The Institute of Asset Management

Strategy and Planning

Demand Analysis

- Asset Management Decision-Making
- Lifecycle Delivery
- Asset Information
- Organisation and People
- Risk and Review

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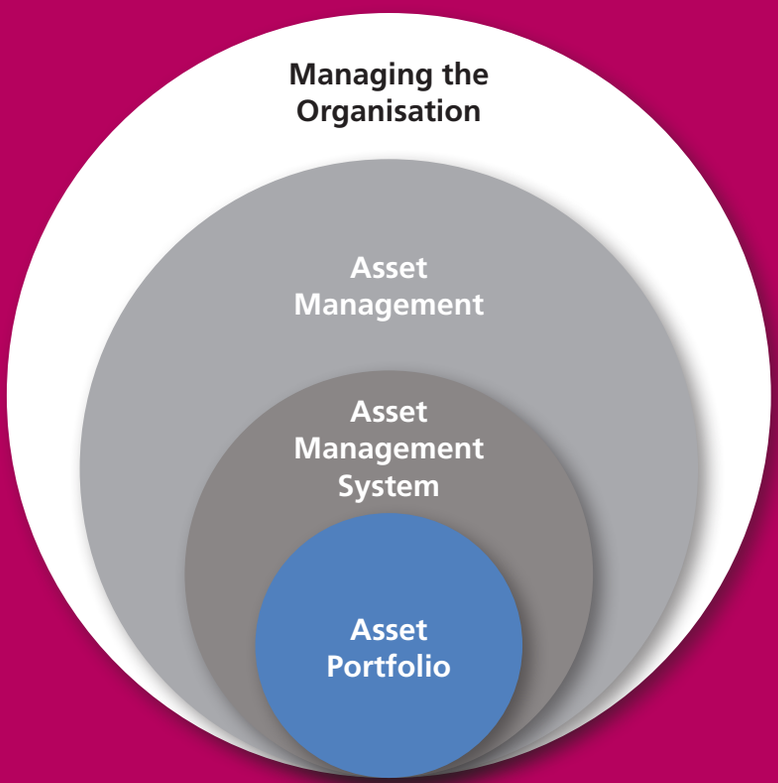

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About the IAM

The Institute of Asset Management (the IAM) is a not-for-profit, professional body. We are owned and controlled by our Members and committed to remaining independent from commercial and trade associations. We exist to advance the discipline of Asset Management, not only for people and organisations involved in the acquisition, operation and care of physical assets but also for the benefit of the general public. Our priorities are to promote the generation and application of knowledge, training and good practice and to help individuals become demonstrably competent.

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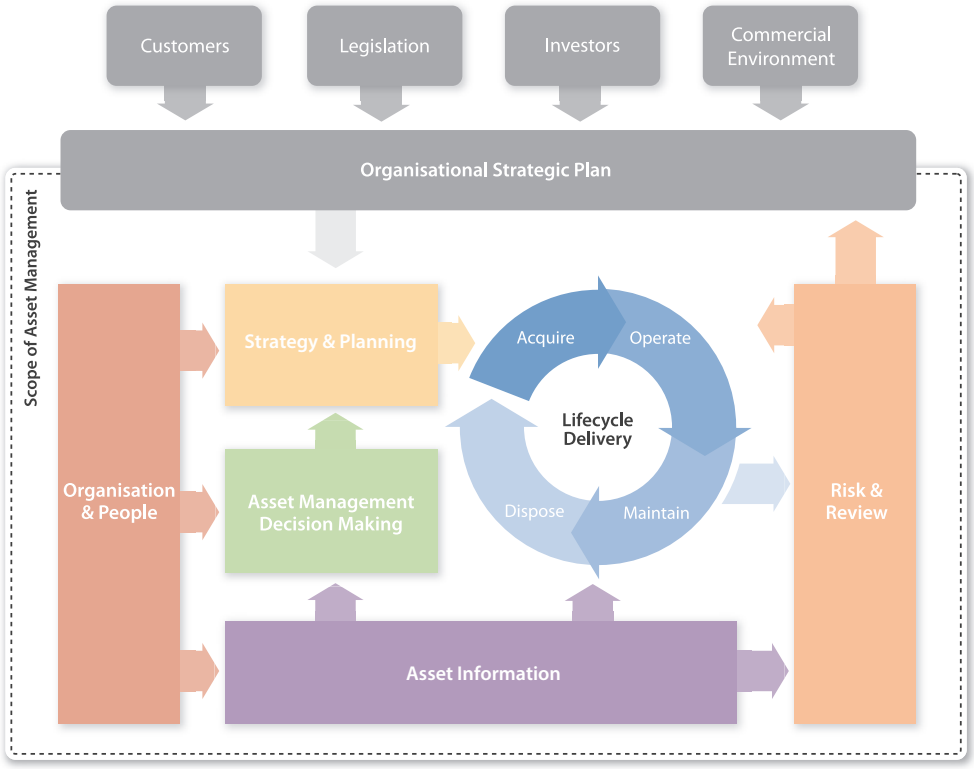
Acknowledgments

