

# How To Start Your Digital Twin Implementation Faster

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Asset-intensive industries, such as oil, gas and process industries, mining, electric, gas and water utilities, and rail and transit transportation, rely on accurate, comprehensive, and up-to-date information for effective operations. However, through maintenance, procurement, modifications, and upgrades, asset information is always changing, and all these functions use the same information. Therefore, it is imperative that asset information is consistent across all consumers to ensure safe, reliable, and efficient operations. But the information is often held in disparate and unconnected silos, with limited management of change across the digital ecosystem, resulting in personnel spending a lot of time trying to find the information they need and verifying its validity and accuracy. This can result in making wrong decisions and increasing costs due to duplication or the wrong work being carried out, which ultimately puts the safety of the workers and the reputation of the organization at serious risk.

What is required is a digital solution that connects these disparate sources together, validates the information, brings visibility to all changes across the asset lifecycle, and ensures reliability at the point of use.

Market-leading asset lifecycle information management software, such as Bentley's AssetWise® ALIM, can help you unlock the value in your digital information from the day it is deployed. Whether you are in the planning stage of a new project, or operating an existing asset, you need a flexible system that is easy to implement and ready when you take the first step on an asset management journey to save costs, improve safety, and reduce risk.

A comprehensive ALIM system helps you reduce costs and improve safety by effectively managing change and enabling easy access to validated and trusted asset data, documents, and drawings – all the information you need to safely run the asset. Lifecycle information management systems, such as Bentley's ALIM, help you receive and manage digital information from all phases of the design, construction, and operational lifecycle in context for reuse in operations, delivering trusted information to the people that need it, and implements proven management processes that assure information completeness and accuracy.

This white paper discusses why you need an ALIM system, the main features and capabilities, the business challenges it addresses, and how to implement the system so value can be quickly attained and used throughout your organization. The paper also describes actual case studies where other users are already using ALIM to their advantage.

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<b>Information Completeness</b>	High	Accurate information is available, but locked in application silos or specific physical locations	Information is accurate and available at point of need
	Low	Information is incomplete, locked in application silos, or specific physical locations	Information can be found, but is often incomplete
		Low	High
<b>Information Availability</b>			

## ADDRESSING THE CHALLENGES

Before getting started on the features and benefits of ALIM, it is important to look at the many challenges ALIM aims to resolve. The key critical business issues from an asset intensive perspective fall into four categories:

**Safety and Environmental** – Preventing asset failure, ensuring the safety of the workforce, reducing accidents and risk, and reducing impact on the environment.

**Regulatory Compliance** – Complying within industry and government guidelines and reducing risk and fines at a corporate level.

**Asset Performance** – Optimizing asset performance, minimizing downtime, extending life of assets, and accelerating scalability.

**Operating Costs** – Operating within budget and reducing project delays, downtime, and rework.

What these issues have in common is that they are all reliant on people having the right information at the right time throughout the lifecycle of the asset, leading to reduced costs, faster project delivery, and accurate decision-making.

Information is used by many people within an organization or project, and one of the biggest challenges is recognizing the importance of the data people are using and how any changes affect other personnel that rely on accurate information to carry out their roles effectively. They all face unique challenges, while also sharing many similar concerns. The challenges and concerns include:

