

## eB® Insight

Powerful asset lifecycle information management

### Better Decisions Based on Accurate, Relevant Information

The infrastructure world runs on information – information that describes physical assets, processes, projects, people, documents, drawings, and records. The cost and success of infrastructure projects and operations are directly dependent on the integrity of the information being used. Bentley's eB Insight software vastly improves the integrity, visibility, and access to all relevant information at the time it is needed, enabling organizations to lower the cost of operations, improve decision making, optimize operational efficiency, and reduce business risk – giving them the edge to gain competitive advantage.

### The Situation

Organizations spend billions of dollars on information technology solutions for document management, project scheduling, engineering design, human resources, accounting, and so on – all critically important applications. All of these enterprise applications are managing information within their own systems, and at times sharing information with other systems, but there's no capability to manage changing information relationships across all systems.

The result? This lack of interoperability across enterprise applications leads to a number of challenges:

- Project and operational information are out of sync – leading to information that isn't trustworthy, which, in turn, can lead to potentially erroneous decisions
- Enforcing information governance policies, along with providing evidence that processes are being followed to meet regulatory compliance, is costly and time consuming
- Quality and safety metrics suffer
- Risk increases
- Communication between departments and organizations is ineffective or difficult
- There is no way to capture institutional knowledge, such as lessons learned and best practices, to maintain actionable knowledge for current and future projects

Lost time finding and verifying information... operational inefficiencies... decisions based on poor quality information... all lowering your competitiveness and eating into the bottom line.

What's missing? A product that links interrelated information, no matter what discrete information system it resides in, and no matter what the format — structured or unstructured, paper or electronic, documents or physical objects, business processes or people.

### The Answer: eB Insight

eB Insight, the foundation of Bentley's AssetWise platform, controls information throughout the lifecycle of change – ensuring the delivery of

relevant, trusted information, in context – to infrastructure operations, where and when it is needed.

Within an infrastructure organization, all information ties back, in some way, to the physical assets that are being developed, operated, and maintained. eB Insight uniquely integrates configuration and change management best practices to deliver powerful asset lifecycle information management (ALIM).

### ALIM Ensures Information Trustworthiness

eB Insight is based on four fundamental principles that support and determine the success of an ALIM solution, as well as the key goal of achieving information trustworthiness:

#### Information Must be Identified, Characterized, and Related to All Other Relevant Information

eB Insight provides flexible and powerful information modeling that makes it easy to define information types and the relationships between them – including documents, requirements, people, processes, policies, physical assets, and more. eB Insight ensures that organizations can deliver information that is accurate, complete, and in context. By integrating with key enterprise applications, eB Insight can provide visibility to the entire set of available information. The ability to continue to refine and expand the information model as needed is the basis for successful adoption of eB Insight. (See Figure 1)



Figure 1: The ability to identify and interrelate all types of information, in context, is a core feature of eB Insight.

#### Information Must be Managed Through Change

Relating information is powerful, but useless if you cannot manage information relationships through change. Not only does eB Insight address this requirement

as part of its core capabilities, but its robust change management can be extended by using the relationships themselves. Effective enterprise change management cannot happen without the ability to create relationships between relevant information. This is key to the ability to identify the impact or effects of change.

## Information Status Must be Clearly Identified and Accessible

eB Insight reports on the status of specific information assets (historic, under change, pending change, latest approved, superseded or obsolete), and also the state and status of relationships between the information. This ability to have a complete view, and even record a snapshot of it at any point in time, is a significant benefit to everyone who uses the information.

## Information History Must be Auditable

Regulations and compliance directives often require that information have an audit trail — who used the information, what was changed, and why it was changed. In addition, it is good practice to audit the use and access of information sources to report on how information is being used and the behavior of information usage. eB Insight has extensive audit reporting and change management capabilities that provide readily available and configurable reports of information history that can be used to prove compliance as needed.

## Better Information Through an Information-Centric Approach

### Process-Centric Challenges

Many times technologists try to solve core information management issues with a solution that is predominantly workflow- or process-centric. On the surface this seems to make a lot of sense, since the information is used in the context of business and work processes. However, it is only the interaction with the information — for the purpose of making decisions and affecting transactions — that is process oriented, not the information structure itself.