This Subject Specific Guidance (SSG) has been produced by the Institute of Asset Management (IAM) through the significant efforts of many individuals and organisations. The Institute would like to thank the following in particular for their contributions.

The scope of Asset Management



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1 Introduction to Subject Specific Guidelines

This Subject Specific Guidance (SSG) is part of a suite of documents designed to expand and enrich the description of the Asset Management discipline as summarised in the IAM's document 'Asset Management – an Anatomy' (referred to throughout this document as "*The Anatomy*").

The SSGs cover the 39 Subjects in The Anatomy directly as a 'one to one' (where a subject is very broad), or grouped (where subjects are very closely related).

1.1 Purpose of the SSGs

This document provides guidance for good asset management. It is part of a suite of Subject Specific Guidance documents that explains the 39 subject areas identified in "Asset Management – an Anatomy", also published by the Institute of Asset Management. These subject areas are also acknowledged by the Global Forum for Maintenance and Asset Management as the "Asset Management Landscape".

PAS 55 and ISO 55001 set out requirements which describe **what** is be done to be competent in asset management, however they don't offer advice on **how** it should be done. The SSGs are intended to develop the next level of detail for each subject in The Anatomy. They should therefore be read as **guidance**; they are not prescriptive, but rather intended to help organisations by providing a consolidated view of good practice, drawn from experienced practitioners across many sectors.

The SSGs include simple as well as complex solutions, together with real examples from different industries to support the explanatory text because it is understood that industries and organisations differ in scale and sophistication. In addition, they are at different stages of asset management; some may be relatively mature while others are at the beginning of the journey.

Accordingly, there is flexibility for each organisation to adopt their own 'fit for purpose' alternative practical approaches and solutions that are economic, viable, understandable and usable. The underlying requirement for continual improvement should drive progress.

1.2 The SSGs in context

The SSGs are a core element within the IAM Body of Knowledge and they have been peer reviewed and assessed by the IAM Expert Panel. They align fully with the IAM's values and beliefs that relate to both the development of excellence in the asset management discipline and provision of support to those who seek to achieve that level of excellence.

1.3 SSGs and the issue of Complexity versus Maturity

It is important to understand and contrast these terms. Put simply:

- The complexity of the business will drive the complexity of the solution required; and
- The maturity of the organisation will determine its ability to recognise and implement an appropriate solution.

A very mature organisation may choose a simple solution where a naive organisation may think that a complex solution will solve all its problems. In truth, there is no universal best practice in Asset Management – only good practice that is appropriate for the operating context of any particular organisation. What is good practice for one organisation may not be good practice for another.

For example, an organisation that is responsible for managing 100 assets, all in the same location, could use a spread sheet-based solution for an Asset Register and work management system. This is arguably good practice for that organisation. However, for a utility business with thousands of distributed assets, this is unlikely to represent a good practice solution.

When reading the SSGs, the reader should have a view of the complexity and maturity of the organisation, and interpret the guidance that is offered in that context.

1.4 Further reading

The Anatomy provides a starting point for development and understanding of an Asset Management capability and the SSGs follow on to support that further. However, the opportunity doesn't end there; the IAM provides a range of expert and general opinion and knowledge which is easily accessed by members through the IAM website.

2 Scope of this SSG

This document provides guidance for the following elements of asset management:

- Demand Analysis

The document provides guidance on how asset intensive organisations can understand, analyse and forecast demand in order to support strategic planning activities.

