AMQ International

Strategic Asset Management

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Strategic Asset Managers
provoke questions

"Learn from yesterday, live for today, hope for tomorrow. The important thing is not to stop questioning"
Albert Einstein

"Effective management always means asking the right questions"
Robert Heller

In a world that is rapidly changing, how can you adjust in a timely fashion and still keep control?

This is an important question that we all need to face up to and over the next few weeks we will explore how Netwerk Essent, the Dutch electricity utility is doing it.

This is not an example to be blindly followed (NE are continually refining and improving and it will be different again next year!) but rather an example of one approach—to stimulate your ideas on the subject.

AM is a multi-disciplinary field: In this issue and the next, we focus on the role of the Architect and Designer.

What questions do they need to ask of themselves—*and what questions do you, as the client, or asset manager, need to ask of them?*

Enjoy - and ask questions!

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"Asset management is a strange business"

YPE WIJNIA & JOOST WARNERS

See Author profiles on the back page.

A typical Asset manager works with an asset base that is very old. For example, at Essent Netwerk the oldest assets in operation are about 100 years old, and the average age of the assets is about 30 years. Each year about 3% of the asset base is either built or replaced. Typical maintenance cycles have a period of about 10 years. So, about 13% of the asset base is touched on a yearly basis.

➢ *This means our basic job is more like staying clear of the assets and let them perform their function than it is like actively doing something with them, as the term Asset Management suggests. Therefore it might be wiser to call ourselves asset non-managers*.

The strangeness of Asset Management increases further if you look at the portfolio of asset and network policies. From long experience with managing assets, most policies have reached a high level of sophistication and they address not only the general situation but all kinds of possible exceptions which have been encountered over the period since the policy was put in place. Those exceptions have exceptions of their own, requiring further detailing of the policy.

➢ *In the life cycle of a policy attention therefore drifts from the original problem to managing exceptions. This means that as the sophistication of the policy grows, the knowledge about why the policy was developed in the first place diminishes.*

Exaggerating a little bit you could say that Asset Managers do not manage most of the assets, and in case they do, they haven't got a clue why they are doing what they are doing. You would expect a system that is managed this way to collapse very soon, but somehow it does not, as the electricity grid in Europe has a reliability of about 99.99%.

➢ *However, this way of managing assets can only work in a stable environment with stable or at least predictable requirements for the assets. Unfortunately, the world we live in is nothing like stable.*

For example, the liberalization of the electricity markets has resulted in an income cut of 50% for the grid companies in the UK in the period 1995-2001. Internally, issues like the retirement problem (due to age profile of staff about 50% will retire in the coming 10 years) or the asset replacement problem (due to age profile of assets) will require policies that solve other problems to sustain the operation of the network at its current performance. On the outside, issues like globalization, terrorism, global warming and oil depletion, most likely will set new requirements for the grids, again requiring policies to solve other problems. This change of needs may happen very fast.

➢ *The current policy adaptation cycle is by no means fast enough to follow those changing needs. How can asset managers overcome this problem? In this paper we describe the approach Essent followed to facilitate a faster policy change.*

Portfolio Planning

YPE WIJNIA & JOOST WARNERS

"We all know the situation that we have the perfect solution for a problem, but that the problem owner does not agree, as he is not willing to spend so much on such a small problem. In other cases a huge argument might arise what the best solution is. Especially in companies that are the result of mergers of smaller companies this might implicate that two completely contradictory policies for the same problem exist."