In fact, the information definition and requirements related to compliance, auditing, and interrelationships are generally stable and state-driven, and are largely process independent. It is the processes that use the information that can be most enhanced with workflow automation software.

But, when the burden of generating and maintaining the information “model” is placed on the execution of a fixed process definition, it becomes so complicated that the workflows themselves become very expensive and time consuming to maintain. This leads to an additional problem — the workflows cannot be easily modified as process improvement efficiencies are identified. The result is a combination of inefficient use of automation and frequent “short-circuiting” of the process to expedite scenarios that don’t fit pre-defined process definitions.

### The Benefits of an Information-Centric Approach

By modeling how information is identified, characterized, behaves, interacts, relates, is reported, etc. — independent of specific workflows — information integrity and control are much more easily achieved. This approach also lends itself to evolutionary expansion of the information data set, independent of workflow automation. Workflow itself can now be optimized, reaping the benefits of this technology with respect to collaboration, reduced queue wait times, and process compliance. Being able to use the enterprise information

set, rather than having to maintain it, makes workflow implementation more light weight and flexible and promotes process improvement enhancements.

## Building Information Trustworthiness Begins with Information Modeling

### Information Trustworthiness

Inaccurate or incomplete information can lead to re-work, cost overruns, and project delays, and can cause employees to mistrust information systems. Those systems then get bypassed and employees start storing information in inaccessible databases, spreadsheets, documents, and paper in personal filing cabinets.

eB Insight exposes information, along with its status and relationships, to other relevant information assets, ensuring that workers have access to accurate information, in context. Visibility to related information enables better decision making, as well as thorough change effects analysis through eB Insight’s standardized reporting.

### Information Relationships

Imagine a component that has a specification, drawing, part number, catalog number, and procurement information. It can be part of a modification, change out, or upgrade, and there is a lot of information related to the component that may be affected. It is important to know:

- Who requested the change,
- What else is impacted if this change is made,
- What else must be changed and who will document the change,
- Who implemented the change and whether he or she is properly trained and certified to do these tasks.

All this is visible in eB Insight thanks to its unique capability to manage relationships that link information. That includes electronic information as well as physical assets. (See Figure 2)

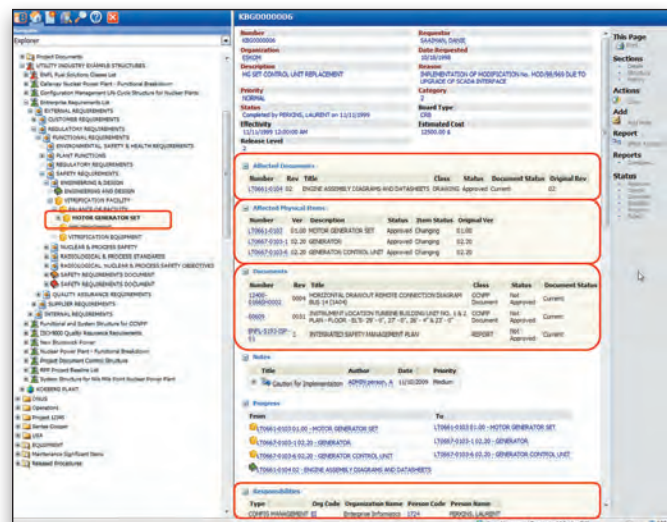


Figure 2: Example of eB Insight screen showing component selected on left, and affected documents, affected physical items, and responsible workers in center. Also visible is the component's status, which indicates that the replacement of the control unit is completed.

## An information centric approach leads to superior eB Insight information applications

### Configuration management

Configuration management is a method of ensuring that asset configurations conform to their requirements. It addresses not only the classical aspects of document management—such as capture, storage, management, and retrieval—but also the ability to identify and retain the context of information and its relationship to projects, products, plants, processes, equipment, organizations, and users throughout their lifecycles. Configuration management ensures information integrity through closed-loop change management, ensuring consistency between all aspects of operational information and the requirements related to the asset being described.

