

Living Asset Management Maturity – An Overview

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Purpose

The purpose of “Living Asset Management Maturity – Overview” is to share the fundamental thinking developed by the authors as part of an informal Asset Management Maturity Concepts (AMMC) think tank that has been discussing and debating asset management maturity for the past year, and to invite participation and feedback.

For the reader

The AMMC think tank is publishing “Living Asset Management Maturity” as a follow-on to “Living Asset Management” by JR Lafraia and J Hardwick. The key audience is senior asset management practitioners, who need to develop what asset management maturity looks and feels like at all levels of an organisation, from board to shop floor in order to implement the asset management maturity journey, and reap its benefits.

The journey of asset management maturity is like the journey of safety - it takes time to develop the behaviours needed to achieve the outcomes desired. Also essential is an understanding of the key principles that drive asset management maturity; and how these principles look and feel in the different parts of the organisation/organisational elements.

Asset Management Maturity

We have defined asset management maturity as

“The ability of the organisation to use its assets and systems to meet the varying needs of its stakeholders over time while anticipating and responding to varying circumstances”.

While maturity in asset management is not an end of itself (only a means to an end), the benefits from the pursuit of asset management maturity include:

- A significantly increased understanding of the “what, why and how” of asset management relating to the future business environment;
- A sophisticated understanding of the value that AM provides to the differing stakeholders;
- Differing perspectives (User, Stakeholder, Employee, Community etc) on how to understand and apply the term “desired balance of cost, risk and performance” within the context of the business;
- A wide appreciation of the role and benefit of applied AM to the many stakeholders, both in the short term and longer term.
- Understanding the continuum an organisation is on with respect to the effectiveness of its capability(s) , the alignment and integration of its capability(s) and the value its capability(s) bring to all stakeholders
- Understanding the continuum an organisation is on with respect to the behaviours and leadership
- Provides confidence in the degree of agility the organisation has with respect to ‘ability to change’ and ‘appetite to change’.

Put simply, in achieving asset management maturity, the selected balance of cost, risk and performance may be achieved by an organisation.

What is the new thinking since the publication of Living Asset Management (LiAM)?

Many of the concepts of LiAM were explored around leadership, behaviour and organisational design and how understanding this can improve organisational performance. Another area of interest was how companies deal with Asset Management within their organisational design. But the concepts from Living Asset Management (LiAM) that caused the most discussion and debate was Asset Management Maturity (AMM). This was the area that received the most feedback and created the greatest diversity of views. It was noticeable that the views expressed were clearly developed through the experiences and positions held by those expressing these views. AMM in LiAM was of such interest that it was seen as the catalyst for the GFMAM creating a position statement on the topic. Work in this area also continued by thought leaders in both the AMCouncil (Australia) and the IAM (UK) and LiAM was a key input to much of the thinking and debate.

Since writing LiAM what has changed? The ISO 5500x standards have been completed, the position statement from GFMAM on maturity have been issued, the second version of the GFMAM landscape, the AM Council's Asset Management Award (including an asset management maturity model) model and the IAM Asset Management Maturity Scale have been published as well.

In a certain way, the writing of Living Asset Management was done under the principles of design thinking:

- There was no clear distinction between the problem and the solution space;
- It was iterative, with a lot of sketches being presented for the group before turning into the final manuscript;
- Almost all of its contents are empirical based rather than formal science;
- The aim of the artefact produced was to provoke debate and thinking rather than a “how to do” list;
- It uses a lot of metaphors and personal histories in order to bring about feelings and emotions;
- The writers' intention since the beginning was to help the readers to devise their own tools to self-assess AM and AMM.
- The writers did not want to constrain AM to only that known at the time of writing. In other words the authors believed that AM itself was still maturing so they wanted to create a publication that encouraged thought leaders to extend themselves to accelerate the learning.

Hence we think we still need to chat & write & chat some more about Maturity and what it means.

Wicked problems

First and foremost, consider that leadership is a set of values, behaviours and set of processes, not one person at the helm leading all. It will have different flavours at different levels of the organization.

Next consider that asset management requires an integrated approach the use of assets, the understanding of stakeholder needs, and the processes and governance of an organisation.