3 What does demand mean?

Demand is defined as what a person (or entity) needs from another person (or entity) to meet one or more objectives. **Supply** is the other half of the equation; i.e. the act of meeting the demand.

Supply and demand is a concept that has been in existence for many thousands of years in the form of bartering and trading. The supply of goods, or services, can be either internal or external to an organisation. For example, one part of an organisation may supply components 'internally' to an upstream facility for final assembly before being sold to a different 'external' organisation. Although both parts of an internal organisation may be subject to their own Profit and Loss account, they both ultimately impact the same organisation's financial performance. Whereas, in contrast, a service procured from an 'external' supplier (e.g. aircraft refuelling) will mean that funds will be passed from one organisation to another and therefore the profitability of one organisation may not affect the other; and vice versa.

Demand is also variable, both in terms of timing and magnitude. This will be further defined later, but an example would be the complexity of supplying electricity where the demand is highly volatile or unpredictable. It is essential that electricity is provided constantly at the correct voltage and frequency. Some demands can be accurately forecasted (e.g. television commercial breaks in peak times); whereas others will be harder to predict (e.g. number of lights turned on due to unexpected adverse weather conditions).

Reasons why it is important to assess 'demand' in the context of an asset management system are:

- It aids with forecasting cash-flows in future months / years.
- It provides guidance on the connectivity between local and overall organisational demand.
- It helps with portfolio planning and assessing working capital requirements.
- It provides the basis for analysing influences on goods or services for each business unit and adapting to such influences.
- It is also used to match the competitive strength of a business unit to the demand.
- It allows for those individuals / teams who inter act with an organisation's assets to appropriately react and flex to the demand.

However, for the purpose of this document, demand is being related to in terms of "assets" and ensuring that an organisation has a sufficient portfolio of assets to meet their current levels of demand and future demand. It is important to be able to forecast demand with a known level of accuracy, as challenges to any organisation's ability to remove, preserve, or add to its portfolio of assets to fulfil its demand now and into the future are critical to the asset management process.

Across all industrial sectors, it is important first to clearly understand qualitatively what your demand is and second to quantify the components that make up your demand. Depending upon how complicated it is to characterise the demand it may be necessary to use a hierarchical approach. For example, in the energy industry, demand is defined as being peak demand, including system losses but excluding power station demand, exports to other networks (i.e. international interconnectors) and Demand Side Response (DSR). The components that make up this demand can be broken down into commercial, industrial, and residential. These components can then be broken down further still to include heating, transport and lighting to name but a few.

Understanding demand forms an important part of an organisation's strategic investment planning, without it they cannot effectively plan for their existing portfolio of assets or determine future requirements to expand their portfolio to ensure that changing demand is met.

Demand elasticity is a measure of how much the quantity of demand will change if one or more

factors change, e.g. the price elasticity of demand; this measures how the quantity demanded changes with price. In certain industrial sectors, the elasticity of demand is low because they provide an essential good or service, e.g. water, gas or electricity, therefore, the demand for such goods and services remains relatively stable for a wide price range.

For the purpose of this document, elasticity of demand is being related to the factors that the asset management process manages and the impacts it has on demand elasticity, and vice versa. These factors can be characterised in a number of ways, e.g. benchmarked against different scenarios. Once characterised they can be fed into an organisation's strategic investment plan allowing them to better manage their current assets and plan for the construction of new ones.

Across multiple industry sectors, the historic relationship between annualised consumption and peak demand (maximum demand encountered) is used to form the basis for the methodology for demand forecasting.

Once the existing and forecasted demands are fully understood, they form key inputs to the asset management process to determine the adequacy of organisation's capabilities to meet the given demand. Peak demand is usually the most onerous demand condition the portfolio of assets needs to be able to accommodate and will therefore drive evaluation of the asset portfolio capabilities.

The frequency that demand needs to be reviewed and cascaded into the asset management process will depend on the rate of change of the key factors that make up demand characteristics, e.g. national strategic infrastructure planning and economic assessments are typically periodic processes and therefore demand analysis is also a periodic process. This means that demand does not necessarily need to be continuously reviewed but an agreed review period is needed.