iPad Apps for AEC: Project Management and Construction

Earlier this month, I published my first take on the growing number of iPad apps that are being developed for the building industry. That article focused on apps primarily intended for design and visualization and included an overview of Graphisoft's BIMx app for iPad, Autodesk's new cloud strategy and the Autodesk Design Review app, the iVisit 3D app from the developer of Artlantis, and finally, the Inception app from Architactile, a new software developer. For all these apps, I downloaded them from the iTunes store on my iPad and used them with sample files or models to see how they worked. That article also included my personal experience with the iPad, and raised the question of when the iPad will go beyond being seen as a "toy" and regarded as a serious business tool by AEC professionals. This was especially true for apps such as Inception that were not developed by traditional software vendors as companion products for their regular software applications and were therefore not "free," as most apps in the iPad universe tend to be.
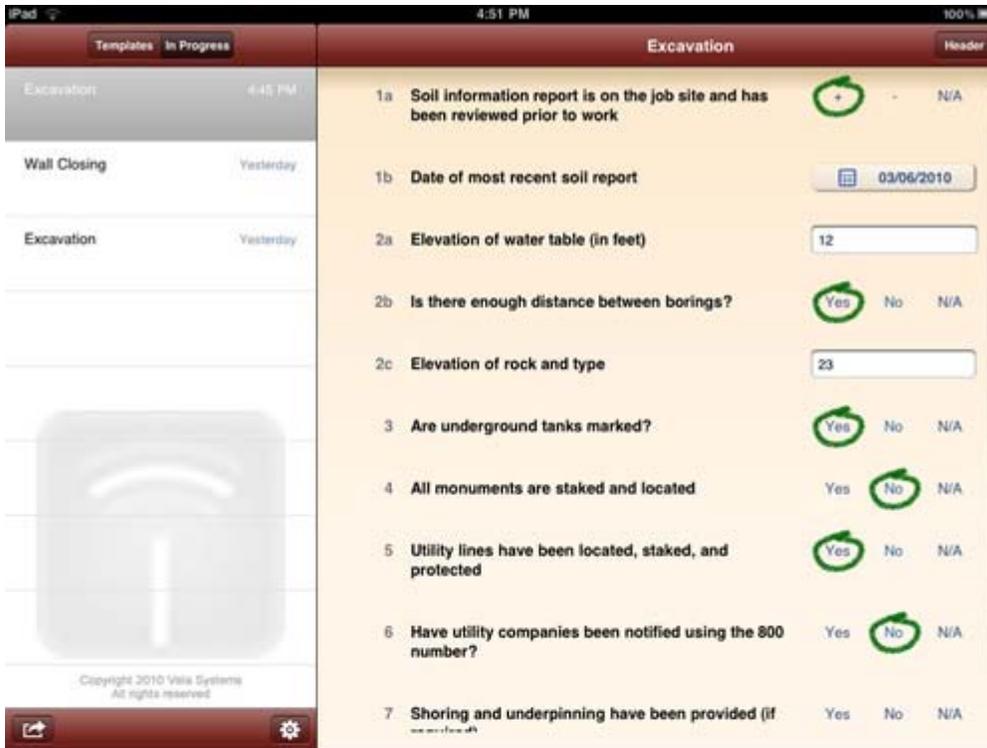
This article is focused on apps that are available for project management and construction in the AEC industry. While many of the apps covered in my last article can also be used by construction professionals, there are several additional apps developed specifically for construction. Vendors such as Vela Systems—which develops field management software for construction—was one of the first to have an iPad app among its products. In the summer, Bentley showed me iPad apps for its Navigator and ProjectWise applications, Autodesk has unveiled apps for its Buzzsaw and BlueStreak applications as part of its recent cloud strategy, and Newforma has just announced its first app for punch lists. I also became aware of other apps for construction: Onsite:AEC and SafetyNet. It seems as though the mobility factor makes tablets more convenient in the construction phase of a project, allowing site professionals to view and mark up drawings, view 3D models, file issues, reports and photographs, if necessary, and generally keep in touch and get access to the most up-to-date project information. Let's take a closer look at these apps and see what they do.

