



SHOAL™

ASSET MANAGEMENT SYSTEMS IN COUNCILS

White Paper

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Overview

For any organisation, asset management outcomes are largely determined by the effectiveness of the underlying management system - the Asset Management System (AMS).

For Australian Councils (Councils) in particular, the development, implementation and ongoing improvement of an effective AMS can be difficult due to a variety of reasons, including: limited resources compared with their asset bases; diversity of stakeholder expectations; large volumes of data in various forms and levels of quality; and managing a complex network of staff, suppliers and service delivery organisations.

It is no secret that Councils in Australia are struggling to implement effective Asset Management Systems, with the Victorian Auditor General's Office recently stating *"Our previous audits of councils' asset management practices over the past 15 years have identified persistent weaknesses in their asset management"* [2].

This whitepaper explores the barriers faced by Councils in successfully developing and implementing a fit-for-purpose AMS. Through this analysis, the case is made that there is a more effective way for Councils to break through these barriers by using a model-based AMS Framework (AMSF) which structures a variety of organisational information into a single package. This improves data integrity and minimises the effort spent managing it. More tangibly, the framework enables the automatic generation of pre-configured documents (e.g. Asset Management Plans or AMPs, as required by ISO55001), that satisfy compliance requirements as well as enabling better asset management practices, such as strategic and operational planning.

"Poor asset management can lead to deteriorating or failing assets, reduced levels of service, higher council rates and an increased financial burden on future ratepayer generations" [1]



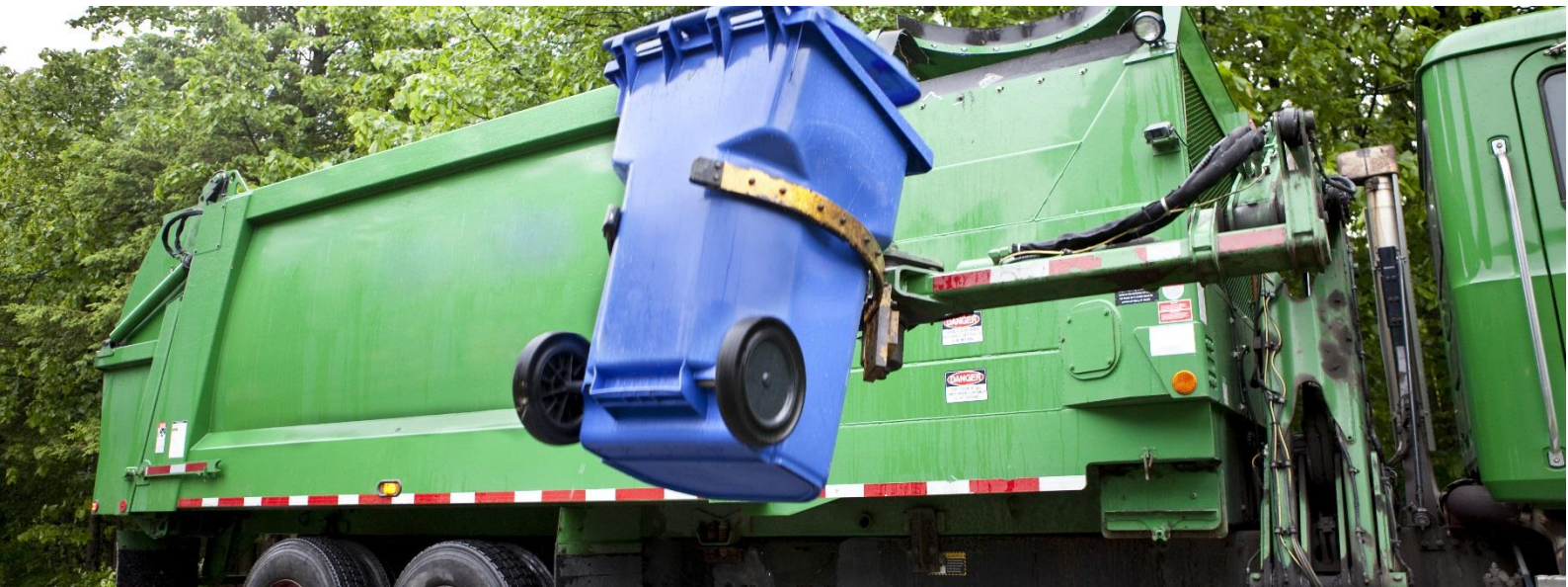
Asset Management

The Asset Management Council defines asset management as *"the lifecycle management of physical assets to achieve the stated outputs of the enterprise"*. Like many sectors, Councils rely on physical assets to deliver on their mission and therefore efficient asset management practices within a robust Asset Management System (AMS) are critical to their success.

Challenges for Councils



The Australian Local Government Association has recently published that: *“Most local councils have the financial capacity to address future scenarios provided they have a sensible and informed conversation with their stakeholders”* [3]. Although this seems straightforward in principle, in practice the complexity of Council stakeholder networks presents a challenge. Current approaches to AMS implementation cannot manage stakeholder expectations across relevant Asset Management practices, nor identify where there are deficiencies.