### Records management

Records management is not just about long-term storage, but rather end-to-end management of information from creation, operational usage, storage and final disposition. Unlike many records management solutions, which force users to identify and “declare” records at the end of the information lifecycle, with eB Insight, records are described as part of the information model, making manual declaration unnecessary. This approach to identification gives visibility to the record throughout its lifecycle and provides much more assurance of compliance. Since record identification is only one element of the information definition, the record can be made accessible in the context that it is used – independent of the record’s file plan. This is key to efficient and proper use of information in an operational environment where records are living documents that are used in the on-going processes of the organization.

### Document control

Effective document control must blend four key functional areas: document management, change management, records management, and distribution. eB Insight integrates this functionality to provide a powerful, full-featured information application for organizations to effectively, efficiently, and accurately capture, manage, control, retrieve, distribute, and archive all types of infrastructure asset information across a facility or network.

In eB Insight, it is easy to see who is responsible for information, what the information describes, and what other information must be considered if a change is needed. The ability to determine the impact of change is key to ensuring the integrity of the information in the enterprise and, ultimately, meeting compliance requirements.

Without this capability to create and manage relationships, determining the impact of change can be a tedious, manual process dependent on tribal knowledge and brute force searches. There is significant risk of missing a critical link that could create cost overruns, missed project milestones, and potential noncompliance penalties.

eB Insight provides out-of-the-box information types, relationships, and templates based on information best practices. In addition, these are fully configurable, allowing data administrators to define use and behavior as needed, to comply with their business processes.

## Modeling Information Across the Enterprise Using Scope

eB Insight has modeling capabilities that extend to define the user’s visibility of information. Information can be global, customer specific, or site specific. eB Insight’s scope capabilities allow information segmentation to be defined for roles within any of these environments, specifying the reach of available information.

This is especially useful for companies and users who manage many projects, clients or facilities. Scope makes it possible for users to search, use, and share project information more efficiently, while still allowing access to broader views of information when appropriate. (See Figure 3)

## Ensuring Information Integrity Through Rights Management and Control

### Rights and Roles

How can you trust information if you don’t know, and can’t control, who uses it and for what? Who is not only permitted but qualified to change it? And, authorized access often needs to extend beyond a single enterprise. eB Insight provides the means to identify the people and organizations that have the authority to use and process critical information.

In eB Insight, users can see only what they are permitted to see. eB Insight’s permission model, based and expanded from the ANSI INCITS 359-2004 standard, enables security definitions down to a single attribute of a single piece of information if the information model requires it. This feature secures data usage from users who should not see it or modify it and allows security definitions to be set at very granular levels. Permissions can be assigned to organization elements, such as folders, making it easy to tailor the presentation of information to different user roles.

### Change Control

eB Insight provides a secure, automated process to ensure conformance and information integrity, clearly showing links to other documents, physical items, people, requirements, and processes. According to CMII, a mere 8 percent reduction in data quality doubles the amount of resources required to do the job. Ensuring rock-solid, up-to-the-minute data quality is where eB Insight shines. It automatically propagates authorized changes forward throughout the project, tracks who made changes and why, and exposes the effects of change. That not only increases compliance, but also dramatically reduces rework and cost.

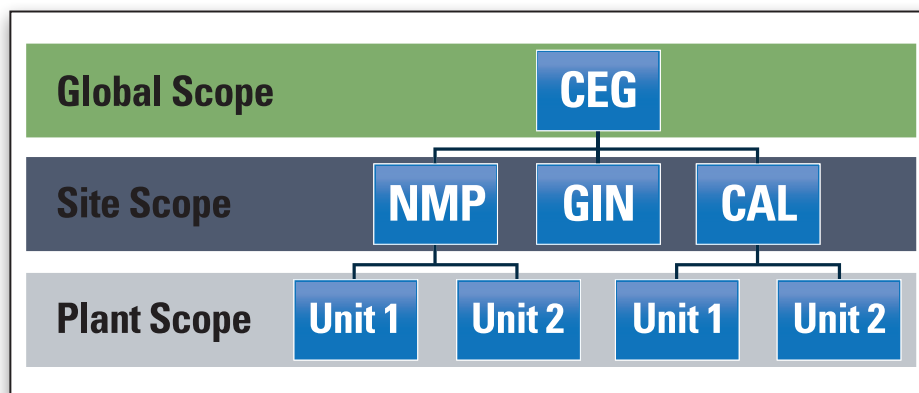


Figure 3: Layered view of scopes using nuclear plant fleet as example.

