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ASSET MANAGEMENT COUNCIL

COLLABORATION IN ASSET MANAGEMENT

Beyond Zero: Collaboration for
Strategic Outcomes

Integrating Management
Systems with Systems of
Management - Aligning the
Asset Management Journey

Can Asset Management
Fundamentals Contribute to a
Project's Success?

INCLUDES
AMPEAK23
SUPPLEMENT

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EDITOR IN CHIEF

THE ASSET, JUNE 2023

In many organisations we observe how difficult it is to create unity and sense of purpose. With increasing focus on Technology, perhaps we anticipate that such difficulties will disappear for currently perhaps little understand factual reasons. Schein tells us in his book "Organisational Culture and Leadership" that with technology ever more prevalent in all aspects of our lives, "... all occupations and professions will become more complex" with the implication that coordination among teams, departments, and subcultures it will become increasingly difficult to coordinate and achieve the value that an Asset Management System seeks to create. One critical element Schein mentions is the notion of culture that exists in and organisation. Especially in large organisations, we observe the development of subcultures, more often than not somewhat counter to the Leadership desired organisational culture.

In the books about Leadership published by the Asset Management Council and others it is pointed out how important Leadership is not only in Asset Management. Leadership creates the Culture that exists in an organisation. If there are differences and perhaps even infighting between departments and teams in an organisation, we can easily see how detrimental that is to their wellbeing and the achievement of the common purpose and value.

Asset Management is intended to ensure that value is delivered from Assets. That requires several organisational and technical elements to seamlessly function together. In a recent organisational review, we were pointed to systems and processes being in place, aimed at assisting personnel to better manage and remove barriers to cooperation and collaboration. The reality we discovered was that there was no real attention paid to those systems, tools and processes, people were following g their own intuition and needs to mostly reactively manage their Assets that are entrusted to their care. A 'healthy, reactive subculture' was in place with interdepartmental conflict preventing the realisation of required outcomes from and through the Assets.

Leadership told us who was responsible for what in the Asset Management teams, but no one in Leadership communicated regularly with their teams and departments, affirming the correctness of their expectations. It was accepted that reliability is poor, and that maintenance was overworked and could not meet the required outcomes (KPIs). Responsibility for Assets, processes and tasks was after not well defined and understood, and no one was accountable for poor performance. Having addressed the involvement of Leadership in the Asset Management process, a change in the behaviour of many of the teams involved became apparent. Redistribution of accountabilities and responsibilities further enhanced the improvement of cooperation and resulted in higher equipment reliability, reduction of reactive work and ultimately risk reduction.

The topic of collaboration in Asset Management has naturally many diverse problems and issues to overcome, not the least with increasing desire for digitisation of everything related to Assets and organisation. The increasing amounts of information internal and external to an organisation can be overwhelming. People tend often to create their own reality at work through this availability of abundant information, not always well founded or relevant. From my own observation, literature reviews and experience by others it is an imperative that organisational design must enable collaboration and communication across teams, departments, and all levels of Leadership. Only then can the intent of Asset Management as a coherent and value add system be achieved.

The Asset Management concept and system models come to mind to reinforce this notion: Outcome focus – Capability – Assurance and Learning across all parts of the organisation that is underpinned by Leadership and Culture created by them.

We hope the topic in this edition of “The Asset” further highlight the importance of collaboration in Asset Management, not only internally but also with suppliers and contractors. Your comments on this critical topic are welcome as always.



FROM MY DESK: NATIONAL CHAIR'S LETTER

**NATIONAL CHAIR,
TOBY HORSTEAD**

We have such a broad range of people, professions and industries across asset management. Possibly the biggest challenge and opportunity for asset management is the understanding and recognition asset management capabilities and competencies across a wide range of human experiences, cultures and perspectives .

So how can we collaborate to define and understand the future, the need for assets, and the outcomes required?

A number of our members are currently taking this opportunity and collaborating with others participating in the review of the Asset Management Landscape with the Global Forum on Maintenance and Asset Management (GFMAM). Known as Project 23 the review of "the Landscape" to version 3 brings together some 200 participants from across the world. The AM Council's David Daines is leading the collaboration across the 7 workstreams with work to continue during 2023.

The recent global meeting in Philadelphia, including those from Australia, of TC 251 is another example of our industry progressing and improving through collaboration. Reports are that the review of the 55000 and 55001 documents progressed successfully and will continue on the approval path.

The recent AMPeak conference held in Sydney was the most well attended and supported in recent memory. The conference responded to the theme "Collaboration through Asset Management".

Highlights and takeaways from AMPeak included:

- Having the international GFMAM members participating and contributing to AMPeak.
- Keynote presentations on "cracking the collaboration code", "organisational culture and 7 megatrends", "collaborating rather than competing" and how to use the "third space".
- We as a community have a responsibility to engage with asset owners at all levels, but particularly at top management.
- There have significant improvements in the application and use of digital information in the operate / maintain phase of managing assets.
- There is an increasing diversity of application of asset management.
- Improving the capability of our community and the value of certification will remain a focus.
- The value you can derive from our assets is directly related to the value you can derive from your people.

The success of AMPeak was only possible thanks to the tireless efforts of The Conference Manager under guidance from our Conference Chair, David Spiteri, and the support of the Sydney Chapter. We also celebrated the outstanding work of our members through the 2023 Asset Management Excellence Awards and inducted Nicholas Phillips to Life Membership.

I must give a massive thank you to Michael Killeen as he steps off the AM Council Board. Michael has been on the Board over the last 3 years and continues to be a significant contributor to our body of knowledge. There have been recent steps forward and change of which Michael has been a key driver.

I would also like to welcome Sarah Hannah to the Board. I am looking forward to the renewables and diversity of experience that Sarah will bring to our leadership. With Sarah's appointment the AM Council board currently has a balanced gender membership.

We should look forward to collaborating with like-minded industry advocates. As an example the AM Council has been working with JAS-ANZ through the sustainment of the asset management scheme for accrediting certifying bodies. The AM Council will also continue to support local international asset management bodies such as the Asset Management Society of India.

Our collaboration platforms beyond AMPeak include our Chapters, our Special Interest Groups, our Symposiums,

our Webinars, our Research and Industry Day and the local and international projects. I encourage both new and existing members to come along to give and also gain knowledge, and create value together.

Our members and our corporate partners can collectively think beyond the build, beyond the assets of today and to the outcomes for the future. Let's collaborate through and with asset management.

Toby Horstead

National Chair, Asset Management Council.



ARTICLE 1 – Beyond Zero: Collaboration for Strategic Outcomes

Dr Monique Beedles, Teak Yew Pty Ltd

ABSTRACT

Traditional strategy approaches are based on the assumption that businesses operate in a competitive environment. Competitive strategy frames business as a zero-sum game, using metaphors from both military and sporting contexts, where there is typically a winner and a loser.

Twenty-first Century approaches to strategy have moved beyond the zero-sum game. Many of the contemporary outcomes we seek for our communities and for society can't be achieved by a single individual, a single company, or even a single nation. Today, sophisticated collaborative approaches are required to address the complex economic and social issues that we face globally.

As a multi-disciplinary field, collaboration is essential to asset management. Asset managers need the skills to collaborate with people from a wide range of professional backgrounds: across teams, across organisational groups, across companies and across countries.

While there are many benefits to collaboration, it is not without its risks. A considered approach is

required to ensure that collaborative efforts produce effective outcomes, aligned to strategic objectives. Collaborations are rarely equal partnerships. So, power imbalances need to be addressed, to ensure positive outcomes for all parties.

This paper draws on research evidence and case studies to explore the current role of collaboration as a strategic choice for organisations. Along with the benefits and risks, the paper will address the key ways that organisations can undertake effective collaboration in pursuit of their desired objectives. These include: creating a safe space for collaboration, ensuring a structured approach to collaborative activities and ensuring that collaboration is seamless.

The paper considers both the processes required for successful collaboration, and the cultural conditions that need to be created to ensure the desired outcomes are achieved.

Keywords: Collaboration, leadership, strategy, decision making, competition, cooperation, game theory

INTRODUCTION

Every organisation operates in a competitive environment. Commercial organisations compete for customers and their spending dollars. In the government and not-for-profit sectors, competition for funding and scarce resources is part of the operating context of every organisation. Competitive strategy leads decision makers to ask questions such as: 'What business are we in?' 'How do we compete in our markets?' and 'How do we differentiate ourselves from our competitors?'

Competitive business strategy has military antecedents. The great generals of history asked similar questions: 'Who is our enemy and how can we defeat them?' Many military metaphors are still embedded in our business landscape. We have 'Captains' of industry and corporate 'war rooms.' The hierarchical and bureaucratic structures of modern organisations are still largely based on traditional military structures. While we can learn a lot from this approach about how to compete and how to defeat our corporate 'enemies,' there are limitations to this

approach in the contemporary business context.

Sporting metaphors are also popular in business today. We reward 'team players,' we strive to put 'runs on the board' and we are keen to demonstrate our 'track record'. Again, this can be useful if it helps us to work together toward a common goal and to cooperate with our teammates because we're 'all on the same side'.

While both the military and the sporting metaphors are useful to some extent when it comes to defeating a competitor, they are less useful in teaching us about how to collaborate with those outside of our own team or our own organisation. What they have in common is that they both represent zero-sum games.

ZERO-SUM GAMES

In game theory, a zero-sum game, also known as a 'constant-sum' game, represents a situation where utility payoffs to the players at every outcome sum to some constant (zero) (Brams 2011). This is typically the case in most competitive sports that involve games, in military conflicts over specific tracts of land, in political contests involving elections, and in commercial environments where the size of the market is fixed.

Two player zero-sum games

A two-player zero-sum game is defined by having one winner and one loser. In this situation there is no opportunity for a draw (such as in Test cricket) or a shared prize (such as a running race where two runners achieve exactly the same time).

A good example of a two-player zero-sum game is tennis. In a tennis match there is always one winner and one loser. The match continues until a result is achieved – there are no draws. In a tennis tournament, the outcome of each match is 'all or nothing' - the winner progresses to the next round and the loser is eliminated from the tournament. Therefore, in tennis there is no reason for a player to cooperate with their opponent. What one gains, the other loses. While they may demonstrate congenial sportsmanship off the court - on the court, the singular objective is to defeat one's opponent.

Zero-sum games with more than two players

Where there are more than two players, the dynamics of a zero-sum game change. While there is still a 'win or lose' outcome, rather than what one player wins being directly lost by the other player, there is an opportunity for two or more of the players to cooperate to improve their outcomes. Anyone who comes from a family of three siblings will know how two of these children can 'gang-up' on the third to achieve their desired outcome.

An example of this is the game of 'Split-the-dollar'. This can be played with a dollar, or preferably with 99 cents (Brams 2011). The total amount is divided equally between three players, unless at least two of the players agree on another way of dividing it. 'This zero-sum game has no stable solution, because however the dollar is divided, there are always two players who can do better by agreeing on another split that excludes the third (Brams 2011).'

While collusion of this nature is prohibited in many commercial contexts, it illustrates that there can be gains to be made by working together with other players, even where the outcome is fixed.

NON ZERO-SUM GAMES

While market share is often used as a performance indicator in commercial companies, a truly finite market is rare. An example is the introduction of Jetstar as a low-cost carrier into the Australian domestic passenger airline market.

Jetstar carried more than four million passengers in its first full year. According to the Qantas Group's Annual Report in 2005, 'Jetstar has also achieved its aim of encouraging more Australians to fly more often. One in 10 customers is a first-time flyer and Jetstar is responsible for a sharp growth in passenger traffic on many of the domestic leisure markets to which it flies. Some markets have grown by as much as 250 per

Figure 1 – Australian Domestic Revenue Passenger Kilometres (Billions)

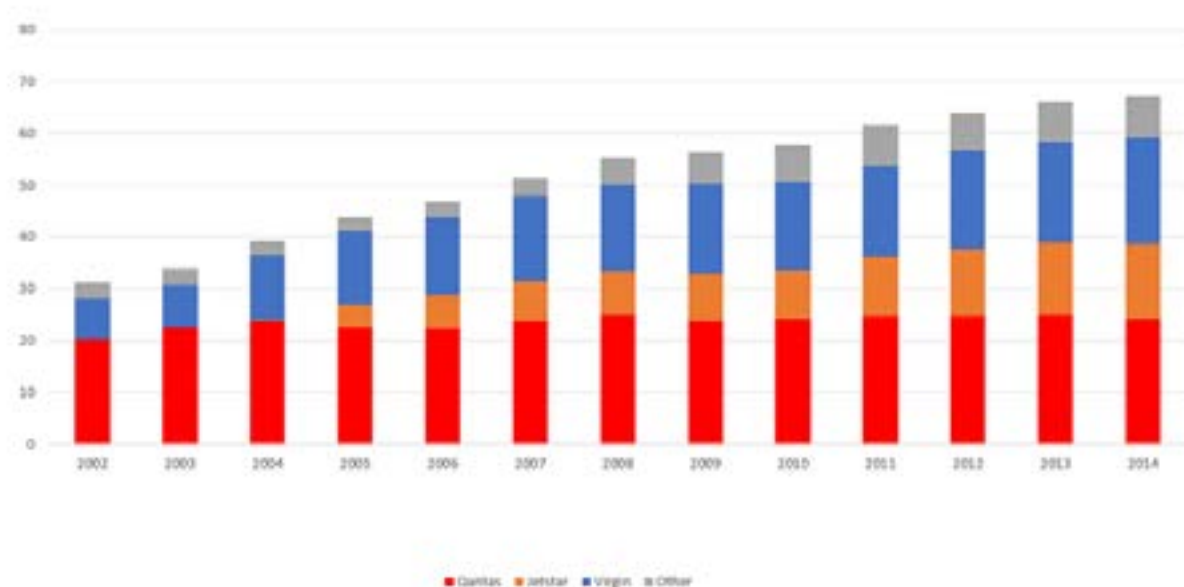


Figure 2 – Australian Domestic Revenue Passenger Kilometres (Billions) Qantas Group

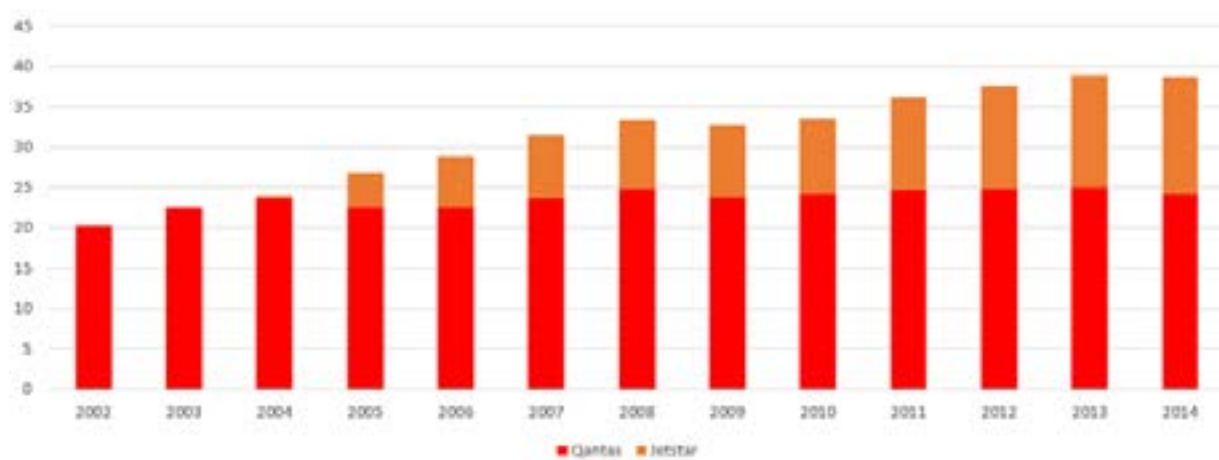


Figure 3 – Contribution to growth in Australian Domestic RPK 2003-2013



*One Revenue Passenger Kilometre (RPK) represents one passenger being carried one

cent. (Qantas 2005)'.

