

## WHITE PAPER

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# On-Demand Collaborative Project Management: Autodesk Connects People, Processes, and Information Across the Plan, Build, and Operate Life Cycle

Sponsored by: Autodesk

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## IN THIS WHITE PAPER

This white paper, commissioned by Autodesk, discusses the challenges that are associated with gaining closer control over the design, build, and operational phases of building projects and processes while increasing collaboration among the various constituents involved in the construction project life cycle. Autodesk has a long history of providing cost-effective and easy-to-learn solutions that address the construction process across a variety of industries, including commercial/retail, government, education, oil and gas, residential/home building, healthcare, transportation, and pharmaceutical. Founded in 1982, Autodesk has more than 5,000 employees, customers in 145 countries, and revenue of \$1.3 billion in fiscal year 2007 and is one of the world's leading 2D and 3D design software and services companies.

IDC believes Autodesk's presence in the architectural, engineering, and construction (AEC) trade is second to none. The company's original flagship AutoCAD® applications for architectural design are practically ubiquitous on a worldwide scale. During the 25 years of Autodesk's existence, the company has continually expanded its offerings for the architectural and construction industries with in-house developments such as Autodesk® Buzzsaw® on-demand collaborative project management, but also through acquisitions such as Revit® and Constructware®.

Autodesk® Buzzsaw and Autodesk® Constructware represent Autodesk's on-demand collaborative project management (CPM) portfolio. IDC believes that with the acquisition of Constructware in March 2006, Autodesk is making a much stronger statement than before about its aspirations to satisfy the project management and collaboration needs of the construction industry. This is a market space that Autodesk refers to as collaborative project management. This white paper outlines what Autodesk can bring to CPM with its two product lines, Buzzsaw and Constructware, which are delivered via the software-on-demand delivery model.

## SITUATION OVERVIEW

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### **Hallmarks of Construction Processes: Fragmented, High Risk, and Cyclical**

There is hardly a discipline that has to deal with a more challenging business environment than the architectural, engineering, and construction (AEC) industry. The long list of business process woes is familiar to all participants — from the immensely complex management requirements of construction projects across a variety of industries, including commercial/retail, government, education, oil and gas, residential/home building, healthcare, and pharmaceutical, as well as materials suppliers, to high-risk financing and lease management. Much of this complexity is derived from the need to manage a significant amount of information, documentation, and material supplies across highly fragmented and geographically dispersed teams that work under tight deadlines and financial constraints.

Another problem surrounding construction projects is time delay between the start of financial investments and the actual availability for occupancy either months or years later. It is possible that during the time spent on execution the economy has slipped from boom to bust, resulting in a glut of unwanted commercial or industrial space, and owners will sit on a pile of loans without any hope for relief in the near future. Clearly, it will never be possible to avoid all risk because there are too many sources. However, effective management of project execution can go a long way to assure the stability of the building and construction industries.

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### **The Construction Project Life Cycle: Key Stakeholders and Needs for Success**

The life cycle of construction projects spans three phases — plan, build, and operate — each with very different stakeholders. All stakeholders in every phase have specific needs to track and control the past, present, and future status of the construction projects in which they are involved. Their specific information needs for success will also depend on their roles. For example:

- ☒ Owners or operators want to track time to completion so they can calculate their return on investment (ROI). Further down in time, they will want to track and document maintenance needs and procedures as well as upgrades and expansions.
- ☒ Architects want to coordinate efficient design review and changes during the planning and building process.
- ☒ General contractors have to track costs and execution on a much more detailed level for bid management, requests for information (RFIs), and change orders. As project managers, they also have to track interactions with owners and architects/engineers as well as coordinate the large number of trade people and coordinate the work and information generated by those involved in completing structural, mechanical, electrical, plumbing, and engineering work as well as lighting, acoustic, landscape, and other consultants.

- ☒ Subcontractors have to be able to get tied into the project's progress to know when they are likely to be scheduled for specific tasks or what may delay their planning. Only then can they effectively rent equipment, hire help, and be ready to go when the project has reached the stage when they are needed without causing costly delays.
- ☒ Owners/operators have to be able to manage their assets efficiently and to gain visibility across their portfolios with continuous access to as-builts, space plans, equipment information, warranties, emergency plans, and, lastly, support for redevelopment projects.

The number of stakeholders in the U.S. construction industry is impressive. According to Autodesk, there are 65,700 architectural and engineering firms and 665,500 construction firms. IDC believes the addressable market for AEC applications includes 1.3 million retail businesses; 323,000 manufacturing plants; 200,000 home-building firms; 49,000 hospitality businesses; 36,000 health services; and a large number of federal, state, and local government agencies. Construction firms servicing these markets may manage their businesses very differently depending on their sizes and success factors, but their goals are always the same: increase efficiency, reduce risk, control quality, assure quality, maintain client satisfaction, and, lastly, gain a predictable level of sound profitability.

Yet the construction industry is currently undergoing profound changes, which make it ever more difficult to achieve these goals. The first issue is the increasing globalization of the construction market. Global outsourcing of specific tasks such as detailed drawing development, structural analysis, wind tunnel testing for skyscrapers, or electrical engineering is now a common practice for architectural design and engineering companies. Major civil engineering projects by state and local governments are opened up for global bidding, leading to ever changing alliances of local and international project participants. Construction execution is increasingly dependent on the availability of fully trained international work crews from low-wage countries for specific tasks such as window setting, roofing, or drainage. Clearly, general managers and subcontractors have to find a way to bid on and control these types of complex projects continuously and globally from the top down, but also from the bottom up.

