

Asset Investment Planning Solutions

A Market Study

An independent
study of solution
vendors who can
support better
decision making
in asset intensive
organizations

To begin your journey to effective asset investment planning, this market study provides a review of leading **Asset Investment Planning (AIP)** solutions, guidance on how to assess your organization's readiness to adopt an AIP solution, and insight into what constitutes good practice. The intended readers of this market study are asset owners, asset investment decision makers, and the information technology communities within asset intensive organizations

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What is asset investment planning?

Asset investment planning encompasses many different types of decision-making on different timescales, with competing objectives. This section details the types of decisions made and how they fit within the wider business context. The asset investment planning process is described, including the key capabilities and business needs.

How do AIP solutions support better investment planning?

For those unfamiliar with AIP solutions, a simplified view of their functionality is presented. This AIP Solution Model considers necessary integration with the wider asset management system and complementary technologies. This view of AIP solutions was used in the assessment of the vendor products to ensure coverage and consistency.

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Who are the providers of AIP solutions?

With an understanding of what an AIP solution is, we present our findings on six leading vendors. Each vendor's product has distinct areas of strength and some areas of functionality where further development opportunities exist. Alongside the solution assessment we have used a structured approach to understand the characteristics of the vendor organization itself, a key consideration in any selection process.

When should you progress your AIP project?

With a better understanding of the available solutions this section considers how best to prepare your organization to deploy an AIP solution. To support this, a basic maturity scale is provided to allow for reflection on your current investment planning process. Benefits from adopting these solutions are presented to support business case initiation.

WHEN

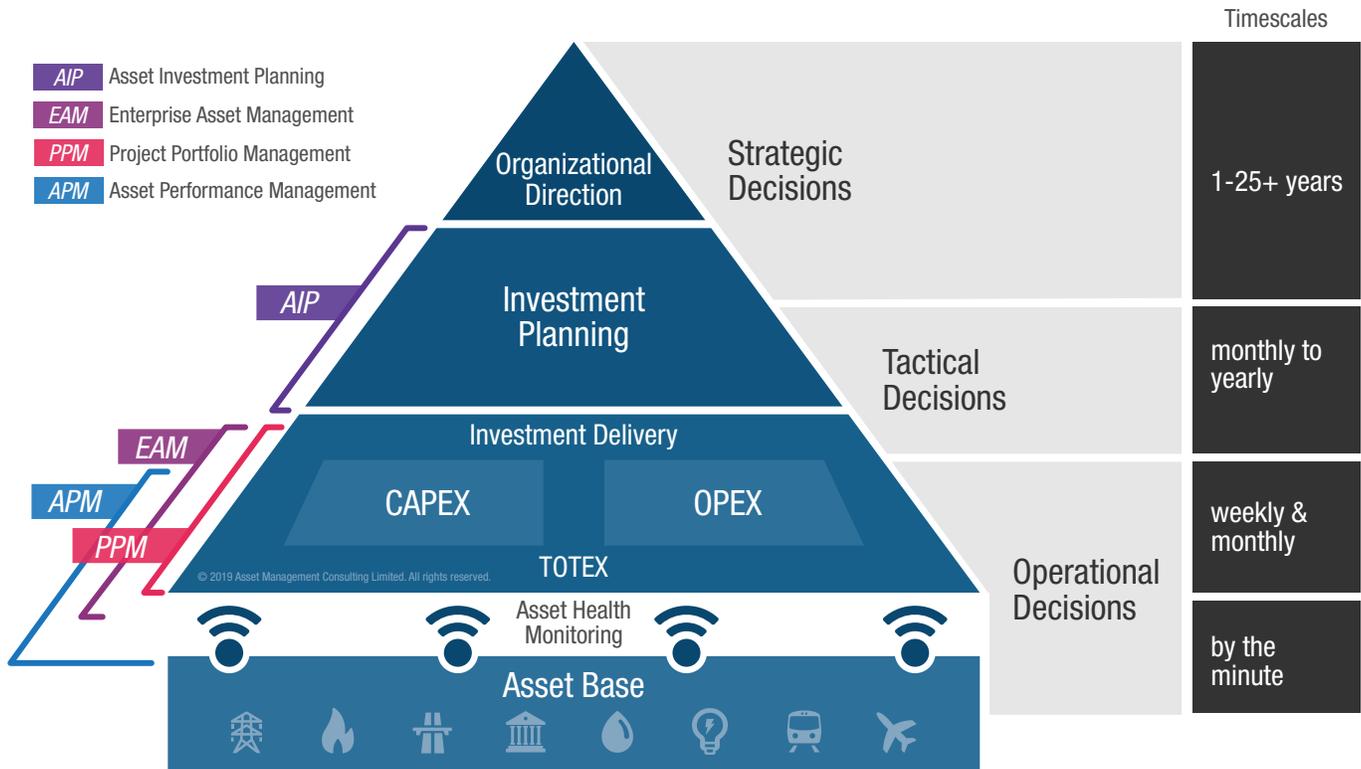
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WHAT

Background

Asset-intensive organizations are regularly challenged to make the right decisions at the right time to realize maximum value from their asset base. These decisions will involve achieving the correct balance between the costs, risks and performance improvements of competing asset interventions ranging from asset monitoring and inspection regimes to maintenance, renewal, disposal or enhancement. Decisions on asset investment are made throughout an organization and not just at a strategic level. The decisions vary in the time horizon and the scale of the asset base they consider: with strategic decisions focusing on the demands placed on the asset base, through to tactical decisions on how best to maintain individual asset classes, down to operational decisions on prioritizing work orders and failures.

There is a global trend for government agencies, professional bodies and the supply chain to promote new digital technologies and business models as a solution to better Asset Management decision making. Concepts such as Digital Twin, Artificial Intelligence, Prescriptive Analytics and the Internet of Things have the potential to automate business process and enhance decision making. However, many of these digital approaches are at an early stage of adoption and remain at proof of concept stage due to challenges with an organization's process and data maturity. Asset Investment Planning (AIP) solutions are a proven digital approach and use advanced analytics to solve complex business challenges.



Many asset-intensive organizations have invested heavily in technology to streamline business processes and to support operational asset management decisions. For over 30 years a key IT system type adopted in the market has been **Enterprise Asset Management (EAM)** solutions, such as SAP, IBM Maximo, and Infor EAM. EAM solutions tend to focus on operational decisions with essential functions for weekly and monthly maintenance planning, supply chain and work management, all supported by an asset register to represent the asset base.

