

ASSET MANAGEMENT

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1 What is “Asset Management”?

Another catch-phrase, another ‘management initiative’ or just re-working of good old common sense?

We have certainly been managing assets for years, and the financial services world has long used the term to mean “getting the best return from their investments”. Nowadays, however, it is also being used to describe the professional management of physical infrastructure, of data and information, of people, public image, reputation and other types of asset. Oil companies, power and water utilities and other industries have recognised that, despite all their cost-cuttings, reorganisations, new technology, productivity and quality initiatives, the picture is fragmented. Inefficiency and conflicting objectives, lack of coordination and missed opportunities are still plentiful.

This is where Asset Management methods are needed – making sure that the jigsaw puzzle is complete and the bits fit together. Asset Management is the set of processes, tools, performance measures and shared understanding that glues the individual improvements or activities together. Or rather, since it is a very dynamic and self-adjusting set of techniques, it is the lubricant that keeps all the cogs from grinding against each other.

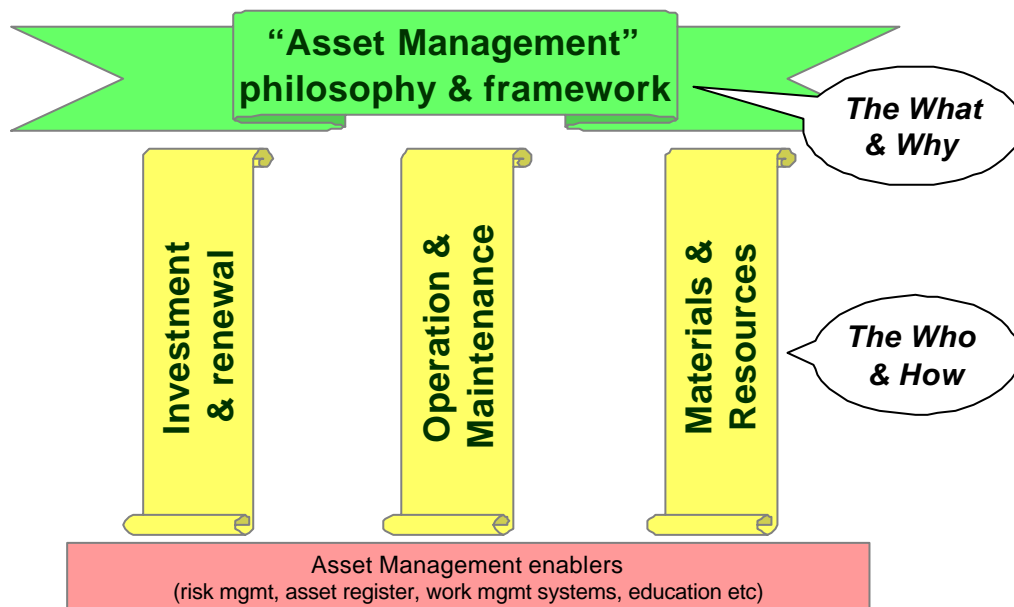


Figure 1. Building a single structure, where all the bits fit together

Of course there are many types of asset – but the principles of best value-for-money are common to all of them. Physical Asset Management, Knowledge Management, financial responsibility and even the care of public reputation, customer impression and goodwill require good understanding of value, priorities, short-term versus long-term trade-off and risk exposures. The language varies a little, but the central concepts are constant. When applied to *physical assets*, for example, a general definition of Asset Management is:

“The set of disciplines, methods, procedures & tools to optimise the *Whole Life Business Impact* of costs, performance and risk exposures (associated with the availability, efficiency, quality, longevity and regulatory/safety/environmental compliance) of the company’s physical assets.”

