Solving the Utility Project Information Management Challenge

A Bentley White Paper

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New applications are helping utilities manage their project data more effectively, securely, and efficiently, reducing project risks and boosting margins.

There is immense opportunity for utilities to reap new value from digital initiatives. Utilities are undergoing a digital transformation across their enterprises and one area they are utilizing is advanced project information management services and applications to improve efficiencies, reduce costs, and mitigate project risks.

In a bid to improve what are often razor-thin margins, utilities are placing greater emphases on performance, productivity, and efficiency in project execution.

Even regulated return utilities, like those typically in the water, wastewater, and energy transmission and distribution sectors, are under increasing cost pressures. In the largely deregulated electricity sector, utilities are seemingly beset. Distributed, grid-edge technologies like renewables are becoming a major influence, and power utilities are struggling to secure their business for an uncertain future. In the midst of this strategic upheaval, the core function of executing utilities services projects is also a growing challenge.

Aging infrastructure already represents a major consideration for utility players, but this is in the context of global mega-trends of increasing population, urbanization, and the associated demand for utility services like energy, water, and waste management. Overcrowded cities coupled with the exponential demand for energy present both challenges and opportunities.

In fact, approximately USD 57 trillion-worth of infrastructure investments will be required by 2030 just to keep up with the global economy, according to some estimates. A significant proportion of this sum is inevitably destined for the global utilities sector.

Managing More Data

Global mega-trends, like an expanding and better-connected population and ever increasing urbanization, mean demand for utility services shows a clear trend for growth. Additionally, the increasingly complex flows of information associated with utility project planning and execution also exhibit an inexorable upward trend. Utilities infrastructure may arguably generate more documents and content than any other discipline. Ranging from legal documents to detailed infrastructure models, the information occurs in a wide variety of formats and with differing requirements for access, security, storage, and use. These deliverables may include elements as diverse as environmental impact analyses; permitting and regulatory requirements; topographical, soil, and noise surveys; developer plans; contractor drawings; standards documents; maps; engineering information such as sag and tension tables for power lines; work order packages; construction drawings and inspection results; safety codes; vegetation management plans; compliance documentation and training materials—the list is almost endless.

This surge in data profoundly affects how projects are designed, built, and operated. Given that even small utilities are typically faced with multiple projects simultaneously, the sheer volume of information circulating can be astronomical. Additionally, all of this data is being dealt with while owner-operators juggle limited budgets against the needs of operations and maintenance, upgrades, and opportunities for new business.

To meet this challenge, utilities are turning to advanced project data and information management services and applications.

Addressing the Challenge of Utility Project Information Management

In some respects, all utilities are project-led enterprises. As a key part of their business model they need to execute capital projects to expand their services, improve performance or reliability, upgrade systems, and meet maintenance requirements. As engineering projects represent a significant element of any utility business, adopting project data management applications, which are often, but not always, cloud-based, can provide accurate and accessible engineering records. The adoption of project information management applications is key to effectively managing a utilities' portfolio.

Inevitably though, designing, reviewing, amending, and approving plans generates large volumes of data. This often iterative process also introduces potential sources of error. Meanwhile, new technologies like BIM processes mean big data is an important factor, amplifying the amount of information that needs to be stored, shared, and manipulated.