Role	Challenge	Concerns	ALIM Solution
Digital Transformation Leader	<ul style="list-style-type: none"> <li>Creating and fulfilling digital strategies</li> <li>Mitigating and managing risk</li> </ul>	<ul style="list-style-type: none"> <li>Reducing risk when change occurs</li> <li>Ensuring integrity of new technologies</li> </ul>	An ALIM system can be the backbone of any digital transformation strategy, including a digital twin, working within a connected, immersive environment.
Head of Asset Management	<ul style="list-style-type: none"> <li>Ensuring information is reliable, up to date, and accessible across the whole organization</li> </ul>	<ul style="list-style-type: none"> <li>Reducing operational risk</li> <li>Ensuring asset availability</li> <li>Lowering operational costs</li> </ul>	An ALIM system can act as the single source of truth and consolidate all information and data types in one reliable application.
Configuration Manager/ BIM Manager	<ul style="list-style-type: none"> <li>Maintaining consistency of a business system or product's performance</li> <li>Ensuring information is reliable, up to date, and accessible across the whole organization</li> </ul>	<ul style="list-style-type: none"> <li>Understanding the status of assets</li> <li>Identifying the people, components, and requirements driving a change to assets, process, and procedures</li> </ul>	Understand the effect of any change before it happens, monitor the progress of change and manage concurrent changes.
Compliance Manager	<ul style="list-style-type: none"> <li>Managing legislative, contractual, or corporate strategic policies</li> <li>Governance and risk management</li> </ul>	<ul style="list-style-type: none"> <li>Remaining compliant</li> <li>Avoiding fines/penalties for noncompliance</li> <li>Trusting that the information they have is correct</li> </ul>	An ALIM system ensures that compliance will always be met, and that information is updated at the right time.
Information/Document/ Records Manager	<ul style="list-style-type: none"> <li>Capturing, managing, controlling, retrieving, distributing, and archiving all types of documents</li> <li>Maintaining the records of an organization</li> </ul>	<ul style="list-style-type: none"> <li>Reducing risk</li> <li>Improving productivity</li> <li>Saving time</li> </ul>	An ALIM system acts as a single point of access for all records. This includes managing revisions, including collating feedback, and approving or rejecting new versions.

## DELIVER VALUE FROM YOUR INFORMATION FASTER THAN EVER

One of the main challenges of implementing any new information management solution into a business or organization is the time it takes to get started and time to value. This becomes more pronounced the larger the project and how asset or information-intensive it is. Getting started can sometimes take months, even years – time which could have been better spent delivering results. With a system such as AssetWise ALIM, you can start small and see the benefits of your asset lifecycle information from day one. From the time your system is deployed, you have access to an environment in which you can load documents and tag information and connect them together with physical models and items. It allows you to run basic workflows, manage documents through submission, transmittal, and approval, and quickly build up a full picture of your asset or project, enabling you to report on and search for information faster.

The sample configuration delivered with ALIM can easily be extended to support more complex business processes such as managing concurrent changes or information packages.

An ALIM subscription model also allows you to think big while proving small, before scaling quickly across your asset base. This means understanding what you want to do and where you want to be upfront. You can start first with a smaller project or asset to learn from, then roll out across the project or across similar operations. Like any leader in business, you want the shortest time to ROI in every project. So, implementing a solution that is flexible, starts at any stage of digital maturity, uses the information you already own, and produces results quickly and leads to rapid expansion.

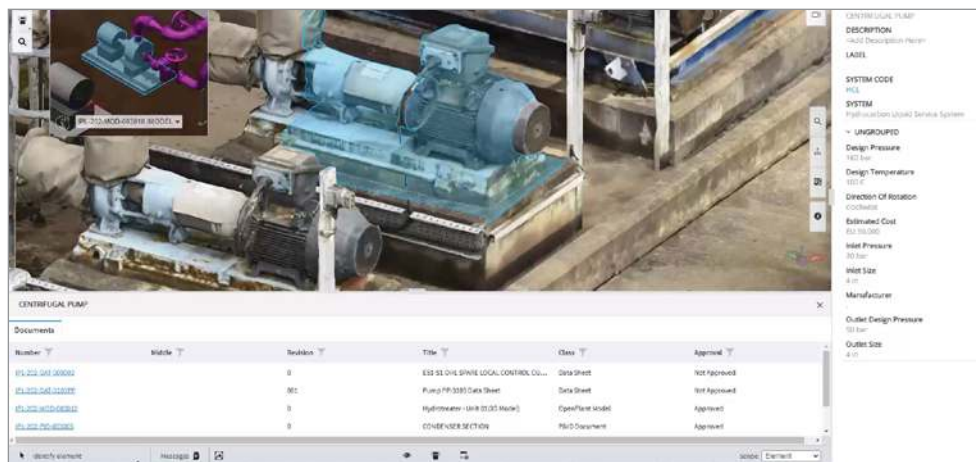
Typically, implementing systems to control and manage information across sources can take a long time and requires significant investment before any returns are delivered. By deploying with a standard template, ALIM can enable benefits to be realized quickly, delivering value from day one and continuing as you expand.