From this we can see that it affects all areas of the business – operations, projects, engineering, maintenance, safety, compliance etc etc. It is only possible to achieve such “whole life optimal impact” if everyone pulls together. Key performance measures must be coordinated, not conflicting. We need a clear understanding of relative importance: is it worth spending more to raise performance or reduce risks further – if so, how far do we go? Such questions are hard to answer: the available evidence (data) is patchy and often speculative; risks and consequences are uncertain; attitudes and traditions sometimes get in the way; the impact of change can take time to emerge. Even the understanding of the language is a problem – getting everyone to agree on what “optimum” means. It is certainly not the ‘balancing point’ where costs, risks and production impact are equal (the crossing point of the Direct and Penalty lines in Figure 2 below): just because costs and risks are equal does not mean that they are small! The true optimum is where the *combination* of costs, risks and performance shortfall is of minimum total impact. This is the best compromise between conflicting component objectives of, for example, reducing downtime or keeping maintenance costs down.

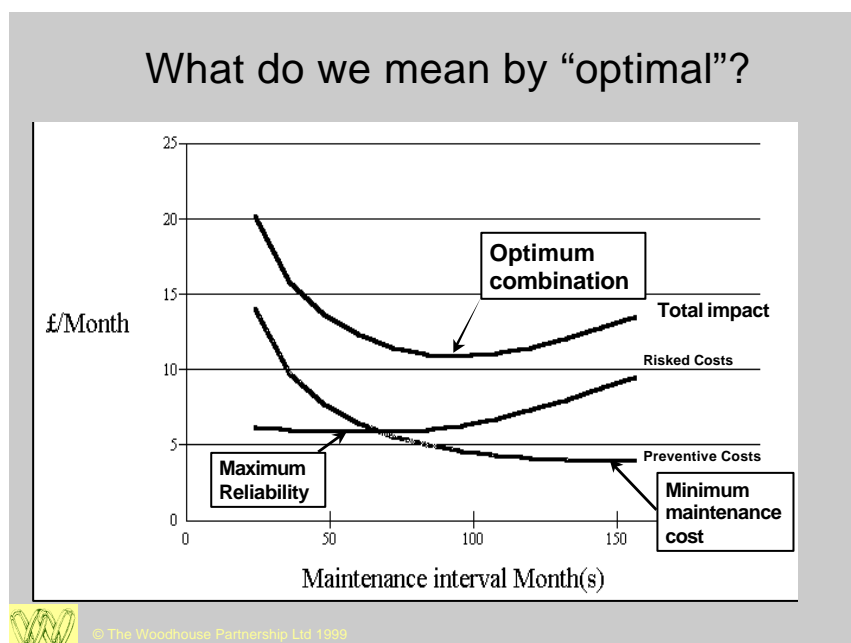


Figure 2. Optimising the combination of costs and risks

Understanding the conflicting factors, and putting appropriate numbers on them, is a substantial task. A few of the challenges include:

- Data collection – focussed on data that is actually needed and used.
- Getting projects to take whole-life view (as opposed to the ‘cheapest/quickest’)
- Condition-based maintenance wherever technically possible/economic (instead of fixed interval work)
- Quantifying risks and building them into all the decision processes

These issues have been comprehensively addressed in a 5-year cross-industry collaboration programme in Europe (the Eureka MACRO¹ project EU1488). This project has yielded some startling results. A suite of ‘best practice’ procedures and decision-support tools has now been published and the workshop tomorrow will cover some of the resulting material.

2 Where has Asset Management come from?

The UK, Australia and New Zealand are leading the world in such an holistic approach to Asset Management. Industrial and political imperatives have forced a radical re-think on how to get better performance-for-cost. Where the commercial or safety impact of failure is high, it is clearly vital to find the right combination of risk, performance and cost. So airlines, oil & gas, power and process industries have tended to develop, test and implement the most sophisticated reliability and performance optimisation tools. However Asset Management is mostly about people – shared understanding, cross-functional collaboration & teamwork, problem-solving instead of repeated fire-fighting etc.

