AECbytes Feature (February 19, 2009)

Collaboration, Project Management, and Project Information Management Solutions in AEC

There can be little doubt that, by now, BIM has become firmly established as a critical technology in the AEC industry. However, BIM deployment by itself is not sufficient to successfully execute and complete building projects while meeting the demands for efficient processes, fast-track design and construction, minimizing waste and construction errors, sustainable design, higher quality buildings, less budget over-runs, and so many others. In particular, with the growing push for IPD (integrated project delivery), BIM cannot deliver on it alone, and it needs to be supplemented with tools for better collaboration, project management, and project information management. This article provides an overview of some of the established and upcoming solutions that belong in this category of applications, as listed in AECbytes VendorHub. They include the server-based Newforma Project Center, the web-based Attolist, and the SharePoint-based Organice.

Newforma Project Center

In a short span of less than four years since it was first launched, Newforma Project Center has succeeded in establishing itself as one of the fastest-growing applications in the AEC industry. It is now deployed in 61 of the top 300 A/E/C firms, with over 28,000 seats under license and 120,000 projects being managed with it, along with a growing international presence and expanding list of partners and resellers. Newforma can also take credit for coining a new term, "project information management" or "PIM," to better describe what it does. While not everyone might care for yet another IM-based acronym (recall the debate we had over the acronym BIM in the early days of its history), we will see that the term is catching on with other applications as well.

A detailed overview of the repertoire and capabilities of Newforma Project Center was captured in its first review in AECbytes published in 2007, and last year, we looked at the enhancements for contract administration and project monitoring that were introduced in the Fifth Edition. Newforma has just released the Sixth Edition of the application, which includes several customer-requested enhancements and, at the same time, focuses on improving two increasingly critical aspects of AEC practice: LEED certification administration for sustainable design, and digital workflows in BIM design processes. According to research done on the LEED certification process, the certification documentation takes an average of 226 work hours, and the costs range from $8,000 and $70,000 per project, with the cost of the first LEED project ranging from $30,000 to $60,000. Newforma Project Center Sixth Edition has several features that can help to reduce these costs and make the process more efficient, including the ability to clearly assign LEED roles and responsibilities, capture tasks as action items, easily file incoming email to the appropriate action item, and conveniently re-assign action items for follow-up via email notifications. The current status of a LEED-related action item can be seen at all times, and reports can be quickly generated to keep all team members informed. Action items can now be associated with milestones in the project timeline (see Figure 1), allowing more efficient execution of LEED-related processes.

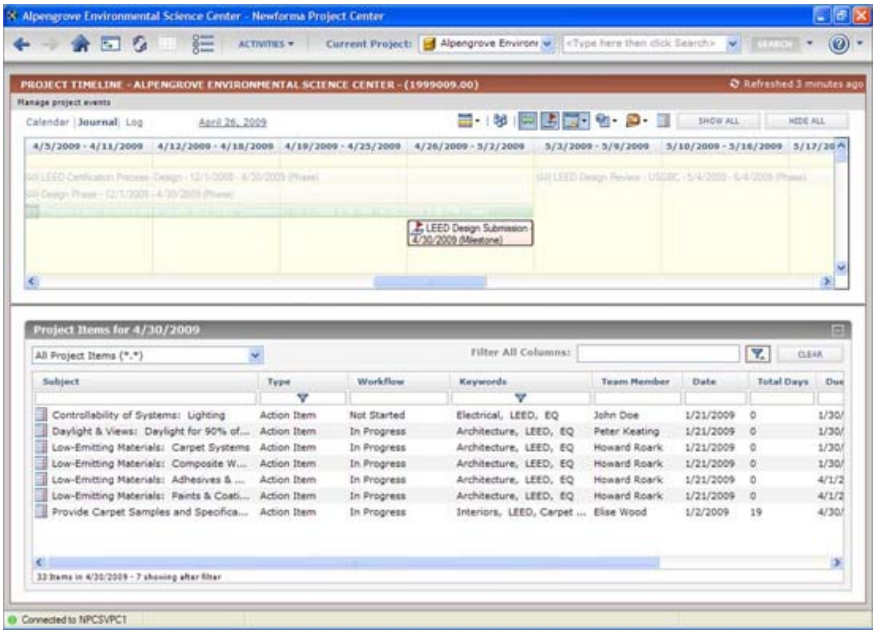

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Figure 1. The new ability to associate an action item with a milestone in the Project Timeline makes it helpful to schedule and execute LEED-related tasks in Newforma Project Center. (Courtesy: Newforma)