Robust decisions are based on robust information. Information required by Councils can broadly be categorised into two types: asset information and strategic information. Asset information describes the asset base of the Council and is often in the form of quantitative data, such as: asset description, location, condition etc. Strategic information can often be overlooked but underpins all asset-related activities undertaken by Councils. In the asset management ecosystem both types of information are intrinsically connected, yet current approaches to AMS implementation do not facilitate visualisation of these relationships across the full spectrum of asset management practices.



Given the significant asset base that is managed by Councils in Australia (estimated to be \$426 billion), the resources allocated for maintenance and renewal are insufficient [3]. In fact, \$30 billion is required today to review and replace aging assets in Australian Councils. A deficit like this cannot be quickly overcome and current approaches to AMS implementation are not proving effective for optimising the limited funding available. This includes trade-off decisions between: maintenance, upgrades, replacements, service changes, etc.

Impacts for Councils

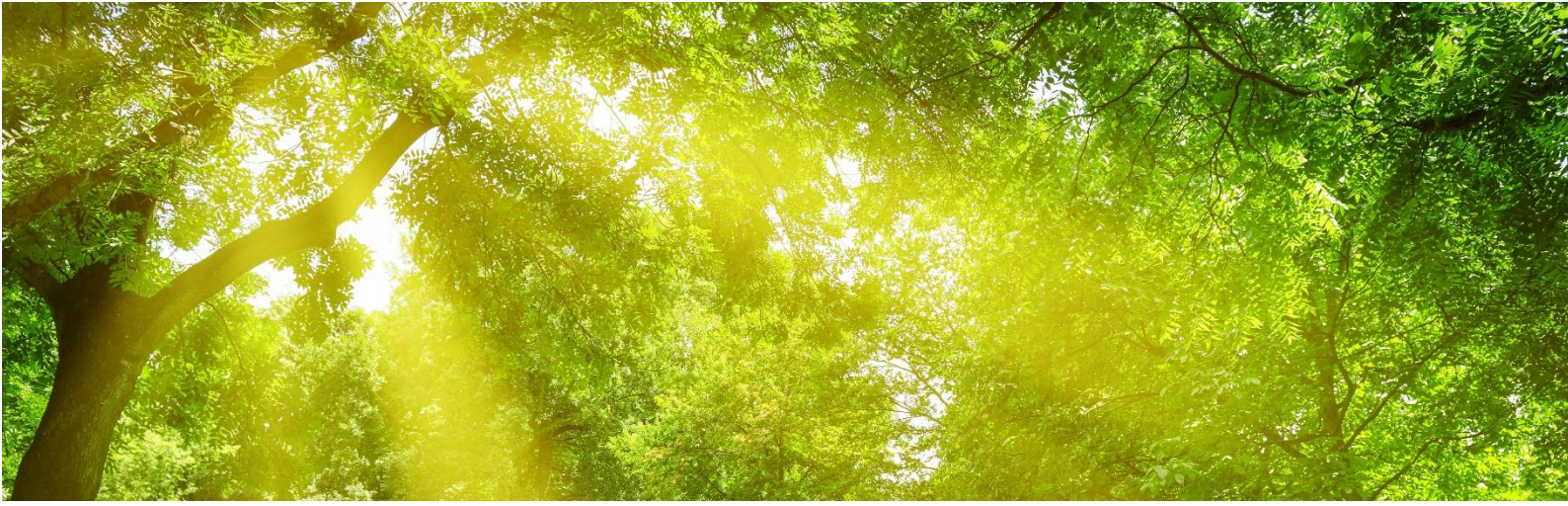


The AMS of an organisation is the management system through which value is realised from assets. Therefore, if the organisation has a sub-optimal AMS, the value realised from its assets is sub-optimal. In the case of Councils, this manifests in terms of a limited service being provided to the community through assets that are community-facing (parks, roads, etc) and assets that are used for service provision (council vehicles, recycling depots, etc). The AMS should be the cornerstone of asset decisions and should enable a clear understanding of the acquisition, operation, maintenance and disposal of these assets. Without this, asset decisions are made without a holistic view of the situation.

Without a consolidated view of strategic asset information, organisations can spend considerable time collecting accurate data to develop business cases and support decision making. Significant decisions requiring business case development can be very time-consuming if the relevant information is not easily accessible. Similarly, day-to-day decisions become onerous if the effort to obtain the information is too great. Both cases lead to inefficient resource use in asset management decision-making.



The 2018 National Asset Management Assessment Framework (NAMAF) results show a decline in compliance with asset management guidelines, particularly in asset management policy, strategy and plans, levels of service and governance. In fact, 7% of Council infrastructure has poor function that could lead to safety or compliance issues [3]. Additionally, Councils require accurate asset information to comply with state and/or federal disaster response programs and if their asset management practices are non-compliant, they risk being unable to access funding.



