IDC VENDOR SPOTLIGHT

Infrastructure Life-Cycle Management Evolves to Improve Capital Program Management and Project Operations

May 2011

Adapted from *Worldwide Software Business Solutions 2011Top 10 Predictions: The Hyperconnected Enterprise* by Erin Traudt, Mary Wardley, Scott Guinn, et al., IDC #226541

Sponsored by Meridian Systems

First-generation investments in large capital project and program management systems, begun in earnest nearly two decades ago, have moved well into their maturity stage. As we move out of the recent global recession, users of these systems — global program managers, private building owners, government agencies, and other project-based organizations — are looking to refresh their earlier investments, and they are doing so at a good time. New, disruptive technology trends are converging to infuse a renewed vitality into the market for capital project and program management solutions and related infrastructure life-cycle management (ILM) systems.

The ILM market focuses on optimizing large infrastructure building programs that require capital planning, new project construction, and eventual facility renovations for building owners and their architecture, engineering, and construction (AEC) industry service providers. This Vendor Spotlight highlights the ILM application market and explores the business dynamics that are confronting project-based organizations today, including public agencies, program management firms, construction companies, and engineering organizations.

In addition, this paper examines how these project-based organizations can improve the infrastructure building life cycle, from planning, execution, and facility renovation to the deployment of ILM technology. Finally, we discuss the role of Meridian Systems in this strategically important market.

The Evolution of ILM

Fundamentally, ILM applications are designed to automate the continuous process of managing complex infrastructure construction and commercial real estate projects, performing an array of tasks, including capital planning, budgeting, project and cost tracking, project team collaboration, and ongoing redevelopment.

ILM was first introduced in the early 1990s, combining project portfolio management (PPM) and facilities infrastructure management functionality to address the need to manage increasingly complex capital projects from a life-cycle perspective, including the ability to manage the planning and building of new facilities and the efficient operations of existing facilities. The goal of ILM today is to optimize the planning, design, construction, and facility renovation phases of a program or project, bringing together key sets of application functionality in one integrated platform or system of record. ILM applications are a response to the capital building industry's mandate to achieve true integrated project delivery, better align project stakeholders through collaboration, and support industry trends driving design teams, project owners, and construction teams to share in the project risks and rewards.

Major software components in an ILM application typically include the following:

- Capital planning and program management
- Budget planning and forecasting
- Contract and change management
- Cost and cash flow management
- Design review and collaboration
- Project team collaboration
- Schedule management
- Risk management
- Project visibility
- Capital improvement planning and execution
- Construction oversight
- Business process workflow

The ILM Market

Organizations that typically invest in ILM applications include program and construction management firms that serve Fortune 1000 enterprises, multinational corporations that work on a global portfolio of large-scale projects, and government agencies. In addition, organizations in various industries, such as healthcare, oil and gas, real estate development, and transportation infrastructure, are adopting ILM applications.

While ILM applications help manage the increasing complexity of commercial building projects, demand for these solutions also comes from the contractually mandated need to document every step in the life of a new real estate asset and the pressure to deliver construction projects on time and within budget. Another market driver spurring growth has been the adoption of building information modeling (BIM), a disruptive technology change impacting both project owners and AEC service firms. Incorporating intelligent building design data into capital program management solutions is providing several opportunities to increase efficiency and cost savings across the entire infrastructure life cycle — a critical need in the postrecession construction and capital building sectors.

Even as federal economic stimulus programs come to an end, there continues to be strong demand for capital project and program management solutions, driven by the following factors:

- **Continued global infrastructure needs.** In both emerging markets and developed countries, there is considerable infrastructure investment, for different reasons. In emerging markets, particularly the BRIC countries (Brazil, Russia, India, and China), infrastructure needs can barely keep pace with economic growth. Developed countries, on the other hand, see a need, critical in some areas, to reinvest in their own infrastructure, either for maintenance or to align with regulatory requirements. This driver is particularly relevant in the transportation, public sector, energy, and healthcare sectors.
- **Increasing project complexity (engineering-centric megaprojects).** Whether modernizing an entire city in the United Arab Emirates or megaprojects supporting energy or "green" initiatives in Europe, the United States, or China, these large-scale infrastructure projects incorporating leading-edge technologies result in ever-increasing project complexity, which in turn drives the need for ILM. In these situations, ILM is needed for better collaboration and improved visual and analytical capabilities to manage risk, reduce errors, make outcomes more predictable, and increase margins.