## KICK-START YOUR DIGITAL TWIN SOLUTION

A digital twin is a virtual representation of real-world entities and processes, synchronized at a specified frequency and fidelity. Digital twin systems transform business by accelerating holistic understanding, supporting optimal decision-making, and enabling effective action.

An ALIM system can be the foundation of your digital twin solution, where the information and data it manages ensures that the digital twin is always consistent and up to date by synchronizing with ALIM. This enables you to take control of your lifecycle information quickly and easily by tailoring your solution with the addition of advanced tag management, document control, or developing robust change management workflows. As such, you can work toward an immersive asset environment in which an object within a model can be clicked on to reveal its information, documentation, and change history.

ALIM operates in an open, interoperable, and connected environment, offering a set of cloud-provisioned services that provides support to digital workflows, context, and concepts, enabling access to accurate, reliable, and consistent information. A set of standard connectors to multiple third-party systems, such as SAP and Maximo, ensures all users are accessing a common, validated, and up-to-date source.



The reality model of a facility provides a clear presentation of the actual site.

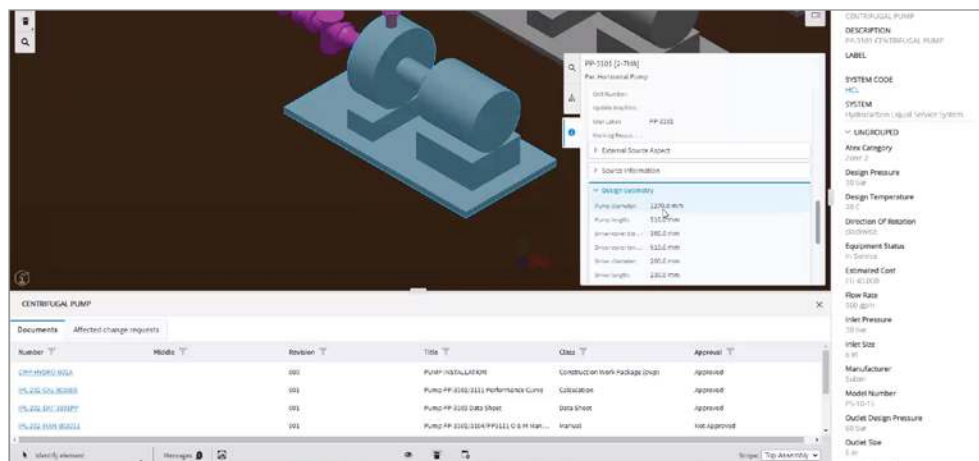
## TRUSTED INFORMATION ON DEMAND

As you build up a digital picture of your asset, ALIM validates the information against your specifications and across sources, building trust. Hosted via Bentley Managed Services, this information is made available to any stakeholders who need it, wherever they are located. A flexible licensing model encourages wide access to the information your teams need to do their jobs safely and efficiently. Changes are managed and then made available, guaranteeing that everyone is working with the same, up-to-date information.

## REMOTE FAMILIARIZATION AND CONTROL OF WORK

Safety requirements, workforce flexibility, remote sites, and infrequent maintenance are driving the need for virtual, simultaneous familiarization and control of work. iTwin Visualization provides a facility to enable dedicated teams, workers, and contractors to prepare work safely and efficiently, while reducing the need for on-site visits.

This familiarization is also critical for supporting daily operations and ensuring that processes are executed safely and on time. iTwin Visualization provides the context for managing work on site by displaying the operational status of the assets and ensuring a holistic view of the operational information that is needed to perform tasks. This is valuable when planning or working on a specific area of a facility as it provides a quick visual assessment on a piece of equipment, showing what changes may be pending, as well as the equipment's detailed information.



View relevant and up-to-date asset information such as the operational characteristics, related documentation, and affected change requests.