The discussions in Living Asset Management around these points kept people troubled. Consider that this is because a traditional systems engineering approach to asset management may be insufficient to describe AMM and that it might be more suitable to consider asset management as a wicked problem.

A “wicked problem” is a problem that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognize. Models that depict asset management such as the Asset Management Council's Capability Delivery Model are based upon a traditional assumption – that the world does indeed follow a traditional systems engineering view. So how do we introduce a new way of thinking or how do we describe a different universe (say of infinite axes) if we continue to use the same language and concepts as the traditional (or 3 axes plus time) one?

We are not so sure we can so readily use such a traditional approach and develop an Asset Management System (AMS) that is capable of dealing with such “wicked” issues as “Leadership, Behaviour and Culture” and the ability to solve wicked problems – such as occurred at Fukushima How can assets be designed, operated and maintained in an environment where human experience is clearly insufficient, and has great

difficulty dealing with such natural and man made complexity! How do you describe those “wicked¹” requirements for an AMS, let alone measure it in a Maturity Assessment?

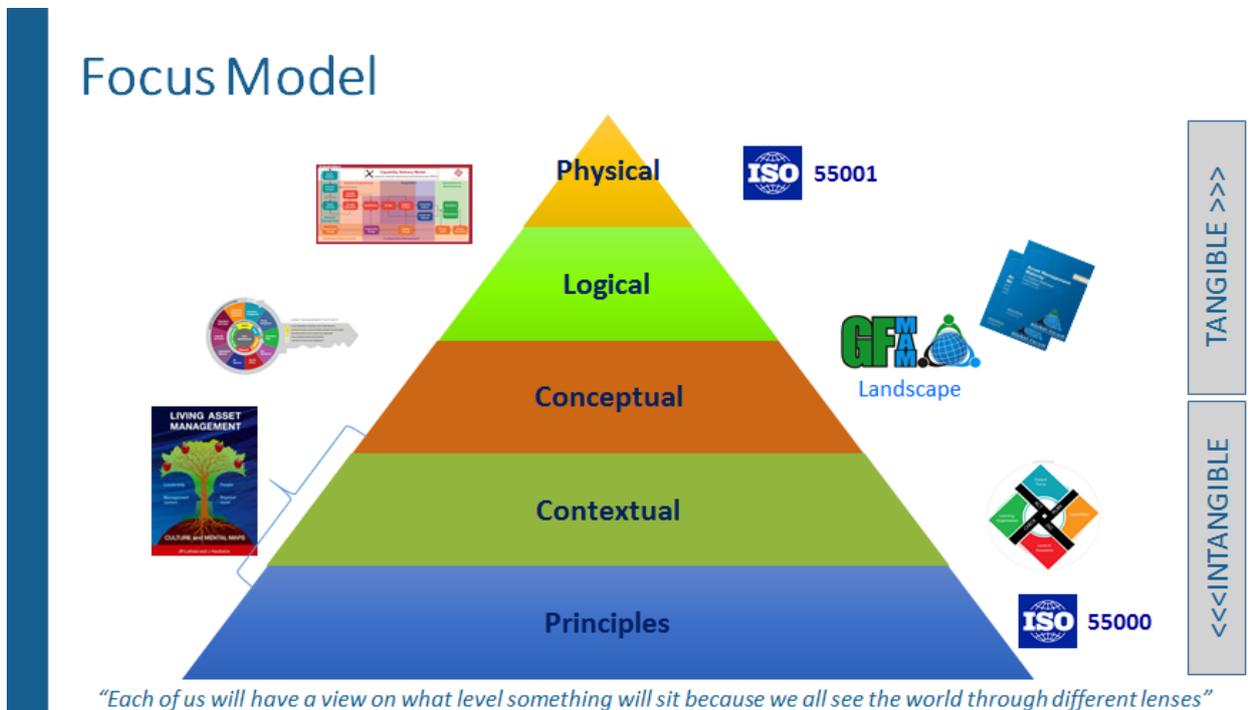
The defining characteristics of a wicked problem are:

- The problem is not understood until after the formulation of a solution.
- Wicked problems have no stopping rule.
- Solutions to wicked problems are not right or wrong.
- Every wicked problem is essentially novel and unique.
- Every solution to a wicked problem is a 'one shot operation.'
- Wicked problems have no given alternative solutions.