There is little doubt that the building and construction industries are ready for a major technology overhaul, and there is no lack of models about how to proceed. For example, the manufacturing industry — confronted with similar cost and outsourcing challenges — has been turning to Web-based collaboration of product life-cycle management (PLM) to improve its global competitiveness through the software-on-demand delivery model. These process changes are supported by business consulting offered either by PLM applications providers or by consulting firms that have taken the time and trouble to develop best practices methodologies. The current development within the construction industry is not much different.

## **Autodesk's Initiative in Collaborative Project Management**

Autodesk has been a major design software provider to the AEC market ever since its inception in 1982. Autodesk's AEC division has taken steps to address the project management needs of the construction industry. For this space, the company is offering two architectural and engineering design product lines, the Revit® platform for 3D design and AutoCAD® software products for 2D design. Additionally, countless software developers worldwide are offering specialized and/or localized niche applications on top of the AutoCAD platform.

But Autodesk did not stop there. In 1998, as the Internet matured into a global communications platform, Autodesk added Buzzsaw to its AEC solution set. Buzzsaw was introduced as a communication and collaboration hub specifically for the building and civil design industries. (Its clone, the Autodesk Streamline® collaborative project management solution, is focused on the manufacturing industry.) The product's strength lies in its easy-to-use document management, design management, and workflow collaboration, with access control and email notifications for project participants. Furthermore, Autodesk makes sure that these capabilities are available to small and large players alike. Buzzsaw availability as an on-demand solution accessible over the Internet makes it particularly desirable for collaboration on construction projects that include a broad array of participants, from IT-savvy owners/operators and general contractors down to subcontractors with a laptop in a pickup truck.

The success of Buzzsaw was quite remarkable. Early on, users from a wide range of vertical industries and geographies subscribed to Buzzsaw for their construction project management. It was obvious that Autodesk was going in the right direction. To complement Buzzsaw capabilities and add to its 137,000-subscriber base, Autodesk decided to invest \$46 million in the acquisition of Constructware, an Alpharetta, Georgia-based provider of construction-focused, Web-based project management. At the time of its acquisition in early 2006, privately held Constructware had been widely recognized as a leader in construction project and portfolio management. The company had 29,000 subscribers, including major general contractors and owner-operators in retail and manufacturing as well as federal, state, and local authorities.

Autodesk now operates Buzzsaw and Constructware as a combined business unit with 900+ customers and more than 200,000 users who access via the Internet. Among Buzzsaw and Constructware customers are AEC firms on the service side and manufacturing companies; services providers; home builders; government, state, and local authorities; retailers; real estate firms; oil and gas companies; hospitality providers; health services; and many more on the owner side. According to Autodesk, 25% of the company's collaborative project management customer base comprises architecture and engineering firms, 25% are construction firms, and 50% are owner firms. Examples of marquee customers are large commercial construction companies, small and large home builders such as Veridian Homes and Pulte Homes, world-class architecture firms such as Wimberly Allison Tong & Goo (WATG), U.S. state and local government entities such as City of Ft. Worth, commercial developers such as Forest City Enterprises, and healthcare facilities such as Memorial Sloan-Kettering Cancer Center. (For details on how Autodesk customers are benefiting from on-demand Collaborative Project Management, refer to the Case Studies section at the end of this white paper.)

## **Software on Demand: An Alternative Method for Acquiring Software**

Staggering industry fragmentation and growing complexity of building project life-cycle management have increased the urgency for comprehensive project management solutions built specifically for this industry. Over the years, participants have turned to a number of approaches: Many of the large players have turned to their internal IT departments to develop in-house applications. For example, a large commercial construction company located in Dallas, Texas — and profiled in the Case Studies section of this white paper — is currently in the process of moving from a Lotus Notes<sup>®</sup>-based, in-house solution to Autodesk Constructware because it had become difficult for IT to maintain and upgrade the application.

Other users have turned to off-the-shelf project management applications that have, in turn, required extensive customizations in order to meet the specific requirements of the users. Smaller players with less IT expertise rely on Excel<sup>®</sup> spreadsheets for project scheduling and costing. While these applications may solve in-house automation needs, they do nothing to improve collaboration between the broad array of geographically dispersed project participants. Information sharing between project participants still largely relies on phone, fax, and paper.

However, an increasingly prominent method for software access and acquisition has appeared over the last couple of years: the software-on-demand delivery model. The software-on-demand business model represents an evolution in the software industry toward perpetual vendor accountability to continually deliver and demonstrate the value of software to customers. Software-on-demand providers need to create software products that are easy to use and intuitive and ultimately enable quality customer experiences with the software. Both of Autodesk's products, Buzzsaw and Constructware, are examples of software products that are delivered via the software-on-demand delivery model.

### ***Shifting Values: Enabling Positive Customer Software Experiences***

IDC believes a value shift is occurring in the industry that is helping to drive on-demand adoption. At the heart of this value shift is the creation of positive customer experiences.

Traditionally, software vendors assumed that the value of the software was in the features and functions of the product as packaged by the vendor. However, this value equation does not take into account the customers' experiences with the product once they bring it into their environment and begin using it. As a result, the software market is cluttered with products that are feature rich, but often experience poor.

Software on demand helps to address this value disconnect in the following ways:

- It helps to decrease the customer sentiment that the cost of software is disproportionate to the value it provides.
- It increases provider accountability because of the ongoing need to demonstrate the value of the on-demand offerings to customers.
- It helps to enhance communication between the customer and provider, which is essential to a positive customer experience.