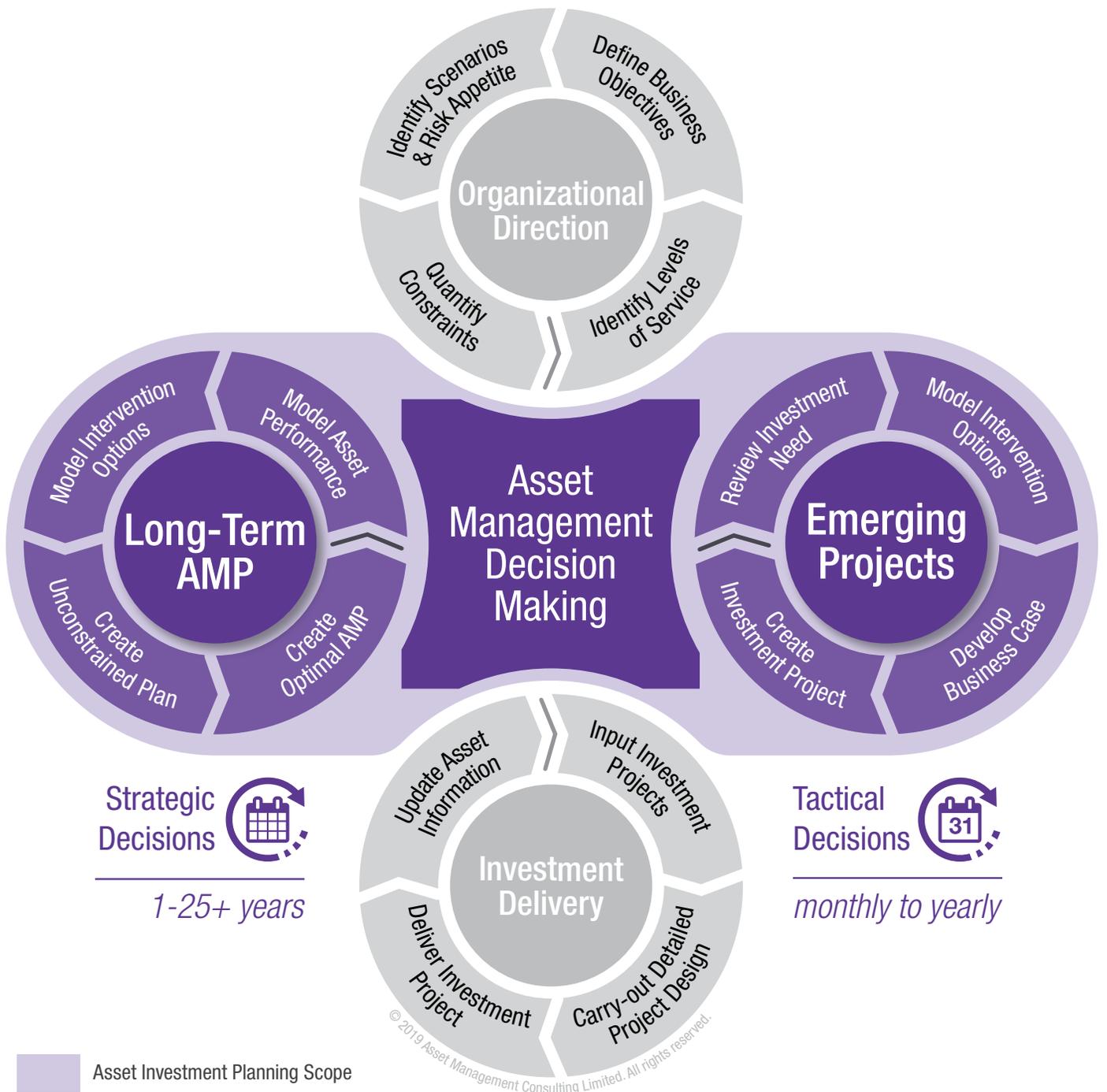
For strategic and tactical decisions, MS Excel and institutional knowledge have been the common 'platforms' used to determine which assets require what Capital Expenditure (CAPEX) and Operational Expenditure (OPEX). Organizations typically segregate budget planning for CAPEX and OPEX not realizing the benefits of a combined Total Expenditure (TOTEX) approach. The focus of this market study is on **Asset Investment Planning (AIP)** solutions, which are now gaining traction as organizations realize the importance of optimizing the production of Asset Management Plans (AMPs) and individual investment projects to meet business objectives.

Once selected, CAPEX investment delivery projects are typically developed, controlled and monitored through **Project Portfolio Management (PPM)** solutions, a less well-defined technology market segment which ranges from single project GANTT chart solutions, to Enterprise Resource Planning (ERP) project cost platforms.

Another related technology category is **Asset Performance Management (APM)** solutions, intended to support nearer term operational and tactical processes and decisions. APM solutions are less mature and combine reliability engineering methods (i.e. Reliability Centered Maintenance) with asset health monitoring and advanced analytics. Our study has found that there is some confusion in the market between AIP and APM solutions. Over time we believe these products will align as data about assets changes from human judgement of asset condition to assessment through sensor technology.

Business Need

The asset investment planning process is the series of steps an organization follows to make decisions on when and where to invest. The outputs from this process are typically in the form of a single investment project or a consolidated Asset Management Plan (AMP) detailing long term investment needs. The asset investment planning process requires a strong interface with other parts of the organization, to ensure that investments delivered align to the organizational direction. AIP solutions aim to address the business need for asset investment planning by providing the functionality and integration required by the process.



Organizational Direction



To enable optimal asset investment decisions to be made, clear organizational direction must be set. This includes definition of business objectives, future demand scenarios including the required level of service, definition of risk appetite and an understanding of any constraints the organization may face. The process of setting this organizational direction is considered outside of the investment planning process, but the inputs it provides are essential. The organizational direction should be reviewed frequently, to ensure any changes in the operating context are accounted for.

Long-Term Asset Management Plan (AMP)



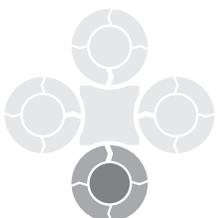
The Asset Management Plan (AMP) provides a view of investment projects that deliver the business objectives, the required levels of service and meet constraints over a predefined time horizon. The primary purpose of the AMP is to identify the investment required across the entire asset base, accounting for individual asset needs and the organizational direction. Development of the AMP typically requires: modelling the current and future performance of the asset base, assessment of the unconstrained asset needs, analysis of all possible intervention options and optimization to create a deliverable plan. This AMP is often developed for several investment or level of service scenarios.

Emerging Projects



While the AMP will define investment needs and projects over an extended time horizon, emerging changes in the business or asset context may result in unexpected investment needs arising. These emerging investment needs may be as a result of changes in the current plan (e.g. project deferrals), changes in regulation, unexpected failures, immediate changes in business priority or a requirement to deliver projects requested by key stakeholders. This type of decision-making and investment planning occurs at the tactical level and requires modelling of asset performance, economic assessment of options and, the creation of a business case for approval of the project.

Investment Delivery



To realize the value of decisions made, effective delivery of investment projects is required. As with setting the Organizational Direction, Investment Delivery is outside the scope of investment planning, but monitoring the delivery of projects is essential in ensuring that any changes in scope, time or budget are accounted for when reviewing and re-optimizing the AMP. On completion of an asset investment, it is essential that asset information is updated to ensure that future planning cycles, and the subsequent modelling, uses data that is accurate.

Asset Management Decision-Making



The investment planning process consolidates these four disparate capability groups to achieve a collective approach to Asset Management Decision-Making. Integration between the different capability groups is key to ensuring that any changes to the AMP as a result of emerging asset needs in the short-term, still aligns to the organizational direction. Close integration with the delivery of investment is also required as changes in project scope, budget or timescales can impact the wider delivery of the project portfolio.