In recent years, problems in many areas have been identified as exhibiting elements of wickedness; examples range from aspects of design decision making and knowledge management to business strategy.

Focus : how everything connects

We also discussed on what we were basing our thinking and why we seemed to have many different points of view about asset management and asset management maturity. Consider the “focus model” shown below.



Principles -: Elementary assumptions, or maxims, generally held to be fundamental or true for a body of knowledge

Contextual: Background, environment, Industry, setting, or situation surrounding an event or occurrence

Conceptual: The reasoning behind an idea, strategy, or proposal with particular emphasis placed on the benefits brought on by that idea.

Logical: a proper or reasonable way of thinking about or understanding something (usually the application of a concept in a context)

Physical: tangible deliverable, model, process, artefact

Figure: Focus on connecting

The AMMC think tank was set up to debate principles and the frameworks/approaches which may apply and the concepts, rather than discrete solutions. This follows on from Living Asset Management, which dealt with principles, and contextual and conceptual issues for leadership and culture in asset management.

¹ Note that “a wicked problem is a problem that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognize.” Currently a draft Standard is being developed for an “open system, systems engineering standard” – where the requirements are never set in stone and can and will change and where Stakeholders can and do change their minds and where the world may look static but never does!

For any model or solution to a problem, it is essential to be aware of the principles, and the applicable concepts and context in which these principles are applied.

Asset Management Maturity Principles

The **principles** that guide asset management maturity (AMM) are Alignment, Value, Assurance, Leadership – the fundamentals defined in ISO55000, and Agility.

Value: Asset management does not focus on the asset itself, but rather what the asset can do for the organization and its stakeholders, that is, what value it can provide. To determine an asset's value, a management system for the management of assets (the asset management system) deploys decision-making processes used by competent and authorised people that incorporate stakeholder-approved risk based criteria.

Value can be anything that one or more stakeholders believe in. It could be market penetration, employee satisfaction, process improvement or customer retention to name a few. It is likely a number of things.

Alignment: Implementing an asset management system enables the organization to translate organizational objectives into technical and financial processes, plans, activities and tasks.

Assurance: The need for assurance arises from the need to effectively govern an organization. Assurance applies to assets, asset management and the asset management system. Stakeholders require surety that assets and the associated management system can and will deliver what is required of them.

Leadership: Leadership and commitment from all levels of management are essential for successfully establishing, operating and improving asset management within the organization. The leadership style of an organization should support both the achievement of organizational objectives and the relationship to the decisions and tasks implemented by employees. For asset management to be successful, employees should understand these objectives, their role in achieving them and how decisions and actions made by other employees contribute. Such commitment/engagement should ideally come from all levels of the organization.

An additional principle – Agility

This has been variously proposed as agility, disruption, change management. In the debate about these terms, there have been some concerns among the authors.

The first concern was the definitions have talked about capability, competency, capacity – and these were very much process terms for what is fundamentally something related to the structuring element of an organization (which are going to be discussed later).

The second concern was that none of the proposals matched our expectation sufficiently and so for the moment we were calling it flexibility. Flexibility is the willingness (determination of risk appetite?) to provide agility and change leadership appropriate to the stakeholder requirements. We were not enamoured of the term willingness, but we were talking about attitudes and approaches, not just capability to apply those processes.

Thirdly, as external environments change (often in a disruptive manner) organisations must have the ability to develop and apply innovative responses – creating step changes of change – in which asset management objectives will alter significantly, requiring appreciably different asset management processes and systems. The term disruptive, is used in business to describe innovations that improve a product or service in ways that the market does not expect, typically first by designing for a different set of consumers in a new market and later by lowering prices in the existing market.

In contrast to disruptive innovation, a sustaining innovation (see Assurance above) does not create new markets or value networks but rather only evolves existing ones with better value, allowing the firms within to compete against each other's sustaining improvements. Sustaining innovations may be either "discontinuous"[1] (i.e., "transformational" or "revolutionary") or "continuous" (i.e., "evolutionary").