With on demand, the customer and provider are both vested in the customer's success with the software. If the customer is not successful, then the provider is not successful, and this places pressure on software-on-demand providers to deliver positive experiences. It is the customer's quest for a positive software experience, as well as a few key events, that is triggering on-demand adoption.

### ***Benefits Associated with Software-on-Demand Delivery***

The software-on-demand delivery model spans all software types, including customer relationship management (CRM) applications, messaging and Web conferencing applications, human resource (HR) management, and project and portfolio management. The awareness and adoption of the delivery model in certain software areas undoubtedly vary. However, IDC believes that strides have been made and that the software industry has moved past the educational phase of the delivery model. The software-on-demand delivery model has gained acceptance and traction not only in the United States but also across the globe. In fact, IDC believes that the software-on-demand delivery model will reach \$14.5 billion in worldwide revenue by 2011. For project and portfolio management solutions, adoption is relatively immature, but IDC is confident that adoption will continue in this emerging area, especially as more offerings are brought to the market and vendors continue to evangelize in this area.

Playing an important part in software on demand's success are the recognized benefits associated with solutions offered on demand. Figure 1 represents results from IDC's 2006 *Software on Demand Adoption Study*, where end users rated the importance of the benefits that had a role in their purchasing decisions.

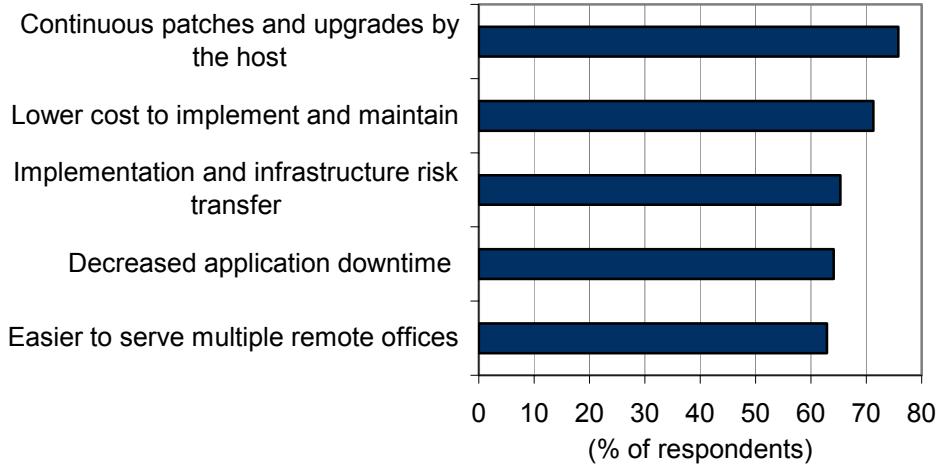
According to IDC's study, continuous patches and upgrades provided by the on-demand providers were the primary benefit, followed by cost savings. Other benefits of the delivery model beyond those listed in the figure typically include rapid implementation times, a more focused IT staff, and increased employee productivity and efficiencies.

Momentum for software-on-demand offerings continues to build across industries and company sizes. IDC believes that software-on-demand providers that can demonstrate competency in select vertical industries will gain a competitive advantage due to customer preferences for service providers that understand their respective businesses. Furthermore, software-on-demand providers must develop their solutions with open architectures that allow ease of integration as well as options for configuration.

**FIGURE 1**

**Recognized Benefits of Software-on-Demand Offerings**

Q. Please rate the importance of the following benefits in terms of their contribution to your company's decision to purchase an on-demand product.



Unweighted n = 122

Source: IDC and InfoWorld's Software on Demand Adoption Study, 2006

**Autodesk's On-Demand Collaborative Project Management Portfolio**

With the acquisition of Constructware, Autodesk is making a much stronger statement than before about its aspirations to satisfy the project management and collaboration needs of the building and construction industries. Its collaborative project management portfolio now covers the following categories:

- Document management with project-related document and contract tracking, version control, and search capabilities
- Design management with automatic notifications of design changes and reference file management to streamline collaborative review and approval of designs, documents, and information across disciplines
- Bid management with coordinated preparation, distribution, and awards of bids to accelerate dissemination, evaluation, and acceptance
- Cost management with budget and expenditure tracking and forecasting and data exchange with accounting systems to enable individual projects and multiproject programs
- Construction management with automatic notifications of RFIs, transmittals, meeting minutes, change orders and reporting, and project management dashboards
- Operations management with access to the complete facility information such as as-builts, maintenance schedules, and equipment information from a centralized secure location

The following sections provide an overview of the application functions Autodesk can bring to collaborative project management with its two product lines, Autodesk® Buzzsaw® and Autodesk® Constructware®.

### ***Autodesk Buzzsaw***

Autodesk Buzzsaw simplifies and centralizes project-related documents and information as well as streamlines and automates the communication and collaboration workflow among project team members. Buzzsaw also enables the simplification of business processes such as bid collection and analysis, construction, and facilities management.

Buzzsaw focuses on document management at the project, folder, and file level and on group collaboration and workflow. It is offered in two versions, Buzzsaw® Standard and Buzzsaw® Professional. Buzzsaw Standard handles the information and collaboration needs of project team members, while Buzzsaw Professional addresses the management support needs of project managers. For example, Buzzsaw dashboards let executives and project managers monitor the status of specific projects and identify and remedy emerging problems before they lead to serious losses in time and cost. The Autodesk® DWF™ file specification enables users to upload large drawing files in DWF and use Autodesk® Design Review software — a free download and a no-cost component of most Autodesk products (For more details on DWF, please refer to [www.autodesk.com/dwf](http://www.autodesk.com/dwf).) — to mark up and comment on the drawings without needing access to the original design program.