History – oil industry

- **N.Sea oil started 1975**
- **Political aim for self-sufficiency by 1980**
- **Typical exploration & prodn costs \$15/bbl**
- **Market value average \$35/bbl**

- THEN...**
- **Price crash 1986 (to \$9/bbl)**
 - **Piper Alpha disaster (167 killed)**
 - **Lord Cullen report on self-regulation**
 - **Diminishing reserves, marginal fields**
 - **Globalisation of marketplace**



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UK Utilities sector

- **Privatisation late 1980's**
- **Deregulation (partial!)**
- **Drought 1997 (Yorkshire Water)**
- **Floods 1999 (STW)**
- **Storm damage 1998/9 (NIE)**
- **Major safety incidents (Clapham Junc. Paddington, Hatfield)**
- **Turnbull report – risk management 2000**



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The relevant Asset Management disciplines and procedures have generally emerged from the highly structured or regulated industries – initially the armed forces, airlines and nuclear sectors but now rapidly spreading to power, water and other utility sectors. Supply Chain initiatives, Quality Management, Total Productive Maintenance and Reliability Centred Maintenance are examples. Their industrial

¹ See website www.twpl.co.uk (MACRO page) for more details

usage has sometimes suffered from poor adaption or implementation, but the underlying common sense (in properly managed introductions) is self-evident.

More recently, the Institute of Asset Management (IAM) was launched in the UK and now has around 300 members. This year the IAM has entered into a joint arrangement with the IEE and relocated to London in response to the growing demand for standards, education support, experience-sharing etc. The first MSc degree course in Asset Management also now exists (based in Aberdeen) and regional, industry-specific versions have been developed.

3 Making it all work together

3.1 Coordinated objectives

The first and crucial task in establishing an Asset Management regime is to make the objectives clear to everyone. There are many interests to satisfy, and some of them are naturally conflicting (e.g. maximum reliability and minimum cost in Figure 2 above). The regime must ensure that *all* business objectives are considered, and minimise the inherent clashes between key performance indicators:

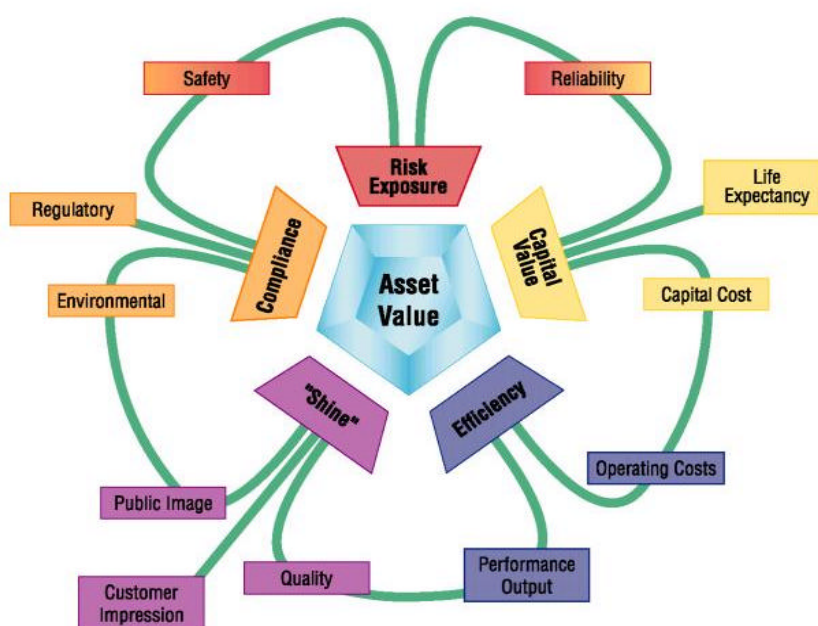


Figure 3. Some of the links between competing objectives

3.2 Linking the activities, processes & responsibilities

The overall map of Asset Management processes is very complex. Figure 4 below is just a view of the main links. Underpinning all of these activities are some vital 'enablers' – without which the individual activities grind together, and we would end up back where we started (lots of well-meaning, but silo-based and sometimes conflicting local interests).

