From Data To Decisions

A case study on how asking the right questions helped a port transform their use of asset data

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1. Introduction

Asset data exists in abundance in many organisations. It may be stored on a spreadsheet, mentioned in an email, or written down on a piece of paper, and locked away in a drawer in the back room.

Although you have the data, how can it be translated into useful information for your organisation? How can this information be used to derive business intelligence and combined with people's learned experience, to enhance decision-making? More importantly, how can the right data be collected and used at the right time?

These are the types of questions that challenge organisations when adopting digital asset management solutions. Too often organisations purchase software solutions well before they've articulated what the asset information problem they are trying to solve is and what functionality they require from such a software to satisfy their asset management objectives.

With the rapid growth of emerging technologies, a desire to be more "digital" as well as the growing popularity of digital asset management solutions, organisations are starting to become more aware of the benefits of using an integrated Enterprise Asset Management (EAM) system and its ability to support decision-making through data evidence. However, it is important to note that the establishment and implementation of data information systems require robust frameworks and dedicated programs and resources that may come with its own challenges.

This paper uses a case study from the ports industry to demonstrate some of the processes and strategies undertaken to support an organisation's asset management journey, as well as highlight some of the experiences, challenges, and learnings from such a transformation program.

**All images used for illustration purposes only*

2. Background and Context

A major Australian port was looking to uplift their asset management maturity and capability, with a desire to be more aligned with the ISO 5500X standards. In 2020, WSP undertook an asset management maturity assessment on the organisation. It was identified that their asset management data and information system offered an avenue for significant improvements that will provide the port with more sustainable benefits to manage asset risks.

Based on these findings, an asset data transformation program was identified as a key activity required to provide decision making capability to the organisation; to support the port's aspiration to be a more mature asset management organisation.

The organisation recognised several key challenges and pain points that presented significant business risk:

- The maturity assessment revealed that large amounts of knowledge sat with the individuals and not the organisation which puts the business at risk when individuals leave the organisation.
- Like many organisations, business units and even individuals within, were often siloed and utilised their own bespoke digital solutions that did not support integration and collaboration. This lack of visibility would impede on the executive leadership team's ability to make well-informed decisions that benefit the organisation as a whole and achieve strategic objectives.
- The maturity review also determined the lack of governance around asset data management. There was limited awareness of existing EAM system capabilities which also meant their EAM systems were not being utilised to its full potential.

WSP had been engaged to support the organisation on a variety of tasks to address the improvement opportunities identified in the maturity assessment. This included:

- Analysing the business' existing software solutions to determine limitations and opportunities,
- Identifying and supporting the organisation in defining their asset information requirements,
- Uplifting the quality of asset data on their EAM system through an asset data maturity program,
- Building a framework for determining asset risk; and
- Supporting the development of an asset information strategy to guide better governance around the organisation's data management.

The purpose of this program was to uplift the organisation's overall asset management capability by:

- Strengthening their asset data quality and information systems.
- Improving the use of their EAM systems to support more informed, data-driven decision-making.
- Developing a portal for the Port's staff to better understand the organisation's assets.

3. Review of the Asset Management Software Solution

The immediate purchase of a new EAM system to support better asset management practices may be enticing, especially after glossy product demos and endless 'cool' features. You would never get advice on which car to buy from the car dealership, similarly organisations should aim to first analyse whether their existing EAM systems can fulfil their needs. By performing a gap analysis on the organisation's existing information system against industry standard asset management business requirements, WSP was able to support our client in understanding their existing EAM system's actual functionality and limitations.

Our client utilises an EAM system catered towards asset-intensive organisations, a powerful system with growing capability. Upon a preliminary review of how the port used this technology, it was determined that due to poor asset data and configuration governance over the years, they were not able to utilise the system's full potential. The port had access to capabilities on their Assets Module such as mapping, storage of asset attributes such as condition, risk, dimensions, specifications, and supply attributes, however these fields were found to be predominantly empty upon our initial review. Additionally, the asset register did not capture the organisation's entire asset portfolio. Where assets did exist in the system, the available information lacked adequate granularity for the asset management function to accurately record activities and track performance.

Organisations with lots of business units and asset classes also commonly experience disparate asset data storage, often on individual spreadsheets or different systems. Where a single system may have been used, there were duplications stemming from the lack of communication between business units and limited of governance around asset creation and information input.

Through the gap analysis stage, WSP asked key questions including:

- What does the organisation currently have in terms of data and information systems?
- Is it fit-for-purpose and adequate for the business' needs? If not, why is not meeting the requirements?
- What kind of improvement actions are necessary to facilitate an uplift?