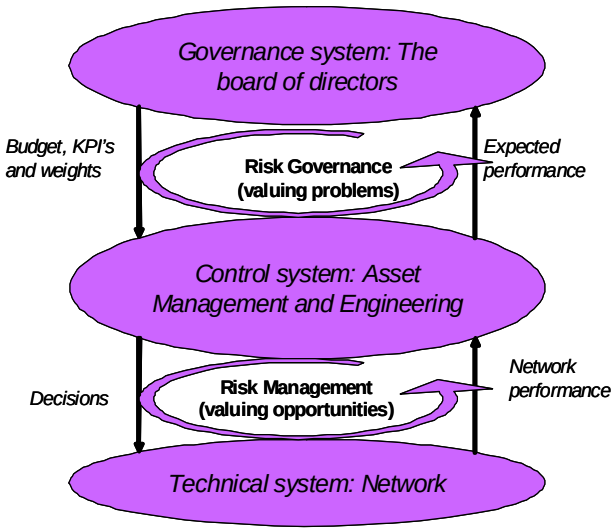
1 Understanding the problem

We asset managers like to think of policy making as problem solving. Somewhere in the network is a problem, we call a smart engineer, she designs the problem out of the system and this design is promoted to a policy to prevent the problem from reoccurring. However, in reality it does not work that way. Finally, sometimes we just have a new design and are looking for a place in the network where it could work, or more directly, we are looking for a problem that fits the solution (cynics might even say that we invent problems to show of our new gadgets).

On one level, we have to determine how much we are willing to spend to solve a problem, or to determine if the problem solved is worth more or less than the new problems the solution creates. On a second level, we have to determine what the best solution is for a problem, given constraints as a budget , et cetera.

Those two levels of decision making are presented in the scheme below as interactions between systems. The bottom cycle represents the interaction between the *technical system* (the network) and the *decision makers* (asset managers) and is about valuing opportunities to improve the performance of the technical system. In our language this is risk management. The top cycle is the interaction between the *institutional environment* (for example, the stakeholders and regulators) and the *decision makers*. (we call it Risk Governance) is about valuing problems. In this cycle the business values are set and weighted, risk tolerance matrices are defined and the total budget is determined. As the risks of electricity networks typically do not only affect the company itself in this cycle the interest of other stakeholders are taken into account. To distinguish it from risk management we call this risk governance.

As you would expect, risk governance influences risk management by determining what should be seen as an opportunity. But risk management also influences risk governance. If for some intolerable risk no feasible solution exists, the risk will eventually be accepted. On the other hand, sometimes a risk becomes intolerable just because a feasible solution exists.



It is interesting to look at this double-loop decision making system from a change perspective.

The system with the highest inertia is the technical system. We have seen the assets have a very long life cycle, but the technology (e.g. 50 Hz alternating current) has an even longer life cycle. In contrast, the institutional environment can change very fast, as we have witnessed in the case of liberalization, or more recently, in the reactions to the threat of terrorism. Asset management is somewhere in between. It is easier to replace the asset management department than to replace the network, but even with the most sophisticated knowledge management systems an asset manager takes some time to reach maturity.

How quickly can you adjust to new demands on your system?

Policy development is in this model a reaction to either changes in the risk valuation or to irregularities in the technical system. But we have seen that policy development is necessarily slow. So, if due to some external drivers the risk valuation changes, asset management starts reacting by making new policies. It takes a few years before the policies can be implemented, and then it can take decades before the policy is fully implemented. By that time the requirements might have changed again. Is there no way to skip this policy development stage? Is there a way to make an investment plan that has built in flexibility, thus allowing last minute changes in targets?

For Portfolio Decision making to deliver its maximum value *the engineering staff has to be encouraged to produce much more project proposals than will fit the budget.* It is even better if some of the proposals are some radical deviations.

Summarizing those requirements, one could state that a portfolio decision requires more decisions in more detail earlier in the process, to enable decision making about the performance of the network. **In the next issue** we show how Essent Netwerk made this happen.

How about a portfolio approach?

Traditionally, decision making is essentially case by case. For this type of decision making policies are needed to evaluate the proposals as the influence of a single proposal on the network performance is very small. But if one looks at the effect of all proposals combined, the effect might be quite significant. For example, the loss of redundancy in a transmission circuit might increase the frequency of outages from virtually zero to once every 10 years, with a duration of 8 hours.

The effect of a single case on the network performance is negligible, but if all transmission circuits lost redundancy the average extra outage time per customer per year would be almost an hour! No policy is needed to see that this is not very acceptable.

> Thus, if you want to skip policy development the trick is to look at the whole, instead of looking at individual cases. Decisions about the whole are often called portfolio decisions. However, portfolio decisions have some special requirements of their own, as they are selections out of sets of opportunities.

The first requirement is that the opportunities can be ranked,

This is only achievable if the value of the opportunities can be expressed on a single scale. As the project proposals address improvements on all business values, this ultimately comes down to putting a financial value on a human life, a conviction or a customer minute lost. These values can be used to calculate the monetary equivalent of the benefit of the project.