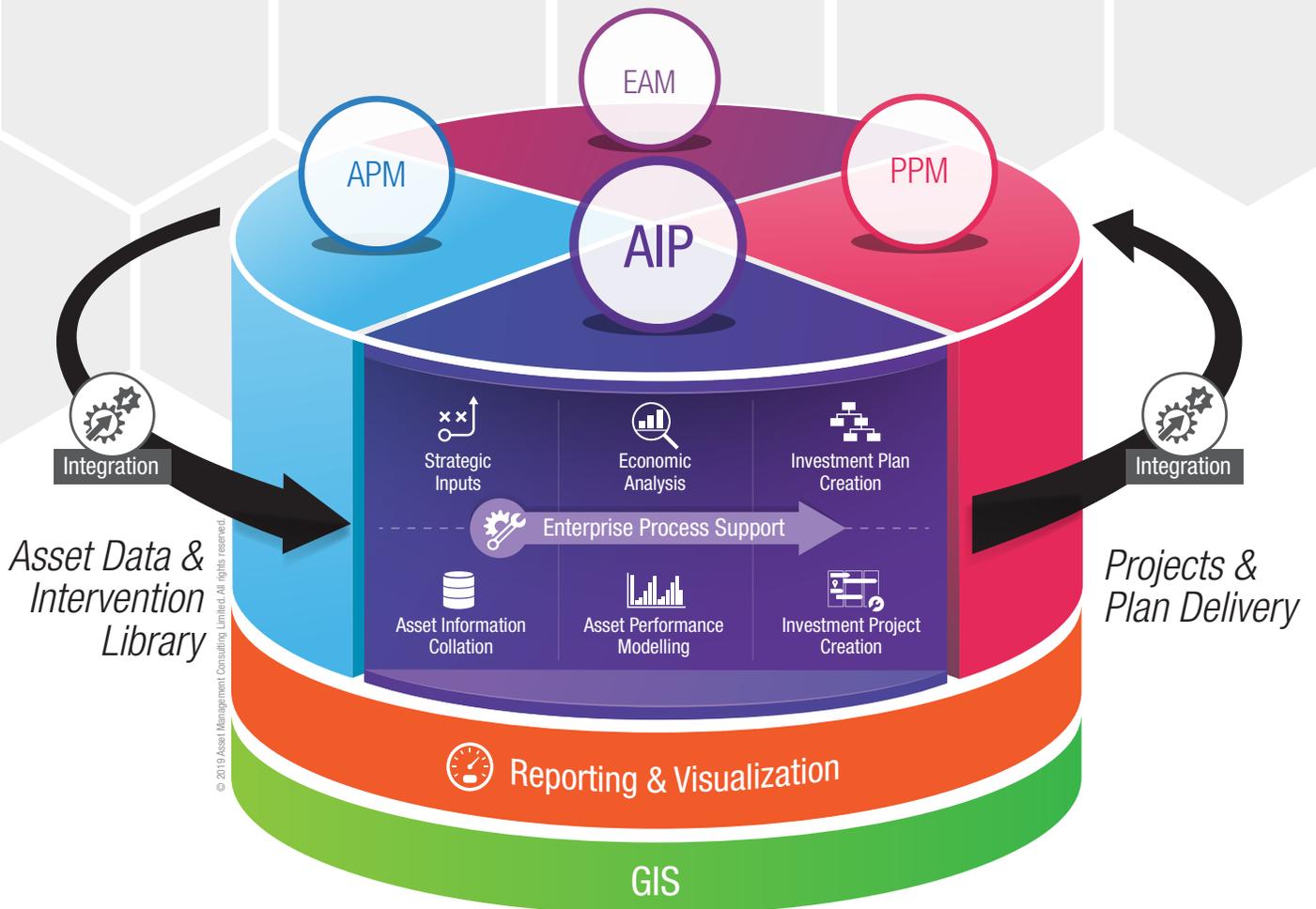
HOW

How do Asset Investment Planning solutions support better investment planning?

The asset investment planning process requires the use of advanced modelling and analytical techniques to produce the optimal output in the form of an Asset Management Plan or investment project. AIP solutions are complex systems that can be more challenging to specify, implement and deploy than other IT systems. We have standardized the typical modules of AIP solutions to present the scope of functionality they support.

The AIP Solution Model

The AIP Solution Model presented in this section shows the nine functional areas found in most solutions. AIP solutions do not function in isolation and as an input require data generated in other enterprise systems to perform required analytics. Once investment plans and projects have been approved these records should be transferred for delivery. Therefore, AIP solutions provide the capability to easily integrate with relevant enterprise systems such as EAM and PPM systems. AIP solutions may have methods of integration with mapping systems such as Geographical Information Systems (GIS), enabling visualization of results and more complex analysis of intervention options through the addition of information layers.



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AIP Solution Functional Areas



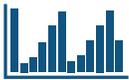
Strategic Inputs are information inputs that detail the investment constraints to be applied to the asset base for optimization of the AMP. This information can range from basic information such as budgetary constraints to resource availability or even industry specific constraints set by legislation. AIP solutions should provide a clear link between these investment constraints and the organizational direction. Investment constraints will often be closely linked with target outcome or services measures.



Asset Information Collation is the collection and preparation of asset attributes that are required for asset performance modelling and analysis of possible intervention options. Solutions should provide the ability to connect data from multiple sources and to understand relevant quality. This can range from essential condition, age and material type attributes to more advanced attributes such as proximity to schools or current asset utilization. The level of information required is dependent on the desired complexity of deterioration modelling and scenario analysis within the process.



Economic Analysis is required to determine the feasibility of each intervention option and is critical to the process of optimization. One of the key inputs to the analysis is the cost of each intervention option. High-level costs may be used, however the more accurate the unit costs are, the more reliable the output from the solution will be. Some AIP solutions provide functionality to estimate costs, but this typically occurs within Investment Delivery and therefore strong integration is required. Economic metrics used to support decision-makers will differ across organizations and may include; Net Present Value (NPV), Payback Period or Internal Rate of return (IRR). AIP solutions have the capability and processing power to carry out this type of analysis across an entire asset base.



Asset Performance Modeling is required to predict the baseline current and future performance of the asset base, over a predefined horizon. Modelling undertaken at this stage also analyzes the impact on asset performance of different intervention options. This modelling would often take the form of failure curves or deterioration models based on asset attributes and existing organizational methodologies. Some AIP solutions on the market provide deterioration models out of the box, which can be of benefit to those who have not previously created these and are looking for quick implementation of a tool.



Investment Plan Creation covers the strategic decisions and an AIP solution typically uses an optimizer to determine the interventions that should be carried out across the entire asset base or a subset, to meet organizational objectives and account for constraints that are input. This is typically an iterative process where multiple optimizations on the asset base are carried out, adding additional constraints, until a final long-term Asset Management Plan (AMP) is produced.



Investment Project Creation covers the tactical decisions made in an organization. An AIP solution will support the development of individual asset projects through; selection of the optimal intervention option based on modelling carried out, development of a business case (within the solution) and the approval process required to create and deliver an investment project. AIP solutions vary in functionality, but these projects should be inclusive of both CAPEX and OPEX interventions.



Enterprise Process Support is the functionality required to support business process within an AIP solution. To achieve this, AIP solutions typically provide modules to create custom workflows, aiding navigation through the solution to achieve a desired outcome. For example, these workflows can deliver automatic notifications of the creation of investment projects, approval of submitted projects and the upload of new asset information.



Integration between an AIP solution and other enterprise systems is essential. AIP solutions should have standard adapters to integrate with EAM, PPM, GIS and other systems to import and export necessary data. These Integrations allow for regular, automated update of Asset Information, graphical reporting & analysis and monitoring of investment delivery.



Reporting and Visualization should be inherent to any AIP solution, covering the visualization of outputs, reporting of uncertainty and the generation of reports. The presentation of outputs may be done entirely within the solution or through external applications. Advanced use of an AIP solution may include additional geospatial visualization to add further insight to the core investment planning processes.

WHO

Who are the providers of Asset Investment Planning solutions?

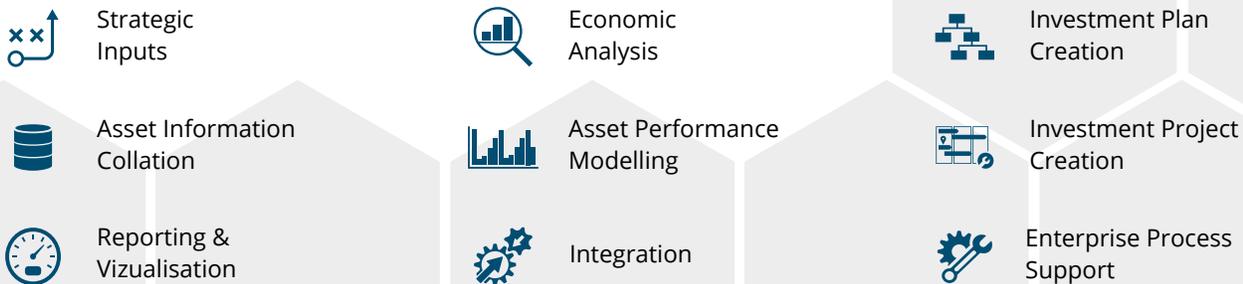
Central to this market study is the assessment of six leading vendors from across the globe. AMCL identified a set of criteria to select which vendors to include. It should be emphasized that there are other solutions available that may be suitable for organizations looking to implement a tool to support asset investment planning. Often these tools form part of a vendor's wider consultancy offer, serve a specific industry sector or may not yet be fully productized. It is expected that in the future other solutions will develop to become a more complete offering. These other vendors will be considered for inclusion in future iterations of this study. To establish our view of the AIP market and the capability of the six vendors chosen, a robust process was followed, and a set of assessment measures established.

Utilizing the AIP Solution Model presented in this study, vendors were consistently assessed against the nine functional categories. Importantly, to evaluate the vendor as a valuable customer partner a further nine company assessment categories were used. Following identification of the vendors, a structured process was followed to gather information against the assessment categories. The vendors responded to comprehensive questionnaires, provided a company presentation and in-depth demonstration of their product. Critically, client reference calls were held providing insight to the vendors, the solutions and the asset investment planning process.