Finally, we have decided to call the 5th AMM Principle as Agility - As external environments change (often in a disruptive manner) organisations must have the ability to develop and apply innovative responses – creating step changes of change – in which asset management objectives may alter significantly, requiring appreciably different asset management processes and systems.

The requirement for some capability to deliver a level of "Agility" must be included in the AM Policy (as a general requirement) and included as a qualitative or measurable objective (including time, cost, risk etc) in the Organisational Objectives. The AM Objectives then picks that up and includes that as an Objective to be implemented by the Asset Management System - as a measure for the AMS itself – perhaps to be included as a requirement for the AMP for the AMS! That requirement might be documented in terms of scenarios

(Minor, Significant, Major and Force Majeure – in line with the organisational risk framework’s risk categories) with how the AMS needs to respond to each, and in what manner, time, set of resources etc.

We have defined **Agility** as the **flexibility and speed to adapt to new demands stakeholders and environmental changes, considering the assimilation rate and time cycle processes.**

Agility introduces additional themes to asset management maturity including:

- Step changes (from needs to solutions)
- Time (the period over which the changes occur and over which the organisation may need to respond)
- The ability to identify changes and the ability to respond as soon as is needed

How the principles may look in different organisational elements

If these **principles** are sufficient to guide a journey to asset management maturity (AMM), then how do they look and feel in the different parts of the organisation/organisational elements.

To deliver typical Financial and Safety stakeholder requirements, examples of AMM principles applied to the organisational elements are given below.

Organisational Element: Business Assets

Buildings, plant and equipment, information technology and data, knowledge, finance, outcome.

Value: Desired asset system and asset performance delivered, Desired cumulative and residual risk delivered, Desired aggregate and individual cost achieved

Alignment: Measurable AM Objectives in place

Leadership: Asset steward and learning culture in place, Timeframe of focus upon assets reflects the business need

Assurance: Continuous Improvement for AM Objectives in place, Monitoring and trending of failure data and failure characteristic, Benchmarking asset performance and reliability and availability

Agility: Aware of available and likely new technology, R and D programs

Organisational Element: Structured Elements

Processes – A systematic series of actions and decisions and associated organisation and technology, directed to an end.

Assurance: Processes that support the Continuous Improvement of AM Objectives in place.

Agility: Processes that support the capability to identify available and likely new technology and relevant societal changes

Organisational Element: Governance and Control

Assurance - Quantifiable level of confidence of a capability.

Assurance: Processes that support the capability to identify and achieve the needed quantifiable level of confidence in place

Figure: Organisational Elements



Organisational Element: Structuring Elements

Culture - A set of learned beliefs, values and behaviours the way of life shared by the members of a society.

Leadership - The process of influencing and directing the performance of group members towards the achievement of organisational goals

Value: Determination of Shareholder Needs

Alignment: Transparency of decision making and Decision making criteria

Leadership: Determination of Leadership Style

Assurance: Risk appetite and profile developed and approved

Agility: Awareness for need for continuous improvement, Awareness of need to identify long term issues, Awareness of societal change

What we can learn from others

One area of maturity assessment that has been underpinned by a range of research (both theoretical and applied) is in the area of safety maturity assessment. Chapter 10 of the OH&S Body of Knowledge published by Safety Institute of Australia Ltd outlines a broad timeline for the evolution of management theory commencing with scientific management theory in the early 20th Century and then progressing on to administrative management theory in the mid 20th Century, behavioural management, management science and finally organisational environment theory. This is presented in the context of understanding the relationship between organisational behaviour and safety performance.

The work of Parker, Lawrie and Hudson (2006) speaks to the steps that have already been taken in occupational health and safety to understand maturity. Their work re-interpreted the five organisational typologies of Reason and Westrum into safety culture levels outlined in the OH&S Body of Knowledge and shown below.

Based upon empirical knowledge, each phase precedes the next – apparently it is not possible to go from Pathological to Generative in one go!