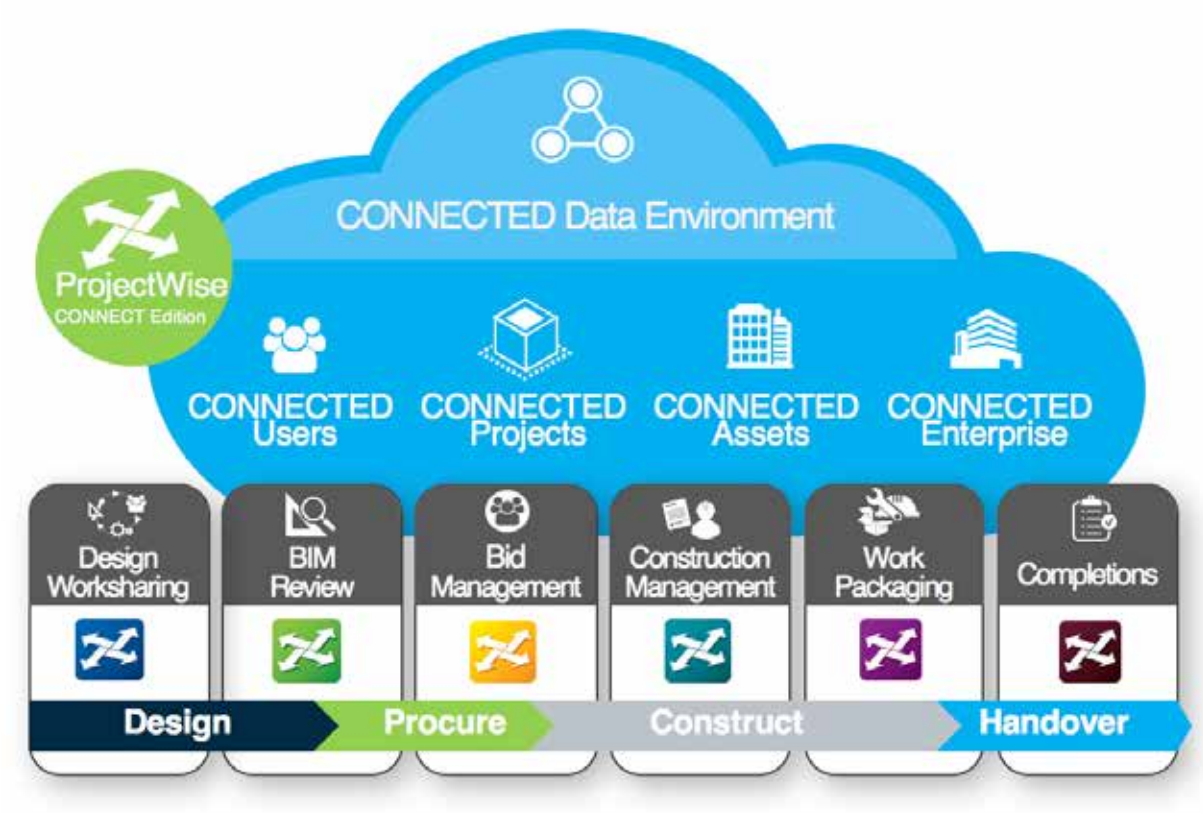
With growing evidence that utilities are taking a more "hands on" approach to project management, appropriate information management applications can enable effective deliverables control when either working with an EPC contractor or when taking a greater share of the project development risk.

It is also becoming increasingly clear that the demand for appropriate and timely delivery of data and records represents a significant drain on an organization's resources. Approximately 40 percent of an engineer's hours can reportedly be consumed by searching for and validating data, which may be spread throughout a company in email chains, hard drives, or office-based file-sharing applications such as Microsoft SharePoint.

A conventional siloed approach to data management can have long-term negative effects. With no single central repository of data, files may be overwritten and out-of-date information might be applied during further development phases. This type of data oversight can lead to errors and delays, slowing down the review and approvals process, and it may mean budget overruns.

Reportedly 25 percent of engineering firms suggest inaccurate project paperwork or problems with version control have contributed to delays in construction projects. Such delays inevitably mean additional costs and risks for project owners, including utilities. Paper-based workflows and generic file sharing solutions are hopelessly inadequate in the modern context. Such approaches ultimately obstruct the ability to effectively connect and collaborate on projects, reducing the value of engineering data during O&M phases and preventing utilities from becoming more productive in the process.

Now, though, utilities are reaping the benefits of advances in information and communication technology (ICT) and data management in adopting new approaches to information management working methods. Using secure, tailored applications to take advantage of these breakthroughs can support energy utilities' goals to increase productivity, accelerate projects, and lower project risks.



ProjectWise offers world class document management capabilities, digital supply chain collaboration, automation, and reuse through the Microsoft Azure Cloud Service.

Putting Information Management at the Heart of Utility Best Practice

In executing engineering projects, utilities must address two principal data management challenges in ensuring that all the necessary information is readily available and that it is accurate. Using a dedicated data management approach that may be cloud-based or on-site can secure those primary objectives.