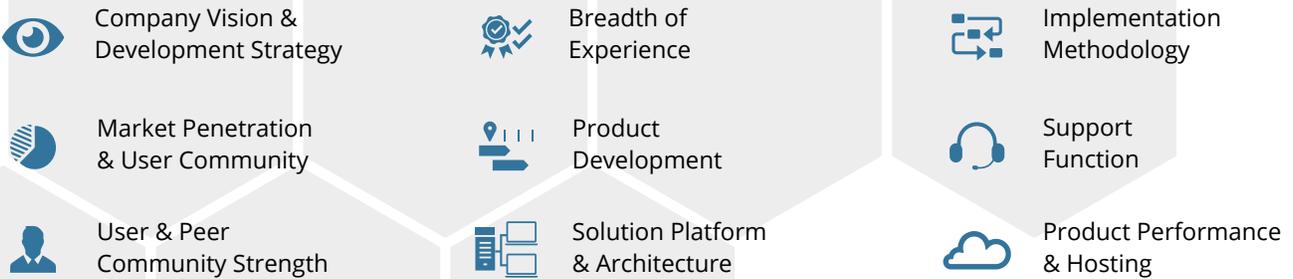
Assessment Process



Functional Assessment Categories



Company Assessment Categories



The six vendors included within the market study are as follows, with detailed analysis provided in the remainder of this section.



www.assetic.com



www.cosmotech.com/solutions/asset



www.powerplan.com



www.copperleaf.com



www.deighton.com



www.seamsltd.com



VISION

“Optimize the world’s infrastructure, enabling sustainability of community services through strategic management of infrastructure assets”

SECTORS



Assetic is a privately owned company founded in 2006, specialising in AIP exclusively. Since inception, **Assetic** has developed an extensive library of asset models covering a broad range of asset types in the utilities, transport, public sector and facilities sectors. These models are accessible to all clients and **Assetic** seek to calibrate and improve these models when new organizations adopt the solution suite.

With well-developed AIP functionality in modelling and optimization, Assetic has switched its focus to communicating the outputs from its solution in a unique way. This additional functionality enables optimized investment plans to be translated into a visual and justifiable format which is delivering significant benefits to many of Assetic’s clients, specifically those in a heavily regulated environment

COMPANY OVERVIEW

Established Strengths



Breadth of Experience

Assetic has implemented its AIP solution multiple times across various sectors giving it a broad range of experience. **Assetic** has leveraged this experience in utilities, transport, public sector and facilities to build a large library of asset performance models. Prospective clients can access this model library, which may accelerate implementation and benefits realization with proven models.



Market Penetration & User Community

As a long-established provider of an AIP solution, **Assetic** has a large customer base with a significant number of active users. Its regular regional, annual and partner conferences contribute to a strong user community and a pool of AIP knowledge that clients can access. This has led to the development of an eLearning platform for future clients to use before implementing the AIP Solution. This platform educates users on degradation curves among many other related topics to support solution implementation.

Improvement Opportunities

Product Development



Assetic’s development of its AIP solution has to date, focused on the underlying functionality required to capture information, produce accurate models and determine optimal investment plans. The solution architecture is currently a mix of on-premise and web-architected modules, with separate user interfaces. Modernization is required to improve the user-journey and development is underway to finalise the move to full web-architecture.

What Clients are saying...



“By using Assetic to optimize our asset management strategies we’re confident we can reach the right balance between cost, risk and performance across our network, which ultimately benefits our customers in the long run.”

Sydney Trains, Australia



SOLUTION OVERVIEW

Established Strengths



Investment Plan Creation

With **Assetic's** proprietary optimization algorithm, and easily customisable scenarios, investment plans can be created over a lengthy time horizon. A standout strength of the **Assetic** solution is the ability to take the final plan and create a graphical storyboard to articulate the chosen investments in a defensible and justifiable manner.



Asset Performance Modelling

The **Assetic** solution has access to a significant library of modelling templates that customers can use to expand their own modelling capability. These models have been developed over past **Assetic** implementations and cover a wide variety of assets including utilities, transport, public sector and facilities. If required, this offering can support a quick implementation of the solution with the existing models then being calibrated over time.



Asset Information Collation

A comprehensive asset hierarchy is provided to store and clearly present data. The asset hierarchy is supported by Asset Data Standards, which set out the information required by the chosen models. This enables clear identification of where data exists and where it must be collected. There are numerous integration points with ESRI GIS so asset information can be viewed geospatially if required.

Improvement Opportunities



Reporting & Visualization

Assetic has developed a strong solution based on its development focus on the core functionalities of information collation, modelling and optimization. However, the reporting within the core solution, while comprehensive, has limited visualization capability. To provide a richer visualization, export of results is required from the **Assetic** solution, hence integrations are provided for ESRI GIS and Microsoft PowerBI.

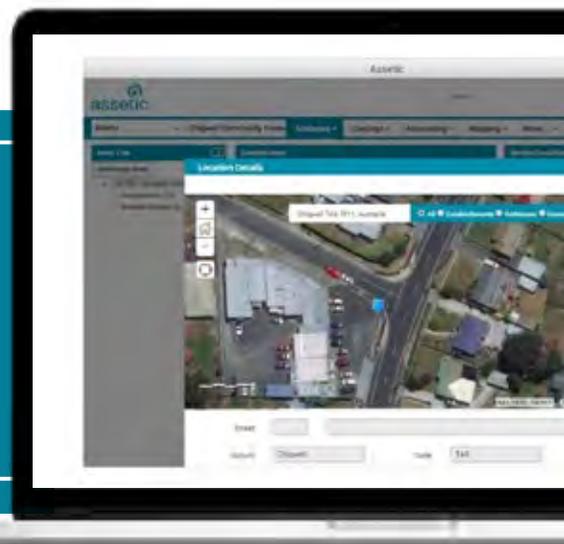


Enterprise Process Support

Assetic's solution produces an optimal investment plan based on sound modelling principles and good quality asset information. To date, the development of the solution to accommodate enterprise processes, such as approval of projects and plans, has not been a core focus. For **Assetic** to further support an organization's investment planning processes, workflows would need to be configured within the system to accommodate approvals and moving of projects to different stages.

Consider Assetic if...

The **Assetic** solution provides organizations with proven Asset Performance Models and accompanying Asset Data Standards to aid collection of asset information. **Assetic** is suitable for an organization at any point on the maturity scale, but will provide an accelerated start to those at the beginning of their AIP journey. While the user interfaces and solution architecture may require modernization, it is simple to follow, and major updates are planned in the near future.

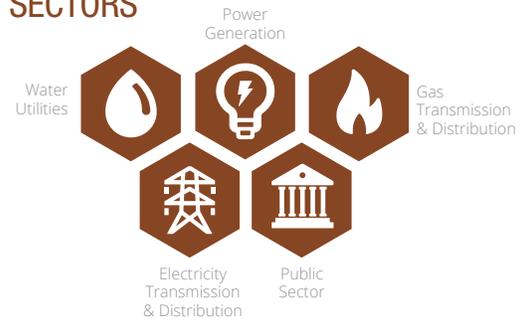




VISION

“Empowering businesses to make the highest value investment decisions”

SECTORS



Headquartered in Canada and with a global presence, **Copperleaf** Technologies has a strong offering in its core Asset Investment Planning solution, C55. Based on customer demand, C55 has an extended scope to include complementary solutions such as a cost estimation and project management tools. **Copperleaf** has a significant volume of users across its clients with many organizations

deploying C55 to business users as part of their investment planning process. The C55 solution is a flexible platform that can be configured to accommodate any type of modelling, before carrying out sophisticated portfolio optimizations to support creation of asset management plans and individual projects. **Copperleaf** have a strong user community who drive significant development of the C55 solution.

COMPANY OVERVIEW

Established Strengths

User and Peer Community Strength

Resulting from numerous implementations across the globe and a desire to develop the solution in line with customer demand, **Copperleaf** has built a strong user community. **Copperleaf's** regional and global conferences allow its customers to share knowledge and use cases of the C55 solution. This forum for knowledge sharing allows for clients to continually develop their own implementation as well as inform the development roadmap of C55 itself.