The introduction of Jetstar did not solely cannibalise existing Qantas customers nor merely poach customers from Virgin. Rather, the addition of Jetstar expanded the total market for domestic passenger air travel in Australia. In the 10 years following the commencement of Jetstar's operations, the total Revenue Passenger Kilometres (RPK)* in the Australian domestic market almost doubled from 34 billion to 67.2 billion [5]. Jetstar contributed 43% of this growth in its own right, while Qantas' carried RPK

did not drop, but rose modestly to contribute 8% of the growth over this period (Mills 2017).

Similar patterns of market growth have been seen in airline markets around the world following the introduction of Low-Cost Carriers (Jarach 2004). An example where a product-based business has grown the total market, rather than drawing from the existing market share, is A2 milk, which expanded the total market for dairy products, not only persuading customers to change their milk brand, but also attracting customers who would not otherwise drink

dairy milk.

These markets do not represent zero-sum games. Rather than competing for a 'bigger piece of the pie', the impact of these new players, is to make the pie bigger.

Collaborating to compete

While it might seem counterintuitive, collaboration can improve competition. In 1989 Gary Hamel and his colleagues published their ground-breaking research on strategic alliances, highlighted by their classic *Harvard Business Review* article: 'Collaborate with your competitors and win' (Hamel, Doz & Prahalad 1989). This research focussed primarily on cooperation between companies in the United States and Asia. In these types of cooperative alliances, each company gains something from the other party, often providing faster and cheaper access to new markets or new technologies. These collaborations were most successful when the companies made a deliberate effort to learn from their collaborators and to grow their overall capability, rather than seeing the alliance as a purely transactional arrangement (Hamel, Doz & Prahalad 1989).

While this research on collaboration has had an enduring impact on strategic decision making that is still relevant today, the perspective taken was to assess who was the 'winner' and who was the 'loser' in each collaboration. Despite the ostensible focus on collaboration, this view continues to frame these partnerships as a zero-sum game.

Role of collaboration in asset management

Asset management requires an organisation-wide approach and involves collaboration between teams and across disciplines and departments. Many large infrastructure projects require collaboration between companies. Community initiatives require collaboration between stakeholders and advancing global development in asset management requires collaboration between countries.

Therefore, collaboration has an important role to play in asset management and leading effective collaboration is an important capability for asset management professionals to develop as they move through their careers.

RISKS OF COLLABORATION

Loss of competitive advantage

One of the main fears companies have in entering collaborations is that they will lose their competitive advantage. If competitors learn more about how they operate, the competitor may adopt or copy their process or practices. The reality is that while formally documented processes or procedures can be copied, a company's competitive advantage relies on more than this. The intangible aspects of company culture and the unwritten ways of working are virtually impossible to replicate in another environment. It's rare for culture to be replicated, even in a deliberately planned merger or acquisition, so there is little risk of this happening from a smaller scale collaborative venture.

Loss of intellectual property

The risk of losing intellectual property, especially patents or product designs and formulas is another factor that may hinder collaboration, especially when it is across countries that have different intellectual property protections. While your patent may be protected in its country of origin, the same protections may not apply in other countries. More critical though than straightforward theft of formally protected intellectual property is the more frequent and, often more critical, inadvertent leakage of knowledge, information and data through in-formal interactions that take place outside of the constraints of the formally documented collaborative agreement. Maintaining discipline around the nature and timing of these interactions can help to reduce this risk.

Loss of reputation

When you work with others outside of your own organisation, there's always the risk that values will be misaligned. Actions of the collaboration partner that are out of your own company's control could be damaging to your own reputation if their company's brand is associated with yours by virtue of the collaboration. Choosing your collaborations wisely and seeking good cultural alignment from the start is one of the ways to reduce this risk.

COLLABORATION FOR STRATEGIC OUTCOMES

Collaboration for strategic outcomes means taking a considered approach that maximises the benefits and minimised the risks. This considered approach

requires collaboration to be safe, structured and seamless. Collaboration requires a safe space, not just an open space. If people don't feel safe in the environment, they won't be willing to share ideas and learning will be limited. Collaboration needs to be structured to avoid inadvertent loss of intellectual property or reputation. Finally, collaboration needs to be seamless, rather than bureaucratic, to ensure that time, money and resources aren't wasted on activity that doesn't further the de-sired strategic outcomes.

CONCLUSION

Collaboration has many benefits and is essential to the contemporary asset management landscape. While competition in business may be perceived as a zero-sum game, it's rare that this is completely true. Organisations can gain a lot from collaboration, but they also need to be mindful of the risks. Ensuring a safe space for collaboration, taking a structured approach to clearly define objectives and responsibilities, and ensuring a seamless approach to the collaborative activities, will help to ensure that risks are reduced and that collaboration enhances fruitful pursuit of an organisation's strategic objectives.

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ARTICLE 2 – Integrating Management Systems with Systems of Management - Aligning the Asset Management Journey

Alison Court CFAM CPA, Capability Partners

ABSTRACT

For many organisations around ISO 55001 has been a core component of their Asset Management journey. However, not all organisations realise the

value of integrating the Asset Management System with the Quality Management System nor the need to distinguish these Management Systems from Systems of Management, to achieve the growth required in

asset management capability. This paper will describe the why and how of integrating the Asset Management System with the Quality Management System. It will then describe how the content of these two

Management Systems draw upon risk management techniques to deliver asset management capability. The paper will then go on to describe how these actions can then build the bridge to the various internal Systems of Management. This paper recognises that the Asset Management System needs to underpin the other Management Systems and interface to the other Systems of Management - if business success is to be realised.

Keywords: Asset Management System, Systems of Management, Integrating Management Systems, ISO 55000:2014 and ISO 55001:2014

Acronyms: FMECA: Failure Mode Effects Criticality Analysis, RCM: Reliability Centred Maintenance, LORA Level of Repair Analysis, TA Task Analysis, FTA Fault Tree Analysis, ETA Event Tree Analysis, RBD Reliability Block Diagram, RCA Root Cause Analysis

INTRODUCTION

The International Organization for Standardization (ISO) has published many generic requirement standards for management systems, this paper focusses on two in particular: ISO 55001:2014 Asset management – Management systems - Requirements (AMS) and ISO 9001:2015 Quality management system (QMS) requirements.

An ISO management system differs from a system of management by virtue that the ISO management system is a formal internationally certified management system as distinct to a bespoke system of management. Both management systems and systems of management are necessary for an organization to achieve growth in their asset management maturity.

As per the ISO website, the generic definition of a management system is *“A management system*

*is the way in which an organisation manages the interrelated parts of its business in order to achieve its objectives”*¹.

The definition of a management system within both ISO 55000:2014 and ISO 9001:2015 is “set of *interrelated or interacting elements of an organisation to achieve policies and objectives and process to achieve those objectives”* ii

Many functions within an organisation may claim to have their own ‘management system’ but after some probing it is evident that many are in fact a system of management – key examples being Project Management and Human Resource Management. These systems of management are necessary to achieve a program of work but they do not direct, coordinate and control asset management activities and their plans, policies and processes are not always in the formal structure as called out under ISO.

It is recognised within ISO 55000:2014 clause 2.6 that there is much to be gained by integrating management systems and that the AMS is a natural candidate for such an approach as *“asset management touches so many parts of the organisation”*. The concept of integrating management systems and systems of management is not new –however for integration to be successful it must extend beyond having a common framework and structure – adoption of Annex SL - High Level Structure for Management System Standards 2021 is a good start but it alone is not enough¹.

An integrated management system with documented integration to systems of management is considered necessary for an organisation to lay claim to an asset management capability. Without a sufficiently mature integrated management system, notably asset management and quality

¹ This paper does not seek to explore ISO Annex SL - High Level Structure for Management System Standards other than to acknowledge that both ISO 55001 and 9001 comply with Annex SL and that the increased awareness and knowledge of Annex SL has made it easier within organisations to interface management systems where they have the same ISO structure. Annex SL provides the 10 generic clause titles, text, common terms and definitions for a management system.

management, the organisation cannot claim a match between the integrated management system capability and the managed asset related risks that are necessary to achieve the organisations objectives.

ASSET MANAGEMENT SYSTEM AND THE QUALITY MANAGEMENT SYSTEM

An objective of asset management is to improve organisational performance – value must be delivered to the stakeholders. The role of the AMS is key as it provides a means of linking organisational performance to value creation and provides those in governance and management with a means of understanding the current performance, determining where to invest resource and prioritising investment across the core components of the AMS (stakeholders, leadership, governance and management, people, processes, information, and asset management activities).

The key role of the QMS is to hold the management plans and processes required to deliver on those plans – by holding these artefacts in a central repository the organisation is better placed to have consistency in application of process and to drive improvement in processes. The processes and plans that are held in the QMS are the asset management plans and the AMS plans. This relationship is explored in the paragraphs below and in the diagram following.

Those organisations that conduct effective asset management planning typically demonstrate a higher level of asset management maturity. Clause 6.2.2. of ISO 55001 states that: *When planning how to achieve its asset management objectives, the organization shall determine and document the processes and methods to be employed in managing its assets over their life cycles.*

The role of the Asset Management Plan (AMP) in the Planning process is key. An organisation must plan the content of the AMP; this is achieved by translating the asset configuration (functional and physical baselines) into a derived set of supporting information. This information comprises the operating and maintenance plans, Investment plans and disposal plans; along with their necessary support (ILS) using risk-based decision processes such as FMECA, FMEA, RCM, LORAs, TAs, FTA, ETA, RBDs, RCAs etc (Refer to the ISO/IEC 31010 and IEC

Dependability Standards notably 60300-3-10, 11, 12 and 14 for more details).

For the organisation to have consistency in planning the AMP the risk-based processes detailed above must be resident in the organisations QMS. By having these processes within the QMS the organisation can apply the Plan -Do-Check-Act cycle to lift the organisations overall performance and individual performance at the process level.

Any organisation stands to be benefit from having a documented decision-making framework which can be audited. The decision-making framework is a core element of the management system as it demonstrates how the decision-making processes are linked to the achievement of the AM Objectives and in turn the Organisational objectives.

Having planned the content of the AMP the organisation must then schedule the content of the Annual Work Program and the delivery of the outer year work program – this is achieved by grouping tasks listed in the AMP and then assigning the resources required for the plan in an optimal manner across the year (access to the physical assets is considered a resource along with the many other necessities of the Plan). The key system of management that is used for scheduling is the Project Management System of Management.

Having scheduled the tasks/activities there is a need to forecast the required resourcing (iteratively with the plan and the schedule) for the resource requirements necessary to implement the AMP and the supporting schedules – this of itself requires integration between the Project Management System of Management and the Finance System of Management – both of which must interface with the AMS and QMS.

Systems of management are typically bespoke systems generated by an internal function that interrelate with other functions to achieve organisational policies and organisational objectives. It can be argued that they are emblematic of internal silos who don't structure their information and data to deliver maximum value to decision makers in respect to achieving asset management objectives and in turn organisational objectives.

In the diagram following there are three core elements: (1) The Management system for Asset

Management – ISO 55001 [Asset Management Systems Framework]; (2) Management system for Quality – ISO 9001, Environmental Management System – 14001, Health and Safety Management System – 18001; and (3) The Systems of Management Framework comprising the various systems of management notably: Project Management, Engineering, Finance, Support and Maintenance Management.

The Asset Management Systems Framework itself comprises four core groupings being: (1) a Strategic Asset Management Plan and Asset Management Policy; (2) Leadership arrangements to establish management and governance, and authorities over planning processes; (3) Asset Management System Plans and the Asset Management Plans to achieve the objectives and deliver on the framework detailed in the SAMP inclusive of outsourcing arrangements, scheduling and estimating of asset management activities; and (4) Asset Management System Output – the defensible budget comprising the Annual Works Program (Year 1) and the Five Year Works Program (Years 2-6).

The Quality Management System houses all the plans and processes called out in the AMS Framework.

The Environmental Management System and the Health and Safety Management System provided inputs to the Organisational objectives. The plans and processes called out in the E, H&S Framework and held in the QMS. The Systems of Management represent key functions within the organisation.

APPLICATION CASE STUDY

Organization ABC was itself in its infancy when it took delivery of three mobile assets which had been designed and built by another entity. The build entity outsourced to ABC the requirement to deliver the maintenance, renewal and small-scale engineering change for the assets for an initial five-year period. Organisation ABC had a high-risk exposure as they had not: designed, built, operated or maintained these 3 mobile assets but were responsible for: estimating and forecasting the budget required to sustain the assets and for subsequently scheduling and executing the annual program of work to deliver the organisational objectives of the build entity.

The internal functions of ABC were focussed on themselves – there was little evidence of cross functional engagement working together to deliver

service outcomes and ultimately Value. The organisation was reactive and “out of control.” The initial level of confidence in the accuracy and completeness of the inaugural budget request submitted by ABC was low, even lower was the level of confidence in the ability of ABC to discharge the program of work. Despite their commitment to “can do” there was widespread recognition that ABC was not delivering Value.

If ABC was to be successful in delivering value to stakeholders and estimating the dollar value of the resources required to maintain and support the assets then they needed to regain control so that they could build and execute a ‘defensible budget’ driven by the AMS based on the content of 55001 integrating with the QMS based on 9001.