Buzzsaw Release 7.2 saw a number of improvements for bid management, which are available as part of Buzzsaw Professional only. These include bid management options such as "add new bid package," bid invitation details with "add documents and drawings," and, finally, bid tracking. As an ease-of-use feature, Buzzsaw offers project templates for an assortment of roles or industries, such as home builders, retailers, hotel and casino owners, architects, engineers, and general contractors.

Buzzsaw can be accessed in several ways: as client software, through the on-demand delivery model, and via the Web-based Distributed Authoring and Versioning (WebDAV) standard for Web authoring and collaboration. The hardware and software requirements for transferring, viewing, and editing files as well as site administration for Buzzsaw include an Intel® Pentium®-based PC or compatible 1GHz processor (2GHz processor or higher is recommended for design file viewing and markup in addition to site administration), Microsoft Windows XP Professional or Windows 2000, 256MB RAM, VGA video display of 1,024 x 768 or higher, Microsoft Internet Explorer® 5.5 or higher, and a broadband Internet connection (DSL, cable, or equivalent).

### ***Autodesk Constructware***

Autodesk Constructware collaborative project management solution provides dramatic efficiency improvements for the construction industry: first, by helping organizations to standardize and optimize business processes and cost control, and second, by solving communications problems between all project partners involved in the design, construction, and maintenance processes. At the core of the system is a centralized database, which is accessible via the Internet and serves as the single source of project as well as business information.



Constructware offers more than 140 individual modules that are made available to Autodesk's collaborative project management subscribers. Through these modules, Constructware provides centralized communication and workflow collaboration across building project life-cycle stages. Constructware helps with design development including supporting electronic file uploads by authorized users with their Web browser, design reviews and reporting, and online viewing and markup that can be saved within the application for future reference. Constructware also assists with facility operations and maintenance by supporting records of as-built conditions, providing access to warranty and equipment information and archiving facility or project documents for future renovation. Construction job costing and cost control is another key aspect of Constructware for tracking documents for requests for information (RFIs), change orders (COs), and reports. It also has version control so parties can create audit trails of current and previous file versions. Lastly, Constructware facilitates the procurement process by supporting bidding documentation, vendor and bidder contact management, and rating systems.

Constructware, which has been under development since 1994, is a true Web-based application that is used through an Internet connection and a compatible browser. The software is supported on a 32-bit operating system such as Windows 95, 98, NT, 2000, or XP. The recommended hardware is a Pentium-based (or equivalent) workstation or laptop with a minimum of 32MB of RAM. At this point, there are no plans for support of 64-bit processors.

## **FUTURE OUTLOOK**

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### **The Road Ahead: Opportunity for a Joint Buzzsaw and Constructware CPM Offering**

IDC believes that with Buzzsaw and Constructware in its product portfolio, Autodesk now has an opportunity to offer a new, expanded collaborative project management solution that relies on the strengths of the collaboration features of Buzzsaw and the project management features of Constructware. In fact, Autodesk is currently developing a common UI for an enhanced user experience across the products.

Although Autodesk's future product road maps are still developing, IDC recommends that the company would do well to offer several editions of its product lines. While all would share the same easy-to-use collaboration features with email notification and workflow, a basic edition could have access to a limited amount of data storage for the centralized database and relatively basic modular project management capabilities with a focus on ease of use, a basic-plus edition could offer additional vertical modular choices, and a premium edition would offer unlimited access to data storage and more sophisticated project management capabilities with separate modules for team members and project managers and for executives. Autodesk could offer these releases as technology platforms with easy integration of third-party applications to meet more specialized customer requirements, and primary access would be through the software-on-demand delivery model. With this strategy, Autodesk would not abandon its current user base, but it would strengthen its support for both current user groups and it would lay the foundation for future demand-driven industry verticalization.

## **Additional Autodesk Services: Business Process Consulting for Collaborative Project Management**

In Autodesk's early days, when the company's revenue came primarily from single-user AutoCAD sales, consulting was not part of its support services. However, as Autodesk introduces products that touch a larger slice of its customers' business activities, business process consulting is becoming an important part of the company's offerings.

Over the last five years, Autodesk has developed a consulting capability specifically for collaborative project management. This was a change in business strategy for the company that has been instrumental in introducing more complex software products targeted at the AEC market. Autodesk Consulting's CPM practice supports clients during the product selection and request for proposal (RFP) process and also supports them in optimizing the efficiency of their business processes throughout the plan, build, and operate phases of the building life cycle across various industries.

Autodesk Consulting's CPM services team brings specialized industry experience to the table in verticals such as state and local government, oil and gas, home building, commercial real estate, and construction. The group has also developed a methodology for client needs assessments and recommendations. The work is structured as a four-step client engagement process:

- Needs assessment
- Application configuration and integration with in-house applications
- Rollout of Buzzsaw/Constructware to users, including training
- Optimization and maintenance

According to Autodesk, the reception of CPM services has been positive. As of 2006, the group has helped more than 250 clients assess, configure, deploy, and optimize their collaborative project management processes across several industries to improve efficiencies. While there is no information yet on longer-term ROI results, clients agree that they are achieving strong benefits, both tangible and intangible. (See the Case Studies section for more detail.)