It is becoming increasingly clear that there is real value in incorporating new approaches like big data and standardized workflows to utility projects. For example, building information modeling (BIM) methodologies are accepted worldwide as an over-arching best practice for project delivery. Currently, the UK government mandates BIM strategies for all centrally-funded public infrastructure projects with the goal of reducing project delivery and operating costs by 20 percent.

With an increasingly sophisticated client base specifying the use of BIM processes to drive down project costs, using BIM strategies in conjunction with data and project information management applications is an approach that is gathering momentum in the utilities sector. Charged with reliably serving millions of customers, utilities have traditionally conservative outlooks. Nonetheless, given the current challenges, the need for increased efficiency and productivity has seen a boom in utility players adopting advanced project data management applications such as Bentley's ProjectWise. A data management and collaboration service, ProjectWise helps project-intensive organizations by managing engineering information, enabling digital collaboration, and automating business processes. ProjectWise increases productivity and reduces risk by accelerating collaboration across all disciplines and phases throughout the project lifecycle.

Designed to organize and manage all the information flows from multiple projects, data can be shared across disciplines and offices through a secure connected environment to access, amend, save, and retrieve files. ProjectWise leverages the reliability and security of the Microsoft Azure cloud as it is deployed as a combination of on-premises and cloud-based software applications and services. This capability enables optimal performance when accessing, saving, and retrieving files from geographically different locations.

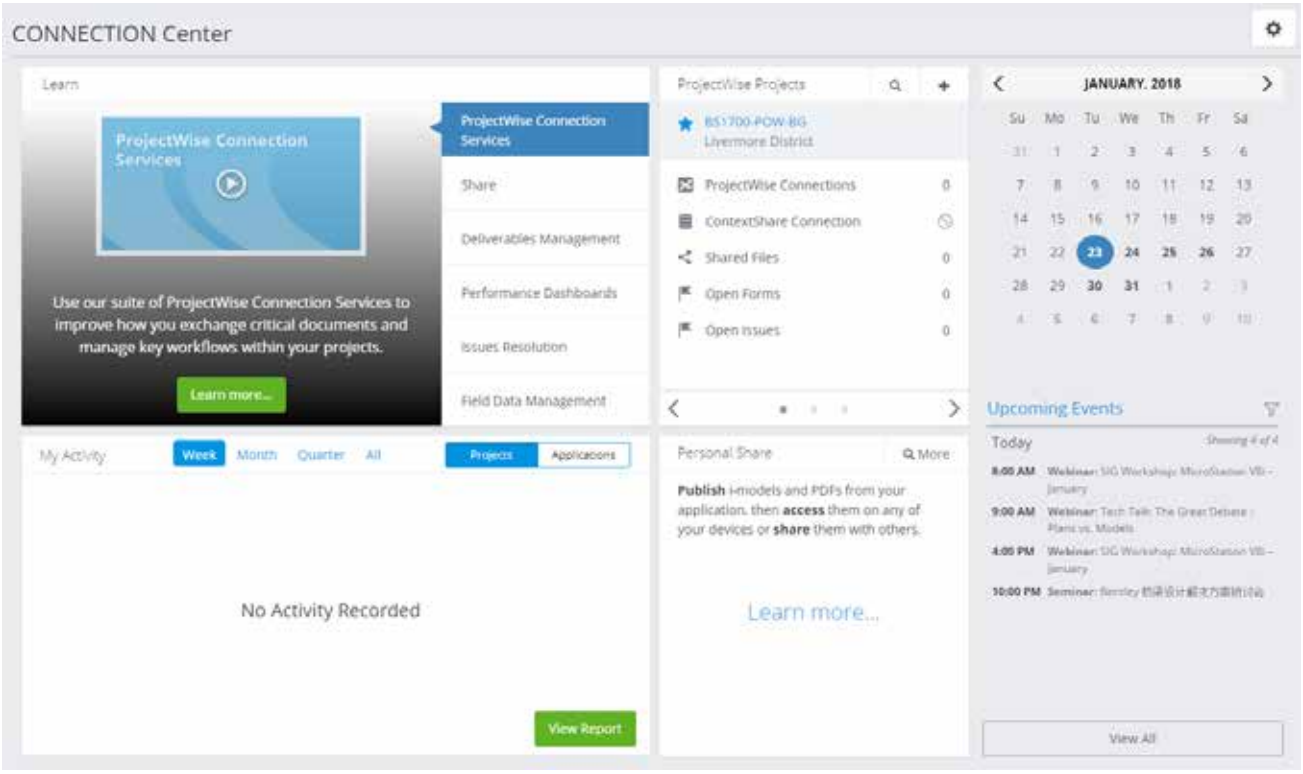
The established workhorse for design coordination based on organizational and project workflows as well as industry standards such as BS1192, ProjectWise empowers collaboration throughout the entire project delivery lifecycle. Bentley's ProjectWise CONNECT Edition can be deployed on premises, as a cloud service, or in any hybrid combination. ProjectWise cloud-based services for comprehensive project delivery include deliverables management, issues resolution, and project performance dashboards for insight into project progress among many other functions.