With respect to model-based design processes, Newforma's premise is that project information management is an important complement to BIM. With purpose-built models distributed among many disciplines, the volume and complexity of information moving among project team members is only increasing, forcing project team members to manage it more effectively. For example, even if the traditional drawing-based RFIs become a thing of the past, questions related to the model will still need to be asked and design changes will still need to be communicated. In fact, given that design and construction decisions need to be made earlier and more collaboratively, the expedient flow of information between the team members is more critical than ever before. To this end, the new release of Newforma Project Center includes several enhancements in the Markup Session Activity Center. You can view and incorporate markups created in other applications such as Adobe, Bluebeam, and Autodesk Design Review. The new release also includes support for markups created using the paper-to-digital technology of Adapx. DWF files can be directly opened in the Newforma Viewer and searched to find objects with specific properties (see Figure 2).

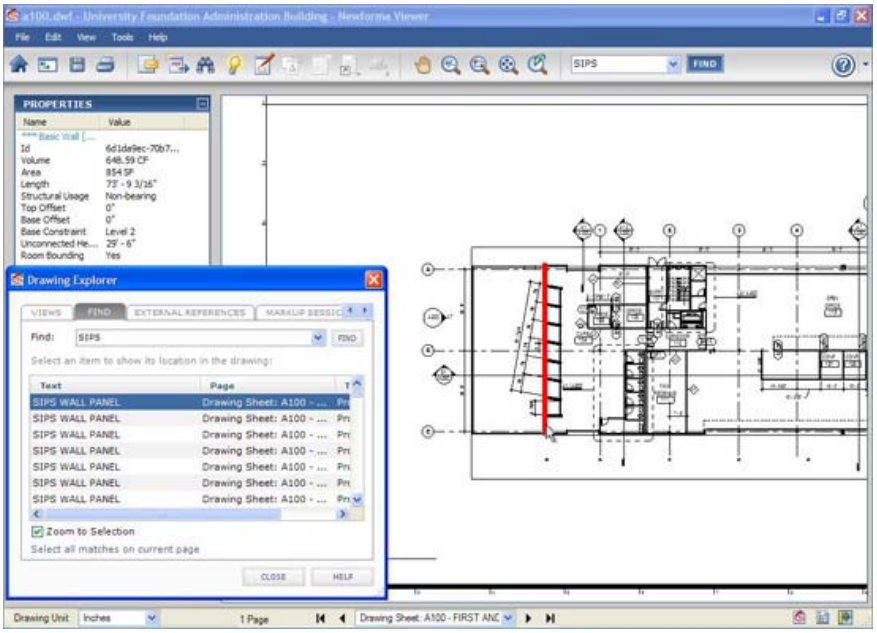

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Figure 2. Directly opening a DWF file in the Newforma Viewer, searching for objects with a specific property,

and viewing a specific instance of the results. (Courtesy: Newforma)

Newforma's Info Exchange, which allows project information to be shared with external team members, has also been significantly enhanced in the Sixth Edition with easier republishing of files (see Figure 3), email notification to team members to download the updates, and better traceability and accountability of information flow. Coordination review drawings published through Info Exchange can be compared to previously issued drawings using the Compare functionality to ensure that there are no unforeseen changes to the design.