Market Penetration

Copperleaf's C55 Solution covers most organization's investment planning process needs and is suitable for those organizations wishing to roll-out the solution to a large number of users. This has attracted a large number of users beyond the modelling community. The recent addition of a cost estimation tool that integrates with C55 will likely increase the number of users and provide a consistent and justifiable input into the economic analysis of intervention options.

Improvement Opportunities

Implementation Methodology

The flexibility of C55 to accommodate different asset models and planning processes requires a certain degree of technical competence within the organization to implement. Furthermore, if an organization wishes to manage the solution in-house over the longer term, then consideration should be given during implementation as to how the technical competence will be developed. For example, the creation of new asset models requires some level of programming knowledge. Copperleaf's growing pool of implementation partners may offset concerns with C55 implementation and support.

What Clients are saying...

“I'm extremely pleased to say that the project was completed on time and on budget, and that we now have a robust process in place to create, manage, and optimize all of our asset investments across the distribution system”.

*Jim Pegg,
Manager of Asset Planning at Hydro Ottawa*



SOLUTION OVERVIEW

Established Strengths



Investment Project Creation

The C55 solution has strong functionality in creating investment projects against an asset and making tactical decisions. The user interface can be configured to contain all the information usually required in a business case, negating the need for traditional MS Word documents and associated document control. Robust economic analysis of any potential projects can be configured to value the costs and benefits relevant to the client's organization.



Investment Plan Creation

Supporting the strong project creation capability of the C55 solution is a robust optimization algorithm that creates asset management plans to meet business constraints. Numerous criteria of varying type can be added to a scenario for C55 to find the optimum investment plan. Scenarios generated can be saved locally for future use or submitted for approval and delivery.



Strategic Inputs

Aligning strategic objectives with asset investment decisions is a key concept with C55. The Value Framework within C55 allows organizations to model asset-level cost and performance metrics, then roll these up to the portfolio level where they can be constrained and reported upon. A new module is currently being developed for the tool that will support organizations to develop their Value Framework and link investment projects back to strategic priorities.

Improvement Opportunities

Reporting & Visualization



The C55 solution possesses information rich user interfaces, which provide essential metrics and functions to the technical users of the solution. Standard reports display information throughout the solution, but these require technical configuration and so the ability to quickly build another type of report is lacking. For more detailed analysis of the results, integration with external reporting applications (e.g. MS PowerBI, Tableau) or the use of MS Excel is required. This approach may suit an organization's analytics strategy.

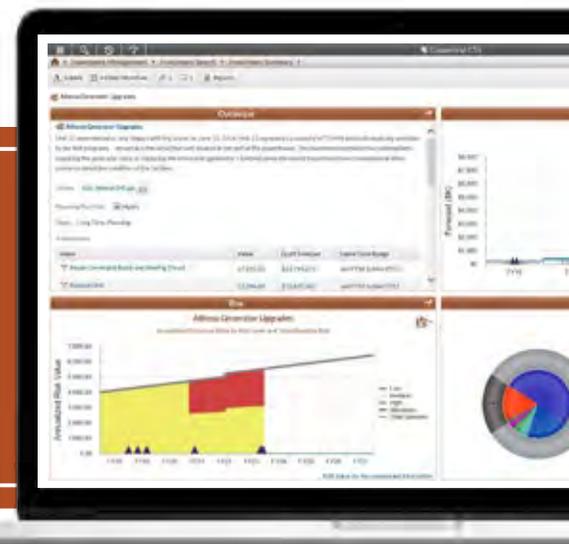
Asset Performance Modelling



Creating models in C55 is done through an open-source programming language. During and after implementation, **Copperleaf** provides support to carry out this coding, but a level of technical understanding would be required if models are to be maintained independently. Some training in the programming language may be provided as part of implementation, however prior programming knowledge would still be required. The library of asset models **Copperleaf** use to populate C55 is currently limited. Whilst this library is growing, organizations may require an existing methodology or third party support.

Consider Copperleaf if...

Copperleaf provides a robust, output-focused AIP solution, accompanied by a strong user community and support function. If you have an existing asset modelling methodology and are focused on implementing a solution that can produce optimum investment plans to meet your business objectives, then **Copperleaf** should be considered. The user forums and conferences will provide a good environment for sharing good practice with industry peers.





VISION

“Bring clarity to the most complex issues impacting industries and the world”

SECTORS



Electricity Transmission



Gas Distribution

Cosmo Tech is an AIP solution provider based in France, with a sales presence in the UK and USA. **Cosmo Tech's** value proposition and solution functionality has a narrower focus than its competitors, centering on the planning and optimization of intervention strategies across groups of assets through a 'What if?' scenario analysis approach. With a modern, SaaS-based platform, the easy-to-use interfaces allow for detailed analysis of the most cost beneficial regimes and strategies.

Cosmo Tech initially focused on the electricity transmission sector through a strong partnership with RTE, which has been a significant contributor to the development of the Cosmo Tech Asset solution. The company is growing in revenue, has a staff base of 70 primarily in R&D and has recently raised \$21 million for future growth in the European market. **Cosmo Tech** is expanding into other sectors, including Gas (GRT Gaz), with the aim to grow into Oil & Gas, Water and Rail.

COMPANY OVERVIEW

Established Strengths



Implementation Methodology

Cosmo Tech's approach to implementing Cosmo Tech Asset within an organization is a real strength of its offering. It focuses on understanding the client needs and checking alignment to solution functionality, before configuring and calibrating the solution. The approach centres on a mutual understanding of the business case for AIP and addresses the challenges posed by implementing a new software platform.



Product Development

Cosmo Tech has a strong focus on R&D with an academic-led development team and a strong understanding of its target market. This has led to a leading architecture based on a modern, scalable platform. The platform and modelling capabilities have been tailored to client use cases beyond AIP, including outage and shutdown planning and supply chain optimization.

Improvement Opportunities

Market Penetration & User Community



Cosmo Tech has delivered tangible benefits to RTE and has a strategy to grow its customer base across multiple sectors. However, it currently has a limited user community from which customers can share best practice and contribute to the development of the Cosmo Tech Asset solution. Given the narrower focus of the Cosmo Tech Asset solution, **Cosmo Tech's** user community may remain smaller than others, missing out on the associated benefits these communities bring to the development of their solution.

Support Function



Cosmo Tech's focus on a specific use case and hence a smaller customer base, has meant that a well-established support function has not been a priority and is currently limited in scope. Accordingly, there is no 24/7 support for customers and resolutions to any issues raised may take longer.

SOLUTION OVERVIEW

Established Strengths



Reporting & Visualization

The standout strength of the Cosmo Tech Asset solution is the flexible, customisable and insightful visualization of results. The Cosmo Tech Asset platform gives users a GUI from which they can create custom analysis and reports to view outputs that are most important to them. The inclusion in Cosmo Tech Asset of a comprehensive reporting and visualization engine may reduce the dependency on a third-party tool to present results and outputs.



Asset Performance Modelling

Cosmo Tech's solution focuses on modelling the impact of different asset intervention strategies across groups of assets, before simulating the strategies on a single asset. Cosmo Tech Asset offers organizations a pre-defined modelling methodology which is simple to understand and can be calibrated to an organization's failure and cost data as it develops. Another unique value proposition of this solution is the ability to model systems of assets and their interdependencies with other assets, interventions and constraints such as availability of skills through a simplified topology scheme.

What Clients are saying...

"We are in a position to test and validate the business plans of our internal clients which is already delivering savings of 10% on their costs".

Olivier Grabette, RTE.

Consider Cosmo Tech if...

If your organization is looking for an AIP Solution and vendor that can support asset performance model development and scenario analysis then consider **Cosmo Tech**. While it may not produce lists of projects for you to deliver, it will provide you with the results you need to make a decision on what intervention strategy to adopt. The modern and scalable solution architecture, flexible reporting engine, including numerous standard reports, and pre-defined modelling methodology will deliver fast, repeatable results to support strategic decision-making.