The Leadership of ABC recognised that they needed to implement a formal management system to “gain control” through “gaining alignment across the functions to deliver the organisational objectives in relation to the 3 mobile assets – the “Business Asset Element “as per AMBok – Framework for Asset Management. *iii*

A further fundamental requirement for success was the agreement that the QMS is the repository of all processes and plans– the “how to.” The agreed interface between the AMS and the QMS allowed the organisation to build on the “Structured Element as per AMBok – Framework for Asset Management. The alignment of the Organisation objectives with the Asset management Objectives through provision of the SAMP and resultant AMPs was fundamental if there was to be success. Every work package estimated and submitted in the annual work program request had to be traceable to the achievement of the AM objectives as a criterion for inclusion.

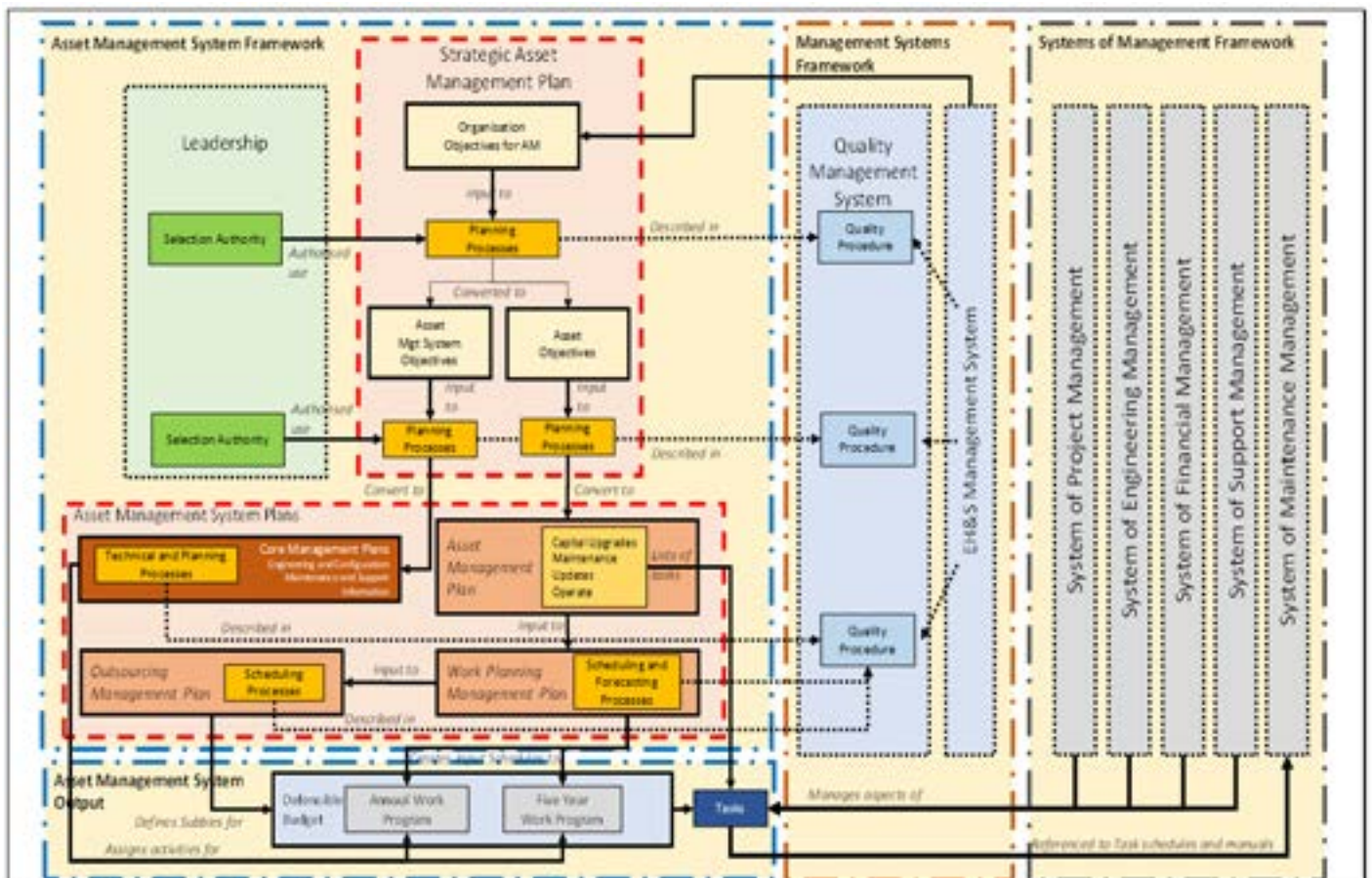
By agreeing the scope of the AMS and the QMS and interface between the two MS whilst recognising the role of the Systems of Management ABC over a period of time was able to demonstrate increasing AM maturity from X to Y. ABC was eventually able to provide assurance to the build entity that the AMS was fit for purpose and the delivery of services was sustainable and with less volatility. This milestone achieved recognition that the organisation had moved from “gaining control” to being “in control” - the Governance Element as per AMBok – Framework for Asset Management was in place.

Figure 2 following shows the AM maturity journey of

ABC – from Instinct to Independence^{iv}.

There was agreement that all the technical processes necessary to achieve their objectives during the operate and maintain stage of the assets lifecycle were to be housed in the QMS. Thus, if the work package called for conduct of corrective and or preventative maintenance then the QMS would hold the applied decision processes which documented for each managed asset the decision elements of Failure Modes Effect Analysis (FMEA)/ Reliability Centred Maintenance (RCM) / Integrated Logistic Support (ILS) for the equipment. Thus ABC was able to demonstrate a traceable connection between the functions of the equipment, the achievement of the AM objectives and the essential resources necessary for the maintenance necessary to deliver those functions.

In supporting ABC we needed to ensure that the System of Project Management Controls was in place to manage the execution of work packages and accurate reporting of work execution against the schedule. Equally the supporting systems of management such as System of Finance Management was paying suppliers on time and that the reported Financial Position aligned with the Project Controls reported position.





CONCLUSION

The adoption of formal management systems of the AMS and QMS and the agreement of the scope and interfaces between the two key management systems is fundamental to growing a sustainable AM capability that delivers value to the stakeholders. By “custodying” the AM and AMS plans and processes in the QMS the organisation can then use the QMS to not only document but to also implement, maintain and continually improve the processes and thus reduce the risk of not achieving the AM Objectives.

However, the integration of the AMS and the QMS alone is not enough to demonstrate AM capability – the Management Systems must also interface with the various Systems of Management which will document their own processes. The Systems of Management should be structured and led to support the delivery of the AM Activities and establish an agreed interface with the AMS, only then there can there be a reasonable expectation that the organisation will deliver Value.

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ARTICLE 3 – Can Asset Management Fundamentals Contribute to a Project's Success?

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ABSTRACT

Different stakeholders will have a different view with regard to project success. Much of the success for Asset Management (AM) principles, especially in the private sector, can be attributed to the learnings of significant disasters or events of asset failure

in terms of loss of life and lost revenues and profits (Giglio et al., 2018). In the public sector, a “perfect storm” is taking place as the combination of ageing Large Scale Infrastructure, reduced budgets, declining population, low affordability and the accelerating renewable energy transition is creating significant issues for

infrastructure managers.

AM is founded on a set of fundamentals which are detailed in the International Standard ISO55000; Value, Alignment, Leadership and Assurance. The Institute for Asset Management also introduces an additional two features that differentiate

AM from other disciplines and management systems which are the 'asset lifecycle' and 'its approach to decision making'.

So why aren't these fundamental concepts supporting the success of the delivery of a project? Where are the linkages to the operational outcomes? Success of any project can be subject to many aspects that may change during the project's lifecycle and also organisation to organisation. McClory et al (2017) quotes that project management success can no longer be determined only by the 'iron triangle' that measures schedule (time), costs and quality. There are still what appears to be unnecessary project failures that result from poor management in the areas of risk and stakeholder management (Xia et al., 2018). Projects should be managed with a focus on the realisation of their strategic and long terms goals (Zwikaël et al., 2019) to realise their expected benefits and operational performance.

This paper further explores project success within the context of Asset Management which is the subject of further research at the University of Queensland.

Keywords: Project success, Asset Management fundamentals, Requirements Management, Project Management success, ISO55000, Project handover, Systems Engineering

INTRODUCTION

What is a project and what is project success? A project is an "endeavour with defined start and finish criteria undertaken to create a product or service in accordance

with specified resources and requirements" (Standards, 2015). Project success maybe a little more difficult to define? Different stakeholders will have a different view with regard to project success. At first glance, project success appears to be a very simple definition, it is a project implemented in accordance to the requirements of the project design and owner satisfaction (Larsen et al., 2018).

There has been much research into project success often getting confused with project management success. Project management success research discusses the "iron triangle" constraints of schedule, cost and quality. (Chan et al., 2004, Shao and Müller, 2011, Baker et al., 1997, Serrador and Turner, 2015). Balancing these factors and generally the outcomes of a project should always ensure project management success. There has been much criticism about these principles and researchers argue that the traditional measures of time, cost and quality are not acceptable to define project success and lead to an inadequate view of this success (Rezvani and Khosravi, 2018).

Asset Management (AM) has emerged as a recent engineering approach in the public infrastructure sector which promises to achieve more value with effective and efficient management of resources (Moon et al., 2009, Giglio et al., 2018, Roda and Macchi, 2018). In the 1970s, the UK Board of Trade and Manufacturing established guidelines and standards and the United States (US) civil engineering sector

established guidelines and asset management requirements. During the 1990s, the UK North Sea oil and gas sector established asset whole of lifecycle planning and management; this was in the period succeeding the Piper Alpha oil platform disaster. Radical change was needed with the creation of dynamic multidiscipline teams managing an asset with a complete lifecycle perspective led to the inspiration of innovation which resulted in large gains in performance, safety and productivity (IAM, 2015).

The AM industry now deploys more technology and equipment across a multitude of technical and engineering disciplines for more service to satisfy consumer needs (Petchrompo and Parlikad, 2019). The relatively new standard International Standards Organisation (ISO) 55001 series of Asset Management and Management Systems (Standards, 2014) reinforces the integrated view of Asset Management that supports a company's reputation when balancing risk, cost, schedule, performance and opportunities, and thus avoiding or mitigating the loss of resources such as time, budget and possible damages (Lima and Costa, 2019).

Project stakeholders all have differing objectives and in an effort for Design & Construction (D&C) organisations to finalise a design, build quickly, get paid and get off site as soon as possible tends to introduce unknown risks that some stakeholders may not be aware (BSRIA, 2014). These project risks are being transferred during project handover from D&C (delivery) to the Operations & Maintenance

(performance) phase without the projects owners (or operators) of the asset being fully aware of the risk transfer or the associated cost implications (Wong et al., 2014). Changes within the delivery phase of an asset are often not fully evaluated across the asset lifecycle introducing unknown risks for the asset operators. These often unknown risks increase the cost of managing and operating the asset due to what appeared to be, cost benefits and savings in the delivery phase of the asset procurement (Wong et al., 2014, El-Akruti and Dwight, 2013). These poor decisions also delay any recovery of assets costs (from any business case) or not fully utilising the asset for what it was intended therefore reducing the operational service and capability.

OBJECTIVE

The objective of this paper is to demonstrate the Asset Management and Construction industry that Asset Management fundamentals are critical elements in the assessment of a projects' success within Large Scale Infrastructure. Large Scale Infrastructure (LSI) are characterised as megaprojects over \$1B and are complex with multiple organisations within the project environment to achieve the project outcomes and goals.

METHODOLOGY OF ANALYSIS AND LITERATURE REVIEW

This paper was researched utilising a literature review exploring the fields of project success, project management, asset and lifecycle management. This methodological review researched evidence utilising

research databases available to the writer of this paper through his research organisation. This paper forms the early examination of evidence of the issues associated with major infrastructure projects and their transition from project delivery to the projects' operational phase. The overall research goal is to determine why some major asset acquisitions outcomes change during the project delivery lifecycle, from their original concept in asset procurement (delivery) phase through to the asset performance (operations) phase, and subsequently limit the success of a project and often its operational outcome?

The literature on project management is extensive and varied focusing on changes and variations and the reasons why a project is unsuccessful but it is often the changes that are unknown in the original plan that brings a project to that difficult environment. Research is finding that the challenges in LSI are largely associated with human skill and competencies, rather than technical challenges (Rezvani et al., 2018). Notwithstanding the active research on project management success and project success, there is a research gap which seems that Asset Management fundamentals may satisfy.

DISCUSSION

Project Management and Success

Project Management (PM) is a complex undertaking that can be affected by a seemingly unlimited number of inputs, (Griffith et al., 1999) with project success being different for many stakeholders so the alignment of goals before a project commences is critical to

the future project success. Project success and project management success are two different issues that are related being project success is a subjective measurement and can change over time (Griffith et al., 1999). This PM success is when a project is delivered on time, within budget and an agreed level of quality, performance and scope are often mentioned with success from the delivery organisations point of view.

"PM is the function of planning, overseeing, and directing activities required to achieve the requirements, goals, and objectives of the customer and other stakeholders within specified cost, quality and schedule constraints" (NASA, 2007).

Any success can be subject to many aspects that may change during a project and also organisation to organisation as a result of the type of project (McClory et al., 2017). McClory et al (2017) quotes Williams (2016) that PM success can no longer be determined only by the 'iron triangle' that measures schedule (time), cost and quality. The concept of the iron triangle also referred to as the triple constraint or golden triangle is a central aspect of how the PM industry recognise success in projects (Pollack et al., 2018). Though it appears there is no agreement on the definition of project success, there seems to be accepted compromise of the successful completion of a project utilising the elements of the iron triangle (Alemu and Thakur, 2022). The concept of project success could be viewed to be at odds with PM success.

Rezvani et al (2018) suggests in

recent empirical research that different types of large scale projects may require different success factors. It appears reasons for these differences vary as a result of project environmental factors, the type of project, prioritisation of project goals and the participating organisations. This disconnect between the asset goals of the acquisition of a LSI project to the project delivery to the actual performance of the asset in its operations phase results in a successful or failure of a project, not how it was delivered. These types of challenges become more critical in a multi-asset system (systems of systems) with multi-interests, multi-stakeholders and investors. Projects are a complex entity requiring a multitude of skills to lead this type of entity and applying a text book model will not always work. Todorovic et al (2015) suggest that project success should be consistently monitored and evaluated to ensure a successful project through its entire project lifecycle. Project leaders need to be aware of their surroundings and applying a structured solution to a complex varying environment will not always be successful. It often may not succeed as the project manager will miss the issue as a result of lack of experience if they had not experienced the problem before.

There are still what appears to be unnecessary project failures that result from poor management in the areas of risk, cost and stakeholder management (Xia et al., 2018). Zwikael et al (2019) states projects should be managed with a focus on the

realization of their strategic goals (Zwikael et al., 2019). A project should focus on its requirements and benefits however Zwikael et al (2019) also states, "projects frequently do not realize their expected benefits and therefore do not enhance operations performance." Pereira et al (2022) describes in their research that there are two viewpoints with respect to project success: the project management success criteria and the project success factors.