Some Asset Management enablers:

- **Organisation alignment:** agreed objectives, shared understanding, excellent leadership and communication.
- **Integrated data, information and knowledge management:** the right data collected, to the appropriate quality/detail, available to those who need it in a timely and appropriate form, based on the actual business (decision) needs for that information.
- **Risk awareness and acceptance:** building risk evaluation into normal decision-making.
- **Long term-ism:** taking account of long term repercussions in short-term actions and decisions (e.g. Life Cycle Cost analysis).

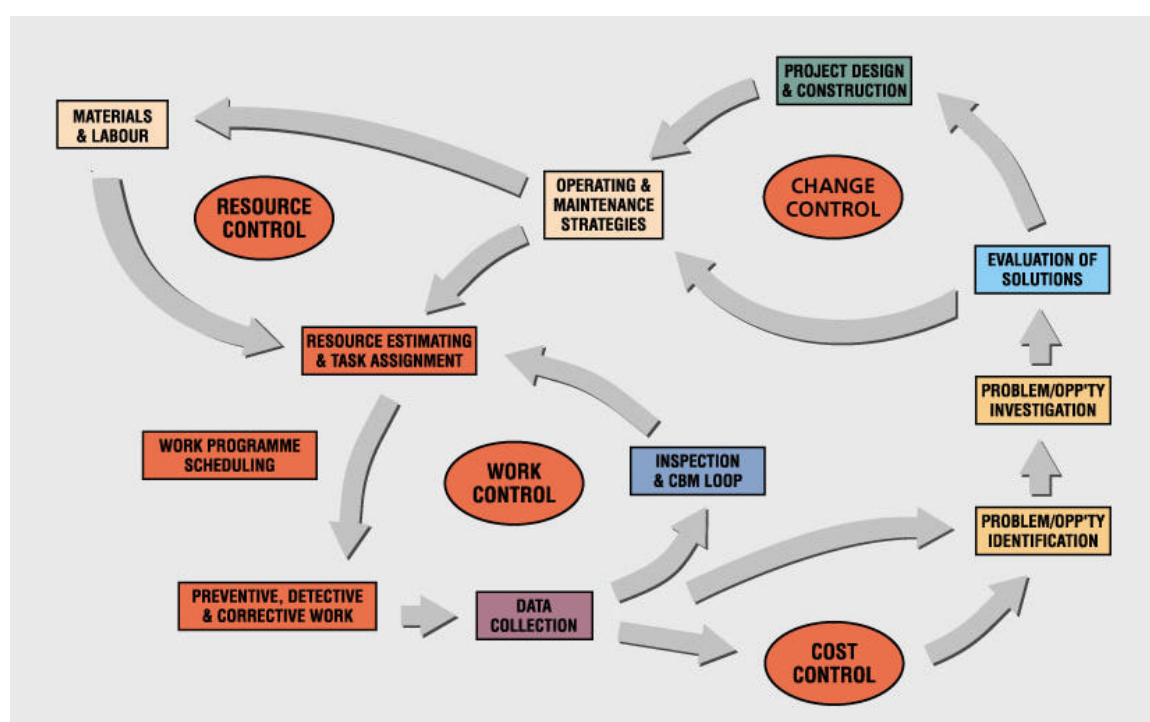


Figure 4. Asset Management Processes – the big picture

4 The Asset Management Toolkit

4.1 Data, Work and Resource Management systems

Sometimes (wrongly) referred to as an “Asset Management System”, the IT support must include:

Asset Register – this may range from a simple coded equipment list to a fully fledged technical information database with GIS diagrams, technical specifications and even video clips of the equipment and how it works. However simple or sophisticated, a comprehensive list of what the assets are, where they are and what they do is essential.