Beyond these consulting services, Autodesk Consulting's CPM practice also provides training and implementation programs, which are part of Constructware and Buzzsaw services. These training programs are customized to address the specific needs of the end users. Buzzsaw and Constructware training is available either online or onsite.

Autodesk also offers basic and premier 24 x 7 customer support as part of its on-demand CPM solution. Basic support is part of any software-on-demand purchase. It provides unlimited 24 x 7 Web support, live phone support 12 x 5, and response times of one business day. Premier support offers response times of 2 hours or less and 24 x 7 live phone support. In addition, it includes access to a team of collaborative project management experts and a dedicated technical account manager, who will assure the availability of required services.

## CHALLENGES/OPPORTUNITIES

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### Competition

The construction project life-cycle management market has been around for many years. During that time, it has undergone a number of changes, including proprietary developments by large construction companies for in-house use, complex applications by the likes of Primavera, and toolbox solutions such as Microsoft SharePoint. There can be no question that Autodesk, with its 2006 revenue of \$31.5 million, 900 customers, 200,000+ users, and 82% renewal rate, is in a strong position to grow its market share.

Commercial competition comes from a handful of vendors:

- ☒ Long-term project and portfolio market player Primavera with its Expedition product line
- ☒ Meridian Systems (recently acquired by Trimble) with its Prolog and Proliance product lines that are now focused on owner-operators of retail chains
- ☒ Microsoft with its MS Project for scheduling, requirements, and portfolio management and SharePoint for Web-based collaboration
- ☒ Niche vendors such as Skire, Accruent, Exesite, and AccuBuild, among others

Considering the complexity, geographic dispersion, and longevity of construction projects, IDC recommends that interested customers take a close look at their potential collaborative project management suppliers. They should examine each vendor's customer base and staff, especially with an eye to expertise in specific vertical industries; ensure that the vendor offers a complete, long-term solution to their business issues, not just a short-term point solution; talk to their reference sites regarding return on investment; evaluate client satisfaction; look at their technology and applications partnerships and check their financial stability and future IPO or acquisition plans.

Potential clients should keep in mind that their employees and their supply chain partners will embrace collaborative project management only if it brings obvious benefits to each and every user — from owner-operators down to small subcontractors, and from design firms out to facilities managers — 10 or more years in the future.

No doubt, these are challenging requirements. IDC believes that they can be met only by software providers that are flexible enough to tailor their product features as well as their delivery systems to the ever-changing needs of more than one end-user constituency and that can advise and support their users on a daily basis to assure maximum benefits from the long-term use of these applications.

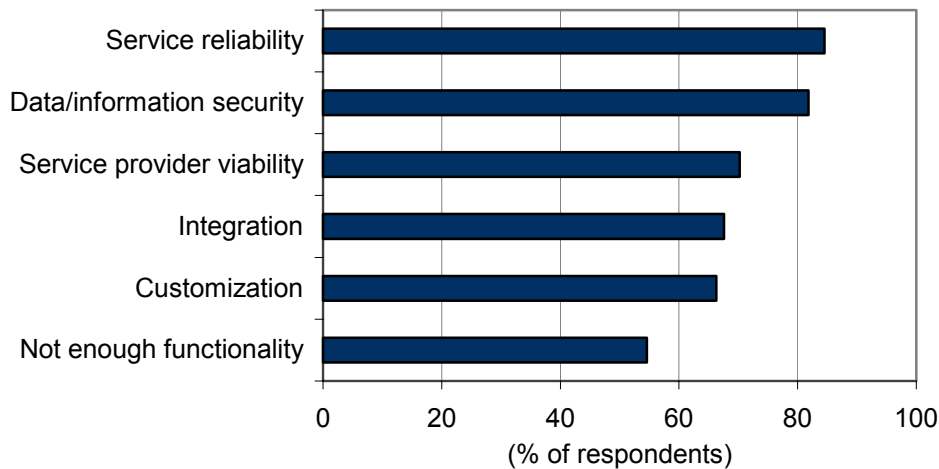
## Software-on-Demand Delivery Model Adoption

With any solution delivered on demand, there are also customer concerns that still exist with the on-demand delivery model itself. Figure 2 highlights some of these customer concerns as indicated in IDC's aforementioned 2006 *Software on Demand Adoption Study*, including those that are more prominent than others in the minds of end users.

**FIGURE 2**

### Customer Concerns with On-Demand Adoption

Q. *How significant a role did each of the following concerns play in your company's decision not to purchase a Software on Demand offering?*



Unweighted n = 17

Source: IDC and *InfoWorld's Software on Demand Adoption Study*, 2006

The first three concerns — reliability of the service, security, and service provider viability — indicate to IDC that customers likely want guarantees and up-front assurances to feel comfortable about moving to an on-demand offering. This could mean that service-level agreements (SLAs) will become particularly important to overall adoption. In the case of Autodesk, the company offers a standard SLA to end customers and also has SLAs with all providers that the company works with in offering and delivering its solutions, including network and datacenter operators, and service providers. Autodesk currently offers 99.9% application availability for its solutions and has partnered with HP to manage its tier 1 datacenter facility, where Autodesk runs and delivers its on-demand offerings.

In terms of service provider viability, Autodesk has been in the software industry for 25 years and has built the brand recognition that customers trust. The company has developed a strong reputation for its solutions and has been seen as bringing innovation to the design and construction project and portfolio management arenas through delivering these software applications via the on-demand delivery model.