Zhang et al (2013) details project success is an abstract concept and there is no general definition however their research revealed a composite project success criteria and correlation between project success and a project managers leadership style. Large and complex projects place further emphasis on project managers needs for Emotional Intelligence (also known as EQ) because of the unique characteristics such as complexity of personnel, multiplicity of goals, intensive of capital, strong uncertainty of activities, difficulty in coordinating stakeholders, etc (Zhang and Fan, 2013). They go on further to discuss EQ contributes to a Project Managers transformational leadership style and subsequently the actual project performance. The paper reviews many studies where researchers found that EQ affects leadership behaviours of the project leader and subsequently contributes to the positive project outcomes.

Asset Management Fundamentals

AM is defined as "coordinated activity of an organization to

realise value from assets" (Standards, 2014, Okoh et al., 2016) it is also defined as "*the optimal lifecycle management of physical assets to sustainably achieve the stated business objectives*." Asset Management (AM) is founded on a set of fundamentals which are detailed in the International Asset Management Standard ISO55000:

- Value
- Alignment
- Leadership
- Assurance

The standard states if any one of these fundamentals are missing from the management of assets, the organisation will likely observe a reduction in value its assets provide (Hardwick et al., 2020). This enabling of asset value realisation is balancing the financial, environment and social costs, risk, quality of service and performance related to assets (Standards, 2014). It is important in understanding AM that an organisation and the leadership of the organisation understands what realisable value is to the organisation and its stakeholders. AM provides the fabric of understanding your organisational long term objectives through a lenses which recognises this value to the organisation.

ISO55000 (2014) states:

"The value (which can be tangible or intangible, financial or non-financial) will be determined by the organisation and its stakeholders, in accordance with the organisational objectives"

Value is a clear fundamental aspect and as mentioned in ISO55000 (2014) does not focus on the asset itself but on the value that asset can provide to the organisation. AM enables an organisation to realise value from assets in the achievement of the organisational objectives and utilising the lifecycle management approach. The asset exists to provide value to the organisation and its stakeholders. The organisation objectives take into account the needs and expectations of the stakeholders. These are investors, customers, regulators, employees and local communities (IAM, 2015).

Alignment is the organisational objectives in how the day-to-day business is operated utilising its decisions, plans and activities. The connectivity between an organisation's strategic plan and the AM activities delivered by the staff. This is the translation of organisational objectives into AM policy, strategy and objectives. This alignment brings advantages in prioritisation and coordination of purpose and creates creativity and innovation including the linkages of the strategic objectives to the organisation processes.

Leadership culture and commitment are essential in ensuring the organisation objectives and the establishment of AM systems including roles, responsibilities and accountabilities. This includes ensuring employees are competent, empowered and there are delegations and authorities for the decision making within the organisation. Visible senior leadership and commitment is crucial in organisations that

aspire to deliver effective AM. Culture can be added to the fundamental as leadership sets the scene through their senior executive leadership team by their behaviours and messaging.

Assurance is the combination of monitoring and auditing to confirm the assets, systems and processes are operating as intended. It is a confirmation stage of effectively ensuring the correct governance exists within the organisation. Assurance applies across the organisation and within the management systems and includes developing and implementing processes:

- that connect to the organisation objectives
- for assurance of capability across all lifecycle stages
- for the monitoring and continual improvement
- for providing the required resources and competent personnel for ensuring assurance (Standards, 2014).

The Institute for Asset Management (IAM) also introduces an additional two fundamentals that differentiate AM from other disciplines and management systems which are the 'asset lifecycle activities' and 'its approach to decision making'. The IAM has drawn these two principles out of the baseline ISO standard values in an effort to highlight their importance. The IAM principle of *lifecycle activities* includes all aspects of managing assets from the initial concept to the asset disposal (IAM, 2015). The *Asset Management decision making* principle is about

compromise between competing interests. Competent, consistent and effective decision making is vital element of successful AM. These are discussed within the baseline values within the ISO standard however the book the "Living Asset Management Maturity" calls for a fifth fundamental of Adaptability (Hardwick et al., 2020).

Adaptability requires organisation and their Asset Management Systems to be able to sense those changes relevant to their environment and be agile enough to respond to those uncertainties in a timely manner. This is the ability of the organisation to respond to changes in the stakeholders' expectations in an appropriated expected rate achieving organisational objectives.

The generation of value also characterises the requirement to balance risk, cost and performance. In achieving asset management objectives, risk, cost and performance relate in a different way to Value as risk needs to be either reduced or known with an understanding of consequence, cost needs to be managed and performance is a measure of success (Hardwick et al., 2020).

The Challenges of the AM Fundamentals

The biggest challenge is how to translate, align and deploy AM fundamentals, values, strategies and activities in any organisation especially an organisation or entity that considers Asset Management only takes place within the operations phase.

Many maintenance organisations struggle with AM systems and its application to their organisations. The future challenge is for construction and project management organisations to understand they are critical elements for the AM lifecycle as a whole. Their asset design decisions often set the direction of the asset for the majority of its life.

AM requires integration of activities across the whole lifecycle not just a consideration of the individual lifecycle phase of Operations & Maintenance (O&M). Organisations can work within the lifecycle or across many and initiating the Value fundamental commences in the concept phase. The asset and asset systems interfaces start to materialise within the design phase as the asset become a design reality. The asset being created needs to create value for the future operational entity and client.

The Value statement from ISO55002 states, *'where an asset is generating financial benefits, the acquisition, renewal or replacement cost of assets, and their operating and maintenance costs are important considerations in decision making and the ability to derive value from the use of assets'* (ISO55002, 2019). This statement presents the

balance and decisions that needs to be made to ensure an asset is generating a Value; eg cost for services or the viability of the organisation in renewal or replacing assets (ISO55002, 2019).

Creating asset Value takes shape in the design phase which can determine as much as 80% of the total lifecycle costs at that point time, (IAM, 2015, Trigunarsyah, 2017) as well as a large portion of its environmental and social impact. The design stage for any asset requires Systems Engineering to ensure all interfaces have been considered to guarantee an effective technical operational solution. The design stage finalises any commitment to how the asset will operate and be maintained. The client needs to understand the operational concept of the early design to reduce issues and improve quality as the design develops and therefore reduces any future litigation which can originate from ineffective decisions and activities taken during the project (Trigunarsyah, 2017). Experienced operational asset managers that have worked in the operational phase of similar assets need to be consulted to ensure lessons learnt and experience are fed back to the design of an asset. This will mitigate many risks and ensure the operational asset outcomes are achieved.

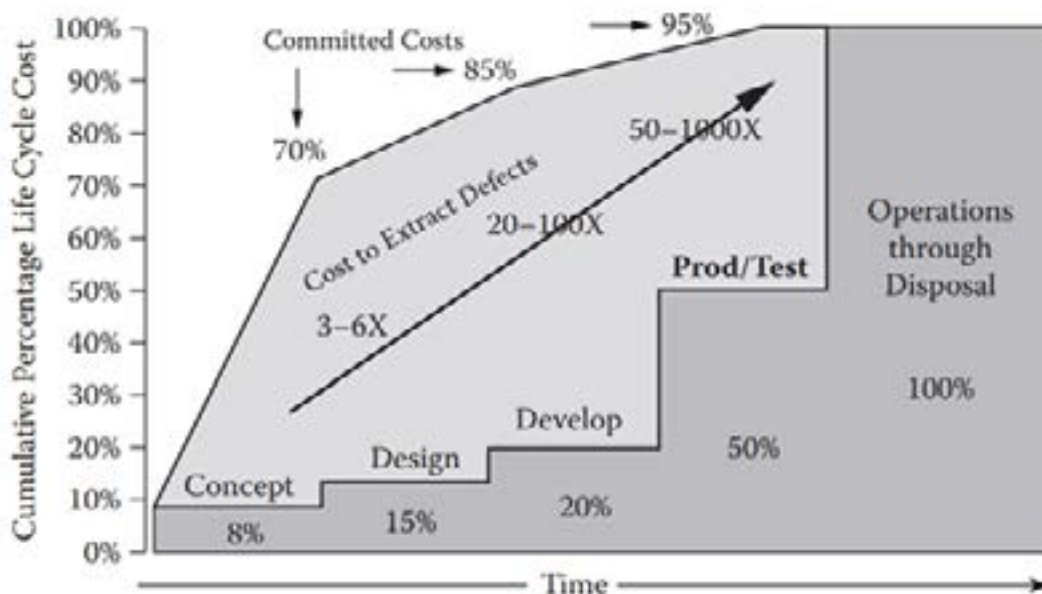


Figure 1 – Committed Lifecycle Cost against Time (Cloutier et al., 2015)

Figure 1 indicates the whole asset lifecycle in time verse cumulative committed lifecycle costs. The locked component of the whole lifecycle costs of the asset takes place early in the asset's lifecycle. As an example, 8% of the whole of life costs are committed in the concept phase and by the design and development stage 15-20 % are committed. At the same time, 70% of the cumulative committed lifecycle cost to develop a system is committed during the concept stage, and when the design phase (within the project lifecycle) is almost finalised, it can be up to 85% committed. This percentage may change a little depending on the asset type and project delivery method. (Cloutier et al., 2015). What this graph also indicates if any defects (or modifications to the design) generated through the concept stage (and not corrected in this stage) will cost three to six times more to modify the design at the next phase. If the errors/issues are not found at that stage the defect could cost 50 to 1000 times more in monetary figures if it was not discovered in the phase it was made (Cloutier et al., 2015).

The fundamental of Value is a critical concern in the Design Phase of an asset. What is the asset's role within an organisation? What is the client's outcome and do they have customers with their own interests in this asset. How are the objectives of the project aligned to the project assets existence? Rezvani et al (2018) discussed the disconnect between the asset goals of the project delivery to the actual performance of the asset in its operations phase. Has the design or construction methodology changed a performance outcome in the operations phase? This is where the review of design by experienced operational asset managers and engineers may mitigate these risks for the asset owner where the interests of the D&C organisation are different to the asset owner and

subsequently the asset operator.

How is the Alignment in the asset objectives being achieved from the concept phase of pre-procurement of the asset to the handover to operations. The many different types of organisations engaged over the asset lifecycle appear to have dissimilar objectives (Rezvani and Khosravi, 2018) which need to be managed by the asset owner as they have ultimate control. The project delivery technical requirements process begins with a customer need. Requirements are the single thread that goes through a project from conception through build, test and capability outcome and operational activity (Authority, 2020). A project is constructed from many required outcomes. The Requirements Management (RM) methodology comprises with all changes to requirements baseline over the asset lifecycle and preserving bidirectional traceability between stakeholder expectations, component requirements, customer requirements, technical product requirements, design documents and test plans and procedures (NASA, 2007).

The business needs create an asset solution and through a design process, the relationship between business requirements, through the asset solutions are being considered, through the requirement analysis process. Requirements Management (RM) includes definition, analysis, allocation, traceability, verification, and validation of stakeholder requirements throughout an asset or service lifecycle. Requirements analysis is to expand the original set of requirements into a fully scoped set of technical specifications. It takes the business requirements and operational outcomes and turns them into a System project requirement (Branch, 2022). Figure 2 illustrates and example of requirements analysis ensuring the transformation to the systems requirements from the business requirements.



Figure 2 – High level illustration of Requirements Analysis (Branch, 2022)

The technical requirements development for a system outlines the requirements to accomplish the following:

- “transformation of the requirements into an effective product
- use the product to provide the required services
- sustain the provision of those services
- dispose of the product when it is retired from service” (Branch, 2022).

The effective conclusion of this area is the Systems Engineering (SE) component of design. SE plays a key role in the project management organisation and is an assurance methodology that supports asset management over the entire lifecycle but often appears to be not implemented through the asset lifecycle just the project delivery cycle. SE is a process that is applied to all phases of the asset lifecycle (Cloutier et al., 2015) as activities in each phase interact with activities of the other phases (Blanchard and Blyler, 2016).

“Systems engineering is about looking at the ‘big picture’ and not only ensuring that they get the design right (meet requirements) but that they get the right design.”
(NASA, 2007).

In SE it is vital to consider the overall asset lifecycle to ensure system issues are addressed appropriately. Systems include technical and non-technical systems like the people and operational procedures. The system interactions and ‘cause and effects’ between all phases of the asset lifecycle especially in the assessment of risks in the decision-making process (Blanchard and Blyler, 2016) are crucial for a successful outcome. Good AM encourages effective risk management and tradeoffs between phases of the lifecycle as there is no short cuts to verification, validation and testing within asset lifecycle management.

The bidirectional traceability between the requirements, design and the testing subsequently is a critical stage to confirm the operational outcomes have been achieved. This assurance activity in SE confirms each requirement has been met. Figure 3 offers a basic outline and Vee development model ensuring the assurance function on the right side of the Vee confirming the appropriate requirement. SE is a complex field of research and study and has not been discussed in detail within this paper.

SE plays a key role in leading the development of the concept of operations (ConOps) and resulting system architecture, defining boundaries, allocating

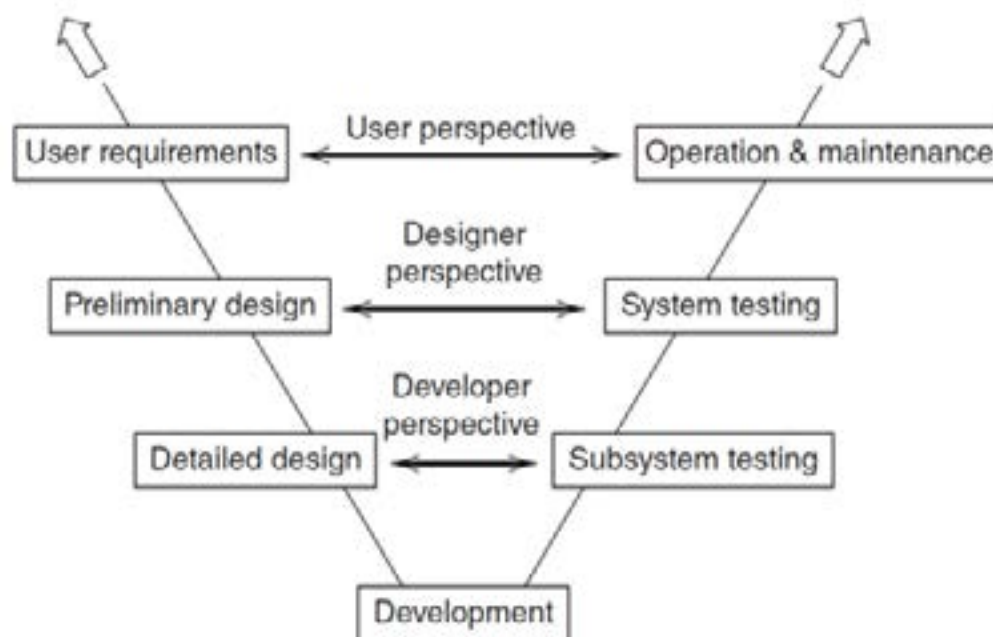


Figure 3 – Generic “Vee” development model (Blanchard and Blyler, 2016)

requirements, assessing interfaces, evaluating design tradeoffs, balancing technical risk between systems and providing oversight of verification and validation activities (NASA, 2007). SE focuses that the goals of the operational system will be met.