Vela Systems Mobile iPad App

Vela Systems is a construction-specific technology vendor which develops a range of construction field software focused specifically on field operations, covering tasks such as materials tracking, work lists, punch lists, field report, quality control and quality assurance, and commissioning. Its technology comes from the result of

research into mobile software for the AECO industry at the MIT Center for Real Estate and the Harvard Graduate School of Design, and is intended to apply the best practices in mobile information technologies to address the key pain points in our industry. It develops a Field Management software suite that helps to streamline and accelerate the field administration process by replacing traditional field notebooks, paper plans and clipboards. The suite comprises four applications: Vela Web; Vela Mobile, Vela Reports, and Vela Field BIM. Field BIM refers to the bi-directional integration that Vela Systems has developed with applications such as Autodesk NavisWorks and Tekla Structures, so that the usefulness of the information created in a BIM model can be brought into the Vela Systems software and used for the different field processes.

Given its focus on mobile technologies, Vela Systems was one of the first vendors to develop an iPad app for construction. This is the Vela Mobile iPad app, and it enables construction professionals to leverage the features of Vela Field Management anywhere on the job site. The app, which can be downloaded from the iTunes App store for free if you are an existing Vela Field Management user, includes a document library, checklists for QA/QC, safety and commissioning, and issue creation/sign off for tracking any issues (including work-to-complete or punch list issues) while walking in the field. The user interface of the app is simple, and the touch screen makes it as easy to use as paper. You can also view drawings or models on it, if required, as shown in Figure 1. The app can run without an Internet connection. When an Internet connection becomes available, users can upload the data they have collected with the iPad app to the main Vela Field Management suite and share it across the project.

iPad 📶   4:51 PM   100% 🔋

Templates | In Progress   Excavation   Header

Excavation		4:45 PM
Wall Closing		Yesterday
Excavation		Yesterday

1a Soil information report is on the job site and has been reviewed prior to work   +   -   N/A

1b Date of most recent soil report   📅 03/06/2010

2a Elevation of water table (in feet)   12

2b Is there enough distance between borings?   Yes   No   N/A

2c Elevation of rock and type   23

3 Are underground tanks marked?   Yes   No   N/A

4 All monuments are staked and located   Yes   No   N/A

5 Utility lines have been located, staked, and protected   Yes   No   N/A

6 Have utility companies been notified using the 800 number?   Yes   No   N/A

7 Shoring and underpinning have been provided (if required?)   Yes   No   N/A

Larger image

Figure 1. The Vela Mobile iPad app, which allows AEC site professionals to record site conditions (top image), and recently includes BIM model neutral viewing and interaction capabilities (lower image).