Furthermore, applications like ProjectWise can streamline operational practices, dramatically improving data management and collaboration across projects to be more competitive. The move to the cloud is radically changing the utilities industries as it takes advantage of new capabilities like mobile apps, reality modeling, and cloud analytics, all of which are becoming more commonplace in the industry. This transition to a more connected data environment profoundly affects how firms design, build, and execute projects as they find new ways heterogeneous teams can manage information.

Improving processes for the creation and sharing of information throughout an organization and its external supply chain depends on a single source of true data. ProjectWise provides a central repository for all design workflows.

With an automated environment that manages all file types and their relationships, ProjectWise allows utilities to collaborate across disciplines and offices without the typical chaos associated with communication breakdowns due to data sharing disconnects and siloed work environments.

This allows project development stakeholders to quickly and efficiently support design workflows and processes with digital technologies. Quick access and faster approvals can eliminate unnecessary steps when delivering an asset. Workflows can be automated, BIM standards can be easily enforced, and project analysis and additional insights are available with an organized framework. In turn, these streamlined workflows enable utilities to match the evolving standards and technologies emerging at the forefront of their respective industries.



The browser-based CONNECTION Center allows personal mobility by allowing individuals to get work done at any time and from any place with access to Bentley's mobile apps. Equally important, it allows utilities to securely share information and collaborate with external suppliers without opening their firewall.

Using ProjectWise to Improve Productivity

From planning through construction and handover, collaboration and information management applications like ProjectWise are specifically designed to support utility engineering and contractor workflows and ensure deliverables management throughout the process. Significant efficiencies can be realized through a common means of accessing diverse and distributed information that may be needed on a daily basis for some teams. Applications like ProjectWise are based on a flexible platform that can provide access to disparate data in different formats. It is built on common parameters and information is indexed in its native form to a common geospatial reference. Such a solution can resolve long-standing issues surrounding differing asset types by addressing inter- and intra-departmental information silos.

For utility projects, the complexity and relationships of content to processes and users can vary greatly given that many types of documents and drawings are used across both internal and external boundaries. For instance, engineering documents are used by street inspectors, permits are used by utilities and street maintenance teams, and deeds are used by legal teams for access and rights-of-way. Both current and historical information can be made quickly available to engineering, customer service, field crews, and others to support facilitating a new design or perhaps addressing sustainability and future planning. ProjectWise allows users to open multiple file types, explore models intuitively and in real-time, and manipulate the display of information to improve the interactive quality of information available on both desktop and mobile devices.