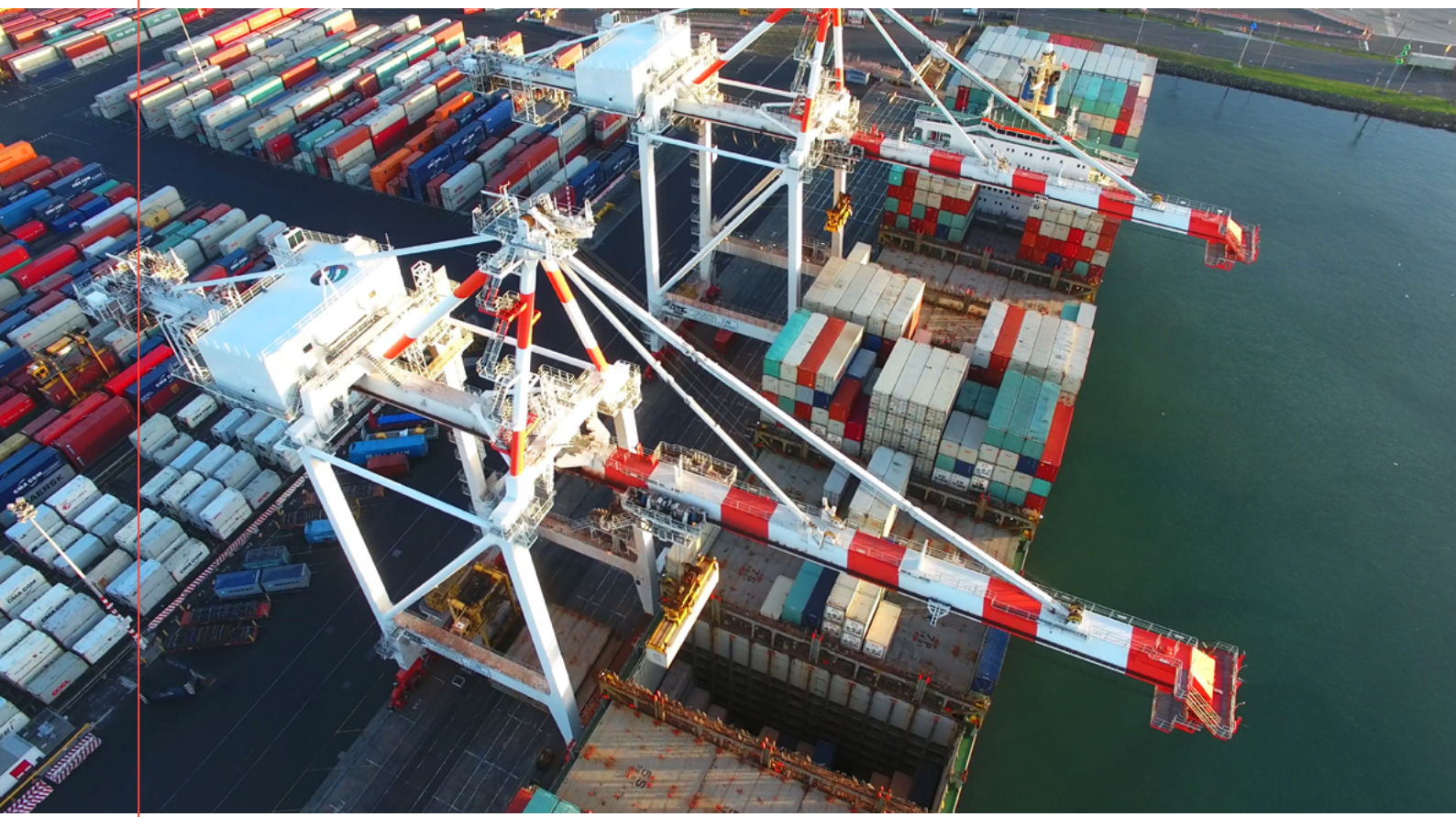
WSP identified that a key reason for the organisation's level of maturity was around the lack of a defined asset management system, fuelled by resistance of staff in adopting software solutions that may change their traditional way of working. The identified gaps also required significant investment and dedicated effort that the organisation may not have access to due to intensive business as usual activities and a lean workforce.

4. Determining Asset Information Requirements

Any transformation program must have clear and robust objectives that can guide the activities and processes within it for it to be effective. Through regular stakeholder engagement, WSP assisted the organisation in identifying their asset information requirements in alignment with their asset management objectives and strategic organisational goals and vision. WSP engaged with industry experience and technical expertise, working closely with the port's leadership team to workshop what information would be critical to business decision-making. Stakeholder engagement was also undertaken with each of the port's business units that would be interacting with the EAM system, to understand their needs and required outputs to ensure the system would support their operations. The overarching asset information requirements then informed which datasets were to be prioritised based on their ability to be transformed into valuable business information.