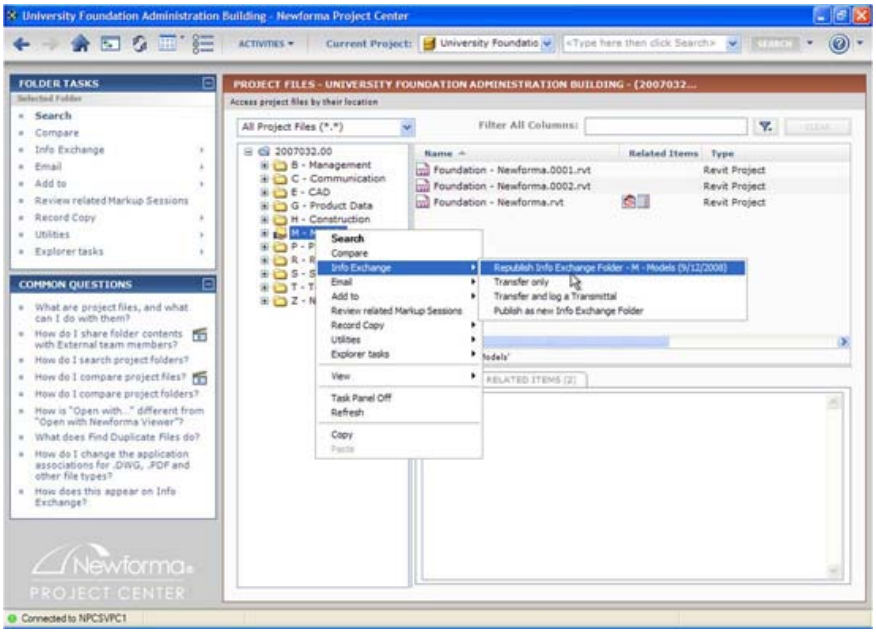

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Figure 3. Updated files being republished to the Info Exchange folder to be shared with external team members. (Courtesy: Newforma)

Attolist

Attolist is a new web-based solution for document management, construction administration, and project information management (the Newforma coined term) that made its debut at the 2008 AIA National Convention (see AECbytes Newsletter #34). At that time, it was primarily focused on construction administration (CA), allowing architects to collaborate online with engineers, contractors, and owners by tracking all the various documents involved in the CA process including submittals, submittal schedules, RFIs, Sheet-Specification Index, CCDs, ASIs, PRs, Change Orders, and Addenda (see Figure 4). The scope of the application has now been extended to cover more aspects of workflow automation and collaboration, with the intent to facilitate the growing move towards integrated project delivery in the AEC industry.

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Figure 4. Attolist's Submittals dashboard, showing an overview of open submittals and the overall submittals statistics. (Courtesy: Attolist)

The document management capability of Attolist allows all the project documents to be organized in a single repository, retaining a history of the project from conceptual design through as-builts (see Figure 5). It also includes version control, enabling the team to work with the most current information. There is a File Transfer application integrated with the application that team members can use to easily upload and share documents (see Figure 6). It is also sold separately as an independent application. In addition to enabling project files to be uploaded to the central project repository, it also allows files to be directly emailed to others or sent as a password protected weblink with a time limit set for download. This is useful for exchanging files that don't need to be part of the central project repository.