Figure 4 is a Venn diagram that illustrates the interface between SE activities and Project Planning and Control (PPC) activities within PM. This research has identified the need to develop a third Venn element related to AM activities to ensure the asset lifecycle considerations. Stakeholder, configuration and risk management, data management and reviews will be central to all three activities. SE being critical component of Asset Management as it seeks a safe and balanced design in the face of opposing interests and multiple, sometimes conflicting constraints (NASA, 2007). Fundamental elements of assurance is demonstrated however adaptability is an feature that appears to confront D&C organisations.

Knowledge Management

Knowledge management is a key term utilised to ensure lessons learnt and project information is managed and transferred between parties effectively. The recent Government Soft Landings (GSL) (BSRIA, 2020) initiative in the UK appears to be a successful method of open communications and engagement between stakeholders. GSL sets out the key element of the design, construction and handover process, because it maintains a 'golden thread' of the assets purpose while still having a link to the performance standards of the asset through its lifecycle (BSRIA, 2020). One of many aims of GSL was to focus on a smooth transition from construction to operations from the outset of a project.

Supporting this GSL is the refinement and application of Building Information Modelling (BIM) standards which has a strong focus on delivery of a project and its information requirements across phases of a project (Barr, 2019). ISO 19650 series of standards states, '*Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM)*' is to support all parties towards achieving their business objectives through the effective and efficient procurement, use and management of information during the delivery phase of assets (Framework, 2020, Standards, 2019). This ISO standard enables an appointing party (owner or client) of a project to establish their requirements

for information during the delivery phase of assets and to provide the right commercial and collaborative environment within which multiple appointed parties (D&C and O&M contractors) can produce information in an effective manner (Standards, 2019). Figure 5 indicates the complex relationships that need to be considered.

BIM according to the ISO 19650 standard series' is about getting benefit through better specification and delivery of just the right amount of information concerning the design, construction, O&M of buildings and infrastructure, using the appropriate technologies. These actions assist in the delivery, the efficiencies and savings envisaged by any Government and others. The ISO 19650 series applies throughout the whole lifecycle of an asset and it applies to all types of assets in the built environment – buildings, infrastructure and the systems and components within them (Phillip et al., 2019). Figure 5 indicates these complex relationships without the contractual consideration. Stakeholder relationships will be more beneficial than any commercial consideration if the element of trust exists.

This summary reinforces the leadership required by all parties especially the asset owner who takes final accountability for ensuring the asset is developed and delivered for an operational value and outcome.

Summary and Results

Few projects proceed fully in line with their specific plans and changes need to be made and managed during the assets lifecycle (Vuorinen and Martinsuo, 2019). Projects are becoming more complex and costly. The modern technical interface and issues of complex software, physical assets and stakeholders issues of sustainability and climate change can add considerable cost due to these modern infrastructure requirements. Infrastructure and large scale acquisition also known as mega projects are costly to scope, tender, acquire, maintain and operate (Chan et al., 2004, Serrador and Turner, 2015, Trigunarsyah, 2017). This modern infrastructure and public assets can be often designed and/or acquired through poor validations and business cases that do not fully cost and understand the assets whole asset lifecycle and risk profiles. AM fundamentals support the asset business case ensuring the Asset's operational Value and Alignment to the business objectives.

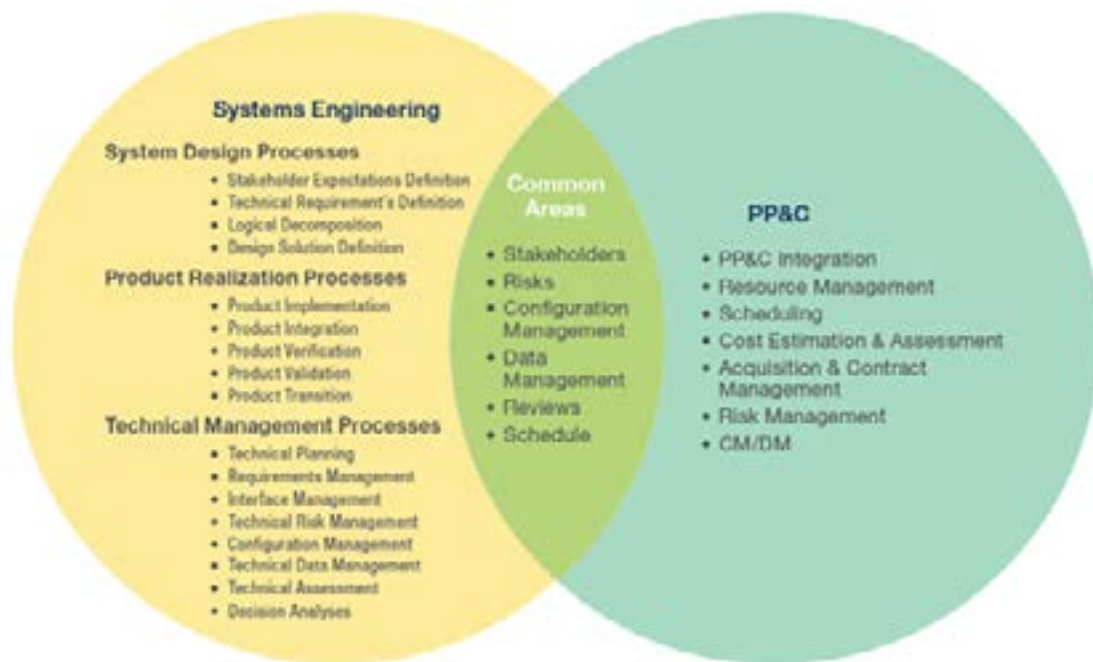


Figure 4 – SE in context of overall project management (NASA 2007)

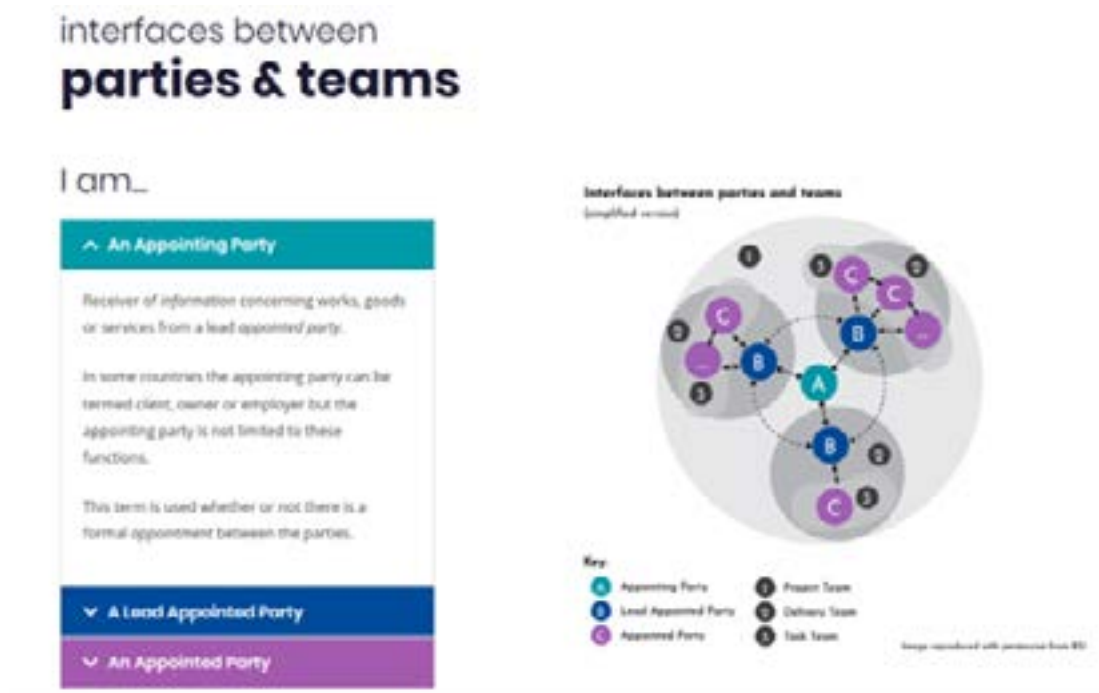


Figure 5 – Interfaces between parties (Standards, 2019a)

The challenges for managing megaprojects appear unique such as the requirement to manage numerous, concurrent and complex activities while maintaining schedules and costs (Caldas and Gupta, 2017). Leading and managing megaprojects and LSI projects are complex and require skilled leaders in all facets of the asset lifecycle. Traditional project managers often had an authoritarian leadership style however today's project managers require flexibility, being adaptable to change and a transformational leadership style. This organisational style needs to be adaptable to ensure the project can respond to the future operational environment (Vuorinen and Martinsuo, 2019). Having the skill to recognise there is a problem and find a solution.

Risk management is an essential element of D&C projects contributing to the identification and management of known risks across the projects also ensuring that a project is delivered within the contract requirements of cost, schedule and quality (Vachhani, 2016, Marinelli and Salopek, 2020). Xia et al. (2018) discusses a key problem is the differences amongst stakeholders with regard to risk-related concerns and the perception and risk based decisions (Xia et al., 2018). They further suggest that stakeholder issues and risk management are interwoven and need to be better managed across the asset lifecycle. Transport for NSW states in their Asset Management Framework (2021) that Risk management is an important component of asset management and informs a risk outcome that balances the operational performance of the assets against the asset lifecycle costs (Cooper,

2021).

This literature review has indicated the complexities of project and asset management within the LSI environment. The AM fundamentals of Value, Alignment, Leadership, Assurance and Adaptability all contribute as key ingredients that skilled project managers should be balancing. The pressures of project managers to manage a project within the schedule, cost and quality to the client expectations and commercial outcomes are critical to their success and the environment. However, these competing demands need to be better managed for the asset lifecycle and operational outcome as the asset owner is the only person or organisation that can assure this result as each organisation has different priorities. These behaviours can also be attributed to the silos that these organisations work within and the project completion timeframes of project completion verse program management, a longer term vision of asset management.

There is a leadership accountability or key operational performance indicators (KPI) requirement from the asset owner that focuses a project on asset lifecycle for all stakeholders. A D&C contractor will not have the same success focus as an O&M contractor or the owner of the asset (Radujkovi and Sjekavica, 2017). Phased projects objectives across the asset lifecycle are required with KPIs for the D&C phase that support the operational outcomes of the O&M phase for the project under construction.

As evident by asset owners who experience outcomes of asset

builds that could have been better designed, early involvement of O&M staff is key for better anticipating obstacles and learning from past experiences (Smyth et al., 2017). Smyth (2017) also argues the lack of integration between D&C and O&M results in a lost opportunity for mobilising synergies and leveraging value of total asset management solution. Project Management and Asset Management teams generally work independently with limited interaction with the priorities of the stakeholders being often different (Wong et al., 2014). This interaction has to change as the end customers' expectation of the asset and the emphasis on user satisfaction is increasing to ensure sustainable solutions are designed for cost effective result with maintainability practises becoming more transparent (Standards, 2019).

CONCLUSION

The application of AM fundamentals to infrastructure projects and to the delivery phase of an asset lifecycle is undisputable. Value, Alignment, Leadership, Assurance, and Adaptability are fundamental ingredients of a projects' success. D&C organisations are already accredited AM professionals however they just refuse to acknowledge it. D&C organisations are an essential element in the equation of a project's lifecycle success. The client decides the commercial delivery models and as a result the models need to consider how operational issues and risks that develop or change during the delivery phase are monitored. The AM fundamentals can influence the asset owner ensuring the operational focus

during the delivery phase for the future asset lifecycle.

Asset management is about understanding the performance outcome of the asset and if required unlocking the Value to gain the most out of the asset (AMC, 2017, Smyth et al., 2017). The project owner has a “primary interest in receiving the benefits from the project” (Zwikaël et al., 2019). Therefore, the leadership and accountability required assigns the owner ultimately responsibility to ensure engagement and risk is managed appropriately across the asset lifecycle. An asset lifecycle framework resulting in a lack of full integration between D&C and O&M presents lost opportunities in seeking alignment towards the organisations operational goals and project stakeholders. Operational risk management is a critical factor within a project and business control towards a single focused operational objective. The loss of knowledge transfer between D&C and O&M is a significant issue. This lack of risk identification, knowledge transfer has attributed to an increase in costs during the operations phase due to a lack of data and information retention.

Despite the increasing number of LSI projects implement around the world, most projects fail to meet their objectives and experience substantial cost and schedule overruns (Rezvani and Khosravi, 2018). Lessons within the mega-project management context appear not to be learnt as there are numerous organisational and literature reviews discussing project management, handover and risk sharing with the same issues and warnings being ‘learnt’ time and time again (Roehrich et al., 2014, Schraven et al., 2011, Moon et al., 2009, Xia et al., 2018, McClory et al., 2017).

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STAR PROFILE – Ryan Barbour CAAM

1. Why Asset Management?

I discovered my interest in and the benefits of asset management while researching personal development opportunities during my time as a senior maintenance planner. It was clear early on that the fundamentals of asset management and its application would be extremely beneficial to the field I was working in. The more I learn about asset management, the more invested I become. Working in asset management allows you to have a holistic view across multiple business functions, which I thoroughly enjoy.

2. How long have you been working in the asset management sector?

Although potentially longer than initially thought, I have been in the sector for eight years. The more I learn and develop my asset management knowledge, the more I realise how interconnected my previous roles have been.

3. What is your speciality?

I have experience in all aspects of work management and maintenance planning. I started in the mining and construction industry in my early twenties as a maintainer, coming from a hands-on technical background. Since then, I have held several positions in maintenance and long-term planning, SAP PM master data, and most recently, I have moved into a specialist asset management position with a keen focus on systems improvements.

4. What makes a great asset manager?

I don't believe there is one set path to becoming a great asset manager. I have been very fortunate to have worked alongside some fantastic asset managers, all of whom have come from diverse backgrounds. If anything, the more experience you can gain from different perspectives on your journey, the easier it will be to engage with and understand the vast stakeholder groups required as an asset manager.

5. What is the most exciting trend that you've noticed in asset management today?

Incorporating artificial intelligence (AI) and machine learning (ML) into our decision-making processes.