To win a competitive bidding process for these types of projects — all while driving better efficiencies and accuracy to keep them on track, deliver them on time, and improve profitability — global program management/construction management firms see the need to refresh or replace their ILM systems, especially if they are using first-generation systems developed a decade ago. These firms look to be able to gain better visibility into their capital portfolios for such things as project status, risk management, and resource allocation. They want to be able to enforce tighter controls within their capital building processes, and they want to have stronger program management, especially where the program comprises many smaller projects, such as facility renovation, remodeling, and rebranding.

Even as ILM customers look to upgrade their first-generation ILM investments, we see the convergence of a number of technology trends, each disruptive on its own, also driving demand for updated ILM solutions:

- **Mobility and user adoption.** Capital building industry CIOs are facing increasing pressure to deliver more and more value to their end users. They are experiencing growing demand for built-for-mobile enterprise applications. The massive expansion of smartphones, smart tablets, and other mobile devices fueled by mobile development platforms and the availability of high-quality mobile consumer applications has created a revolution among employees. These employees are clamoring for better and easier access to enterprise tools from mobile devices, as well as connected/unconnected capabilities for their tablets. Additionally, ILM solutions need to provide more accessible, easy-to-use interfaces to create a balance between the C-level executives who see value in a corporatewide project controls system and the line-of-business managers who need their end users to adopt their technology.
- **Integrated project delivery via BIM.** BIM has the opportunity to drive significant process efficiencies across the capital building and construction industries, from both a project owner perspective and a general contractor perspective. Each stakeholder is adopting BIM methodologies and technologies to leverage intelligent project design data at different project phases (planning, building, or operating) to support better integrated project delivery, where all parties share more in managing the risks and potential rewards of any project. ILM solutions are uniquely positioned to provide a central technology platform for sharing BIM data, improving the project collaboration, change management, and facility operational processes.
- **Faster deployment via cloud computing.** Both through virtualization of databases and operating systems and through software-as-a-service (SaaS) delivery, cloud computing provides the underpinning for growth in ILM markets. Capital programs have tremendous deadline and scheduling pressures and leveraging cloud- and SaaS-based models enables faster deployment options than previously allowed. On top of that, SaaS also increases the flexibility of business processes while reducing total cost of ownership of enterprise software by freeing up IT resources.

Connecting project teams with business leaders has never been easier with the proliferation of new mobile devices and increasing broadband speeds. PPM and ILM vendors are increasingly offering their solutions with mobile and collaboration tools and SaaS delivery options to remain competitive.

Using Technology to Connect the Planning, Building, and Operating Life Cycle

In the past, the infrastructure project life cycle was managed as three segments, each with different stakeholders:

- Planning/designing by architecture/engineering firms
- Construction execution by general contractors and subcontractors
- Operating/managing by owners/operators or real estate managers

Occasionally, these stakeholders would pass their project information from one team to the next, but more likely, they did not. Reasons ranged from data incompatibility to the desire to keep information such as pricing, scheduling, and materials costs within the company's own four walls. Frequently, the result was distrust, misunderstanding, and litigation among owners and construction execution partners. However, the increasing complexity of global projects is now requiring the construction and real estate industries to look for better ways to handle the management and documentation of projects, from inception to retirement.

The ILM market addresses three particular areas of challenges:

- **Project data.** Where is project and design data? How do I access it? How do I maintain it?
- **Project management.** Which tools and resources do I need for the plan, build, and operate phases of capital programs and redevelopment projects?
- **Risk reduction.** How do I develop repeatable processes, standardize project processes, and mine project data to transfer key business intelligence to future projects?