> Dividing those monetary equivalents by the costs of the opportunity gives the yield, the value for money. To achieve the highest value your budget can buy, just allocate your money on the highest yielding opportunities until you run out of budget.

Besides this single scale criterion, *another important property of portfolio decisions is that they are only useful if there is something to choose.*

Ranking projects is only interesting if there are projects to be rejected. The more the spread in the opportunity list, the more value the portfolio decision can deliver.

> This need to explore can be quite conflicting with the culture of a company, especially if it is seen as a defeat if a project proposal one has been working on is rejected.

The final requirement is that the opportunities be assessed in terms of the key performance indicators, but nothing more than those indicators.

Whereas in individual project proposals always some room exists for additional benefits, it is almost impossible to capture those benefits in a systematic way for all projects, if the list contains more than a handful. In addition, the assessment of all projects has to be finished before the year starts.

> In the case by case scenario you would make a selection to determine the budget, but the details and the decision per project would be worked out in the next year. Therefore, the portfolio decision requires the assessment on average half a year earlier.

Asset Management is for more than Engineers; Architects and Designers have a critical role to play

QUALITY DESIGN

This is an excerpt from my chapter in a new book on **Managing Quality in Architecture**, to be published in May 2006 by Architectural Press, Oxford, an imprint of Elsevier. - Ed.

Quality is not just quality now or the way the building looks and functions on delivery, but rather 'quality for a lifetime'; this is where the asset management requirements of the brief become important.

Asset management is choosing, using, maintaining and disposing of an asset in a manner that optimises benefits for the owner and stakeholders. It concerns the decisions made before the asset is acquired, and those decisions that continue throughout the life of the asset. In essence it is about maximising benefits over the entire life of the asset, be that ten, twenty or 100 years or more.

Is such a 'life cycle' approach relevant for the designer whose involvement in the project is a pretty short one?

'Asset management' is an umbrella term that is used to cover the *integration* of all the steps in the life of a building asset from concept, through design, construction, maintenance, use and its eventual disposal. It looks at the links between these hitherto largely separate functions, for the purpose of producing the lowest life cycle cost for the desired function. The technical fields dealing with this include 'life cycle analysis' and 'post-occupancy evaluation'.

Surely the responsibility of the designer cannot extend to maintenance, use and disposal?

But asset management is concerned with maximising the cost effectiveness and quality delivery of *the total asset portfolio* of the business, rather than with maximising the output or quality of any one individual building. In other words, each asset, each building is evaluated not as a 'stand-alone' but rather in terms of what value it will add to the owner's total asset portfolio. The technical fields dealing with this include 'corporate asset management' and 'portfolio management'.

What does this wider management function have to do with the designer?

Why Asset Management is important for Architects and Designers

Actually, all of the above points apply to the designer – and thus to excellence in design documentation. While the actual construction is the responsibility of the builder, and the maintenance and use of the building is the responsibility of the facilities and maintenance managers, the *integration* of these elements has its basis in the way the asset is designed.

The Quality Promise

Quality promises are implicitly made to the client, the wider community and the profession.

The quality promise to the wider community is that the building will add value to the total urban landscape – or, at the very least, that it will not diminish it! Building designs that do not consider the management of the asset through time can quickly become urban eyesores rather than highlights.

The promise to colleagues is that this design is one that will support, even enhance, the reputation and credibility of the profession.

AM not an 'extra' but integral to the brief

Incorporating the explicit, or implicit, asset management requirements of the brief is not an 'extra' requirement; it is part of effective communication with the client, of meeting and exceeding the client's expectations and also of meeting international standards for quality. It is fundamental to quality in design and delivering on the quality promise.

Public Sector Clients now incorporating AM requirements

Building owners, especially in the public sector, are now developing specific asset management requirements. For many, the asset management requirements of the brief may be implicit rather than explicit. But this does not diminish the responsibility of the designer; it just makes it more of a challenge!

The Test of Good Design is how it holds up in the longer term

Design concepts are tested, not only by the way the building looks, but by the way it behaves through time; whether it leaks or does not, whether it suits the needs of the occupants now and into the future, whether it is easy to maintain and adds value to the owner's total building portfolio.