Bentley Navigator and ProjectWise Apps

Bentley showed me iPad apps for its ProjectWise and Navigator applications earlier this year at the AIA 2011 Convention. Recall that ProjectWise is Bentley's platform for project management and collaboration, while its Navigator application is used for navigating, viewing, and marking up models, making it a competitor to Autodesk Navisworks for those who prefer to stay on the Bentley platform. Both the ProjectWise and Navigator apps are extensions of its desktop ProjectWise platform, extending its core concept of project sharing, flexible publishing, and dynamic review to the iPad. From their office, Bentley users can author documents, package them together, and transfer them to the iPad. On site, they can view those documents on the iPad, review their properties, and mark up as needed. They can also be repackaged and synchronized with their work on their desktop in the office. Figure 2 shows a document set for a sample project being accessed and viewed in the ProjectWise app on the iPad.
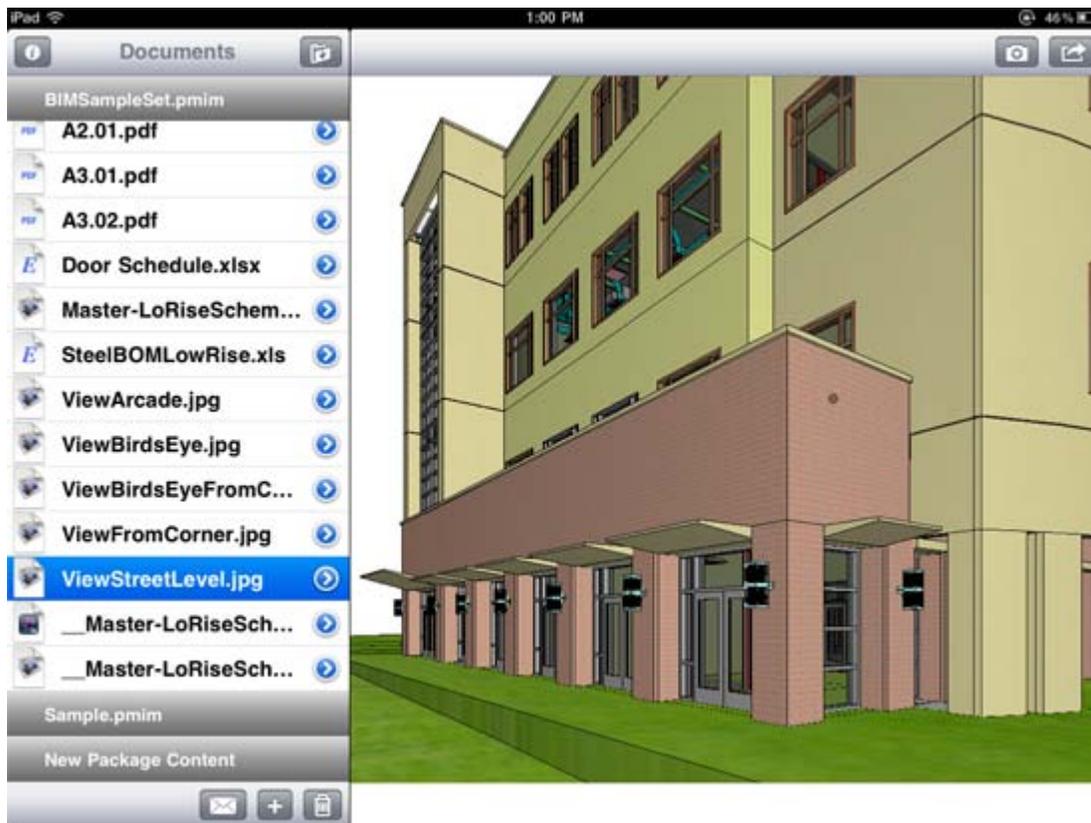
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Figure 2. Viewing an image file from the document set of a sample project in Bentley's ProjectWise app.

Figure 3 shows a sample 3D model being viewed and navigated in the Navigator app. It allows a 360-degree panoramic view of the model, and the ability to add redlines and markups. However, in contrast to Graphisoft's BIMx app, the navigation controls for navigating the 3D model in Bentley's Navigator app seem quite rudimentary. It does not even have the ability to select an object and view its properties, which is so helpful in Autodesk's Design Review app.

Figure 3. Navigating a 3D sample model in Bentley's Navigator app.

Bentley's apps are intended to be used with its "iWare apps" that can be downloaded and used to create optimized i-models (called "maps") and i-model packages that can then be viewed with the apps. The i-model was introduced by Bentley at its 2009 Be Inspired event as a "container for open infrastructure information exchange." Bentley has subsequently used the i-model technology to promote open collaboration, such as the Revit plug-in it showed at the Revit Technology Conference earlier this summer, which allows a Revit model to be saved as an i-model and subsequently opened in MicroStation, Navigator, and other Bentley building products, retaining the Revit properties information from the Revit model. These i-models cannot be directly viewed on the iPad; they need to be optimized for iPad viewing, which is where the "iWare apps" come in. I did not get a chance to try these out, and instead relied on Bentley to send me the optimized i-models that I could view on the iPad. I really

missed the ease with which I could access content on a cloud, such as the Autodesk cloud described in my [last article](#). Instead of a cloud, Bentley relies on external applications like dropbox, email, or iTunes to get project data on the iPad, which I did not find very convenient.