Overall, integration, customization, and functionality continue to be a focus for all on-demand providers as they strive to improve their offerings. IDC expects these concerns to subside over time as offerings reach maturity and improve through the rapid release cycles that are characteristic of the on-demand delivery model. With any type of software purchase there will be concerns, but IDC believes that the benefits of the delivery model have been largely recognized and customers are adjusting to the new delivery method.

## CONCLUSION

There is no doubt that Autodesk is on the path to further cement its leading position in the AEC applications marketplace. IDC believes that the company's combination of its current collaborative project management product lines — Buzzsaw and Constructware — onto one platform will enable Autodesk to serve large, medium-sized, and small firms and organizations on a global basis. Its recent move into business consulting for collaborative project management will also open client doors that before had largely remained closed to Autodesk's VAR distribution channel partners.

The three Autodesk customers interviewed for this IDC white paper are on the road to making Autodesk's collaborative project management solution the core of their business operations. The benefits experienced by our case study participants include, but are not limited to, the following:

- ☒ Increased collaboration and access to real-time project information by project participants
- ☒ Quick implementation times and greater control over projects
- ☒ Improved cost savings and the ability to reallocate employees to other areas of the business

In summary, IDC believes that Autodesk's emerging collaborative project management solution will play an important role in solving the major problems of the AEC trade — information sharing and collaboration among external partners as well as those internal to the organizations, greater control of all partners involved in construction projects, and efficiency improvements. As a result, users should achieve better alignment of their corporate goals, greater profitability, and improved client satisfaction.

## CASE STUDIES

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### **Large Commercial Construction Company**

A large commercial construction company with 1,400 employees worldwide is among the largest multimarket builders in the country. The company's operations are divided into four divisions: Military Housing; Healthcare; Secondary Education; and Commercial, with retail, hotels, office buildings, and so on. A Corporate Accounts group does new construction and renovation for banks across the United States. The company has offices in Virginia, North Carolina, Georgia, Florida, and Texas.

The interview respondent IDC spoke with is located in the Atlanta, Georgia, office, which has about 100 employees, excluding people who are temporarily on local job sites but are attached to other divisions. The Atlanta office is focused on building military housing across the United States on Army and Navy bases. The respondent was in charge of introducing the Autodesk Constructware collaborative project management solution to the company's Military Housing division about three years ago. In fact, the respondent used Constructware previously at another company. Currently, the large commercial construction company's Military Housing division has about 500 Constructware users, both internal and external.

When the large commercial construction company decided a year ago to replace its Lotus Notes-based in-house project management applications, which had become hard to maintain and to upgrade, the interview respondent joined the evaluation team for the new solution. This new solution was intended to support the company in addressing the key challenges facing the construction industry in general and the company in particular. For the large commercial construction company overall, which is serving many different markets across large geographic regions, the interview respondent emphasized the importance of sharing real-time information and of collaboration. More specifically, at the corporate management level, the respondent stressed the need to align operations and strategies as the company expands its geographic coverage and to increase revenue through improvements in operational efficiency and productivity.

Once the evaluation team was organized last year to search for a new corporatewide project management solution for the company, the respondent's three years of experience with Constructware at the Military Housing division served as an early pilot. The team's stated goal was to find a project management system with broad functionality that would handle a project from start to finish and align with the company's business practices. In particular, the team was looking for functionalities such as CRM bid solicitation, HR management, risk management, and scheduling. Another important requirement was that there be some history to demonstrate successful integration with other applications, and here specifically with the accounting solution by Oracle/JD Edwards, which in 2007 will replace the current AS/400 system. Furthermore, the interview respondent underlined the importance of flexibility, ease of use, and performance for the final product selection. Overall, the company evaluated products by three vendors and, in the end, found that Constructware was the best match for its requirements.

Next, we asked the respondent about the potential users of the Constructware system. They will come from within the company and are involved at the corporate management level, at project sites, and as support, and they will also come from external partners, such as owners, architects, and subcontractors. Support groups in the Military Housing division are already using Constructware for 95% of their centralized purchasing and for much of their project accounting. The interview participant expects this use to expand corporatewide once JD Edwards accounting has become available. External users in Military Housing such as owners, architects, and subcontractors currently already have access to Constructware for information sharing and collaboration. Beyond that, Autodesk is providing extensions to AutoCAD, which is the practically ubiquitous design tool for architects and construction companies. The company is also planning to expand this corporatewide.

The interview participant describes the new concept of collaboration with access to all real-time project information by all project participants without the need for manual synchronization as a great source of efficiencies; one of the examples is the reduction in turnarounds for architects dealing with RFIs. Beyond that, the ability to track the progress of a project and to flag areas that are not handled within the specified time frames helps the company and its external partners significantly to get better control over their projects at the execution level and to expedite and streamline their processes.

Another area of interest was the fact that Constructware offers an on-demand solution. The two major concerns that were discussed among the evaluation group members were the threat of server crashes and backup security and the question of connectivity at remote jobsite locations.

Now that the decision has been made to go with Constructware companywide, what will be the most likely implementation strategy? Based on the company's many years of Constructware experience, the interview respondent recommends that it start to implement Constructware at all divisions simultaneously, although probably not the entire product. During the Constructware implementation at the company's Military Housing division three years ago, it took about four months to get 100 users up to speed. The upcoming companywide implementation will require support by Autodesk as well as a larger in-house staff.

There can't be a doubt that for the interview participant, Constructware had a strong advocate onsite to promote its adoption. In fact, the company already had its own ROI data from the experience with Constructware at its Military Housing division, where, in the interview participant's words, it had "most definitely" contributed to the company's profitability.