### Requirements management

Even small requirements changes can have a big impact as projects progress, cascading through numerous tasks and potentially affecting costs and milestones. Requirements management is a continuous process that is critical to meeting design specifications and operational and regulatory compliance. In eB Insight critical requirements information can be updated in real time, and the information is then automatically propagated through established interrelationships so that it is accessible to stakeholders everywhere it is needed.

### Knowledge management

With today's transient workforce, it's vital to capture knowledge gained and lessons learned during all phases of the operations in a way that provides actionable information. Using eB Insight, operations personnel can now enter knowledge items through intuitive forms as part of normal business processes. The captured knowledge items are then linked to all other relevant interrelated data so that they are visible when information is being accessed or changed, making the knowledge actionable when and where it is relevant.

### Incident management/corrective action

Though known by different names in different industries, the need for incident management, sometimes called corrective action, is critical for infrastructure facilities and networks. Incident management automates and facilitates the identification and resolution of incidents through user-friendly condition reports, reviews, action tracking, and eventual closure.

### Work and maintenance management support

eB Insight enables status accounting for changing infrastructure asset information through business workflows in an auditable manner, tracking notification, distribution, and approval. Interoperability enables eB Insight to pass data in XML format to downstream enterprise applications and systems. Incoming data is handled either asynchronously using the eB Insight message queue capability or synchronously by allowing upstream systems to tailor their integration requirements using the powerful eB API toolkit. By providing a link between relevant interrelated information in disparate systems, eB Insight enhances the efficiency of all enterprise processes that need to access the information.

## Document Control

Document control is the data hub of every project. eB Insight manages the capture, creation, revision, and storage of all information assets such as daily logs, journals, meeting minutes, RFIs, submittals, transmittals, and work orders. eB Insight also offers connectors to CAD tools like MicroStation® and AutoCAD. Using eB Insight, you can manage documentation and the information hidden inside document 'containers.' Documents can be identified and categorized long before the actual Word file or CAD drawing exists. They can then be tracked through the project lifecycle with milestones for moving from 'planned' to 'released' to 'as-built,' and then through all its revisions when changes are introduced.

## Auditing/Information Snapshots

eB Insight provides the capability to create a snapshot of eB Insight managed information, at a specific point in time. The captured set of data, or snapshot, is represented in XML. This XML file can be rendered to more readable representations like PDF, and is managed as a type of document within eB Insight, which can then be managed as a record with a disposition via file plan capabilities, made available for a compliance audit, or transferred to other enterprise systems. The self-contained, open nature of snapshots allows regulated industries to store them for a very long time. All applicable information can be resurrected at a future point in time with or without eB Insight, including the details of the process used to approve a set of documents, as in a change package, for example.

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*Complex processes, such as the development of nuclear combined operating and licensing applications (COLAs), which involve many organizations and hundreds of participants, are streamlined and more efficient when accurate information is connected.*

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## Reporting and Delivery

The format in which information management software presents data, and its ability to configure reports to match enterprise needs and processes,

are key considerations when evaluating products. Information can't be a business asset unless it can be exposed as needed and evaluated to make better business decisions.

eB Insight has a unique, fully configurable reporting layer that combines the information relationships already in the system with search outputs to provide in-context data on how information is being used, by whom, and when. The capability to customize reports enables organizations to oversee information governance based on established policies and produce thorough, accurate reports to support proof of compliance.

## Reporting Features

eB Insight provides several layers of reporting capabilities. Simple user-defined reports are provided for easy presentation of eB Insight information. Full accessibility to related information, as well as the ability to choose the meta data to present, the sort order, and the page size, combine to make a powerful reporting mechanism that any user with the appropriate permission can utilize.

The Report Editor makes it easy to create user-configured reports that mine the complex information networks managed by eB Insight. Reports can be saved and shared for viewing within the eB Windows or web user interface. The Report Editor is integrated with Microsoft Reporting Services, where eB results can be combined with information from other enterprise systems. Using Microsoft Reporting Services, dashboards can be configured to expose system-wide key performance indicators (KPIs) using Microsoft SharePoint.

eB Insight reporting capabilities are configurable to enable the development of reports of information usage and trends, adding transparency to how information is being used, by whom, and when, in the context of your business processes. Dashboards such as that shown in Figure 4 (on the next page) are user-defined and can be configured to expose relevant KPIs and accessible information.