Autodesk Buzzsaw and Bluestreak Apps

In addition to the Design Review app that I described in my last article, Autodesk has also introduced apps for Buzzsaw and Bluestreak as part of its "cloud strategy" that it unveiled in early October. Recall that this provides free cloud storage to Autodesk users for drawings, models, and other documents, which can be used to access these files from any platform and which can also be used for sharing and collaboration. In contrast to the general cloud access which requires an individual Autodesk ID, the Buzzsaw app is tied to the Buzzsaw desktop application and uses the Buzzsaw login credentials, project information, and permission settings. Essentially, it allows the information in Buzzsaw to be accessed from anywhere using an iPad (or iPhone), enabling project teams to view and exchange project information from the field, similar to Bentley's ProjectWise app. The Buzzsaw app allows viewing of DWF, PDF, image, and standard office files, as shown in Figure 4, where a 3D DWF file is being viewed using the Buzzsaw app on the iPad. You can also take photos with the iPad's camera and upload them so that they are part of the project. If you have the AutoCAD WS app installed, you can use it to view and edit DWG files managed on Buzzsaw.
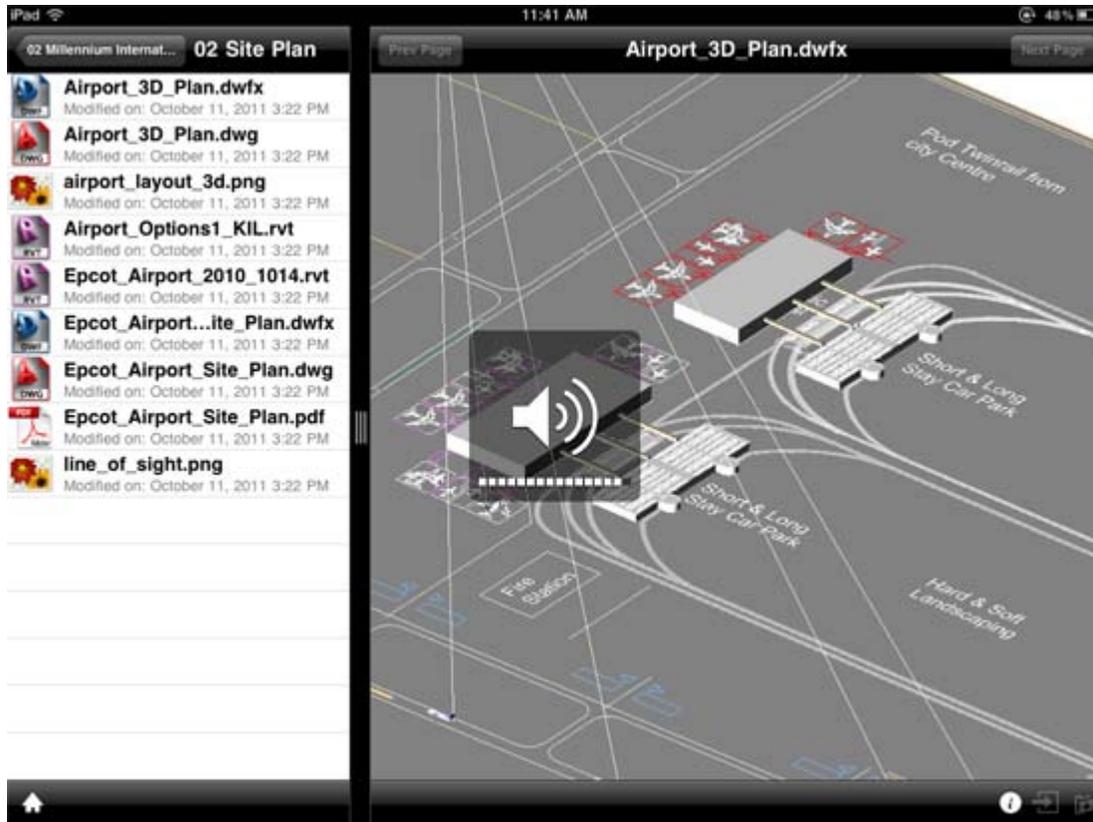
[Larger image](#)

Figure 4. Viewing a 3D DWF file using the Buzzsaw app on the iPad.