Work Order (planning & control)

A systematic and consistent scheduling system is vital to make sure that the right job is performed on the right assets, at the right time, with the right materials etc. This is the core of a work management system and another 'must'. Many companies are on their 4th or 5th generation of such systems (often without really questioning what work is worth doing in the first place!).

Condition assessment & monitoring

Core to the improvements of Asset Management is a shift towards condition-based activity: only doing work when the assets need it. Inspections, condition assessment and monitoring systems need to drive maintenance, renewals and modification decisions. There has been considerable over-selling of on-line condition monitoring, however; the Asset Management approach considers the 'crude but cheap' options of operator monitoring or visual inspection quite objectively in comparison to the high technology (and high cost) approaches.

Performance and Maintenance History Data

In the past, data gathering has often been a weak link in the chain. There is usually no real incentive to provide the data ("nobody seems to use it"). To break this vicious circle, Asset Management methods address the decision-making steps first (why do we need the data, and how would we use it?), then identify what data is needed to support such decisions. Once the usage is clear, we have a much better chance of gathering the right data in the first place - and maintaining enthusiasm for its continued collection.

Further important 'modules' of an integrated Asset Management regime include

- **Resource Management** (materials, contractors, tools, facilities)
- **Safety, Risk & Environmental Management** (compliance, risk identification & prioritisation etc)
- **Project Management** (planning, logistics, document management & change control)
- **Financial Management** (budgeting, reporting).

4.2 Decision support & continuous improvement

It is business-based decision-making that really makes the difference. There are three key stages to better targeting of resources and getting better risk/performance value-for-money:

What are the problems and opportunities?

Key Performance Indicators, trend analysis, suggestion schemes and quality management activities (e.g. Balanced Scorecard, where personal objectives are linked directly to the business drivers). Asset Management challenges even a 'balanced' scorecard – what is the right balance?

Why is there a problem, and what can be done about it?

Various systematic techniques (e.g. Failure Modes & Effects Analysis and Root Cause Analysis) are needed to investigate problems and identify feasible solutions or improvements. Asset Management requires a ‘culture of asking “why?”’.

What is worth spending, when?

Cost/risk/performance evaluation of the possible options, and best blending (optimisation) of the chosen solution. This brings us back to the starting point – what comprises the best combination of costs, risks and performance, with a whole-life view of the infrastructure? Here the Asset Management toolkit is rapidly expanding to include “what if?” analysis, system performance simulators, cost/risk trade-off calculators, project life cycle costing and investment prioritisation tools. Like most areas, however, the technology is not the limiting factor – it is our input, understanding and correct implementation that will determine the degree of success that is achieved.

5 Conclusions

So, Asset Management is an umbrella for bringing a lot of existing good practices together, and for filling some of the remaining gaps. It aligns what we do to clear business goals, and ensures that the component activities operate in harmony. It requires some sophisticated technical solutions but the most important element of all is the human one – shared understanding, motivation, trust and collaboration to find the best *combined* outcome, rather than local and short-term self-interest. There is no real doubt that integrated “Asset Management”, or whatever it may be called in the future, is becoming a vital business discipline. Yet there is a significant gap between those who “think they already do it”, and those who realise the challenges and rewards of the integration/alignment step (and are investing heavily in the merger of new technical solutions, management processes and the human factors).

Those companies that have had the vision and faith to adopt such an approach have universally recognised the tangible benefits – in some cases this has ensured continued company survival, in others it represents their key competitive edge in the next phase of global performance pressure

For more information I suggest the following sources as a starting point:

- An MSc degree course in Asset Management has been running in Aberdeen (Robert Gordon Univ.) for 4 years now, and is being spread to multi-industry, modular and *in situ* delivery for 2001. <http://univation.rgu.com>
- Various commercial organisations (including The Woodhouse Partnership Ltd) are offering short courses in the component techniques. <http://www.twpl.co.uk>

- The Institute of Asset Management has matured from a 250-strong group of enthusiastic individuals into a significant professional body (now endorsed and hosted by the IEE). *<http://www.iam-uk.org>*

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