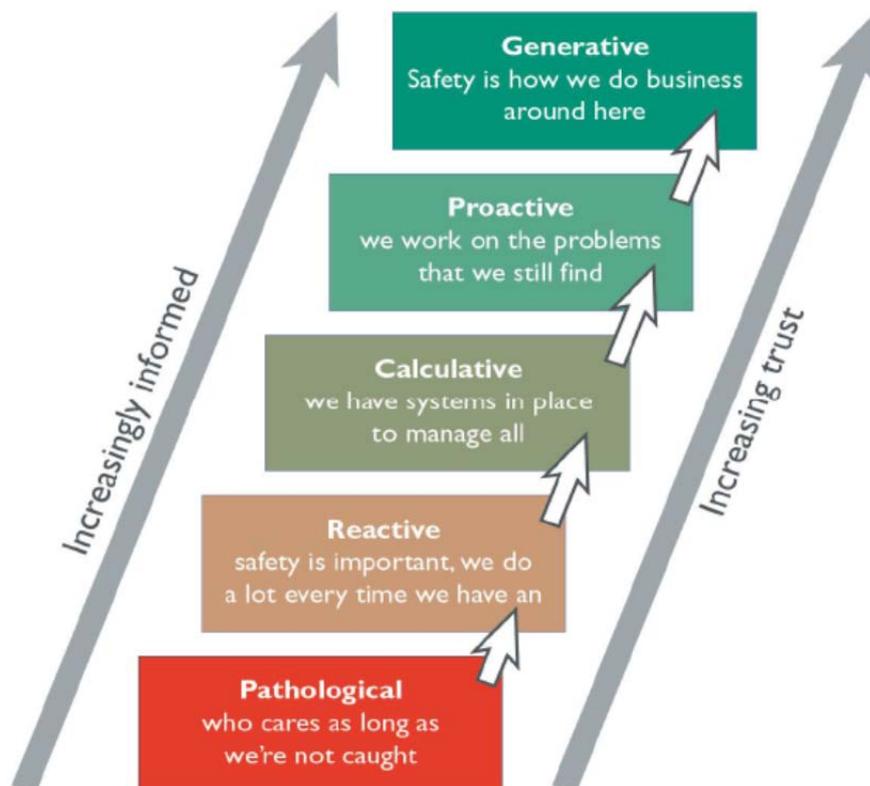


Figure: The five levels of safety culture defined by Parker, Lawrie and Hudson (2006)

Importantly the linkage between culture and maturity has also been explored extensively in the safety context. The term safety culture was purportedly coined by the International Atomic Energy Agency during

the investigation into Chernobyl (Fleming, M, 2007 Developing Safety Culture Measurement Tools and Techniques based on site audits rather than questionnaires (St Mary's University Halifax)). Fleming goes on to describe how the investigations into incidents like Chernobyl, Texas City Fire and Piper Alpha identified that despite the technical safeguards in place on these systems 80-90% of all industrial accidents are attributable to human factors (at all levels of the organisation).

The application of maturity in the safety context is not just limited to industrial settings. Exactly the same framework has been applied to the primary care elements of the NHS in the UK. The Manchester Patient Safety Framework (MaPaSaF) considered a range of dimensions of patient safety and assessed their performance across the five levels espoused by Westrum et al based on responses to a questionnaire. (University of Manchester, 2006, Self-reflecting on our safety culture, National Health Service).

Summary

This document has briefly outlined the conceptual thinking developed by the authors as part of an informal Asset Management Maturity Concepts (AMMC) think tank that has been discussing and debating asset management maturity for the past year.

We are continuing to test the key principles of AMM, and how these principles look and feel in the different parts of the organisation/organisational elements.

There is no doubt that the lessons learned from safety are directly applicable to asset management maturity - after all well-known incidents that drove this evolution in safety culture understanding and improvement were in asset intensive industries like power generation and oil and gas. Importantly, though, the objective of understanding what others (especially those in safety have done) is about more than just 'copying' the attributes of their models. It is about understanding the steps in the human evolution they have been on and how asset management can be moved through those same steps without going through the same pain.

We invite participation and feedback. Please email us at info@livingassetmanagement.com.