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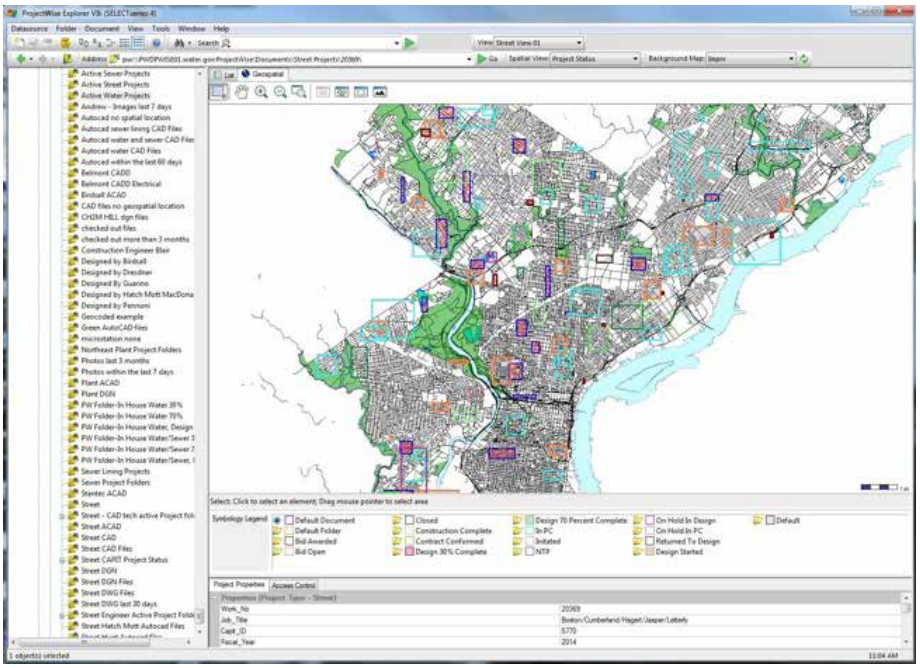
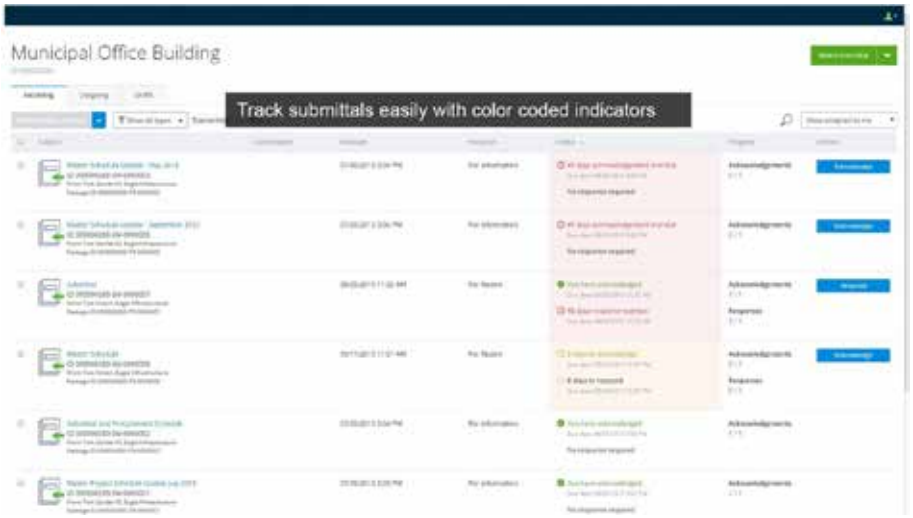


ProjectWise can incorporate 2D and 3D data from Geographic Information Systems (GIS) and geospatially reference project information to accurate maps.

In commissioning utility infrastructure, multiple inspection and compliance tests are typically mandated alongside appropriate documentation. For example, compliance documentation for North American Electric Reliability Corporation's (NERC) Critical Infrastructure Protection may require the maintenance of an audit trail to demonstrate that the North American electricity grid is secure from cyber threats. ProjectWise can be used to ensure workflows are enforced and documentation audit trails are in place for regulatory and standards reviews and audits. Furthermore, collaborative work can be accelerated with the ability to collect, manage, view, and approve field data from almost any device or location.

ProjectWise also supports the move to 3D design strategies, saving time in the construction of many types of utility infrastructure projects by working in concert with Bentley Navigator for up front clash detection and eliminating interferences. These 3D models can be used to automatically generate 2D construction drawings and ensure changes are reflected throughout supporting documentation. Such approaches facilitate real-time interactive model reviews of infrastructure for realistic visualization by stakeholders, such as management, permitting organizations, the public, and contractors. The 3D models enabled by ProjectWise can also be used in construction planning to minimize development costs.



ProjectWise automates transmittal and submittal processes for secure and accurate project execution.

Currently, some utilities are incorporating 3D information into GIS applications and now utilities infrastructure may be found in 3D city models. This data is used to better understand both underground and overhead situations, reducing the likelihood of potentially costly mistakes.

Additionally, in facilitating a distributed work environment, ProjectWise minimizes the need for workers to physically attend an office in order to access standards, drawings, or operating manuals.