Just as Autodesk's Buzzsaw app is a mobile complement to its Buzzsaw desktop application, its Bluestreak app complements the use of its Project Bluestreak desktop application, which is essentially a text messaging and collaboration tool for members of a project team. Recall that Project Bluestreak is integrated with Autodesk's AEC applications such as Revit, with its instant messaging capability making Revit's worksharing notifications more efficient. This ability to communicate and collaborate more effectively with the project team is now available on the iPad with the Bluestreak app, allowing team members to be up-to-date on project activities—including Revit worksharing and Buzzsaw automated notifications—from anywhere, whether they are on a job site, a client meeting, or at an airport, waiting to catch a flight (see Figure 5). They can also use the Bluestreak app to post their own updates and keep team members informed on details relevant to the project.
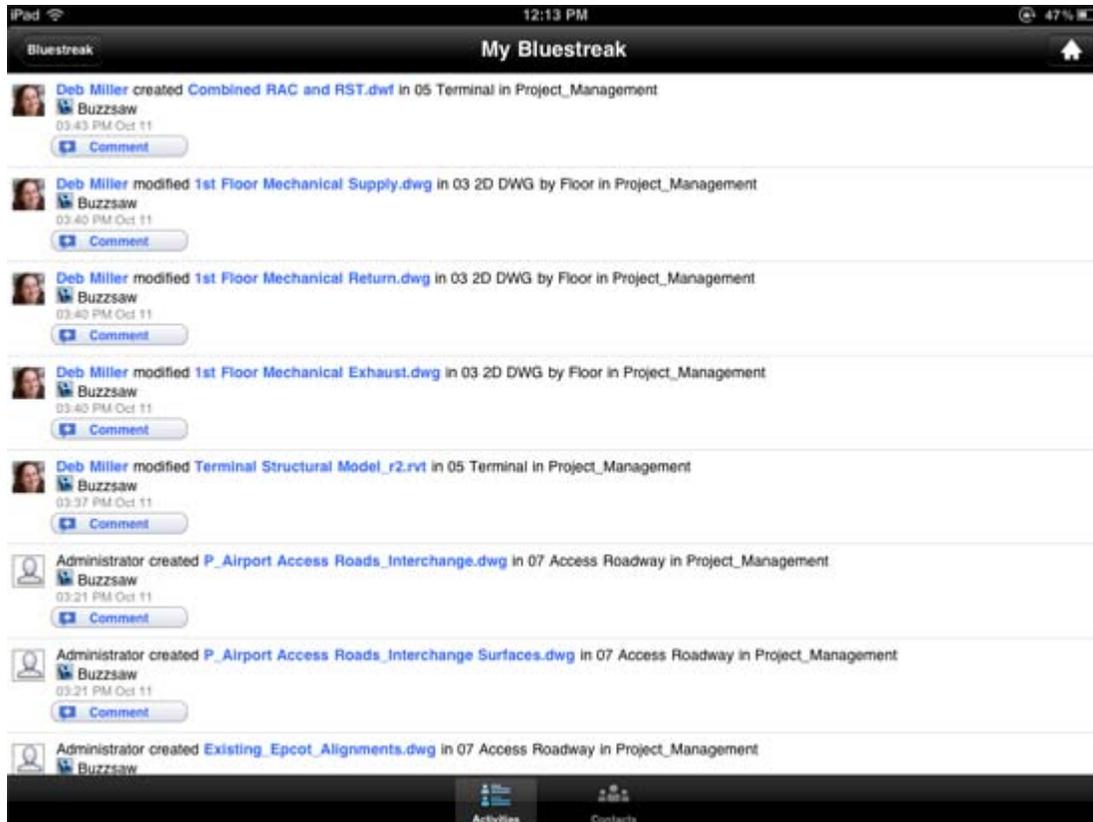
Figure 5. Seeing the log of activities for a project in the Bluestreak app. It requires users to be signed into their Project Bluestreak accounts.