Business Challenges for Project-Based Organizations

Life for project owners in any infrastructure-intensive industry is fraught with risks. Depending on their business focus and management structure, building owners are facing a range of challenges that can make or break their success. Operators have to manage the maintenance of their assets over many years to protect them against deterioration or unexpected catastrophic failures. Examples include collapsing bridges, caving roofs in shopping malls, and neglected roads and highways with potholes and water damage. The construction industry itself is notoriously subject not only to economic fluctuation but also to increasingly global competition. To survive and thrive, market players have to plan, build, and operate as efficiently as possible. Finally, cost management, particularly for complex programs with large numbers of stakeholders (including architects/designers, general contractors and subcontractors, owners and operators, and, of course, government agencies and financial institutions), can be very challenging, and costs can easily spin out of control. The utilization of ILM applications can support the budget development process and ensure greater precision for funding and spending approval.

Considering Meridian Systems

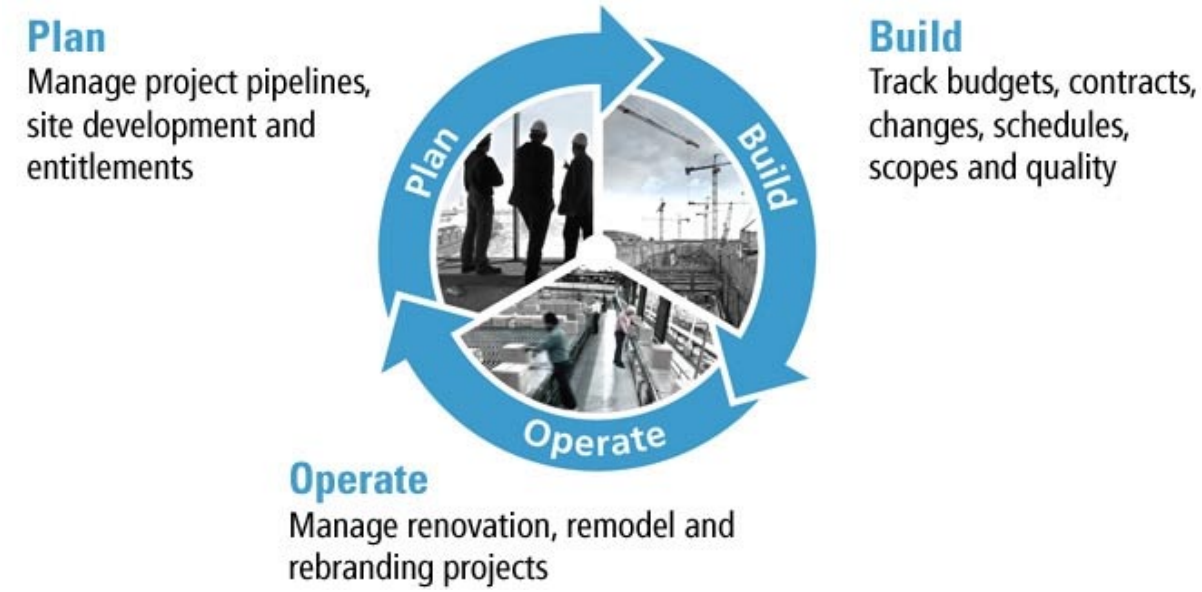
Meridian Systems, based in Folsom, California, is a provider of solutions to optimize the plan, build, and operate life cycle for AEC, public, and commercial organizations. Meridian combines technology, industry expertise, services, and partners to deliver complete construction project control on infrastructure projects of any size.

Meridian originally earned its stripes in the AEC project and portfolio management arena. It now has more than 5,000 customers with nearly 100,000 users around the world in industries including transportation, energy, public sector, and healthcare. Since 2006, Meridian Systems has been owned by Trimble, a provider of advanced positioning solutions designed to make field and mobile workers in businesses and government more productive. Built on a Web services technology platform, Meridian's solutions are available in either on-premise or SaaS deployment options.