When asked about messages to Autodesk about Constructware, the respondent had only good things to say. Here is a direct quote: "They have always taken what the client has to say really to heart and try to make it work. . . . Anything we've brought to them they've corrected or given us an alternate solution." The latest improvement the interview participant pointed to is the premier support program, where the company's support staff and trainers can directly turn to a higher knowledge level at Autodesk, rather than get elevated through lower levels.

## **Veridian Homes, Madison, Wisconsin**

Our discussion partners at Veridian Homes of Madison, Wisconsin, were as follows:

- ☒ Dan Gorski, vice president of home building services
- ☒ Florence Garcia, traffic coordinator

Veridian Homes, with an office in Madison, Wisconsin, and 106 employees, is focused on residential construction. The company's revenue ranges from \$100 million to \$500 million, and it builds between 450 and 500 homes per year, each at an average price point of \$256,000. The company also builds multifamily homes, which can stretch from two to 12 units per building. Veridian Homes is family run and has been in business for more than 50 years.

Asked about the company's specific market challenges, Dan Gorski explained that Veridian is under pressure to manage the rising cost of materials and to maintain its prices at a level where they are still affordable for home buyers. The company has been trying a couple of different approaches. One is the concept of big box (which provides more square footage at a reasonable price), and the other is to complete homes to the drywall stage only, thereby providing prospective homeowners with the fun of selecting interior finishes such as flooring, fixtures, cabinets, and carpet. Veridian is also working to improve its own operations and internal efficiencies. Its purchasing team is striving to maintain costs and to improve processes and productivity, and it collaborates closely with its trade partners to improve scheduling and to shorten cycle times. A normal cycle time per home is now 59 days, from framing to closing. With the goal of faster, better collaboration, Veridian started to use Autodesk Buzzsaw 2 1/2 years ago. Today, all of its 80 partners are now getting their information from Veridian through Buzzsaw. In fact, when partners sign on with Veridian, Buzzsaw is part of the agreement.

Like many smaller construction companies, Veridian originally relied on telephone, fax, and courier to distribute design plans, specifications, and building permits to its trade partners. This was the job of 4 1/2 employees in the "traffic department." Two and a half years ago, Veridian began looking for a more efficient way to handle this job. Gorski described the purchasing process as follows:

We first learned about Buzzsaw because we were Autodesk customers and users of AutoCAD LT and Revit. Once we found out what it could do for Veridian and how easy it was for the team to use we went with it. I've been an avid Autodesk fan, so we did not do a lot of shopping or comparing. I trust the product; I trusted AutoCAD and other Autodesk products. The final purchase decision was made by the owners and senior managers, after a product presentation and discussion of the pros and cons of the system. Our evaluation is based on the up-front cost and return on investment. Initially, our IT department was somewhat reluctant to bring in an outside vendor, as they develop most of the company's software programs internally. Because Buzzsaw was hosted outside of our firewall, they were a bit leery. However, I believe the Autodesk representative was a key component in helping to overcome the reservations of our IT team. In fact, in the end, IT helped us get started.



At this point, Veridian has two people rather than four doing the job of the former traffic department, and it has been able to add responsibilities to the department. The initial investment began to pay off at the end of the first year. Overall, the traffic department is fairly self-sufficient from the IT standpoint. In the 2 1/2 years that it has been using Buzzsaw as hosted by Autodesk, it has had one day when the system went down for a couple of hours, but that was nationwide, not even a Buzzsaw problem. And the Autodesk support group notified Veridian about the outage. At this point, Veridian has between 120 and 130 internal and external Buzzsaw users and relies on three site administrators in its office.

Florence Garcia was the individual in charge of this process and is now the go-to person for internal and external users. She describes the start-up process as follows:

It took three months to roll out Buzzsaw and to get all 130 trade teams on board. The traffic department was in charge of the implementation. To do this, they developed the plan; collected the user data like email addresses, etc.; set up the computers; and did the training. We started by testing the implementation plan with two larger trade partners, which created a successful environment and helped spread the word throughout the field. Veridian also set up a trade partner advisory council, which was also attended by local Autodesk representatives. Beyond that, Veridian is now organizing user conferences to explore and share Buzzsaw success stories to which Autodesk representatives are invited. After these initial successes, we gradually brought the rest of our trade partners onboard. Some trade partners didn't even own a computer before we implemented Buzzsaw, but they are now up and running.

Clearly, one important success factor was the fact that Garcia provides the trade partners with a contact person who is always available to answer questions and who is committed to keeping the system going. Gorski adds that Garcia had no background in the computer world before Buzzsaw but that she was able to acquire the necessary skills with some initial training.

And how do the users evaluate Buzzsaw? Garcia recently set up two appraisers, who used to work from paper plans and specifications and who had to come to the office repeatedly to pick up the documentation for their work. They are now using the Buzzsaw community folders to get their plans and specifications. Garcia says, "They find it easy to use and self-explanatory to install on their end. They get up and running in one day and they love it."

Buzzsaw users at Veridian are actually the external trade partners, but the traffic department uses it internally for the distribution of the documents. When Veridian first rolled out Buzzsaw, Gorski would go in every other day to confirm that people were not bypassing the system. He also wanted to make sure that they had enough memory space. Now things are going so well that he doesn't need to conduct these checks. Asked who else uses the system, Gorski explains that senior management does not use it, "not because they don't want to, but because it isn't applicable to them in the way we use it today." According to Garcia, Veridian's trade

partners are raving about Buzzsaw: "Whenever they need their plans or documents, Veridian's traffic department distributes them, and they print them on their end. They have everything right there at their fingertips when they need it."