Newforma's New Punch List App

Earlier this month, Newforma announced its first app for tablets, the Mobile Punch List app, which allows AEC professionals to capture, assign, manage and verify punch lists in the field. The app integrates with Newforma's flagship application for project information management (PIM) and collaboration, Newforma Project Center (NPC). Recall that the Eighth Edition of NPC that was launched earlier this year (and subsequently reviewed in AECbytes) included a dedicated Construction Management (CM) module that brings together and supports all key CM tasks including submittals, RFIs, contracts, bulletins, addendums, change orders, punch lists, etc., each of which has a dedicated activity center to manage them. The new Punch List app is included with this CM module. Instead of carrying paper documentation and drawings into the field, site professionals can just carry a tablet which allows them to access the project drawings and use the Newforma Punch List app to electronically record problem areas in the constructed building as punch list items, take photographs with the tablet's camera and associate them with the individual items (see Figure 6), add markups to the individual drawings or photos if required, and synchronize all this data recorded on site with the punch list activity center in NPC. (Video and audio files can

also be associated with punch list items, if required.) The process could save the hours of time and labor that is typically spent in manually transcribing punch list data recorded on site back to the system used in the office. This is a great example of how tablets can really be used to dramatically improve efficiency and productivity on site during the construction process and speed up project closeout.
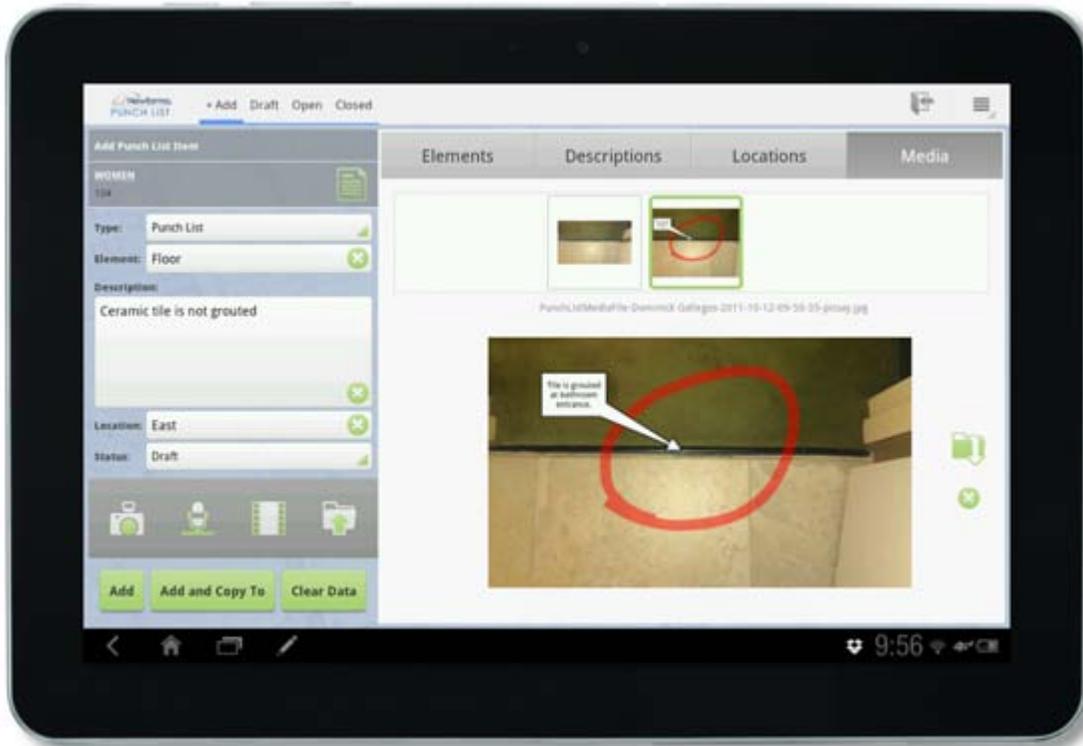
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Figure 6. Newforma's new Punch List app allows photos to be taken on site, marked up showing design or construction flaws, and associated with a specific punch list item.