For our case study, the identified requirements for asset information were determined to be:

- To have a better understanding the organisation's assets and have transparency over any business risks
- Enable better decision-making through data-driven evidence, including information to support investments (e.g. acquisition of new assets, capital programs, major maintenance programs)
- Provide improved asset life cycle cost forecasting and modelling
- Identifying opportunities to improve business intelligence through integrating datasets across the business



5. Developing data on an Integrated Enterprise Asset Management Systems

Once the asset information requirements of the organisation have been defined, a dedicated data transformation program was developed to build and establish an integrated EAM system, providing a single source of truth for asset information. With the support of WSP, a data cleansing exercise was carried out to consolidate disparate data, collect additional data and remove any duplications in the asset register.

The team firstly modified the asset class hierarchy structure through stakeholder engagement, to provide a simplified and easy to use asset classification system that would better service the needs of the business. It was then necessary to identify the key attributes and datasets needed that would provide the greatest value to the organisation within the given timeframe and resourcing constraints. This program focused on ensuring that the organisation had good quality data, but more importantly, data that mattered and applied consistently across all asset classes.

Through consultation with stakeholders, the following minimum asset attributes were determined as data points that would need to be populated in the asset register:

Clear and concise Asset Name	GIS Attributes	Annual OPEX estimate
Appropriate Asset Classification	Asset Life	Asset Dimensions and Unit of Measure
Location Reference	Asset Photo	Asset Condition
Asset Supply Attributes	Expected Useful Life	Replacement Value

Given limited resources and time constraints, the data cleansing exercise followed the 80/20 rule in consolidating asset data from around the organisation, with a priority given to assets that posed the greatest risk to the business. It is understood that it would be an iterative exercise where data was progressively validated and updated to be more accurate as the organisation matured. A validation tracking field was built into the asset information page to aid the port in tracking which data sets were the most mature.

The following program was undertaken for each asset class:

1. **DATA CLEANSING**
   Cleansing data already on the EAM system by verifying against alternate sources of asset information, updating asset attributes where required and removing duplications in the system. Where information was not available in the system, new assets were created.
2. **STAKEHOLDER ENGAGEMENT**
   Workshops with stakeholders to fill in any additional information gaps that can be resolved through individual or business knowledge not documented. This was also an opportunity to ensure that the available information is accurately inputted and would service the requirements of the business unit.
3. **REVIEWING AND IDENTIFYING DATA GAPS**
   Once all available asset information had been loaded into the system, missing asset information was identified for future collection through site inspections or otherwise.

Overall, the key challenges of this process are ones that many organisations will face, particularly for organisations with older asset portfolio ages. A common obstacle that hinders the effectiveness of this process is that there may be large amounts of missing information or data that is difficult to verify. For this organisation, this issue was prevalent when collecting information on asset life and replacement values of assets that extended back historically beyond accessible records. As such, multiple checkpoints were needed during the data cleansing process to ensure the alternate data sources were current and to inquire after individual knowledge to fill data gaps where needed.

This program also needed to run concurrently with business-as-usual activities. Hence, it was critical to gain leadership team buy-in, and consistently engage with stakeholders to build awareness and inform users of the change occurring within the business, promoting a gradual shift in the ways of working. Ensuring our activities were strategically aligned with a change management plan was vital as it would enable the project team to create a collaborative environment, with staff feeling comfortable in sharing their data.

Collaboration with multiple experienced personnel, such as an asset management representative from the EAM system provider, supplied valuable insights for the various program activities. The program was also supplemented with the development of an Asset Risk Framework and detailed Asset Information Strategy to provide guidance for the organisation on best-practise risk and data management going forward for the management of assets at the Port.

6. Outcome and Future Program

Through this dedicated data transformation program, the organisation was able to establish an integrated EAM system that supports important decision making through data evidence. The asset register experienced a significant uplift in asset information, with the majority of asset now mapped based on their GIS coordinates and asset photos attached. The process has also enabled the piloting of a dashboard that gives critical asset information, such as which asset class presents the greatest risk due to their asset condition or age, and the estimated replacement values of the asset classes and expected year of asset replacements.

The integrated EAM system established a single source of truth for asset information, allowing for holistic understandings of asset portfolio characteristics such as asset class life, asset values, asset risks and asset conditions. Additionally, the capabilities of the EAM system combined with healthy data will allow the organisation to determine their forecasted capital and maintenance spend through the life cycle analysis of their assets now that the appropriate data is available. Maintenance work orders are can also be assigned to specific assets more accurately, to allow better tracking and monitoring of activity. With this information, the business is now able to provide strong justifications for their prioritisation of investments and reduce business risks through having a more accurate understanding of what they own.

As the organisation matures, this asset information quality is expected to increase, with more rigorous governance structures and asset risk management to be implemented and adopted by the business. It is evident that the process of data transformation is a substantial one and requires significant collaboration and investment from the business. By defining the organisation's business requirements early on and developing asset information strategies, organisations can benefit from EAM systems that are fit-for-purpose and catered specifically for their needs, driving better performance, optimising costs and delivering more effective asset management practices.

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