## GENERATE SUSTAINABLE BENEFITS – USER STORIES

AssetWise ALIM has been successfully implemented over many years across a wide range of industries, delivering tremendous benefits and ROI. Here are two examples highlighting how ALIM delivered trusted information to engineering, operations, and maintenance teams.

One of Australia's leading natural gas producers, based in Queensland, has a master tag registry for its assets that includes over 20 million data points. To handle a doubling of data from documents and model files, as well as migration of documents from systems based on energy performance certificates (EPCs), the company uses AssetWise ALIM software, hosted on Microsoft Azure. This has reduced tag capture time by 90%, as well as lost time from maintenance crews arriving on site without correct parts and tools.

The Ameren Callaway Energy Center in Missouri, USA, is a nuclear power plant that started operating in 1984. The efficiencies introduced by using AssetWise ALIM as a single modern platform for Ameren's information management system ensured timely and effective modification and maintenance during scheduled plant outages, significantly reducing costs. Using ALIM's relationship capabilities to automate manual processes and streamline information improved its access and accuracy, reducing time required for plant staff to find and verify documents and resulting in less rework.

## ALIM CORE FEATURES<sup>1</sup>

As well as delivering value faster than ever, at its core, AssetWise ALIM receives digital information from all phases of the design, construction, and operational lifecycle in context for reuse in operations. It has a suite of features and capabilities to help you manage your critical information and keep it up to date. These core features include:

### The Tag Register

A 'tag' is used in many industries to represent the need for a piece of equipment, or a functional requirement. It contains information about what should be there for an asset to perform a function. A room would need a door, a fire detection system, and ventilation, for example. The tags are fulfilled by physical assets.

The tag register manages high volumes of tags from multiple sites, enabling you to manage tens of millions of records. It records all instances of design requirements, ensuring the information is documented for each tag, therefore supporting decision-making that is based on the optimal operating conditions for each tag. These design requirements are often lost during handover and are an important part of the understanding of an asset – not just what is there, but why it is there.

### Physical Asset Register

The aircraft, manufacturing, and motor industries have long relied on product lifecycle management solutions to drive out cost, realize economies of scale, and drive efficiencies across complex supply chains. AssetWise ALIM uniquely brings these benefits to the industry, enabling you to manage and control change to a complete portfolio of assets at a truly global scale.

The Physical Asset Register contains the details of compound and package equipment, including the sub equipment within the assembly. View and manage any individual instance of equipment models – serialized items – and any relevant documentation, such as inspection reports, pertaining to that asset.

### Document Control

ALIM integrates disciplines of document control, change management, records management, and distribution. This provides the ability to classify any document and allocate metadata requirements, including definitions of applicable workflows and access permissions. Manage workflows more effectively to distribute documents for review, comment, collate feedback, and approve or reject, as well as add mark-ups and revisions throughout the document's lifecycle, including recording reasons for changes and new revisions.

### Configuration Management – Identification

Define a clear and robust specification, based on a class hierarchy (Reference Data Library) that helps track the degree to which asset configurations conform to requirements to allow consistency of information standards across an asset, facility, project, or organization. This helps to define plant breakdown structure, allowing the asset to be broken down by process system or location. Numbering specifications enforce control over tag and document numbering throughout projects and/or facilities so that all numbering is consistent throughout the project.

### Configuration Management – Change Management

ALIM records relationships between objects, information, and their dependencies, allowing for varying levels of change management, from design changes that involve alteration to the fit, form, and function of equipment, to swapping like-for-like and administrative or corrective changes. It can also perform an impact analysis report that allows the user to understand the effect of any change before it happens.

ALIM can also monitor the progress of a change request by providing status details for each affected object and tracing the lifecycle of changes made with revision history, including recording the business reason for changes, as well as the detail of the change itself. Concurrent changes can also be managed to ensure changes are not lost and all approved changes are incorporated over time.

### Configuration Management – Status Accounting and Auditing

Provides a full audit trail, down to individual attribute changes, so you know what was changed, why it was changed, when, and by whom. Contains detailed status information for each object, including outstanding change requests affecting the object.