It's early days, but we are already deploying natural language processing models (NLP) to our reliability and budget reporting functions. Manual tasks that previously took several days to complete are now done within minutes, allowing team members to spend more time analysing and presenting the data for decision-making. There are a lot of apprehensions around the transformative impact of these emerging technologies, and their full implications have yet to be realised. It's exciting and disconcerting at the same time.



6. What advice would you give to an up-and-coming asset manager today?

It's essential to focus on continuous learning and development. Learning new skills and staying up to date with the latest industry trends will help you stay competitive.

7. What is your proudest career achievement?

There's no one standout moment. I really enjoy making the life of the end-user as easy as possible and seeing their reactions when their pain point or roadblock is removed.

8. What's next for you?

I'll continue working through the Graduate Diploma of Asset Management through IQ-AM (highly recommend!). This ties in nicely with the strategic roadmap our business has just released, and a significant amount of the course content can be contextualised to the work we are completing. My new role also expands my responsibility to all aspects of mining through to ship-loading, so getting to know all the players in this space will keep me busy!

STAR PROFILE – Monika Lemajic CPAM



Monika loves everything Maritime, which can be seen in her 14 years straight of Maritime studies. She focused her studies on Naval Architecture, Maritime Sciences and finally completing her Exec MBA in Shipping and Logistics (the Blue MBA) in Copenhagen in

2019, her final dissertation explored the belief of capitalising on Corporate Social Responsibilities to retain competitive advantage. Monika received a student of the Year Award by the Global Association of MBAs for her dissertation and has also ranked twice on the allaboutshipping.co.uk Top 100 Women in Maritime, her highest ranking being number 13.

Monika now spends her time upskilling in leadership and asset management, she enjoys process improvement initiatives that focus on human design decision making and behavioural asset management. On a professional level, Monika has worked in the Ship Repair and sustainment industry since she was 19. She spent that majority of her career working at Garden Island Dockyard as Dock Naval Architect Technical and Assistant Dockmaster, where she then went onto to work in operational strategy and project management. Monika is now a Senior Manager Maritime Assets, holding an extensive portfolio of assets across the state in Aids to Navigation, Coastal Infrastructure, Fleet and Wharves. Monika also has a passion for education, upskilling, social justice and strives to think about community impact in her decision making.

1. Why Asset Management?

Asset Management was a natural progression for me, I come from a ship repair and maintenance background and as my career started to evolve moving towards Asset Management just made sense.

2. How long have you been working in the asset management sector?

Officially, I have been in Asset Management for 3 years, however, after completion my CPAM I realised I have been doing elements of Asset Management my entire adult life.

3. What is your speciality?

I specialise in all things Maritime, I love working in the Maritime industry, it makes me happy and I really couldn't see myself even working on other modes, let alone other assets.

4. What's the best career advice you've ever received and who gave it to you?

Every single time I sent engineering calculations to the Naval Architecture Manager for approval, he would call me and say "You know the math, you know the dock, you saw the ship, you spoke to the crew, does it all make sense?" He would make sure I connected the math with reality, to ensure it was realistic and doable and in turn make sure the ship was safe. Ensuring the math was correct was only one part of the outcome, we had to make sure the outcome could be achieved in real life, otherwise the math was redundant. So the best career advice I ever received and have taken it into my daily life and use it in my own teachings and coaching is "the sense check" if it doesn't make sense, something has been missed or is not right. So matching the math, the strategy or goal to an unattainable outcome is not realistic and needs further thinking.

5. What is the most exciting trend that you've noticed in asset management today?

I find digital twins really interesting, so much data in one place that influences whole of life sounds magical. It makes decision making a lot easier and quicker, but also it changes the way we do things. So thinking about applied asset management, how will operators be trained to use the assets or fix the assets when digital twins are in place. We already see how augmented reality has shifted how we do things in remote or corrosive environments, so I am looking forward to how digital twins will also shape our future.

6. What advice would you give to an up-and-coming asset manager today?

No one seems to notice Asset Managers until something is broken or not working. So, to keep sane, my advice is 1. In these instances, don't lose hope, seek out other Asset Managers or like-minded thinking individuals for support. 2. Acknowledge your wins no matter how big or small they are, depending on your role a win could look like monitoring how many days since last breakdown, money saved on spares, improved processes or productivity, whatever it is, notice and celebrate.

7. What is the biggest challenge facing the asset management sector today/your particular field of asset management today?

The biggest challenge facing the rapid changes is technology, the rate in which technology is changing does not reflect the rate at which the industry is evolving. It appears that scrapping old infrastructure or tools is the easiest, cheapest way to move into the future, however, from a people and cost perspective that is really difficult to do.

8. What is your proudest career achievement?

Becoming President and Chair of WISTA Australia and then to represent at United Nations International Maritime Organisation and our local Australian Maritime Safety Authority events, its really blown me away.

9. What's next for you?

Two things I am dabbling with right now; 1. I really love to teach people, so I have been working on contextualising Asset Management for my Maritime colleagues. 2. I have always really liked strategy, I would like to work more in organisational asset strategy and direction setting.

10. When you're not busy at work, what do you enjoy doing to unwind/relax/explore?

If I am not talking, eating, drinking, baking, cooking or drinking coffee, I am generally dancing, shopping, learning something new, trying to master bike riding, travelling or working in my volunteer role and anything else that comes my way. I try to be open to life, opportunities and experiences as much as I can be.

STAR PROFILE – Jon Irving CSAM



1. Why Asset Management?

It took me quite a while to become aware of the asset management field. Which is funny as I had been involved in many aspects of managing assets, but it wasn't until I was involved with developing and implementing an asset management system at Babcock NZ that I fully understood asset management as a whole.

A sensible, closed-loop framework which provides alignment to organisational objectives through a risk-based, long-term approach to realising value from assets; it just made sense. From my involvement with asset management I have met many like-minded, competent professionals which has further strengthened my interest.

2. How long have you been working in the asset management sector?

23yrs, though for almost the first 20 I was blissfully unaware. I started as an avionics mechanic in the NZ Air Force in 1999. After 10yrs on the tools I gained my commission as an Engineering Officer. I was fortunate to work on the mighty P-3 Orion on the flightline, and support it in the repair bays and in the technical support cell. An advantage of a military career is you are posted every couple of years which ensures a broad-range of experience and enables you to be part of and see the organisation from different perspectives. This enabled me to experience many aspects of the asset management field. I have now been with Babcock NZ for 4yrs where we provide Maintenance, Repair, Overhaul and Engineering Change/Services for the Royal New Zealand Navy's fleet. Again I've been fortunate enough to work in several roles/areas of the business which has enabled my understanding and ability within our system.

3. What's the best career advice you've ever received and who gave it to you?

Wing Commander Nige Sainsbury (rtd) advised me when I was a junior Flight Commander – "Once a year take time to reflect on what you've achieved and what you want to achieve." There was a side note of "do it over a bottle of wine and involve the missus." This has put me in good stead and ensured I have remained focussed in spite of the continual flux that is life. I found this technique very useful both in the military and now as a civilian with career fulfilment and advancement.

4. What makes a great asset manager?

Asset management is about alignment with organisational objectives, providing a framework for the business to perform/improve and realising value from the assets. A good asset manager enables this having the ability to make sound and just risk-based decisions with a long-term/sustainable mindset. Key to a great asset manager is being able to constantly understand the context (organisational, assets, personnel, information, financial) as well as being able to understand and effectively communicate with the stakeholders, often whilst in a challenging/reactive environment.

5. What is the most exciting trend that you've noticed in asset management today?

I find digital twins really interesting, so much data in one place that influences whole of life sounds magical. It makes decision making a lot easier and quicker, but also it changes the way we do things. So thinking about applied asset management, how will operators be trained to use the assets or fix the assets when digital twins are in place. We already see how augmented reality has shifted how we do things in remote or corrosive environments, so I am looking forward to how digital twins will also shape our future.

6. What advice would you give to an up-and-coming asset manager today?

Keep learning and don't be afraid to fail. An area to gain a good understanding is data (the collection, management, analysis, storage and use of it). Data is king and an enabler of an asset management system; it will either empower you (and your organisation) or it will hinder you.

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1

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2

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3

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5

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CHAPTER NEWS

ADELAIDE

The Adelaide Chapter held its AGM on 15 March and the Chapter is delighted to confirm that Michael Nicholas and Jack Nelson have been re-elected as the Adelaide Chapter Chair and Secretary respectively.

The above join re-elected committee members Shane Bissmire, Mae-Ryn Chong, Bill Filmer and Andrew Wilson, along with newly elected committee member Luke Dix. Welcome, Luke.

BRISBANE

The Brisbane Chapter held its AGM on 8 March which followed by a webinar on how to get executive support for asset management change. All nominations were accepted and the re-election of Ella Hingston as Chapter Secretary was confirmed. Sparshy Rablin (Chapter Chair) and Stephen Walker (Vice-Chair) who were elected last year in 2022 for a 2-year term remain in position. The Brisbane Chapter Committee for 2023 is as follows:

- Sparshy Rablin (Chair)
- Stephen Walker (Vice Chair)
- Ella Hingston (Secretary)
- Chris Armstrong
- Thomas Bainbridge
- Bobby Birdi
- Susan Chamberlain
- Ken Chapman
- Caroline Elms
- Greg Hugo
- Ned Lodge
- Lallyn Masangcay
- Roy Mosquera
- Keith Paintin
- Peter Pennell
- Edwin Salazar
- Mick Windsor

MELBOURNE

On 15 March, the Melbourne Chapter hosted another technical event. Guest speaker, Clive Moore, started up a conversation on Industry 5.0 that may have significant implications for all of us by posing the question 'can you sue an algorithm?'

This session was preceded by the Chapter's AGM. All nominations were accepted and Andrew Sarah (Chapter Chair), Dianne Scheepers and Nicole Opie (Co-Vice Chairs) and Sharon Michael (Secretary) who were elected last year in 2022 for a 2-year term remain in position.

The Melbourne Chapter Committee for 2023 is as follows:

- Andrew Sarah (Chair)
- Dianne Scheepers (Co-Vice Chair)
- Nicole Opie (Co-Vice Chair)
- Sharon Michael (Secretary)
- Ghazal Boroumand
- Himanshu Jindal
- Ian Thomas
- James Carroll
- Jamie Maslen
- Svetlana Makoutonina
- Julian Watts
- Luke Vaughan
- Peter Robinson
- Sean Reeves
- Shane Scriven
- Tom Carpenter

CHAPTER NEWS

PERTH

The Perth Chapter held its AGM on 29 March. All nominations were accepted. Ankur Maheshwari (Chapter Chair), Adam Rotapel (Vice-Chair) and Pooja Haria (Secretary) who were elected last year in 2022 for a 2-year term remain in position.

We wish to acknowledge outgoing committee members Robert Musca, Garth Walter and Robert Pradera for the selfless effort over the past years within the committee and their active participation in the various forums, a big thank you for your contributions.

The Perth Chapter Committee for 2023 is as follows:

- Ankur Maheshwari (Chapter Chair)
- Adam Rotapel (Vice Chair)
- Pooja Haria (Secretary)
- Neen Barry
- Dr Carla Boehl
- Mark Bourhill
- Francois Joubert
- Kenny Khoo
- Jarrad Lahne
- Dr Yvonne Power
- James Wright

NEW ZEALAND

On 20 April, the New Zealand Chapter hosted its first technical event of the year where delegates gathered and were provided with an overview the structure of the Auckland Harbour Bridge, and learned from Alex Ingram, Division Manager of the Auckland Harbour Bridge, of how asset management practices on this 63-year-old structure have evolved and improved over time, the key challenges currently faced, and those anticipated in the future.

The Chapter also held its AGM on 23 March. Following nominations for the 2023 New Zealand Chapter committee at the March AGM, the New Zealand Chapter is delighted to confirm that:

- Wayne Hatcher has been elected as New Zealand Chapter Chair; and
- Luka Baresic has been elected as New Zealand Chapter Secretary

Jon Irving (Chapter Vice-Chair) who was elected last year in 2022 for a 2-year term remains in position.

The Asset Management Council would like to extend its sincere thanks to Andrew Gatland, outgoing New Zealand Chapter Chair, for all his time and effort within the committee over the past years and as Chair over the last year.

We would also like to extend a warm welcome to Mark Chatterton and Adele Jones, who joins all re-nominated committee members rolled over to the new committee.

The current 2023 New Zealand Committee is as follows:

- Wayne Hatcher (Chair)
- Jon Irving (Vice Chair)
- Luka Baresic (Secretary)
- Mark Chatterton
- Jack Crutzen
- Peter Griffiths
- Rex Harland
- Adele Jones



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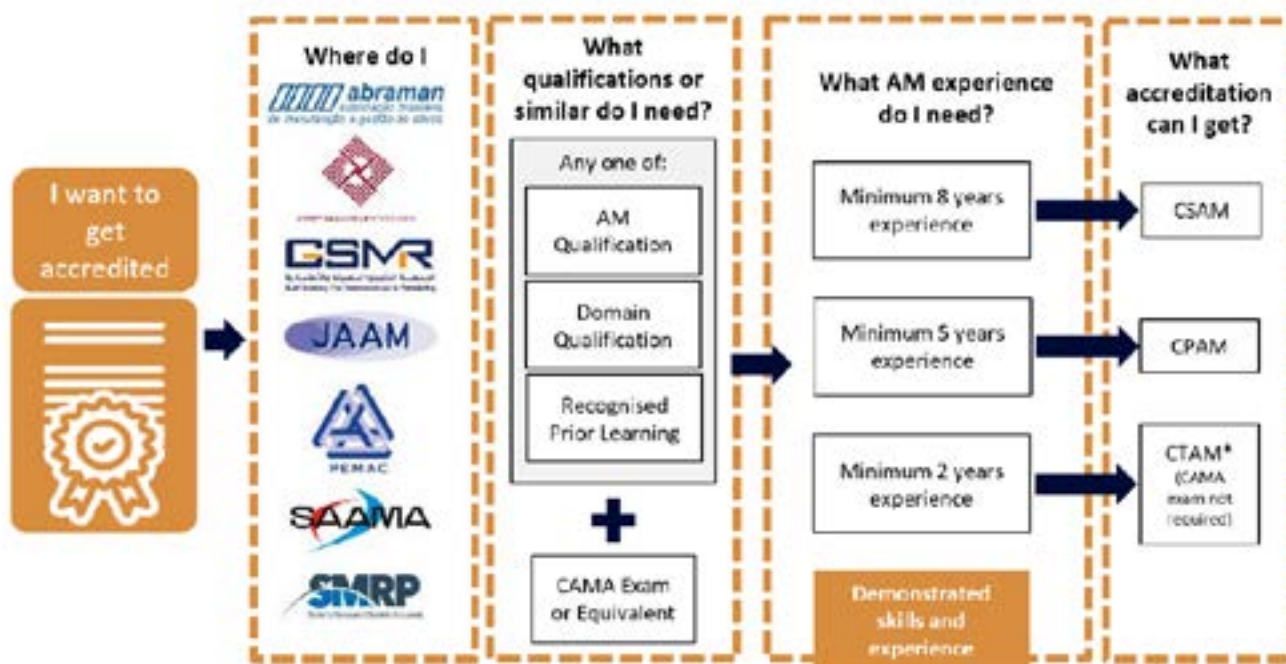
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STAR PROFILE – Tejaswi Laveti CPAM



1. Why Asset Management?

I always worked in large scale organisations, and it becomes challenging to have a good grasp on the operational and strategic short term – long term processes. This is where Asset Management provides the context to monitor the status of each

individual asset throughout its operating life cycle, up until disposal.