Improvement Opportunities



Economic Analysis

When analyzing and prioritizing the different intervention strategies, the Cosmo Tech Asset solution determines the most appropriate option based on the improvement in asset performance. There is currently a limited focus on the economic analysis of the different strategies and further external analysis would be required to determine the most cost beneficial strategy. A future release of the Cosmo Tech Asset solution will start providing this capability.



Investment Project Creation

The Cosmo Tech Asset solution supports decisions on the most appropriate strategies across groups of assets, but does not produce deliverable projects that could be integrated with a PPM solution. Further development of asset-specific projects in other tools would be required to complete the investment planning process. **Cosmo Tech** has made the strategic decision not to target this part of the AIP process with their solution.



Enterprise Process Support

The **Cosmo Tech** solution does not have the capability for workflows and approval processes to be configured and existing processes would have to be retained for delivery of the strategies. This is as a direct result of the solution focusing on the 'What if?' scenario analysis and not on the creation of deliverable projects and plans.





VISION

“To be the globally respected leader in management systems”

SECTORS



Highways



Public Sector

With an extensive history in the AIP solution market, **Deighton's** dTIMS product is well established and covers the full range of functionality required by a typical investment planning process. Having originally focused on the highways and roads sector, the dTIMS product has a large library of Asset Performance Models for these asset types. In recent years it has added other asset type models to this library. **Deighton** has a strong partnership with GIS vendor ESRI,

meaning the solution provides a geospatial interface throughout to visualise and interrogate modelling results. The easy-to-use user interface flows through dTIMS, ensuring that complexity is hidden when necessary, and not apparent to the user when it is not needed. While **Deighton's** focus to date has been on one sector, its experience in developing a comprehensive product for multiple asset classes in highways, makes dTIMS applicable to many other sectors.

COMPANY OVERVIEW

Established Strengths



Market Penetration & User Community

Throughout **Deighton's** 32-year history, a strong user community has developed. It has a high customer retention rate, with few clients migrating away from dTIMS. **Deighton's** implementation of dTIMS has historically been focused on the Canadian, USA, South African, Australian and New Zealand markets, but it aims to grow the user community into the European market. Regional and Global conferences are a regular occurrence.



Company Vision & Development Strategy

Deighton communicates a clear vision and product development strategy stemming from its extensive development of dTIMS. This is combined with a strong understanding of how the market has changed and its future direction. This will likely ensure that dTIMS remains current and expands into new areas to support emerging digital trends.

Improvement Opportunities

Breadth of Experience



The predecessor of dTIMS was **Deighton's** dRoad product, an early-to-market AIP solution specific to the highways and roads sector. Although the product has developed since dRoad, the focus of the solution is still geared towards linear assets; hence, modelling discrete assets may pose further challenges. The limited exposure to sectors other than roads and municipalities also restricts the experience **Deighton** has in modelling other asset classes.

Implementation Methodology



Deighton's historical sales focus and deep understanding of highways and municipalities mean it has only developed a standardised and simple implementation methodology. If **Deighton** is to expand into new sectors with clients of varying maturity, it would need to enhance its implementation approach to account for these new project needs.

SOLUTION OVERVIEW

Established Strengths



Asset Information Collation

The dTIMS solution is centred on rich graphical and map-based user interfaces with native integration to ESRI GIS. A benefit to this approach is the ease of communicating modelling results to anyone across the organization. Another key benefit is the ease in which asset information can be enhanced by pulling data from GIS layers to support further analysis.



Reporting & Visualization

With common design principles the dTIMS solution uses a consistent, modern and clean user interface through graphical analysis and reporting. Investment plans and projects across the client organization's asset base can be viewed on a map, aiding communication. The reporting framework is easily navigable.



Asset Performance Modelling

Deighton has a strong modelling capability within the solution. Its consultancy arm, dedicated to developing client specific models, has developed a significant library for highways assets. Furthermore, the flexibility of the dTIMS solution allows for existing client deterioration models or methodologies to be integrated into the solution.

Improvement Opportunities



Strategic Inputs

For closer alignment to a client organization's Asset Management Framework, consideration needs to be given as to how existing strategic information can be brought into the dTIMS solution. This may be in the form of Asset Management Objectives or Key Performance Indicators, which then directly link to optimization constraints. This is critical to monitoring performance against overall objectives and ensuring investment plans deliver the required benefits, which the dTIMS solution does not currently allow for.

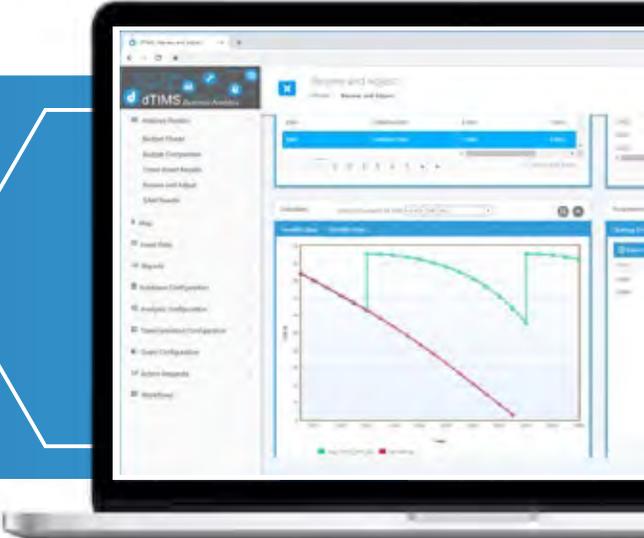
What Clients are saying...

"With dTIMS we can test different investment scenarios and understand the consequences of these decisions. Its allowed our council to reprioritize spending to benefit our community. I thoroughly recommend dTIMS".

*Jamie McPherson,
Tasman District Council, NZ.*

Consider Deighton if...

If you are a roads, highways or municipality organization, Deighton's experience in these sectors and the breadth of the dTIMS solution suite provide a compelling proposition. Although **Deighton** has limited penetration in other industry sectors the strength of their product platform, the extensive modelling experience and geospatial integration makes them a worthy consideration for many other sectors.

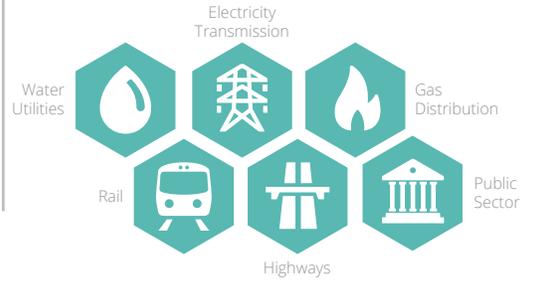




VISION

“**PowerPlan's** mission is to help organizations of all sizes simplify the complex. Across the company employees want to help organizations stream line their processes and help them optimize the outcome.”

SECTORS



PowerPlan's Asset Investment Optimization (AIO) solution has been available to the market since 2000. **PowerPlan**, now owned by the Fortune 1000 company, Roper Technologies, has developed a wide software portfolio with some solutions complementary to AIO. With its strong foundation of technology development, **PowerPlan's** AIO solution has simple connectivity with other tools in the portfolio, covering operations through to finance.

With use cases across numerous sectors, **PowerPlan's** solution can model many asset types and investment decisions and it demonstrates innovative deployments for the system, including the support of Asset Manager to Asset Owner funding cycles. The AIO solution provides a modern, web-architected platform and can support the configuration of many existing enterprise processes within the solution as workflows.

COMPANY OVERVIEW

Established Strengths



Product Development

To develop the AIO product and **PowerPlan's** wider solution suite, there is an established, customer-centric approach to driving improvements in the product. This is done through an advisory board focusing on the core improvement areas of Modelling, Analytics, Visualization and Usability, Reporting and Integration.



Support Function

As an established software provider, **PowerPlan** offers customers an extensive support function with a range of options to solve any issues with the solution. This support function uses a comprehensive helpdesk to prioritize service requests based on impact, before determining the most appropriate action through on-line and call center functions.

Improvement Opportunities



Implementation Methodology

PowerPlan is a software organization, which is evident in its implementation approach being focused more on deploying its software and less on the readiness of the client to adopt its solution.