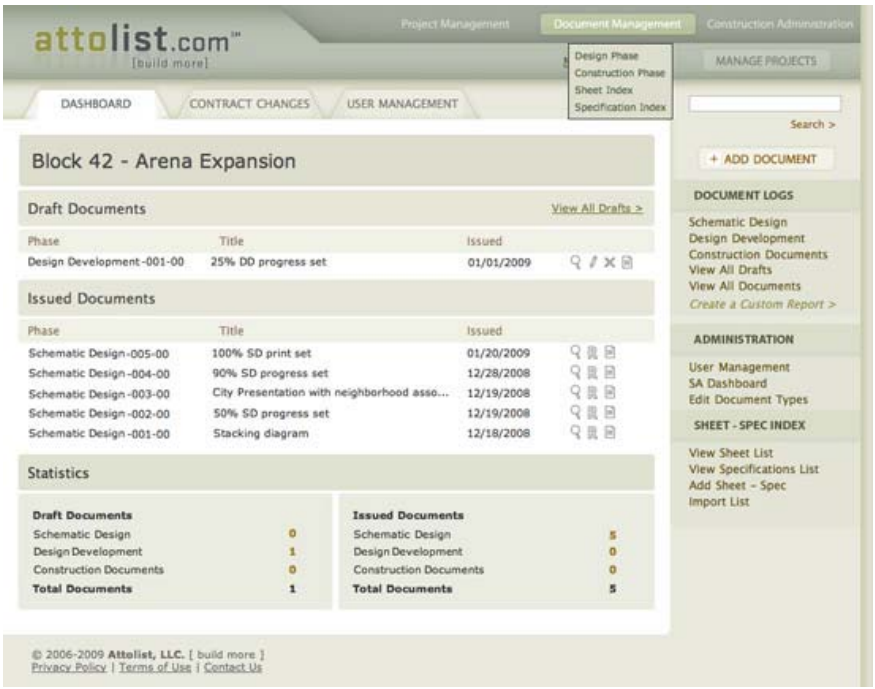

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Figure 5. Attolist's Document Management interface, showing the various draft and issued documents in a project. (Courtesy: Attolist)

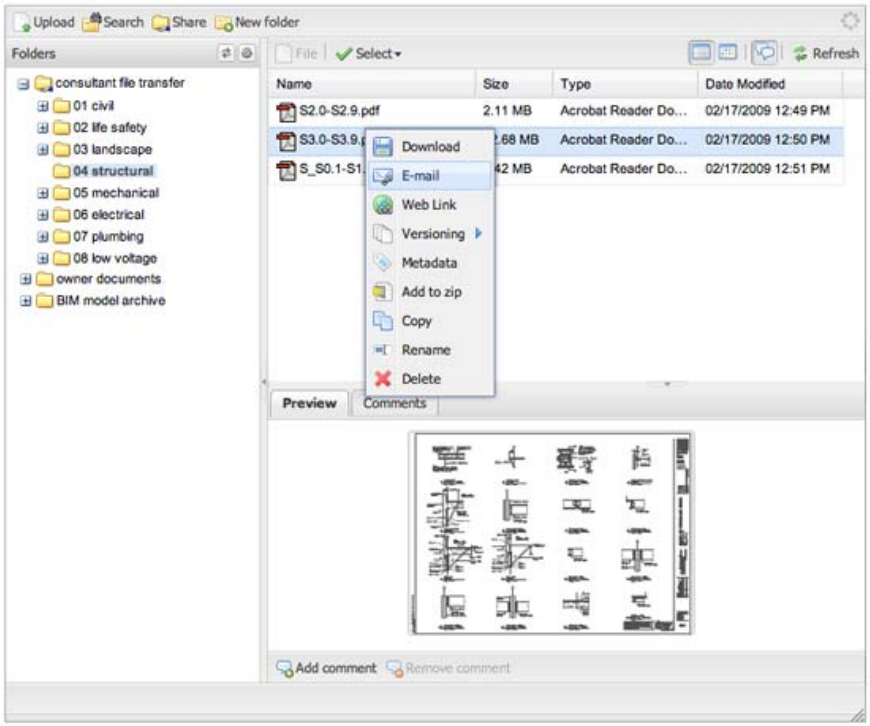

Figure 6. Attolist's File Transfer application that can be used for conveniently uploading and sharing files. (Courtesy: Attolist)

The project management interface of the application allows tasks lists to be generated for any user, with automated email notifications to inform team members of tasks. Anyone linked to the project can view and post information and see the lists of open and closed items, enabling transparency and better accountability. In addition to tasks assigned collectively, individual users can create their own to-do lists in the system which can be viewed only by them. The project administrator can set up deadlines and milestones with a Gantt chart to help keep the team up-to-

date and on schedule. Attolist does not currently have a built-in viewer and markup capability for drawings, but these are in development and expected to be available very soon. The company is also working on ways to enable sharing of BIM models, which should be forthcoming as well. Attolist will be demonstrating these enhancements at the upcoming AIA Convention in April.