Adopting the principles of Asset Management will ensure assets are developed with the right specifications, operated within the allowable limits, maintained at the right intervals, critical equipment's constantly monitored and upgraded in a planned manner, assets are renewed at the right time managing cost vs risk vs performance.

As a manager, the biggest strengths of adopting concepts of Asset Management are during future capital renewals projects and programs budgeting [3 years, 5 years, and 10 years] whilst balancing and managing the affordability and cash flow.

2. How long have you been working in the asset management sector?

I started my engineering career in Australia in 2016, since then, I was lucky to be associated and introduced to the fundamentals of Asset Management. It took me a while to absorb the principles initially, however, I started applying the terminologies, lean six sigma, developed critical equipment lists followed by critical spares and

predictive and preventative maintenance strategies.

The outcomes were a minor improvement in overall throughput effectiveness for the plant by 2%, which translated to significant financial cash flow and reduction in reactive operating costs. Ever since, I have been accumulating CPD requirements in Asset Management and encourage all my colleagues to achieve AMC certification.

3. What is your speciality?

My specialisation is within the sphere of Mechanical Engineering as a core, combined with practical project management and asset management expertise across multiple sectors, Mining, Multi Metals processing, maritime sector and currently in local government environment dealing with water and wastewater asset classes.

4. What drew you to explore more about this speciality?

I was always fascinated and believed engineers can and will solve problems, eventually. At university, I was not exposed to the facets of asset management. Once I started my career, I understood that engineering alone won't train me to manage assets effectively. It must be a combination of asset management and project management that adds value to the employer and employee.

5. What's the best career advice you've ever received and who gave it to you?

My best career advises came from two people I look up to, "always check facts and figures" assumptions can misguide a project and "never compromise safety".

6. What makes a great asset manager?

A great asset manager should be aware of the physical status of their asset classes, able to

prioritise renewal of assets balancing cost, risk, and performance with internal stakeholders. They must initiate, and drive the development of Asset Risk Management Framework, Asset Renewal Framework, Asset Maintenance Framework, Asset condition and Performance Framework and contribute to the strategic asset management plan. Most importantly, they must empower and provide training for their team members in various facets of Asset management and learn, grow as a team.

7. What is the most exciting trend that you've noticed in asset management today?

Firstly, establishment of digital twins of dams, water and wastewater treatment plants, effective water asset condition, risk and renewal/rehab programs that can be accessed by both technical and non-technical people through a simple web environment for improved decision making and managing cash flow.

Secondly, upgrading to smart water meters that enables utilities and residents to manage and monitor water consumption as well as early leak detections. A great outcome for rate payers and they will be able to save money on excess water bills, and for utilises, better visibility and control over the water network.

Thirdly, improvements in sensor technology that enables proactive detection and monitoring of anomalies in pipe networks, AI driven to analyse captured and stored data to identify and localised leaks at an early stage with immediate reporting.

8. What is the biggest challenge facing up-and-coming asset managers today?

I personally believe, most buried asset infrastructure has been laid down around the 1950's -60's. Based on the material of construction and pressure rating, most of those buried assets are due for renewal 2020 -2030. The challenge is where to start and where to end, with funding and resourcing availability/limitations.

They are various technologies available to perform conditional assessments on buried infrastructure, however, they are quite expensive and time taking.

Prioritization of these assets becomes a logistical challenge – should we replace them too early to avoid high reactive costs or push the boundaries as close as possible to the end of design life to manage cash flow and take a risk by having critical spares.

9. What advice would you give to an up-and-coming asset manager today?

Keep up to date with new technologies and products in the related industry. Train the staff and empower them with the right tools and exposure. Learn from mistakes, lessons learnt and ensure the same mistake are not repeated ever again. Make sure forward works capital planning is prioritised and well budgeted with contingencies.

10. What is your proudest career achievement?

Have successfully managed a small team of young engineers in developing preventative and predictive maintenance strategies for critical infrastructure, which improved the overall equipment effectiveness of a metal manufacturing facility. Not only did we achieve a significant reduction in reactive costs, improvement in the planned to unplanned ratio, more importantly, improved the moral of the staff working on the infrastructure, as we got away from this vicious never-ending cycle of fixing the same thing repeatedly. Eventually, the culture shifted from being reactive to proactive.

11. What's next for you?

I would like to continue my Asset Management Journey, with the aim of becoming a Certified Assessor in Asset Management. Motivating all my staff and colleagues to start on their Asset Management Journey and assist where I can.

12. When you're not busy at work, what do you enjoy doing to unwind/relax/explore?

Spending time with my loved ones, exploring the most remote destinations and flying my drone keeps me on my toes.

STAR PROFILE – Jared Morkel CPAM



Why Asset Management?

I've always had a keen interest in the operation and maintenance of physical assets and, as an ADF veteran, am especially passionate about producing reliable, repeatable outcomes for Defence. As asset managers, we have the exciting responsibility of managing critical assets on behalf of asset owners and play a vital in their overall success. I enjoy the variety of tasks involved, from maintenance scheduling to data analysis and reporting. Asset management is becoming increasingly vital as organisations become more reliant on technology and physical assets to drive their operations—it's an exciting time to be a part of the industry.

2. How long have you been working in the asset management sector?

I started my career in the asset management sector as a technician with the Australian Army and have since gained 15 years of experience in the industry. Having obtained tertiary qualifications in business and project management, I have worked as a senior operations and maintenance manager for Downer, supporting our delivery of asset management

services to Defence.

In recent years, I have become a Certified Practitioner in Asset Management through the Asset Management Council, as well as a Certified Asset Management Assessor and Project Management Professional. I engage with industry forums and professional development opportunities wherever possible, keeping up to date with the latest trends and best practice in asset management. My unique background and expertise have allowed me to excel in this field and to provide valuable insights to my organisation.

3. What is your speciality?

I specialise in the management, operations and maintenance of critical assets, equipment and infrastructure across ADF bases. Through my time with Downer, I've gained expertise in establishing operations and maintenance models that balance three asset management objectives: minimising the total cost of ownership, maximising asset performance, and mitigating risk. My particular area of work ensures maximum uptime of equipment, which is crucial for the ADF to maintain its readiness and effectiveness at all times.

4. What drew you to explore more about this speciality?

During my time in the ADF, I witnessed firsthand the importance of well-maintained physical assets in supporting mission success. Equipment failure or downtime can have a significant impact on Defence capability and the safety of its people. I have a deep understanding of the challenges faced by Defence in managing physical assets, such as operating in harsh and remote environments, maintaining aging equipment and complying with strict regulations and standards. I was eager to apply my technical experience and knowledge of unique ADF operational environments to continue to support Defence as a veteran.

5. What's the best career advice you've ever received and who gave it to you?

In the early stages of my career, I was mentored by Dr Garry Tester, the CEO of Sports Challenge Australia and an Adjunct Professor at the University of Western Australia. Garry shared with me a quote by Maya Angelou that has stuck with me to this day: "At the end of the day people won't remember what you said or did, they will remember how you made them feel."

As someone who has gained significant asset management experience throughout my career, I've come to appreciate the importance of a shared strategy that aligns with the objectives of asset owners. Transparent and authentic leadership is key to inspiring a team to work together towards a common goal. I strive to set a positive example in all I do, building a culture of trust and collaboration that allows my team to thrive.

6. What makes a great asset manager?

A great asset manager is someone that has a strong understanding of the technical aspects of asset management and can effectively communicate those aspects to stakeholders. This technical know-how should be matched by strong leadership skills, flexibility and a customer-focused mindset, ensuring that assets are managed in a way that meets the organisation's needs.

7. What is the most exciting trend that you've noticed in asset management today?

Digitisation has transformed the way we can approach predictive maintenance and empowers asset managers to make better informed decisions. Through the Internet of Things and machine learning and analytics, asset managers have greater access to real-time asset data than ever before. We can use these technologies and platforms as powerful tools to unlock insights into asset performance, predict when maintenance is needed, and identify opportunities for optimisation.

8. What is the biggest challenge facing up-and-coming asset managers today?

As technology continues to evolve at an unprecedented pace, asset managers must keep abreast of new developments and adapt their strategies accordingly. Emerging technologies like artificial intelligence, the Internet of Things and blockchain all have an impact on asset management, so taking the time to learn about and understand these changes is critical.

9. What advice would you give to an up-and-coming asset manager today?

Pursue professional development opportunities, collaborate closely with operations and maintenance teams, leverage data analytics tools, incorporate sustainability goals into strategies, and be open to new ideas and approaches.

10. What is the biggest challenge facing the asset management sector today/your particular field of asset management today?

One of the biggest challenges facing asset owners today is the need to maintain and upgrade aging infrastructure and equipment. Many of the assets within my field have been in service for several decades and are approaching the end of their useful life. This poses a significant challenge in terms of maintaining the required level of readiness and ensuring that assets can continue to perform their intended functions. Budget constraints and competing priorities can also make it difficult to allocate the resources needed to address these issues.

To tackle these challenges, we must support asset owners to prioritise asset management and invest in strategies that optimise the performance and lifespan of their physical assets. This includes developing comprehensive maintenance and upgrade plans, investing in new technologies, and ensuring that assets are managed in a way that aligns with the organisation's overall objectives.

11. What is your proudest career achievement?

Successfully overseeing the area operations of the Defence Estate Maintenance and Operations Services (EMOS) contract has been the highlight of my career. Using my asset management knowledge and experience, I developed and enhanced operational strategies that improved the performance of physical assets in the Townsville and Central Queensland regions, resulting in greater reliability and customer satisfaction. I worked closely with internal and external stakeholders to align priorities and ultimately deliver value to Defence. I'm extremely proud of my contribution to the strong asset management outcomes that continue to underpin our service delivery.

12. What's next for you?

I am Downer's estate maintenance subject matter expert for the Base Services Transformation Program, which aims to redesign Defence base services contracts to be agile, collaborative, innovative and responsive to future changes in the geopolitical environment. My focus for the next 12 months is to ensure the program's success in meeting these objectives. Longer term, I hope to guide and mentor emerging leaders in our business, sharing my expertise to build a cross-functional team that meets the needs of Defence and our customers.

13. When you're not busy at work, what do you enjoy doing to unwind/relax/explore?

As a North Queenslander with two young children, most weekends you can find us outdoors –camping, fishing, and watching/being involved in club sports.

Membership Application



ASSET MANAGEMENT COUNCIL

ASSET MANAGEMENT COUNCIL LTD

A Technical Society of Engineers Australia

ABN: 15 141 532 747 www.amcouncil.com.au

Phone: +613 9819 2515 Email: accounts@amcouncil.com.au

Thank you for joining the Asset Management Council. Please complete all sections. Phone or email with any queries.

PERSONAL DETAILS (Please print in BLOCK CAPITALS)

Title (Please circle) Dr Mr Mrs Ms Miss Other (Please specify) Sex (Please circle) F M

Family Name Given Names (in full)

Date of Birth Engineers Australia Membership No

CONTACT DETAILS (Please print in BLOCK CAPITALS)

Preferred Address: ☐ Private Address or ☐ Business Address

Position

Organisation

Postal Address

City State

Country Postcode

Phone Fax

Mobile

E-mail

AREAS OF INTEREST (Please tick)

Technical Topics

- ☐ Reliability
- ☐ Availability
- ☐ Maintainability
- ☐ Performance
- ☐ Spares Planning
- ☐ Maintenance Planning and Scheduling
- ☐ Maintenance Plan development and implementation
- ☐ Maintenance Policy/Strategy development
- ☐ Logistics
- ☐ Shutdown planning and the maintenance interface
- ☐ Asset Management
- ☐ Other:

Issues

- ☐ Skills development
- ☐ Training
- ☐ Other:

Industries

- ☐ Facility Management
- ☐ Consulting
- ☐ Power
- ☐ Transport
- ☐ Defence
- ☐ Oil and Gas
- ☐ Mining and Industry
- ☐ Water and Utilities
- ☐ Infrastructure
- ☐ Other:

Return completed Membership Application with payment to:
Asset Management Council
PO Box 2004, Oakleigh Vic 3166

GROUP AFFILIATION

☐ Young Asset Management Practitioners (18-35 year olds)

CHAPTER AFFILIATION (Please tick one)

<input type="checkbox"/> Melbourne	<input type="checkbox"/> Canberra	<input type="checkbox"/> Hobart
<input type="checkbox"/> Darwin	<input type="checkbox"/> Adelaide	<input type="checkbox"/> Brisbane
<input type="checkbox"/> Overseas	<input type="checkbox"/> Sydney	<input type="checkbox"/> Perth

MEMBERSHIP FEES (Please tick one membership type only)

Individual Annual Fee (including GST)	Corporate Annual Fee (including GST)	
<input type="checkbox"/> Member \$190.00	<input type="checkbox"/> Unlimited \$11,500.00	<input type="checkbox"/> 11-20 Members \$3,950.00
<input type="checkbox"/> Student \$35.00	<input type="checkbox"/> 6-10 Members \$2,100.00	<input type="checkbox"/> 0-5 Members \$1,100.00

GST (10%) does not apply to overseas memberships.

CORPORATE MEMBER NOMINEES

Name	Email	Date of Birth (Mandatory)	AM Council Chapter
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Contact Asset Management Council to provide more corporate nominee details.

PAYMENT

Method of Payment (please tick one and enclose payment)

☐ Cash

☐ Money Order or Cheque drawn in AUD from an Australian bank) payable to **Asset Management Council Ltd**

☐ International Money Order

☐ Credit Card
(Australian or New Zealand Bankcard only acceptable)

Credit Card Details Please charge my card (tick one card type)

☐ Visa ☐ Bankcard ☐ Mastercard

☐ Diners ☐ American Express

Card no _____

Expiry _____ Amount \$ _____

Name on card _____

Signature _____ Date _____

Corporate Partners and Corporate Members

STRATEGIC PARTNER

Rio Tinto

PLATINUM

ASC Pty Ltd

Asset Management, Safety
Environment & Regulation,
Transport for NSW

Ausgrid

BAE Systems

BGIS

Downer Group

Pacific National

Roads and Maritime Services,
Transport for NSW

Serco AsPac

South32

Sydney Metro

Transdev

Ventia Pty Limited

GOLD

Airservices Australia

Alstom

Aurecon Australia Pty Ltd

Boeing Australia

Capability by Design

Copperleaf Technologies

Department of Defence CASG

Department of Families, Fairness
and Housing

Department of Finance Western
Australia

Department of Fire and
Emergency Services (WA)

Department of Health

Department of Transport - Network
Planning Group

Energy Queensland Limited

Evoenergy

GE Digital

GHD Advisory

HATCH Ltd.

