysis, thus missing the fact that 'gut feel' is able to integrate a wide range of information far more efficiently and far more quickly than data ever can and thus should be a valued – and developed – part of our toolbox?

Danny Azavedo looks at the neurological basis of gut feel to show why it should be used (but not exclusively relied upon). (see pages 1010-1011)

And have we tended to focus so closely and exclusively on data and data analysis that we have failed to develop **assumptions and assumption analysis**?

This is surely work that now needs to be done and I take an initial look at where we are in the use and analysis of assumptions. (see pages 1008-1009)

Finally, observing the enthusiasm and excellent intuitive work of asset managers in Canada where data is yet to be developed to the levels that it has in Australia and New Zealand, had led me to speculate that too much emphasis on data might destroy the spirit!

When asset management is reduced to feeding data into models do we then stop thinking?

And, not thinking, become detached, dis-engaged and despondent?

For fun (and repositioning if negativity is creeping in) is "It's the institution!" on pages 1012 –1014, a short version of the closing plenary address to the IPWEA National Conference in Adelaide in September.

As always, please enjoy!

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ASSUMPTIONS –our tool for dealing with the future.

This is part of a plenary address to senior utility managers in Europe that I gave in London last month. It attracted a lot of attention there and also with asset managers in Canada.

Over the past twenty years and more we have greatly improved our ability to collect and manage DATA. This, of course, has been greatly aided by the rapid development of computer technology and by the ever-cheaper costs of data storage.

This means that we are better able to understand what has happened.

But when we start to extrapolate from the past to the future, we need more than DATA - we rely on ASSUMPTIONS. But these are not so readily available for analysis, or at least, we have yet to develop the tools for their analysis to the same degree that we have done for data.

Assumptions are not 'collected' - they are most often, implicit and not recorded and so not amenable to analysis. This leads to them being neither 'verified' nor ' validated'. Even when they are made explicit, they are frequently not subjected to much examination (e.g. assumptions at the broad planning level of future productivity change).

This results in assumptions that are

- Not widely understood
- Not necessarily consistent with each other
- Difficult to change when the world changes

ALL MODELS DEPEND ON ASSUMPTIONS. So all of the work that we do in collecting data and analysing it is at risk. There is no point in continual sharpening of only one blade of the scissors (data).

ASSET MANAGERS ARE IN THE FUTURE BUSINESS. The decisions that we make today have long-lasting and far-reaching consequences. We may decide to do something today – but the reason for that decision is to affect something in the future.

TO DEAL EFFECTIVELY WITH THE FUTURE WE NEED TO DEVELOP OUR ABILITY TO ANALYSE OUR ASSUMPTIONS ABOUT IT.

So where are the tools for using, generating, evaluating, and testing ASSUMPTIONS?

Over the page is a brief summary of our current tools for dealing with the future – and the assumptions they employ.

DEALING WITH THE FUTURE—the current toolbox

This is a summary of the current state of play—almost all of our tools for dealing with the future are aimed at removing uncertainty

In the next issue, I want to look at ways of living with uncertainty

High Forecast/Low Forecast Planning

- Often focussed on one market driver
- Optimistic and pessimistic outcomes derived from sensitivity analysis
- Seeking the 'most likely', a 'one point' focus
- Usually straight line
- One thing that can be said for forecasts – they are nearly always wrong!
- Assumption: linear extrapolation from the past

Trend Impact Analysis

- Eg effects of trends in markets, population, oil prices, over a given time period.
  - **Assumption** - Extrapolation but trends are examined rather than simply being extended into the future. Looking for the single 'most likely" future.

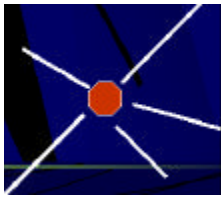
Cross-Impact Analysis

- Analysis of complex systems. Looks for ways in which forces combine to generate effects bigger than the sum of the parts
  - **Assumption** – This is more than extrapolation, results may not be linear because they are the intersection of different effects.