Functionality, Buildability, Maintainability

The client wants a good end result, and unless the brief is for a monument, that result includes functionality. Clients *trust* the designer that the design will be one that the builders can actually build, that it can be maintained and will meet the functional (and emotional) needs of the users.

Design, Construction, Maintenance & FM not Separate

Until now, design, construction, maintenance and facilities management have developed as separate disciplines, paying little heed to each other. However, in all fields from science to the arts, to politics and to business, great new ideas and developments are today being wrought by collaboration. Asset management is an expression of collaboration. It is a multi-disciplinary field that brings together the building owner, the user, the designer, the constructor, facility manager and maintainer.

Planning for asset management is part of the QM process

Clients' expectations extend beyond their intended period of use of the building to the resale value of the building. They expect that when the time comes to sell the building that its condition and functionality will commend the building to future buyers.

Design practices that included a requirement for all designers to review, within 2-5 years of building completion, what worked and what didn't, taking into account the views of both user and maintainer, would go a long way to re-assuring clients that their design would be one that would 'work in the longer term', and that it would really take into account the asset management requirements.

Internationally, there is now a strong movement to design buildings that are aesthetic, functional, *and* that care for the environment. For example, in the United States, energy usage in federal facilities is to be reduced (on a Btu/SF basis) by 35% by the year 2010 relative to 1985 levels, and in industrial and laboratory facilities by 20% relative to 1990 levels. All energy conservation measures have to be life cycle cost effective.

In the next issue we look at how to bring AM thinking into design

In this section we look at a major world issue and its impact on the future shape of infrastructure – what we need, how we will use it and how we will manage it. And to start with, what better than

FUTURE OIL PRICES

Will Oil prices continue to rise?

What do we need to know and to think about in order to make the right decisions now on current and future assets?

The price of anything is determined by demand and supply. So what we need to look at are the factors influencing the current and future demand for, and supply of, oil.

Demand is increasing

Let us make a distinction immediately between people buying more because the price is lower (a movement along the demand curve) and more being demanded at all price levels (a shift of the curve). Rich westernised countries have always consumed lots of oil and *as their incomes have increased*, they have bought more – a shift of the demand curve.

But recently there have been major shifts in demand brought about by the growth of the Indian and Chinese economies. So what we have is demand increasing, i.e. demand shifts (as shown in fig 1). If the supply curve remains unchanged we have two impacts from this. One, the price of oil increases. Two, the higher price of oil chokes off some of the previous demand in the developed world, from point Q to point Q' in the diagram.

(See diagram at the top of the following page)