Where Attolist differs fundamentally from Newforma Project Center is in its approach to project management and collaboration. While Newforma resides on a company's server and allows team members to continue to use their individual email applications extensively for project-related communication, Attolist is decidedly a web-based application where all the data is centrally located in the "cloud" and team members use the Attolist interface to access data and communicate with each other. This raises the question of why this approach should succeed now, when it did not during the dot-com boom and bust of the late 90's and early 2000's—so many AEC collaboration dot-coms had been started then, but most of them did not eventually survive. In response to this, Attolist counters that in the dot-com days, most of the workflows were still paper-based, which is why the digital approach didn't quite take off. However, most of the information in AEC now is produced and distributed in electronic form, so a web-based collaboration solution has a much greater chance of success than the ill-fated dot-coms of a decade ago. Moreover, web-based technology has evolved dramatically with better bandwidth availability, with leading companies such as Google and Microsoft working hard to making cloud computing work, and an increasing number of Web 2.0 companies with SaaS (software as a service) business models. Attolist is also keeping its pricing low in order to attract small and medium size firms which might find other solutions too expensive. Unlike competing web-based solutions such as Buzzsaw that charge based on the amount of information that is stored, Attolist is priced based on projects only, irrespective of the number of users or the amount of information that is stored. It has two pricing options: a monthly fixed fee for a single project, or an annual billing for unlimited use.

Organice

Organice is a suite of solutions for engineering document management, document control, and project collaboration that is fully based on Microsoft SharePoint. It has been developed by Cadac Organice, a 20-year old software company based in Europe and North America that develops design automation, management, and collaboration solutions for project driven industries such as AEC, Process, and Manufacturing. Microsoft's SharePoint is widely regarding as the world's leading collaboration platform, providing an integrated suite of server capabilities for developing all the web-based applications required by a firm, including Intranet, Internet, and Extranet, and a central repository for shared workspaces and documents. However, it is not an AEC-specific solution, which makes the process of deploying it a complicated process for the average AEC firm. There is where a solution like Organice comes in, which takes the powerful collaboration capabilities of SharePoint and customizes it for the AEC and related industries, making it a lot easier to deploy. The company is a Microsoft Gold Certified Partner and also partners with leading AEC technology vendors such as Autodesk and Bentley to integrate their applications into its SharePoint-based collaboration solution.

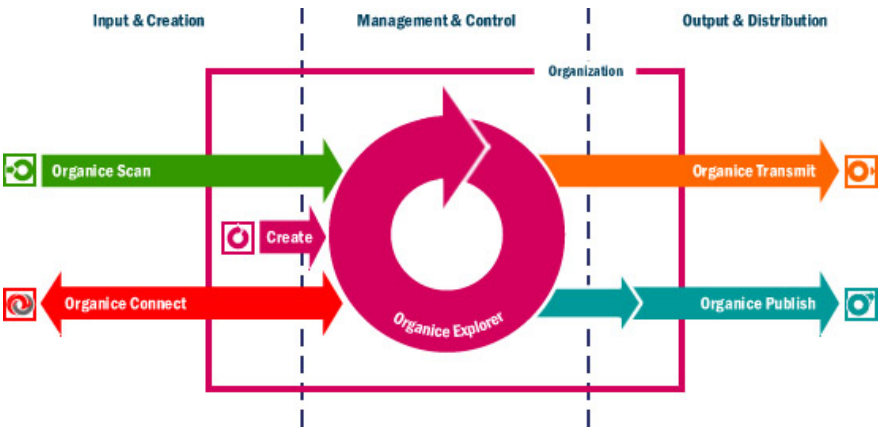

Figure 7. A diagram showing how the different Organice applications work together in the product suite. (Courtesy: Cadac Organice)

The Organice product suite comprises several different applications that work together, as shown in Figure 7. The central application is Organice Explorer, which provides all the fundamental document management functionality to create, store, search, retrieve, view, check in, check out, edit and revise documents. The user interface has a Microsoft Outlook look and feel, making it easy to learn and use. It integrates with Microsoft Office, Outlook, and various CAD applications, including AutoCAD, BricsCad, Revit and MicroStation, enabling these files to be opened directly from SharePoint and saved back to it. It also installs an Organice toolbar within the CAD application, making document management easier and more intuitive for users. So, for instance, in Revit, the Organice toolbar allows RVT and RFA files that are stored in SharePoint to be easily retrieved and directly opened in Revit (see Figure 8), as well as save and store new or revised

Revit RVT and RFA files directly into the SharePoint document environment. Organice also supports the “load family” function in Revit, with which all the components that belong to a family and that are stored in SharePoint can be loaded into Revit in one step.