Delphi Method

- A consensus view among experts
- Widely used in Technology Futures
  - **Assumption**: Goes beyond mere extrapolation, but still looking for a single point

Scenario Development



- "An internally consistent view of what the future might turn out to be – not a forecast, but one possible future outcome" **Michael Porter**
  - **Assumptions:** Explicitly recognises scope for multiple futures - **not a single point**

This makes it possible – and necessary – to pit **assumptions against each other for examination**

Gut Feel

Danny Azavedo, Sydney Water Board

Gut Feel—We use it everyday

An assessor **examines** an operating pump to grade its condition (1= excellent, 2= good, 3= fair, 4= poor, 5 = failed) The **sensory processes** (eyes, touch, smell, sound), **Input** the information, to the central processing system (cognitive processor) where : **Information** is examined, **previous experiences** is *drawn* from the memory , **response** is then *passed* on to the motor process , that *provides* an **output** - an action that the condition is **fair –3.** Action may be written or spoken

This is an example of the **Intuitive Approach to Asset Management..** In this intriguing short article, Danny Azavedo shows how neurological research supports the use of gut feel in the decisions that we need to make as asset managers – *and why we should not rely on gut feel alone..* It is part of a paper he recently presented to an IQPC Conference on Asset Life Extension

Intuitive approach

Neurological research shows that – by tuning into our **feelings,**we find the meaning in data this leads to **better** decisions.(**Emotions** have a place in the rational world specially when we are **flooded** with data, and try to make some sense of it to **forecast ,** estimate or decide on **s**omething**.**

Intuition alone can lead to **bad** decisions**. "You have to be in it to feel it."** We use *intuition* to **build** from other information and experience**.** We **weigh** information in terms of their intuitive gut feeling.

How intuition is developed?

We **learn** from life experiences to **build** up our intuition. When we are placed in an **environment, decision rules** are registered in the brain based on what does **work** and what does not **,** what **tactics** succeed in a particular situation.

Intuition and the human brain

This type of learning happens in the **Basal Ganglia** region of the brain**,** here we **do not** process memory in **words** but as a **complete incident** and the **corresponding feeling(Complex decisions** involve the **basal ganglia** as well as the **amygdala** area of the brain.

Amygdala stores emotions associated with experiences**.** Every **experience** has an emotional reaction which is **encoded** in the amygdala. When making a decision we often draw on the **learning** that we do sub-consciously. It is the **feeling part** of the brain that **delivers** the best result as compared to the verbal part.

On-the-job experience of people**,** continuously contribute to their **wisdom** throughout their working life**,** even when their **abilities** to learn

Recent studies in **"implicit learning"** have given *credibility* to intuitive reasoning, when deciding on **complex** situations. When a **problem** arises the mind weighs the emotional responses from previous experiences to deliver the *answer* in the form of a **hunch**. An **intuitive decision** come from a subconscious logical analysis, where the brain comes up with a **weighted conclusion** that this option seems more right.

new technical skills may have reduce**.** The brain does not process *intuitive decisions* in **words.** Instead it is the **amygdala** that *signals* to the gastrointestinal tract and *creates* the **gut feeling**.

Some people **analyse** information and then make decisions using their *intuitive feeling*. *Others* use **emotions** to make decisions and then *justify* the hunch with **rational analysis**. We need **both** *analytical* and *intuitive* approach to be **effective**. The **gut feeling** does not outweigh the **facts** but it should be weighed with the **facts**.

We are basically **information processors**. The human information processing **(HIP)** system consists of functional elements. The **input** comes from various sources of information and, the **output** from the system are actions or behaviours.

The information-processing model is made up of:**Sensory** Processes; **Attention** and Perception; **Cognitive** processing and decision making; **Motor** processes and outputs.