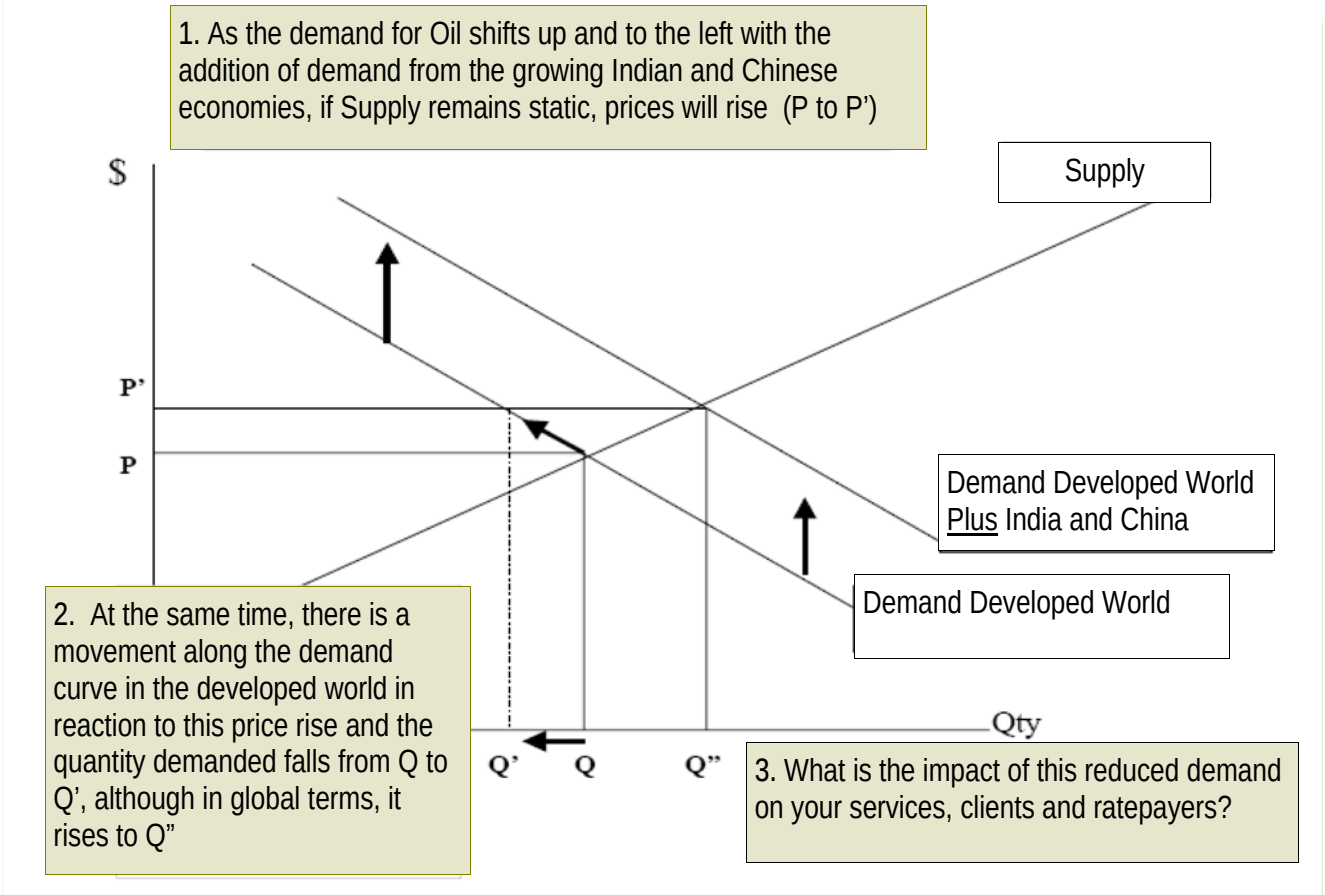
This affects us, as asset managers, in two ways:
(1) the higher price of oil needs to be factored in to all of our own expenses and forward projections. (This will be more than the construction price index.)
(2) The reaction of our clients, customers and ratepayers as they cut back their oil demands as prices increase, will impact the demand for our services.

Consider what changes this might mean for you?

- Will the amount of tourism decline?
- Will there be a change in transport patterns?
- If you are a transport hub, or planning to be, how might continuous price rises over the next, say, ten years, affect your estimates?
- Within townships will there be increased demand for facilities that can be reached on foot, or by public transport, rather than by car? Does this affect the size of the recreation facilities, for example, that we construct?
- If you are an energy supplier, what does this mean for you in the mix of fuels that you use?
- What other questions might you ask?

If supply keeps pace with demand, prices will stay constant. What are the chances? **In the next issue** we will look at the question of **oil supply** and its impact on our work as asset managers

FUTURE OIL PRICES



Contributors to this issue

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Having received a Ph.D in the field of applied mathematics and computer science in 1999, Joost has been employed as scientist/consultant at KPN Research and TNO. He has been actively involved in making mathematical techniques applicable to practical issues, such as network structure optimization, capacity management and general decision support. He has led projects for several Dutch companies in the area of telecommunication and energy.

YPE WIJNIA is Risk Manager for Essent Netwerk , a large Dutch distribution company for electricity and gas. Essent Netwerk has a strong commitment to the use of the best available asset management practices. Ype Wijnia works for Essent Netwerk since 1999, the start of the Essent Asset Management initiative.

Since his start at the company Ype was involved in rethinking decision–making on infrastructure issues. Starting as decision analyst he introduced Multi Criteria Analysis to Essent. In the following years his focus gradually changed from decision analysis of individual proposals to the portfolio decision

Ype was the author of "The Challenges of a Risk-Based Asset Management Organisation", Issue 155, Dec 10, 2004 which is available in the SAM Subscriber Archives.