Health Infrastructure

Infrastructure NSW

Innovyze

Jacobs

KiwiRail

KPMG

Naval Ship Management (Australia)

Northrop Grumman Integrated
Defence Services Pty Ltd

NSW Telco Authority

Parks Victoria

Port of Newcastle

Power and Water Corporation

Service Stream

Southern Ports

Stanwell Corporation Limited

Sydney Water Corporation

Territory Generation

Thales Australia Limited

TransGrid

Transurban Ltd

V/Line

Warship Asset Management
Agreement Alliance

Western Australia Police Force

Western Power

Wood Plc (Australia)

WSP Australia Pty Limited

Xenco Pty Ltd

SILVER

AECOM Australia Pty Ltd

AMCL

Anglo American Metallurgical Coal

Armidale Regional Council

AssetFuture Pty Ltd

Aurizon Network

Australian Rail Track Corporation
Ltd (ARTC)

Babcock International Group

Comfort Delgro NSW

Council of the City of Gold Coast

Court Services Victoria

Department of Transport

Fire and Rescue NSW

Flinders Port Holdings

GHD NZ

Greater Western Water

ISS Facility Services

Jemena

John Holland Group Pty Ltd

Kellogg Brown and Root Pty Ltd
(KBR)

Mackay Regional Council

Minset

New Zealand Defence Force
(Defence Equipment Management
Organisation)

Norship

Northern Territory Government
Dept. of Infrastructure, Planning &
Logistics

Nova Systems

Origin Energy

Programmed Facility Management
(PFM)

Public Transport Authority

PwC Australia

RES Australia

Sodexo Australia Pty

Stantec Australia Pty Ltd

Sutherland Shire Council

Sydney Opera House

Sydney Trains

TAFE Infrastructure NSW

Tasports

Unitywater

Water Corporation

Windlab

BRONZE

ANSTO

APP Corporation Pty Ltd

Arup

Assetivity Pty Ltd

Atos (Australia) Pty Ltd

Australian Museum

Baker Hughes Digital Solutions

Australia Pty Ltd

Ballance Agr-Nutrients

Beca

BetterAIM Pty Ltd

Brightly Software Pty Ltd

Brisbane Airport Corporation

CBC Facilities Maintenance

Channel Terminal Services

Covaris Pty Ltd

Cushman and Wakefield

DAS Consulting

Defence Estate Infrastructure,
NZDF

Delta Facilities Management Pty
Ltd

Department of Jobs, Skills,
Industry and Regions

Department of Planning, Industry
& Environment

Department of Transport ITS Asset
Management Section

Department of Treasury and
Finance

Dubai Roads and Transport
Authority

Egis Oceania Pty Ltd

Endeavour Energy

Fremantle Ports

Gladstone Area Water Board

Gladstone Regional Council

Goulburn Valley Health

Goulburn Valley Water

Hardcat Pty Ltd

Harvey Water

Hexagon

Horizon Power

Hunter Water Corporation

Innovative Thinking IT

Ipswich City Council

Lake Maintenance Corporate Pty
Ltd

Landcom

Lucid Consulting Australia

LYB Operations & Maintenance
Pty Ltd

Maca Infrastructure

Melbourne & Olympic Parks

Melbourne Water

Miglic MacLeod

Monash University

Nexus Global Australia

North East Water

Northern Territory Government
Dept. of Infrastructure, Planning &
Logistics

NRG Gladstone Operating
Services

Onto Global Pty Ltd

OpenMove

Orica

Oropesa Port Management Pty Ltd

Osmose Australia Pty Ltd

Pacific Hydro

Port Botany Operations ATF Port
Botany Unit Trust

Powerlink Queensland

QENOS

Quality Management Australia

Quarterbac

Queensland Rail

Raytheon Australia

Reeves Group Services Pty Ltd

Retriever Communications

Rockfield Technologies Australia
Pty Ltd

SA Water Corporation

School Infrastructure NSW

SEQWATER

Shoalhaven Water

Silver Edge Technologies Pty Ltd

SPM Assets Ltd

STRUCTURED CHANGE PTY
LIMITED

Strukton Rail Australia Pty Ltd

Talis Consultants

Taronga Conservation Society
Australia

TasWater

TATWEER MIDDLE EAST AND
AFRICA L.L.C.

Terotek (NZ) Limited

Townsville City Council

Unison Networks Limited

United Energy Services Pty Ltd

Valmec Limited

VCG Digital

Verbrec

Victoria State Emergency Service

Wesfarmers Chemical Energy and
Fertilisers

Worley Power Service

Yarra Ranges Council



ASSET MANAGEMENT COUNCIL

ASSET MANAGEMENT

AMPEAK

PROMOTE EDUCATE ASSIST KNOWLEDGE

Collaboration Through Asset Management



AMPEAK 2023 Supplement

AMPEAK23 WRAP UP

.....

The AMPEAK conference, held in Sydney in April, was a great success! It broke previous AMPEAK records for attendance, speakers and award submissions, and delegates welcome the opportunity to come together on site to share knowledge and best practice, create new contacts and network.

Over three days, delegates got to experience and enjoy:

- over 160 different sessions
- 5 varied and interesting key note speakers
- interactive workshop sessions
- international GFMAM delegates and speakers from Australia and across the globe including, USA, UK, South Africa, Brazil, Belgium, France, Japan, Malaysia, Canada and Indonesia
- professional development opportunities
- poster presentations from universities around Australia
- fun and energising social events
- many opportunities to network with each other and with sponsors and exhibitors

Conference Themes

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Drawing on the collective wisdom of over 160 speakers, the 2023 conference considered common asset management themes that included:

- Excellence in Asset Management
- Value & Benefits of Asset Management
- Asset Management Planning
- Asset Lifecycle Delivery
- Asset Information & the Digital World
- Asset Management People & Leadership
- Government for Asset Management
- Future proofing Asset Management



KEY NOTE SPEAKERS

.....

A line up of impressive keynote speakers kept the audience engaged and provided great insights. Keynote speakers included:



Simon Dowling, leading expert in building workplaces that thrive on collaboration, author, former lawyer and cast member of *'Thank God You're Here'*.



Stephanie Pearce, Head of Rio Tinto's Asset Management Centre for Excellence, and previous finalist in the Exceptional Women in Resources National Awards.



Jason Clarke, founder of Minds at Work and one of the most sought-after creative minds in the country.



Sophie Renton, social researcher, trends analyst and Team Leader of Research at the internationally recognised McCrindle.



Dr Adam Fraser, human performance researcher who helps people strive to achieve better performance in everything they do and author of *'The Third Space'*.

THANKS TO SPONSORS

SOCIAL FUNCTIONS

AMPEAK was also incredibly successful because of the sponsors in particular:

Monday Plenary



Tuesday Plenary



Welcome Reception



Coffee Cart



Professional Development



Supported by



All exhibitors at AMPEAK added an important element to the conference, allowing delegates to network, make new contacts and learn about key companies servicing the asset management field.

Everything about AMPEAK was a reflection of the vision and passion of the AM Council and the commitment to work with and support professionals from across all industries involved in asset management.

The AM Council was delighted with AMPEAK23 and we look forward to seeing you all at next year's conference.

AMPEAK included several social events where delegates got to relax and network.

It began with a Welcome Function on the Sunday night at Madame Tussauds, where guests were treated to a private viewing of the figures and mingled amongst the stars for the first social event of the conference.

This was followed by networking drinks on the Monday night and the Gala Dinner Awards Night on the Tuesday evening. The Gala Dinner was held in the magnificent ballroom at Doltone House Hyde Park, with impressive architecture, stylish and innovative catering and spectacular backdrop overlooking the iconic Hyde Park.

And the winners are...

This year, excellence awards were given in the following categories, recognising excellence in the management of assets and the use of best practice. Congratulations to all our winners.

- **Innovation** - Duratec in collaboration with AECOM and BHP – BHP Berth C&D Structural Remediation
- **Information Management** - Sydney Trains – Measurement and Inspection Digital Twin (MIDT)
- **Cost/Risk/Performance** - Ausgrid – Consolidated Asset CBA Model Project
- **Sustainability** - Ventia in collaboration with Transurban – Hills M2 Motorway Sustainability Achievements
- **Resilience** - Southern Ports – Asset Resilience through Digital Innovation
- **Safety** - Transport for NSW – Transport Electrical Safety
- **Diversity** - KPMG – Engineering a Diverse Workforce



AM Council presents awards at AMPEAK Gala Dinner

.....



INNOVATION

Duratec in collaboration with AECOM and BHP for BHP Berth C&D Structural Remediation



INFORMATION MANAGEMENT

Sydney Trains for their Measurement and Inspection Digital Twin



COST/RISK/ PERFORMANCE

Ausgrid for their Consolidated Asset CBA Model Project



SUSTAINABILITY

Ventia in collaboration with Transurban for their Hills M2 Motorway Sustainability Achievements

AM Council presents awards at AMPEAK Gala Dinner

.....



RESILIENCE

Southern Ports for Asset Resilience through Digital Innovation



SAFETY

Transport for NSW for Transport Electrical Safety



DIVERSITY

KPMG for engineering a diverse workforce



RISING STAR

Ella Hingston

AMPEAK

DAILY DOWNLOAD



DAY ONE | MONDAY 3 APRIL 2023

Last night's Welcome Reception sponsored by PWC was a fantastic start to AMPEAK, where guests were treated to a private viewing of Madame Tussauds Sydney. From superhero's to sporting legends, to icons of the silver screen, delegates joined together amongst the stars for the first social event of the conference.



POSTS OF THE DAY

@AlexA: Meeting so many new and familiar faces at AMPEAK23

@LorraineG: Just arrived today from Manila! I'm thrilled to interact and connect with members of AM Council Australia, colleagues and AMPEAK 2023 participants

@SusheelP: Looking forward to Welcome Evening and hopefully make new acquaintances!

@BenjaminH: Having completed scanning through the program and abstracts for the event, there's some interesting topics and some familiar (legendary) names presenting. Big couple of days ahead!

@RohitS: So nice to see familiar faces!

AMPEAK

DAILY DOWNLOAD



DAY TWO | TUESDAY 4 APRIL 2023

CONFERENCE KICKSTART

Day One did not disappoint! In the opening plenary, Simon Dowling encouraged us to 'banish rubbish collaboration' in order to crack the collaboration code. With three rules to live by - be for them, get your ASK into gear, and play the 'What's Possible?' game, the audience left the session armed with their own versions of 'go scripts'.



NEWS UPDATE

AMCouncil held its AGM on Day One at 1pm. Congratulations to **Sarah Hannah**, who has been voted in to the Board.

Many thanks go out to **Michael Killeen**, outgoing board member, for his work, commitment and dedication to the board over the past 3 years.

POSTS OF THE DAY

@AllenT: Technical Career Progression Pathway - a way to retain technical talents

@AlexA: To go fast, go alone, to go far, to Together

@RohitS: Useful, usable and used!

@SahilN: Great Preso by Simon - knowledge wrapped in humour!

@StoyanH: Great Ampeak23 opening!

@JustinB: Great focus on diverse collaboration.

@RohitS: So what?

@StephenR: Interesting infographic from Downer's defence presentation

@Maryl: Today is the Day!

@SharanganV: Full house! Great session by the CQU team! What's your elephant in the darkroom?

SRIAM AT AMPEAK

Make sure you find **Pesky Peacock**. The QR code on its neck takes you to the AMCouncil's #SRiAM (Sustainability & Resilience in Asset Management) website for feedback on our White Paper - *Embedding Sustainability Principles in Asset Management Key Considerations*.

Made of 100% non or hard to recycle products, Pesky consists of: car tyres, straws (single use), coffee cups (single use), styrofoam, waxed paper, nail polish, foil balloons, road cones, corflute, plastic (single use), and ceramic tiles.

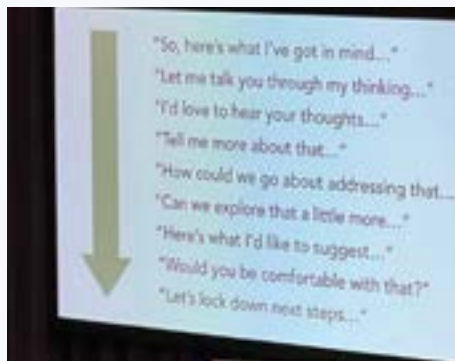


STAND OUT SLIDES

Big So What!



Make your own Go Script



SOCIAL SPLASH



AMPEAK

DAILY DOWNLOAD



WEDNESDAY 5 APRIL 2023

2023 ASSET MANAGEMENT EXCELLENCE AWARDS



Doltone House Hyde Park set the scene for our much anticipated AMCouncil Excellence Awards last night.

Congratulations to winners:

Innovation:

Duratec in collaboration with AECOM and BHP - BHP Berth & C&D Structural Remediation

Information Management:

Sydney Trains - Measurement and Inspection Digital Twin

Cost/Risk/Performance:

Ausgrid - Consolidated Asset CBA Model Project

Sustainability:

Transurban - Hills M2 Motorway Sustainability Achievements

Resilience:

Southern Ports - Asset Resilience through Digital Innovation

Safety:

Transport for NSW - Transport Electrical Safety

Diversity:

KPMG - Engineering a Diverse Workforce

Rising Star Award:

Ella Hingston

AMCouncil Life Member:

Nicholas Phillips

Best Paper:

Andrew Wheatley - Can Asset Management Fundamentals contribute to a project's success?

Best Student Research Poster:

Scott Everard - Establishing the Strategic Shutdown Management Plan

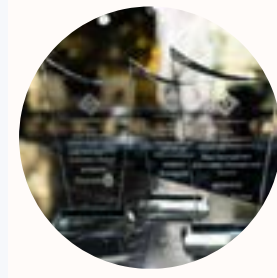
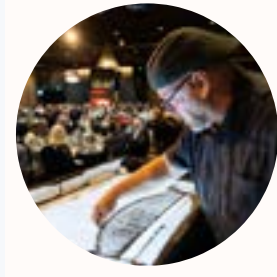


PICTURES FROM AMPEAK 2023

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APRIL 2023 SYDNEY, NSW





ASSET MANAGEMENT COUNCIL

THE
ASSET
JOURNAL

Asset Management Council

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