Lessons learned, according to Gorski, are twofold: "First, use Autodesk help not just to educate the users but to provide real-life stories about the benefits of the system. Second, keep the time between training and the start-up of the systems as short as possible so that users don't forget the instructions in the meantime." One recommendation to Autodesk is to provide better explanations as to how the Buzzsaw hosting costs are calculated.

At this point, Veridian would like to find out how other people are using Buzzsaw and to use more applications to help its business. Veridian discussed changing to Autodesk Constructware, but there is no internal demand as of yet for more applications.

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### **Wimberly Allison Tong & Goo, Irvine, California**

Our discussion partners at Wimberly Allison Tong & Goo (WATG) in Irvine, California, were as follows:

- ☒ Lawrence M. Rocha, senior vice president and chief information officer
- ☒ Daniel Polkinhorn, corporate CAD manager

WATG describes itself as the fourth-largest architectural design firm in the United States and has been in business for more than 55 years. The company has 450 employees and operates international offices in London and Singapore, in addition to its four U.S. offices in Orlando, Florida; Seattle, Washington; Honolulu, Hawaii; and Irvine, California. The company's headquarters are located in Irvine, California. Its architectural work serves primarily the hospitality, entertainment, and leisure markets with resort hotels, casinos, and spas. WATG has worked in more than 80 countries around the world and is quite active in the Middle East and China. Among its especially notable achievements are Hotel Bora Bora and the Venetian Hotel Casino in Las Vegas.

When asked about the company's specific market challenges, WATG's Larry Rocha lists integration and supply chain management in a very fragmented industry. "Owners, contractors, and designers make up the three main areas of our market," he says. "Design teams and builder teams are heading dozens if not hundreds of subcontractors. So integrating and sharing information and achieving continuity and consistency across that sort of a supply chain is one of our biggest challenges."

The biggest strategic initiative for WATG is the effort to develop and strengthen the company's role as a trusted advisor to the owners and not only to integrate the design team but also to act as a consultant and aggregator of construction services and construction team management.

The specific business challenges that led to the company's adoption of Autodesk Buzzsaw for project management started with the Venetian Casino project in Las Vegas, where information dissemination to the various project teams turned out to be a huge challenge. WATG required a full-time person responsible for nothing else but assembling information and getting it to the design team and its consultants, having them return it, and then aggregating it so WATG could manage it. In fact, Rocha believes that WATG was one of Buzzsaw's first customers. Before adopting Buzzsaw for project management, WATG used a product called Blue-Line OnLine, which now, after a number of mergers and acquisitions, lives on as CITADON. Simultaneously, WATG worked with Autodesk on the development of what came to be known as Buzzsaw. WATG did not complete a formal competitive evaluation but did see other project management systems in the market.

The final gravitation to Buzzsaw as the company standard for WATG was made as a team by WATG's account managers, and it was implemented by an in-house team. To quote Rocha: "We selected Buzzsaw because of its ease of use and its industry acceptance. WATG's project teams are using Buzzsaw as the primary way of disseminating information with external partners. Buzzsaw is the central portal for posting and retrieving information that the project teams share — design information, scheduling, etc. Consultants use it the same way — to post information that they want us to have and to retrieve information that we make available to them." Buzzsaw is now used on almost every project. The company has about 20 employees who can administer Buzzsaw. As Daniel Polkinhorn puts it: "It is so easy that it does not require day-to-day management."

When asked about the benefits WATG derives from using Buzzsaw, Rocha is quite emphatic about its efficiency and profitability. He explained: "Buzzsaw allows us to share information with our internal design team, our external design team, our clients and contractors. We manage that by using the logs and the automated processes that Buzzsaw provides. We are now using Buzzsaw for information sharing between all of our offices." Polkinhorn adds, "Security is a big issue — security not only from the outside world but security for external team members as well."

Savings from Buzzsaw come from not having to copy and ship documents to the design teams, either as printed documents or as electronic media. Rocha could not give a precise dollar number but used the example that, on the Venetian project, WATG worked with 23 consultants. It copied and sent out information every two weeks, something that is no longer required on most projects. Beyond that, using Buzzsaw for document dissemination gives WATG greater control over projects and provides traceability of what the company did and when, and what its project partners did or did not do. WATG now has about 800 users on Buzzsaw, 200 in-house and 600 from outside consultants and contractors.

Rocha stresses that WATG has benefited from a fairly close relationship with Autodesk over the years. However, he is concerned that WATG as a design-only firm and the acquisition of Constructware have the potential to dilute Autodesk's attention or focus on the design side of the market in order to capture a larger market share by adding construction. This is a concern that Autodesk has acknowledged.

## DEFINITIONS

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### Software on Demand

IDC considers software on demand a delivery model for software acquisition and therefore not a discrete market. Software on demand is characterized by the software, services, and support offerings that are specifically built and designed for one-to-many delivery over the Internet. Software-on-demand providers typically embrace a Web services architecture strategy, and customers share the same public infrastructure. The following are defining characteristics of software on demand:

- ☒ **Software.** Software is built specifically for network delivery and is not deployed in-house. Some software-on-demand providers offer an offline module to complement their core online solution.
- ☒ **Pricing.** Software license and hosting revenue is combined into one annuity stream whereby the software license and hosting fees cannot be differentiated. There is typically no up-front licensing fee associated with the on-demand offering.
- ☒ **Flexibility.** There is little or no customization of the application apart from limited configuration that is allowed by the application provider.

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