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<sup>1</sup>The full set of ALIM features can be found in the AssetWise ALIM Product Datasheet

### **Records Management**

Records management provides detailed evidence for all transactions, compliance audits, and legal discovery to help assist with regulatory compliance and reduces the risks associated with audits and litigation. Records management also enables the complete lifecycle management of all corporate records and associated information, including record types independent of the document class hierarchy.

Records management capability complies entirely with your organization's corporate record-keeping policies, including automated file plans. This also includes the ability to set rules around archiving or destruction of files based on time, status, and change history.

### **Openness**

It is essential that your employees, contractors, and supply chains have ready access to the information needed to run your business. However, it is your data and further value is gained when it is integrated into your ecosystem of other IT systems, engineering systems, and operational systems.

ALIM works closely with our advanced Enterprise Interoperability solutions to ensure that the data can flow freely around, between, and through all of your operating solutions, ensuring that regardless of where you find information, it can be relied upon and used with confidence.

### **Information Handover**

When handing over information at any stage of a project, it is important to maintain the integrity of the information that is being transferred. ALIM promotes best practice information management through each stage of the lifecycle, supporting a seamless handover where requirements are driven from operations and delivered via an incremental handover. This ensures that the information needed to commission, operate, and maintain an asset is validated and available at the point it is required. ALIM also supports industry standards including CFIHOS RDL and processes.

### **Requirements Management**

Requirements management allows you to track and measure against contractual, industry-specific, and lifecycle requirements throughout projects and into operations, including proving regulatory compliance. It allows you to manage changes to requirements in real time to understand the impact of changes before they are applied. Any changes made to requirements can be easily communicated to any stakeholders anywhere they are needed.

### **Support Your Digital Twin**

Used as the starting point of your digital solution, ALIM is integral for keeping your digital twin evergreen through formal change management and workflow automation. This is achieved within AssetWise ALIM via an iTwin viewer that enables access to your asset's operational information in the context of reality models, 3D models, and 2D drawings. ALIM users can search for assets based on specific criteria and then visualize them within the iTwin platform for further analysis.

The ALIM iTwin viewer simplifies daily operation and maintenance activities by providing quick access to relevant and up-to-date asset information such as operational objects, related documentation, affected change requests, and projects, providing complete visibility of the asset's status including any planned changes. This visualization aspect provides effective tools to navigate within the model, find information faster, highlight critical asset data, and share information easily. ALIM is the ideal entry point for your digital twin strategy and can be easily scaled up to advanced use cases by using PlantSight.

ALIM's flexibility and openness means you can work with the information you have from third-party software – by supporting interoperability, the data doesn't have to come from Bentley applications. ALIM also provides integration with other mission critical systems including SAP and Maximo. Sixty-nine percent of operations executives in the 2020 Verdantix survey mentioned open architecture for integration as either a "very important" or an "important" criterion when evaluating software applications for asset management. AssetWise, including ALIM, works within your existing information ecosystem to drive actionable information from the data you have.



View operational status of any asset within the digital twin.

## ASSETWISE ALIM – YOUR TRUSTED PARTNER

While there are many vendors in the market that profess to have the same capabilities and features, there is really no one else that can provide what ALIM does in a single application, including:

1. Change and configuration management
2. Compliance management
3. A digital twin environment
4. One source of truth
5. Always accurate information
6. Immersive digital operation
7. Context and information visibility
8. Interoperability with other AssetWise services
9. A connected data environment
10. Faster deployment

With over 25 years of development and improvements, as well as hundreds of successful implementations around the globe, ALIM is the solution for trusted, reliable, and up-to-date information when and where it is needed.

ALIM is a part of the AssetWise family of products, which covers information management, reliability, and 4D analytics. These systems work together to enable the construction and use of a truly rich digital twin. AssetWise allows you to think big while proving small and scaling fast to create a comprehensive and dynamic picture of your asset.

## About the Author

Richard Irwin is a Solution Marketing Manager for Bentley Systems, covering a wide range of products and industries in process, plant, asset performance and digital twins. He has more than 15 years of experience in reliability and asset performance management, asset lifecycle information management, and digital twin solutions in the energy and process industries.

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