More emphasis on client maturity and prerequisites to adopt AIP in **PowerPlan's** implementation approach, would ensure its clients benefit fully from the AIO solution once deployed. **PowerPlan** is beginning to address this through its focus on acquiring strategic asset management advisory partners from the marketplace.

SOLUTION OVERVIEW

Established Strengths



Asset Information Collation

The **PowerPlan** solution has an entirely configurable and visual asset hierarchy. With a background of implementing AIO into an organization's suite of IT Systems, **PowerPlan** provides standard integrations with EAM and supports real-time linkages to gather the most up-to-date information. Data quality validation is carried out automatically for each asset in the hierarchy.



Enterprise Process Support

With **PowerPlan's** enterprise-wide suite of interconnected software solutions, a strong benefit of the AIO solution is that it provides leading functionality in workflows, security and the approval of plans and options. A further strength is the ability to manage many projects through approval stages, send notifications by email automatically and generate templated Asset Management Plans.



Reporting & Visualization

The AIO landing page is customizable based on the information different user groups wish to see. This is enabled through a series of standard reports with the option to create individual custom views and reports within the AIO solution. This reduces the requirement for an external reporting solution. **PowerPlan** has an established partnership with leading GIS vendors, has offered spatial visualization over a number of releases, but still plans to expand the amount of geospatial views within the solution.

Improvement Opportunities



Asset Performance Modelling

With the **PowerPlan** pedigree and emphasis on effective software implementation, the capability to support clients to develop deterioration and lifecycle models has been a secondary focus. Clients would likely require existing models prior to implementing the AIO solution, though moderate support may be provided by **PowerPlan** based on past project experience and further development of existing industry models. Alternatively, new engineering consultancy partners from its alliances programme can provide support in this wider implementation.

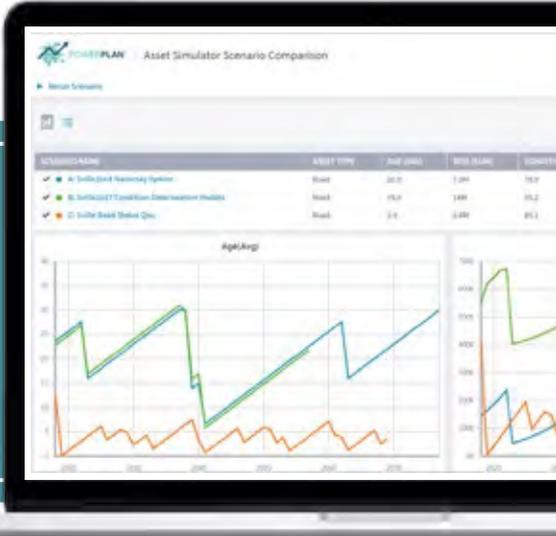
What Clients are saying...

“We realized the growing need to have a systematic Asset Management System that provides value to our customers, defensible to both regulators and stakeholders, and also fit the future organization objective for an ISO 55001 line compliant Asset Management System”.

*Ross Goggin,
Asset Strategy – Energy Networks, Evoenergy.*

Consider PowerPlan if...

PowerPlan is an established and software development-focused organization with strong product management and support. The **PowerPlan** software portfolio extends beyond the typical AIP processes, offering customers further functionality into the areas of Operations and Finance. **PowerPlan** presents a compelling option for organizations looking to tie AIP closely to EAM and other Asset Information Systems and with an existing modelling methodology.





VISION

“Smarter decisions to improve quality of life”

SECTORS



SEAMS provides an advanced modelling platform, Enterprise Decision Analytics (EDA), to support robust analytics and informed decision-making. **SEAMS** has worked across numerous markets, including water, energy, transport, local government and is beginning to develop capability across other sectors, including cities and airports. EDA's core applications cover the full range of functionality expected of an AIP solution, but notably the EDA Asset module allows users to quickly create asset models and define optimal plans for

maintenance and capital investment. **SEAMS** have a dedicated services arm to implement the EDA solution including training and the building of analytical capability. The solution also allows for the integration with organization's existing management frameworks, and their input into optimization scenarios. **SEAMS** have recently been acquired by Arcadis a global design and consultancy company. This has increased **SEAMS** reach and their ability to offer clients a broader range of services within the analytics market.

COMPANY OVERVIEW

Established Strengths



Company Vision and Development Strategy

SEAMS has a clear vision for the future of the EDA platform, which will build on its strong underlying technical capability. To make the **SEAMS** vision a reality, an ambitious product development roadmap is in place that will expand its offering beyond the AIP solution market.



Breadth of Experience

The EDA solution has been implemented across numerous and varied sectors. This experience, combined with a strong academic background, has provided client organizations with a modelling-focused AIP solution. **SEAMS** will support the development and calibration of models specific to a client organization's assets, through its purpose-built modelling tool and experienced analytics team.

Improvement Opportunities

Market Penetration



The **SEAMS** EDA Solution provides a comprehensive analysis of potential investment options, underpinned by complex modelling methodologies. As a result, the solution is aimed at a technically focused user group with some simplification required to engage end-to-end business users involved in other areas of the investment planning process.

Implementation Methodology



SEAMS has a team dedicated to implementing the EDA solution to ensure accurate models are embedded. They follow a structured and traditional approach to implementation. However, with the high complexity of the EDA platform, associated user interfaces and underlying models, an area of focus for **SEAMS** should be innovation in client maturity assessment and project readiness.

SOLUTION OVERVIEW

Established Strengths



Asset Performance Modelling

One part of the EDA platform is a model development tool that can be used to quickly create models for new or existing asset types. These are based on existing models provided by **SEAMS**, models in the public domain or existing client's models. If further support is required to do this, an experienced analytics team can help clients in developing new models. For each new client, **SEAMS** will create a model library, which may support future development of its EDA platform.



Enterprise Process Support

Workflows and approval processes are embedded throughout the EDA platform to move investment projects and plans through different stages as required by the client organization. Another standout strength of the EDA platform is the functionality to take an optimal list of investments and further optimize into packages of deliverable projects; this requirement is sometimes overlooked.



Strategic Inputs

To unlock the benefits of an AIP Solution, it is essential that any modelling scenarios run meet organizational objectives. The Service Management Framework (SMF) component of the EDA platform meets this criterion, by aligning organizational KPIs and automatically allowing constraints to be applied based on these.

Improvement Opportunities



Reporting & Visualization

Rich analytical user interfaces can be found throughout the EDA platform, which provide essential information to technical users of the solution. For users of the system without a technical background, simplification of screens and restricting the information displayed may be required.

The core modelling development tool is currently deployed in a different technology set to the web-architected modules. Consideration should be given to cloud, on-premise or hybrid deployment. **SEAMS** offer a managed service model to cover all aspects of software provision including hosting and ongoing maintenance.

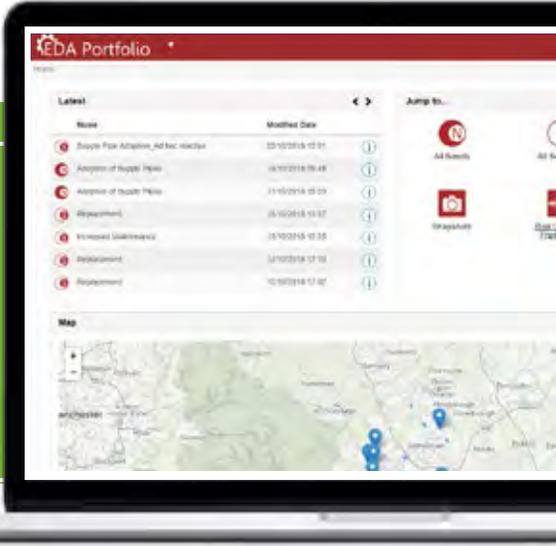
What Clients are saying...

"We have used SEAMS software and models for the last 3 Price Reviews. Over this time, we have successfully embedded analytics as part of our BAU process, reducing our reliance on external consultants. SEAMS have provided ongoing advice and support, enabling us to do this."

Nikki Walsh
Business Transformation Lead - Northumbrian Water Group

Consider SEAMS if...