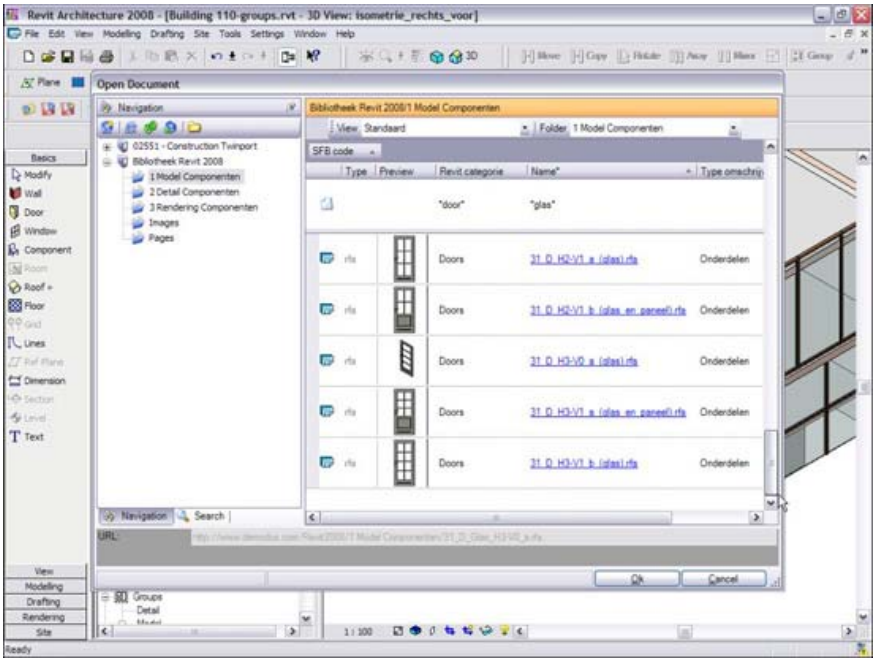

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Figure 8. Open a Revit family using the Organice Explorer interface. (Courtesy: Cadac Organice)

For applications such as AutoCAD, the Organice Explorer provides full support for reference files (Xrefs), blocks, and images, and mapping of SharePoint metadata into CAD attributes such as the ones contained in title-blocks. There is also an integrated viewer through which users can open, view and redline all documents, even if they do not have access to the native application (see Figure 9).

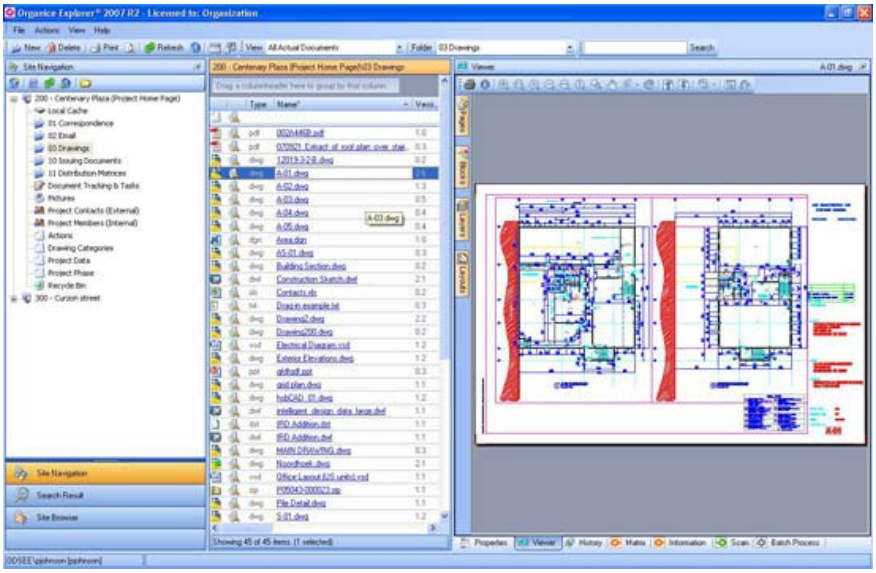

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Figure 9. The integrated Viewer in Organice Explorer. (Courtesy: Cadac Organice)