The Eighth Edition of NPC that was released earlier this year also included an optional add-in for Autodesk Revit that allowed building elements and their associated properties, as well as sheets and spatial information, to be synchronized between the two applications for a project. This add-in allows the spaces for recoding punch list items in the new Punch List app to come directly from the Revit model. The punch list items recorded with the app can also be synchronized back with the spaces in the BIM model, allowing the color-coded space plans in Revit associated with outstanding punch list items in NPC to be more accurate and up-to-date.

Contrary to the other apps discussed here, Newforma will first be releasing an Android version of its Punch List app. However, an iPad version is in active development and will soon be released.

Other Apps for Construction

In addition to Vela's System's iPad app, Onsite:AEC was another example of an early app for the construction industry. It was designed for the iPhone/iPod and therefore also works on the iPad, although it does not take advantage of the larger screen space of the iPad. A native iPad version is in development and will be released soon. Onsite:AEC is targeted towards creating field reports or simple punch lists for the AEC industry, and is therefore somewhat similar to Newforma's new Punch List app, except that it does not integrate with any enterprise-wide project information management desktop application. The value proposition is simple: instead of site professionals taking photos with a digital camera and handwritten notes on a notepad that are then taken back to the office to be transcribed in a software like Microsoft Word, they can use the Onsite:AEC app to take pictures and notes, create the field report, and send it to their project team directly from the site, saving both time and trouble (see Figure7). Other useful features in the app are the use of its GPS function to automatically import addresses and current site weather info, as well as the ability to import room names and numbers via IFCXML, gbXML, and Excel spreadsheets, which should appeal to its BIM users. The app, which sells for $9.99 on iTunes, seems to be doing well, with several hundred customers and a beta team of about 20 people in different countries. It is translated to 11 languages, and international sales are beginning to pick up, according to the company.

Figure 7. An example of a site report created using the Onsite:AEC app.

Another construction-specific app I recently became aware of is SafetyNet by Predictive Solutions Corporation. The SafetyNet app can be used by construction companies to collect safety observations (through inspections) from the field and then synch those inspections wirelessly with the SafetyNet desktop application, developed by the same company, which they can then use to predict where they will have injuries so that they can be prevented. The SafetyNet desktop application was originally built for the construction industry shortly after the company was spun out of a California-based construction company in 2001. It facilitates the collection and analysis of workplace safety data which allows customers to predict and prevent workplace injuries before they occur. The SafetyNet app makes it easier for construction companies to collect real-time workplace safety data that can fuel the advanced analytics models SafetyNet uses and provide more robust predictive capabilities, reducing their injury rates dramatically. As shown in Figure 8, the SafetyNet app on the iPad is the same for an iPhone or iPod as well, as it does not really need the larger screen of the iPad. An Android version of the app is currently under development.

Figure 8. Some screenshots of the SafetyNet app being used for a site safety inspection.

Conclusions

Clearly, the mobility factor of the iPad, as well as other tablets, makes them very compelling to construction professionals, particularly those who need to go out in the field and perform inspections to make sure that the project is being built according to specifications or compile reports, punch list items, safety observations, and so on. With tablets and apps such as ProjectWise and Buzzsaw, they can easily access the most current project drawings and models, without needing to cart around bundles of drawing sheets on project sites. It is hardly surprising to find, therefore, that tablets are taking off in construction and an increasing number of apps are being developed for construction professionals. Most of these are still tied back to desktop applications that they work with and are free, with their cost being subsidized by the price of the corresponding desktop application. Those that are not are relatively inexpensive, with the expectation that they will be adopted by many users. So the "price" issue that came up in the last article doesn't really apply here. Also, the iPad is more likely to be seen as a professional tool rather than as a "toy" by construction professionals, with the many more tangible tasks that can be done with it and the concrete benefits that it can provide.

Perhaps it is time to rest the myth that the designers have all the fun in AEC?

About the Author

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