The **SEAMS** EDA platform has been developed over many years with input from numerous industries. Their platform and expert knowledge in the asset performance modelling space would be well matched for an organization looking to develop these as part of a wider AIP deployment. Despite a more technical user-experience, the **SEAMS** solution does provide end-to-end support for a typical investment planning process and can provide a strong link to an organization's wider Asset Management Framework through the Service Management Framework.



Summary

From our assessment of these six leading vendors, we have found that the market is well served, with good quality solutions that will support most investment planning processes and functional needs. However, it is important to understand when comparing the products' capabilities that each vendor approaches the AIP solution space in different ways, displaying varying strengths and areas for improvement.

	Solution Strengths									Company Strengths
	Strategic Inputs	Asset Information Collation	Economic Analysis	Asset Performance Modelling	Investment Plan Creation	Investment Project Creation	Enterprise Process Support	Integration	Reporting & Visualization	
										Market Penetration Breadth of Experience
										User Community Vision & Development Strategy Market Penetration
										Implementation Methodology Solution Architecture Vision & Development Strategy
										User Community Vision & Development Strategy
										Support Function Breadth of Experience Vision & Development Strategy
										Breadth of Experience Market Penetration

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Key  Does not support this function  Supports function with areas for improvement  Fully meets requirements of function  Provides functional excellence

Given the differing focus and functionality of the six vendors, choosing the right AIP solution for your organization will not be a simple decision. There is not a clear market leader, as the right choice will depend on your organization's specific needs.

Pricing structure was not an assessment category in this study, however, this will vary significantly across vendors. The costs can be highly dependent on the scale of desired deployment. For example, some vendors' solutions focus more on the niche asset performance modelling roles with less involvement from wider enterprise users to develop and deliver asset management plans. Deciding on your user distribution model and subsequent benefits case is critical for an effective comparison of vendor pricing.

Another commercial and technical consideration is between traditional and cloud solution delivery models. The intensive nature of the modelling and optimization engines within an AIP solution suit hosted deployment rather than on-premise, with some variation of approach noted across vendors.

During the assessment process, the vendors organization characteristics and culture were reviewed. Vendors either have development strategies driven almost entirely by their customers or a smaller number of partnerships with key organizations, such as research institutes, which largely dictate the development of the solution. Vendor experience varies significantly, with some focusing on a specific market and developing relevant expertise, while others have implementations across multiple sectors.

Developing a clear project scope, requirements and improvement roadmap will allow you to select the right solution from a functional perspective. But it is equally important to choose an AIP solution vendor with a culture and approach to match your own. The benefits of a good partnership are numerous, from increased speed of implementation to tailoring the development of the product to your organization's needs.

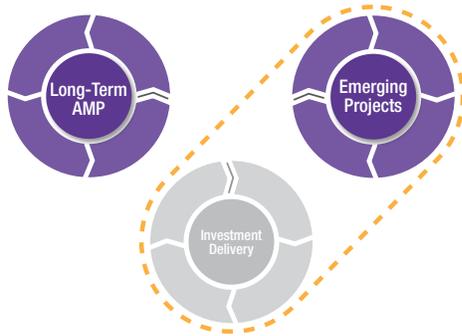
WHEN

When should an Asset Investment Planning Solution be implemented?

Deciding on the appropriate time to implement an AIP solution is key to ensuring the best chance of success and realization of agreed benefits. There are typically four levels of asset investment planning maturity found in the market. These maturity states are characterized by the understanding, presence and integration of the four capability groups required for successful asset investment planning: Organizational Direction, Long Term AMP, Emerging Projects and Investment Delivery.

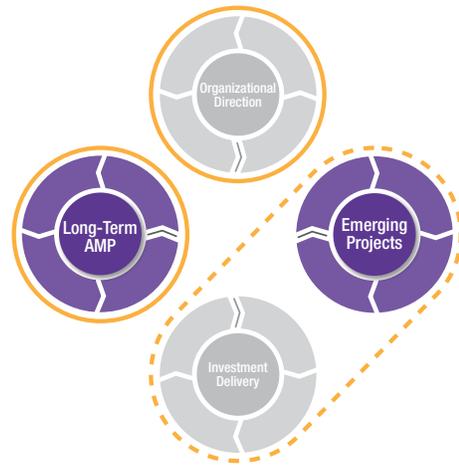
Maturity State 1 Incomplete Process

Organizations do not have all the required capabilities to carry out the investment planning process. Investment projects are continually delivered based on emerging asset needs without a view towards how they achieve the organizational direction or account for investment constraints.



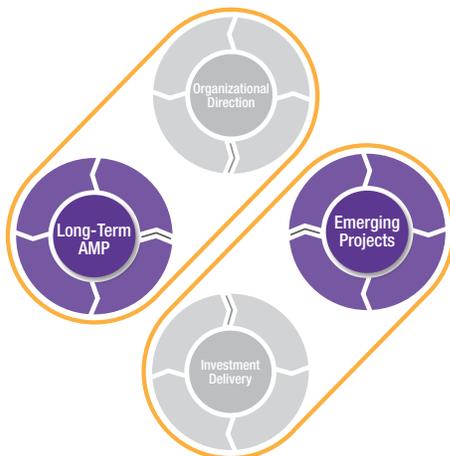
Maturity State 2 Processes Exist but Not Integrated

Organizations have the majority of required capabilities however the processes are carried out in isolation of each other. This leads to the development of an AMP which remains static, with emerging projects being developed and delivered based on short term asset needs.



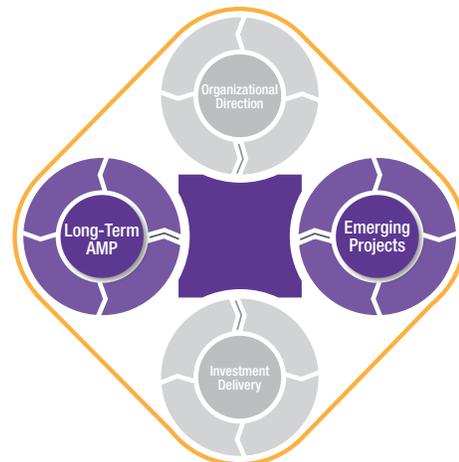
Maturity State 3 Processes Exist with Partial Integration

The required capabilities exist within the organization. The AMP delivers on the organizational direction, but investment projects are still identified based on emerging asset needs. There is no review of the projects delivered against the AMP to ensure investment constraints and objectives are being met.



Maturity State 4 Processes Exist with Full Integration

Collective asset management decisions are being made throughout the organization, ensuring that investment projects are delivered to meet both emerging asset needs and the long-term direction for the asset base. Regular review of the AMP is undertaken to ensure any changes in business context are accounted for.



The correct point at which to implement an AIP solution on this maturity scale is highly specific to individual organizations. If an organization were to implement a solution at Maturity State 1, the correct level of understanding, capability or necessary data will not exist to realize the benefits. If an organization waits too long to implement an AIP solution and embeds isolated processes shown in Maturity State 2, then the ability for an organization to change and realize improvements from technology may be lost.

A significant capability gap that many organizations will likely face, is in the modelling methodologies required to predict the current and future performance of their asset base. Some industries and regulatory bodies have developed standard modelling approaches that may provide a starting point for your organization. For some organizations a phased approach to capability improvement and technology adoption may be appropriate. To support your decision on when to implement an AIP solution and improve your asset investment planning process, we have created a checklist of the most important readiness steps to complete.

Readiness Checklist

- A clear understanding of your current investment planning process and its level of maturity.
- A clear definition of your future investment planning process.
- A roadmap to take you from your current state to the future state.
- Organizational commitment to drive necessary change.
- An understanding of level of service requirements and future demand of the asset base.
- Decision-making criteria aligned with the organizational objectives, risk framework and value framework.
- An understanding of current and future data requirements.

With a well-developed roadmap for business improvement and technology adoption, the selection of a vendor whose company culture and AIP solution matches your requirements can be made. The resulting implementation can realize significant benefits from an improved approach to asset investment planning.

Potential AIP Solution Benefits



*Benefits supplied from across vendors

AMCL would like to thank the six AIP solution vendors for the time and effort given in support of this project, and the valuable insight provided by their nominated clients: Anglian Water, District of Columbia, Sydney Trains, RTE and Utah Department of Transportation.

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