Human Information Processing (HIP)

The HIP system receives information through the sense organs. We **filter** and only accept a limited quantity of information. We then **select** and **interpret** the information before using it. These processes of information **selection and interpretation** are known as "attention" and "perception".

Cognitive processing and decision making.

The information we take in is usually **incomplete.** We **overcome** this by interpreting the information. **Perception** is the process of interpreting sensory information. The **information** we accept and interpret, together with the information stored in our memory becomes our **Knowledge base** in decision making process.

Motor Process and outputs.- As a result of various cognitive processes the output of HIP may be verbal (what we say),or locomotor (what we do).

Information may be processed in two ways:

- Subconsciously this is done in parallel, and occurs at many different places in the brain at the same time. It gives rise to what we call **"intuition".**
- Consciously this is more logical and a serial process.

Why we cannot rely on Gut Feel alone

Decisions are made within the frame work of **attitudes**. **Attitudes** are components of a persons **psychological** makeup. Attitudes are developed through **experience,** and may be heavily influenced by **cultural** and **social** pressures.

It's the System!

Have Asset Managers lost their positive 'can do' attitudes?

Are we, instead, becoming a community of whingers?

It's great being at conferences; we are so upbeat! We are in 'can do' mode. But when we get back into the office, what will we hear then?

"Woe is me! My assets are ageing, there is insufficient funding, my data is poor, I have difficulty finding any decent young graduates let alone people with experience, my elected members just don't want to listen, the public aren't interested and don't understand, and no-one is thinking long-term."

What do you notice about this catalogue of woes? First, it is all negative! And Second, not one of them is <u>our fault!</u>

It's the system! It's the politicians! It's, it's, it's …….
But it is <u>not me!</u>

When we say the elected members don't care; the public isn't interested or the finance section doesn't understand— We are basically saying there is nothing we can do about any of it – it's the system!

At the IPWEA National Conference held in Adelaide last month, I was asked to challenge this. My assigned topic was "When we do what we always have done, we get what we always have got. " But what if we did something different? What would it take to get you to see these issues in a positive light?

1. Ageing Assets

Q: What is good about ageing assets?
A: An ageing asset often presents a number of LIFE EXTENSION OPTIONS with different lives and different costs compared with a new asset. Take an ageing swimming pool. Renewal of the pool liner may get another 5-10 years of life, or upgrade the change rooms and put in some shade and the pool may be functional and attractive perhaps for 10-15, or renew the pipes and pumps and get 20-25. Three options, three costs. Where else can you mix and match so easily the demand need and service supply? And if the asset is absolutely on its last legs, you have the most cost effective opportunity you will ever have to change direction or reconfigure!

2. Insufficient Funding

This is really shorthand for 'IF we continue to do what we have always done, we won't have enough funds" – and as such it enables engineers to do what they are famous for the world over – being creative! And we need creativity because <u>*more*</u> funding for one service inevitably means <u>*less*</u> funding for another. So we need to ask ourselves what should be given up, and who should do so. Should other council or organisation services be cut, should ratepayer or customers manage on less? Should funding be provided by another level of government (and <u>*their*</u> services be cut, or <u>*their*</u> taxpayers manage on less?)

Of course, you may well argue that your outcome is more important than other outcomes that are being funded and that they should be cut and you should get their budget for your outcome. Fair enough. They can do likewise, of course, and put in a bid for your budget. And now we find that we are comparing outcomes across the full spectrum, roads with water, with libraries, with sport and rec, with garbage collection. And before you know it we have fully integrated asset management.

3. Can't find good staff

Perhaps this one should be recast this as "We can't find good maintenance engineers with heaps of experience, who have a good interest in wider asset management and who are available at the rates we can afford to pay". As with Issue 2 above, this will take some creativity as demographic changes now taking place mean that this problem will get worse and not better.