Figure 1 illustrates the integrated plan-build-operate aspect of Meridian's ILM application and how its components enable companies to track and monitor an infrastructure project from inception to completion as well as capital program renovation.

Figure 1

Meridian's ILM Software Functionality



Source: Meridian Systems, 2011

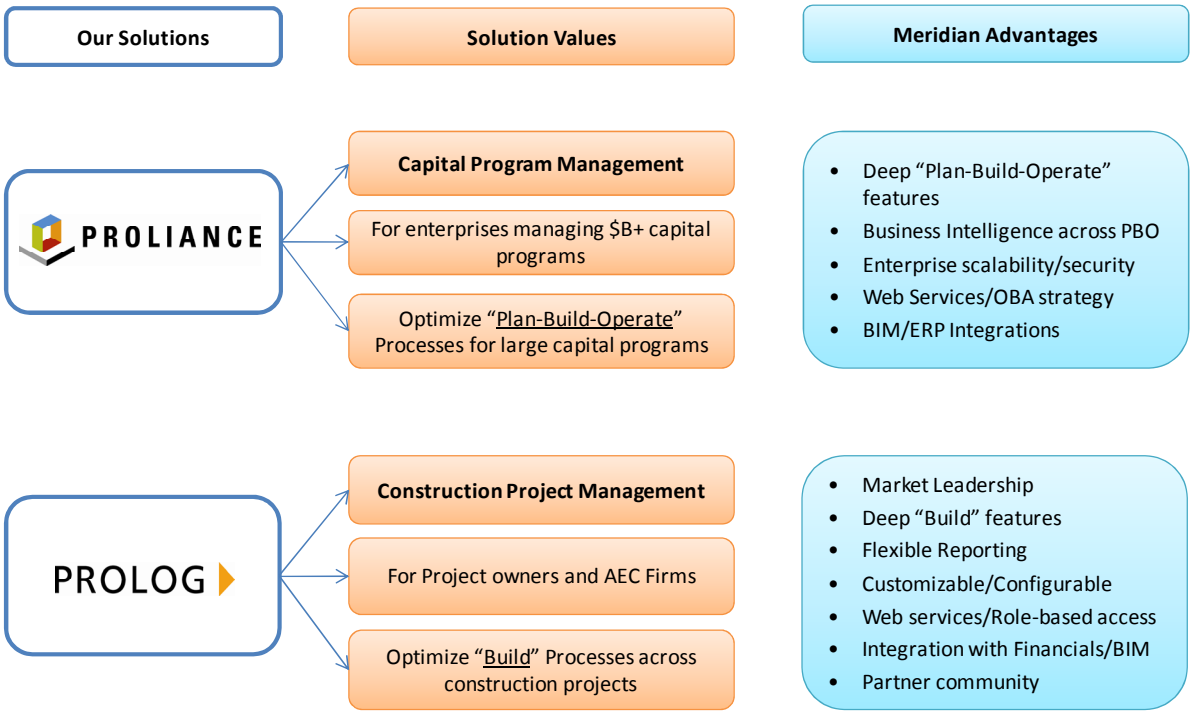
Meridian Systems has two product lines (see Figure 2):

- **Proliance.** Proliance software is a solution for capital program management that is designed for project-based organizations managing capital planning, building, and renovation processes across large infrastructure programs. Proliance customers include global program managers, real estate developers, commercial building owners, and government agencies that want to optimize an ongoing infrastructure portfolio and need to manage budgets for future projects, execute new construction currently in their pipeline, as well as plan for capital improvements on existing facilities. These customers look to Proliance to provide process workflow automation, program management, capital planning, budget planning and forecasting, schedule management, project visibility and dashboards, cost/contract/change management, construction oversight, and project collaboration.
- **Prolog.** Meridian's original product offering, Prolog software, is a construction project management solution aimed at project-based organizations that are focused on the "build" phase of ILM and want to automate and optimize daily construction processes. Prolog is designed to help customers, including AEC firms, manage construction project risk by providing risk management, project reporting and visibility, budget planning and forecasting, cost control, procurement, field administration, and design review. Prolog automates all aspects of the construction life cycle, from project design to closeout, and includes Prolog Manager, a Windows desktop client application, and Prolog Converge, a Web-based project management application powered by Prolog that enables secure collaboration with internal users and external partners.