Moving on to the other applications in the Organice product suite, Organice Scan allows incoming correspondence and other hardcopy documents to be scanned and stored into the SharePoint document environment, making all documents centrally and digitally available to all users. It can be used in combination with any scanning device, including small format and wide format scanners, standalone scanners and multifunctional devices. Organice Transmit is used for distributing multiple documents efficiently to multiple recipients at once and offers management

information to document controllers who need to keep track of transmittals. A distribution matrix specifies exactly which recipient needs to receive which documents, and how many (see Figure 10), and a distribution tracking list in SharePoint keeps track of who received what and when. When documents are updated, Organice Transmit automatically notifies the document controller which recipient needs to receive the updated documents.

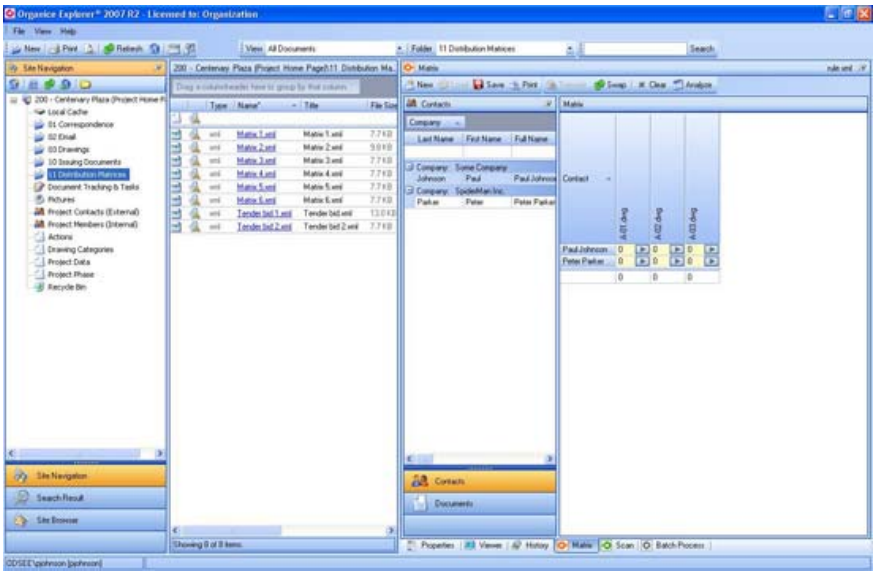

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Figure 10. A document distribution matrix in Organice that specifies the exact documents that a recipient needs to receive. (Courtesy: Cadac Organice)

The Organice Publish application can publish documents that are stored in SharePoint, either in their native format, or by converting into PDF, so that they can easily be opened, viewed and annotated by others without the native application. Published documents can be easily distributed, accurately printed, and securely archived for many years. The application can be initiated at any time through a custom SharePoint workflow, for instance to publish documents to any document library or SharePoint site for distribution, printing, archiving, or to an extranet for external access. And finally, the Organice Connect application includes a family of connectors that allow the Organice/SharePoint environment to be integrated with other third party business applications used by the firm such as ERP.

Conclusions

We have looked at three applications with widely differing approaches to addressing the collaboration, project management, and project information management needs of the AEC industry. Despite the differences between them, all of these applications are aimed towards better information sharing, better accountability, more transparency, less redundancy, and less duplication of content. This is also true of the many other AEC-specific solutions for collaboration and project management that are available in addition to those discussed in this article, including Bentley's ProjectWise, Autodesk's Buzzsaw and Constructware, CADworks' WebAxis, and others. Implementing any of them should help a firm streamline operations and processes, operate with greater efficiency, and collaborate more effectively with external team members. While some firms might not still see this as an immediate pain point that needs to be addressed, it is going to become increasingly mission-critical as IPD (integrated project delivery) gains momentum in AEC practice, since you cannot have integration without effective collaboration and information sharing tools. None of the solutions discussed in this article are actually integrated with BIM yet, but their developers are aware of this need and are working towards it. Once this integration is achieved, the AEC industry should see dramatic benefits from the combination of an intelligent, model-based design and construction process and an equally intelligent, model-based collaboration and project management process.

About the Author

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