Relatively speaking the age of our skilled work force may not be as much as we think It is! Consider: We used to start work at about 15 and work to 65 (well, we did if we were men, women had it easier!) So that is 50 years in the work force. Now what do we find? What with extended school and further education our young people are delaying entry to the workforce until about 20/25. But on the other end with improved health and fitness, 65 isn't what it used to be, and finances are not what they used to be either, so more and more people will be finding that they can go on working, and need to go on working. It is quite likely that we will now see people quitting the workforce around 70/75. So again we have a 50-year span in the work force. Only compared with a 70/75 year quitting time, the fact that our experienced people are now around 45 –50 suddenly doesn't look so urgent! This gives us some breathing space – so how are we going to take advantage of it?

Here are a couple of suggestions:

1. Can we use our experienced engineers more effectively – in a mentoring or teaching role – to guide the work of others rather than do it themselves? In this less physically demanding role, would it be possible to attract back some of your recently retired folk – at least those who haven't moved out of the district and taken up fishing or coastal living – are they getting bored, would they fancy a few days a week of light work in guiding and mentoring?

2. Youth unemployment in some rural areas can be 50% or more. What an incredible waste of young talent and young lives! These young people cannot do what the experienced engineer can do but is this really necessary? How many of our supermarket checkout operators can actually add up? Really, it is a moot question; *they don't have to!* Could we break down the components of asset maintenance into simpler tasks that can be taught to beginners?

4. Poor Data

Poor data, we all have it. Dirty, incomplete, unreliable data. It's endemic. And in many ways it is getting worse. Why? Often because we collect so much, with lots of duplication, that we have trouble keeping it all up to date. Being more selective can save money and improve quality. (Think back to the example of Boroondara Council that did

an audit of its data systems, expecting to find about a dozen and found around 80 or more!) Often we can greatly improve the usefulness of limited data by sensible use of assumptions (we will cover this in more detail in a later SAM issue). But the main thing to realise is that it is not DATA that we need but INFORMATION. In an earlier issue this year Ruth Wallsgrove reported on a UK study showing that good INFORMATION and processes actually costs *less than poor* - so if your information processes are not good, there is scope to improve and save money at the same time! (check the SAM archives)

5. The Community isn't interested

How do we know? Is it the fact that they didn't come out of their warm houses on a cold night to sit in a drafty community hall to be lectured at? Or because they didn't put the time into to responding to community plans and proposals coming up with innovative suggestions, insightful critiques and useful questions that are ignored? Hey, who would be interested under these conditions?

Wanganui in New Zealand offered to consult with the community anywhere they chose, in the council rooms, in association halls or in their own homes. A large number chose to meet in homes and invited the neighbours in. Some of these houses were packed to the rafters. The average number of people per house per meeting was about a dozen. Now THAT doesn't sound like a lack of interest to me! (The tea and scones were good, too.) (i.e. To get a different response – do something different!)

6. Elected Members are not interested

Elected Members are only interested in being re-elected? Why not, we all want to keep our jobs. But when we make this complaint we forget that it is the politician who is so secure that he doesn't need to listen to his community that is the real danger to our democracy. The REAL reason that the pollies are so keen on ribbon cutting is that WE (the community) reward them for giving us new things and they get to keep their jobs. As asset managers we can make changes here – presenting politicians with well reasoned and documented business cases that focus on service to the community will give the politicians the tools they need to sell a good story and stay in business – and we (asset managers) stay in business too! The South Australian "Step by Step" program has demonstrated many times over that Elected Members are very interested in asset management when it is presented to them as a tool for achieving their community objectives – and not as a financial constraint.

7. Nobody takes the Long Term View

So, is it the System?

Or is it us?

We think that we are the only ones who take the long-term view. But – bear with me here folks – we are only doing the <u>*easy*</u> bit! We know how to keep our assets operating for the longer term. But what we know how to do is to keep them operating <u>*as they are now*</u>. Yet if there is one thing that we know about future demands is that they will <u>*not be what they are now.*</u> We need to develop new tools for examining possible futures. We will be tackling this important issue in future issues of SAM so watch for them!