## Information Sharing and Review

Built on the Microsoft .NET architecture, eB Insight leverages Microsoft Office SharePoint Server technology to automatically provision SharePoint workspaces for information sharing and reporting. In addition to the benefits this provides, user acceptance in organizations already using SharePoint is fast and straight forward as eB Insight information is exposed transparently in the SharePoint UI.



Information sharing features are supported by the highly granular security model. All users, including project participants across multiple enterprises (suppliers, contractors, consultants, etc.) can be given secure access to information on a role-based, need-to-know basis.

Figure 4 shows eB Insight data viewed within SharePoint and demonstrates how views of project information can be customized for the user. Information assets can reside across multiple disparate information silos, even across multiple organizations, and be visible in eB Insight, whether through the SharePoint UI or eB Insight, to those users authorized to view it and/or change it.

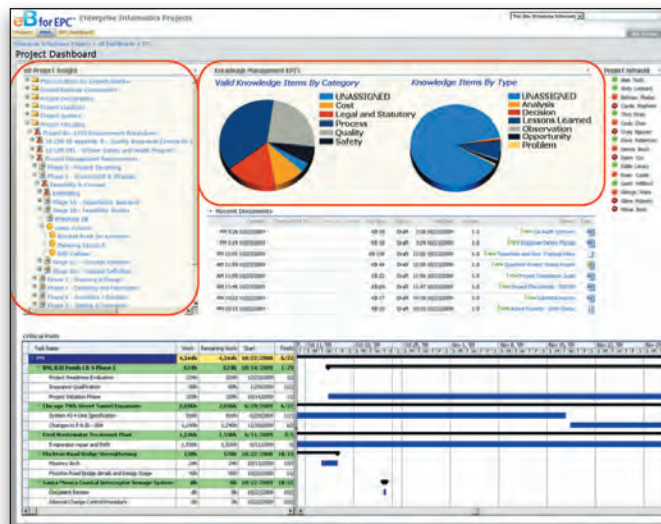


Figure 4: eB Insight data can be user-configured and viewed within SharePoint.

## Advanced Content Management Services

Your repository or ours?

It's a global community, and businesses run 24/7. So, information needs to be available 24/7. eB Insight's service-orientated architecture has been proven to be available globally. eB Insight provides a secure, scalable repository as well as support for the management of federated information. eB can link to information in third-party content management systems (including EMC Documentum, IBM FileNet, and Microsoft SharePoint) and create relationships that enable access and change management as if the information were stored in the eB repository.

## Run Your Business on Information You Can Trust

Decisions being made in your organization need to be based on information that is 100 percent trustworthy. These days, creating information is easy...in all forms of structured and unstructured formats. Having visibility to accurate information, when your business users need it, is the challenge.

eB Insight is built on the pillars of asset lifecycle information management principles, connecting related information from disparate repositories and exposing it as needed, and in context. Working with trustworthy information positions organizations to reduce the cost of meeting compliance requirements, minimize business risk, improve decision making, and optimize process efficiency.

Don't stop with your enterprise content management application, your enterprise resource management application, and your product lifecycle management application. Integrate asset lifecycle information management to manage the constantly changing information on which your organization relies. Add eB Insight to create a world-class information management system.

## About AssetWise

Bentley's AssetWise platform combines multiple information modeling services to improve the lifecycle management and operational performance, safety, compliance, and governance of infrastructure assets while increasing the return on investment for owner-operators.

## About Bentley Systems, Incorporated

Bentley is the global leader dedicated to providing architects, engineers, constructors, and owner-operators with comprehensive software solutions for sustaining infrastructure. Founded in 1984, Bentley has nearly 3,000 colleagues in more than 45 countries, \$500 million in annual revenues, and, since 2001, has invested more than \$1 billion in research, development, and acquisitions.

### Getting started with eB Insight

Using eB Insight is not an all or nothing proposition. The best approach is to select a business process that has a lot of changing information – the process that surfaces the most inaccurate information – and start there. From there model other business processes and start connecting the dots. You will be surprised how quickly you see positive results.