The Solution

Shoal has developed an Asset Management System Framework (AMSF) which is based on a structured information model using systems engineering design tools. This information model is capable of collating and structuring a variety of organisational information including: organisational roles and structure; organisational and asset management objectives; guiding documentation such as external and organisational standards; identification of AMS stakeholders and their expectations; physical asset information; business processes; and organisation context information such as economic risks.

“An AMS framework shifts the focus of AMS implementation from document-centric to information-centric, allowing for a greater focus on information quality and consistency.”

The main premise of the AMSF is that an organisation’s asset management information is captured in an information model rather than a set of documents. This shifts the focus of AMS implementation and management from document-centric to information-centric, allowing for a greater focus on information quality and consistency. The information model structure allows for traceability between various elements of the AMS: for example, the development of an organisation’s asset management policy and asset management objectives should be based on the organisation’s mission and objectives, and they are linked in this way using the AMSF.

The outputs of the information model are generated automatically from within the framework using pre-defined templates. These are aligned to the ISO55001:2014 standard and consist of: an asset management policy; a strategic asset management plan; asset management plans; asset management system plans; organisational reports; traceability reports; and asset management maturity assessments.



Key features

- Single source of information
- Traceability reporting
- Documents automatically populated
- Compliance to ISO55001 plus others

ASSET MANAGEMENT SYSTEM FRAMEWORK

The Asset Management System Framework (AMSF) is a novel approach to managing the complexity of large asset portfolios with a focus on traceability and data integrity. This is achieved via a model-based systems engineering methodology where information is captured in a structured but accessible format to ensure a single source of truth.

INFORMATION INPUT

Asset management information is elicited from the organisation via documents, workshops, discussions, or any combination of these. This information is collated, related via the AMSF and input into the a database model.

1

OUTCOMES



Traceability. Relationships in the model provide traceability to clearly capture decision rationale.



Decision support. The model provides an information-centric view of the organisation to enable better decisions.



Single source of information. With the model, there is no duplication of information.

CORPORATE RISKS & ISSUES



ASSET MANAGEMENT OBJECTIVES



OPERATIONAL PROCESSES



REGULATORY STANDARDS



DYNAMIC DEVELOPMENT



the model is updated as information is gathered

MAINTENANCE STRATEGIES



PROJECTS INFORMATION



BUDGETS AND FINANCING



OTHER RELEVANT INFORMATION



SUITE OF ASSET MANAGEMENT DOCUMENTATION (SAMP / AMPs)

DATA TO INFORM DECISIONS

CUSTOM REPORTS

OUTPUT GENERATION

Using the data in the model, outputs can be created. These outputs can be standard artefacts that conform to ISO55001 and other relevant standards or could be tailored to the specific needs of the organisation.

3

MODEL DEVELOPMENT

The information relevant to the AMS is populated in the model and connected through relationship links. This is completed by an experienced modelling team and includes both descriptive and analytical data.

2

CONTINUOUS IMPROVEMENT



With the information model at the centre of the AMS, regular review and update of information can be streamlined. When information is updated, the outputs can be regenerated easily from the model.

Benefits of the AMSF



Building key requirements (e.g. ISO55001) into the information model and linking this to available Council asset information means that demonstrating compliance is simple and available at no added cost. Traceability reports can be run to show where requirements are executed by Council business processes. Conversely, any exceptions can be readily identified to form the basis of an improvement plan.



By removing the need for Council staff to write and manage a suite of documents, they can maintain focus on what matters: ensuring the assets deliver the required outcomes. Of course, changes to information will still need to be managed, but a key difference with the AMSF is that each piece of information exists in one place and therefore needs to be updated only once for any given change. Any documents affected by a change can be quickly regenerated from the information model at the click of a button.



The AMSF delivers a better management system for Council assets. A better management system can align any 'siloes' of asset management activity that are being done well, along with those that aren't, to generate a common understanding of the asset management ecosystem. This holistic view supports Councils in establishing a clear and traceable strategy for how assets will be managed. With this common understanding, Councils are able to proceed in a unified direction, enabling progression towards best-practice asset management and better provision of services to the community.

References

[1] Victorian Auditor-General's Office, *Asset Management and Maintenance by Councils*, February 2014

[2] Victorian Auditor-General's Office, *Annual Plan 2018-2019*

[3] Australian Local Government Association, *National State of the Assets*, November 2018

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Shoal

Shoal is a wholly Australian-owned consultancy with offices in Canberra, Adelaide, Sydney, Melbourne and New York. The company was established in 2001 to provide conceptual design consulting services to clients in the aerospace, defence, information technology and telecommunications sectors. Shoal has now expanded its experience and offerings to include the provision of Asset Management System services to clients in a range of industry sectors including defence, transportation, utilities and Councils.

Shoal's Asset Management Systems Program aims to assist organisations in developing a fit-for-purpose Management System to define how Asset Management is undertaken. This is achieved using Shoal's AMS Framework which has been published and presented at multiple national conferences. The Shoal team works closely with clients to understand the current state of Asset Management within the organisation and input this understanding to an information model. This allows the generation of outputs that are aligned to ISO55001 and focused on enabling maximum value to be gained from the Asset Management practices of the organisation.

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