Meridian's solutions leverage Web services platforms to facilitate role-based user interfaces and accessibility across computing devices and applications. For example, to help project-based organizations bridge the gap between enterprise applications and users' desktop and mobile devices, Meridian enables Microsoft Office Business Applications (OBAs), allowing end users to access project data through Excel, Word, and Outlook applications, and offers integrated collaboration features to facilitate team project work. In addition, field employees get role-based, secure access to project data via tablet PCs and can work in either connected or disconnected modes.

Figure 2

Meridian Solutions for Infrastructure Projects



Source: Meridian Systems, 2011

Meridian's customers range from large global enterprises to smaller midmarket organizations — including engineering and construction firms, program managers, real estate developers, and public and private sector building owners — across several industries, including energy, healthcare, education, government, and transportation. Meridian's customers include:

- **The Corradino Group.** This engineering, infrastructure design, and program management firm uses Prolog to perform oversight for a multibillion-dollar project with the Florida Department of Transportation (FDOT). Specifically, the Corradino Group uses Prolog to support document tracking and provide a way to collaborate with design teams at the FDOT.
- **AECOM.** This global provider of professional technical and management support services uses Proliance software to provide program management for multibillion-dollar projects. Among the projects in which AECOM is involved is the $7 billion greenfield port project in Doha, Qatar. Some divisions of AECOM were also early adopters of project management systems and are using Prolog on a number of multimillion-dollar projects.
- **U.S. General Services Administration (GSA).** The GSA's Public Buildings Service uses Proliance software to manage new facility construction and renovations of existing government buildings. With Proliance as a foundation, the GSA has deployed an electronic project management system that will be rolled out to 3,200 users.

Meridian's competitive strength lies primarily in its capital building and construction industry expertise and its open technology platform strategy based on Web services. Meridian's strengths against competitors in the enterprise segment are its best-of-breed solution breadth, its support for business intelligence across the plan/build/operate infrastructure market, and its ability to provide complete solutions through business consulting expertise and its partner network.

Challenges

The hallmark of the capital building and construction industry is its fragmented, high-risk, and cyclical nature. There is hardly an industry with a more challenging business environment — immensely complex projects, high-risk financing, dependence on global and local business climates, and long delays between initial project planning and final completion of the project.

Since its entry into the construction and facilities management arena over 17 years ago, Meridian has been a pioneer in defining the ILM market and has continued to evolve the market for ILM solutions. At this point, the benefits of ILM are well-understood and Meridian faces a variety of potential niche competitors. To remain ahead of formidable competitors, Meridian will have to continue to improve the end-user experience of its products and, just as it has done up to now, continue to embrace trends in new technologies such as supporting integrations to BIM to enable integrated project delivery, provide support for mobile workers, and offer rapid deployment options that leverage cloud computing and SaaS-based offerings.

Conclusion

Few projects are as complex and have as long a life cycle as infrastructure projects — bridges, high-rises, and airports require hundreds of experts in a vast number of specialties to coordinate their efforts during the plan and build phases and to then make their as-built data available to asset operators for the many decades of the functional life of these assets. These challenges, plus ever-increasing global competition, require infrastructure-related companies to increase their efficiencies throughout the entire plan-build-operate cycle. One way to increase efficiencies is through the use of robust ILM applications that are evolving to encompass every aspect of an infrastructure project.

As the global construction market looks to upgrade from first-generation investments in ILM to be competitive, IDC believes that Meridian's flexible software delivery options and investments to improve the end-user experience of its products with mobile capabilities and collaboration features position the company very well for success by addressing rising end-user expectations in a challenging market.
