

Design Considerations for Engineering Asset Management Systems

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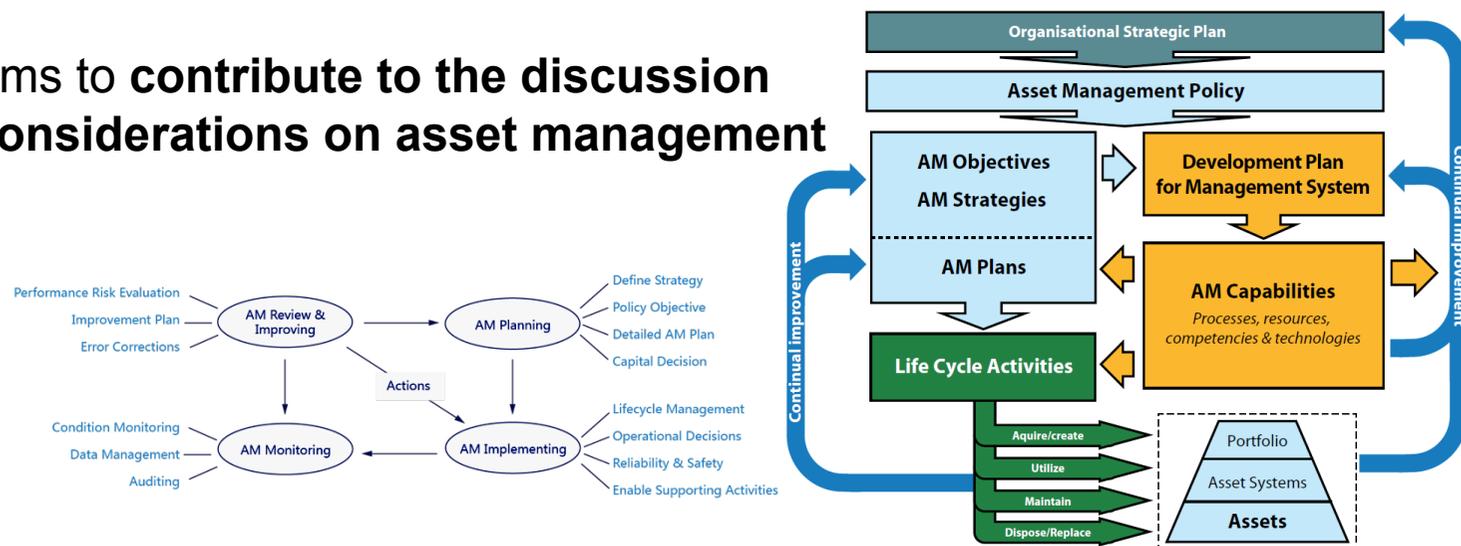
Background:

Existing standards for asset management systems

This paper outlines the key design considerations to improve approaches to the design of the asset management systems needed for effective service delivery

When looking at the standards an asset management system can be seen as monolithic, and lies within the four walls of an organization. In practice however, it is often seen that the management of assets are done by a number of organizations.

The paper aims to **contribute to the discussion on design considerations on asset management systems.**



Research approach:

Evaluation of AMS design approaches in organisations

- **Series of interviews with asset managers in companies across a variety of industry sectors ranging from**
 - Aviation
 - Facilities management
 - Utilities
 - Heavy equipment
 - Consulting etc.
- **These interviews aimed at understanding**
 - Their asset management practices
 - The process they use for designing and improving their asset management systems
 - The shortcomings of these processes and their implications.

Interviews followed a semi structured approach.

Design considerations: Asset management systems - Overview

Organisations see their AMS not as an outcome of a concerted design effort, but a system that has evolved over a number of years through

- External (e.g. customer requirements)
- Internal (e.g. organizational strategies)
- Market forces (e.g. competition, regulation).

However, a common factor is that all the companies continuously strive to improve their existing systems for managing assets.

Six aspects discussed in this paper:

1. Risk and scenario analysis
2. Standardised interfaces
3. Definition of performance measures and KPIs
4. End-value of value chain
5. Alignment and value distribution of performance measures
6. Changing customers and needs

Design Considerations:

Risk and scenario analysis / Standardized interfaces

1. Risk and scenario analysis

- Is seen as essential in the literature
- However neglected during the design stage of an asset management system
- **Neglected were specifically economic impact**
 - Taking higher risks on the assets in circulation hence lower servicing of assets or refurbishing assets, hence keeping assets longer in circulations, was not be taken into account.
 - Same for the application for mathematical models they are great, however do not allow a very high degree of flexibility.

2. Standardised interfaces

- Every organisation starts to build up a service ecosystem
 - Often multiple stakeholders supplying parts to one asset management task within a system.
 - Optimization of communication between the stakeholders (internal and external) is seen as key
- **This is currently neglected by the literature**
 - There is a need for both process standardisation as well as IT interface standardisation.

Design Considerations: Definition of performance measures and KPIs

3. There is a need to define KPIs / Performance measures for the service asset management system

- First the organisation has to see as much as possible the long term potential and take out the short term overall view when it comes to asset management.
- KPIs need to be aligned to ensure an effective asset management across an entire ecosystem. There is need to incentivise the correct management of assets throughout the organisation and incentivise sharing where needed.

4. End-value of value chain

- End-value is the value that the user of the asset obtains from the use of the asset. There is the need to communicate the end value throughout the organisation. This ensures that the common goal of the service delivery and hence the goal of the assets are communicated clearly.

Design Considerations: Definition of performance measures and KPIs

5. Alignment and value distribution of performance measures

- There was no indication that KPIs throughout all organisations were end value focused. It is well known that services operations should always focus on the end value generated and this indeed across the whole organisation. The cases indicate that specifically personal performance KPIs as well as department and wider KPIs do not incentivise the end value generated.

6. Changing customers and needs

- Finally an effective AMS should have change management capability to adapt to changing customers and requirements. The case studies have shown that usually there was not a provision for a redesign of an asset management system encountered on the basis of customer needs.

Design Considerations: Conclusions!

- Organisations often **do not have a structured methodology** to design an Asset Management System from scratch
 - Mostly they strive to **improve an existing system**.
- **Risk and scenario analysis** (akin to FMEA) is essential during the solution design stage for a resilient asset management system.
- A service ecosystem will contain various organisations each running their own asset management systems. There is a need for a “**standardised interface**” **for asset management systems** to ensure value generation for the different stakeholders. A standardised interface will help minimise complexity and help in sharing data and information between stakeholders.
- It is essential to **define KPIs and performance measures for the asset management system** in addition to service-level KPIs and there is a need to align KPIs with the value generated to the end customer.
- It is essential to **improve transparency of end-value** through the value chain in order to cultivate and improve integrated working practices.
- An effective asset management system should also have an **efficient change management capability** to adapt to changing customer requirements.

Questions?

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