Utility Project Information Management in the Information Age

Realizing that their efficiency is obstructed by ineffective management of design and construction information, utilities are employing cloud- and/or premises-based applications that enable swift access to accurate engineering information, reliable exchanges with contractors, and rapid reporting for audits.

The ability to locate accurate and up-to-date documents quickly is a significant advantage in any engineering project. Data streams within and between organizations associated with utilities projects are becoming more and more complex. Where large capital projects are underway, the complexity of collaboration with external contractors, the public, and other stakeholders increases significantly and multiple contractors may be working in parallel. Meanwhile, for even the smallest utilities service providers, many infrastructure projects may be underway simultaneously—all of which will involve both in-house and external designers, engineers, and contractors. Under these conditions, collaborative work processes are absolutely mission-critical to commercial success.

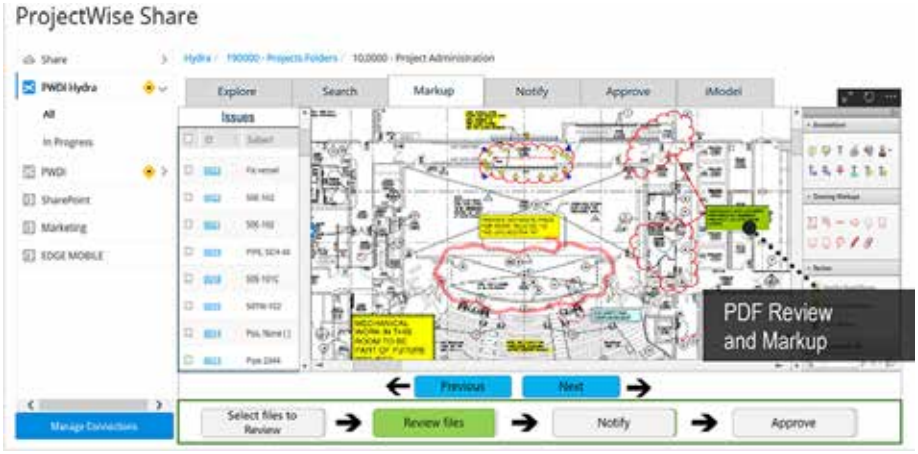
By delivering a single information source that allows all relevant parties to securely source data quickly, ProjectWise reduces the risk of costly errors due to the use of out-of-date information and problems associated with version control. Project documentation distributed across employee desktops, shared drives, and emails is susceptible and results in lower productivity, duplication of effort, and mistakes.

The ability to secure, use, and reuse documents confidently is essential to start projects faster, eliminate redesigns, and reduce development risks for utility companies building generation, transmission and distribution, water treatment, or processing plants. Adopting best practice data management through BIM and applications like ProjectWise can also help to address issues such as regulatory and standards compliance and contractor workflows throughout the asset lifecycle.

Accurate engineering information data can also be made available to external contractors during construction and subsequently to maintenance staff such as asset management partners and third-party operations staff. This distribution of materials can be used to support ongoing operations and can be applied during emergency management too.

There is mounting evidence to suggest that by updating operational practices, engineering and construction firms can significantly increase margins. These improved margins could result in more profitable utilities companies as well as lower prices and better services for consumers.

Using data management applications to improve design, build, and O&M practices, utilities can improve reliability and reduce costs through simple, location-based access to past and present information. Ultimately, ProjectWise brings order and structure to utilities' data management, increasing productivity, accelerating projects, and lowering project risks.



ProjectWise allows you to review and markup PDFs without leaving your digital workflow.

About Bentley

Bentley Systems is a global leader in providing engineers, architects, geospatial professionals, constructors, and owner-operators with comprehensive software solutions for advancing the design, construction, and operations of infrastructure. Bentley users leverage information mobility across disciplines and throughout the infrastructure lifecycle to deliver better-performing projects and assets. Bentley solutions encompass MicroStation applications for information modeling, ProjectWise collaboration services to deliver integrated projects, and AssetWise operations services to achieve intelligent infrastructure — complemented by managed services offered through customized Success Plans.

Founded in 1984, Bentley has more than 3,000 colleagues in over 50 countries, more than $600 million in annual revenues, and since 2011 has invested more than $1 billion in research, development, and acquisitions.

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