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White Paper

Rugged Tablet PCs and Optimized Software Applications Transform the A/E/C Industry

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Mobility translates to speed, quality and cost savings. The quest for flexible field devices, 24/7 connectivity and truly portable and powerful computing solutions is on the rise as evidenced by the growing use of the latest technology solutions in the field and on the jobsite.

In some markets, rugged tablet PCs are leading the way in this cultural computing revolution, fast becoming the field hardware of choice particularly in the architecture, engineering and construction (AEC) markets. As AEC professionals seek the advantage of mobility and power, developers are introducing more advanced applications from punchlists to project tracking tools uniquely suited to the tablet environment. These tools take advantage of more sophisticated voice and handwriting recognition capabilities, 'connected' field-based solutions, and building information modeling (BIM) concepts to translate and transfer project information in near real-time with unprecedented accuracy, creating the ultimate field-ready system.

Tablet History: Moving to Mobility

The development of and demand for pen slate tablet devices re-emerged in the early 2000s, driven mostly by a need for a field-based tool with the power of a desktop PC and the flexibility and mobility of a handheld device.

David Krebs, senior analyst for VDC Research Group, an independent technology market research and consulting firm, explains, "Many things contributed to the limited adoption in the 1990s, including price points, weak handwriting recognition capabilities and disconnected point applications. That's all changed."

By 2000, Microsoft had introduced the tablet PC specification with technology that included true handwriting and voice recognition capabilities, tablet PC prices dropped and developers began to introduce true field-based applications and tools. The introduction of Microsoft Windows 7 last month should further accelerate adoption due to enhanced handwriting and formula recognition features.

"With this shift, the market for slate tablets is now growing, particularly in niche markets that need more powerful modular and detachable solutions," notes Krebs. "The architecture, engineering and construction industry is one of the leading adopters along with healthcare, field service organizations and military."

In fact, according to VDC Research, demand for slate tablets continues to be robust. Studies show that from 2007 to 2009, annual shipments of commercial grade slate tablets increased by 34 percent. Growth from 2009 through 2013 is expected to be 14.6 percent compounded annually. Similarly, the number of rugged slate tablets sold from 2007 to 2009 has increased 61 percent, supported by continued strength in the military sector and field data collection applications in a variety of commercial markets. The rugged slate tablet market is expected to grow by 13.6 percent compounded annually from 2009 through 2013.

VDC defines rugged mobile computers as devices that have been designed to withstand harsh environmental conditions including exposure to water, extreme temperatures, humidity and altitude and drops from at least 3feet. These devices conform to Internet protocol (IP) specifications (5X minimum) and Mil Spec 810-F or 810-G.

In this time, slate tablets have expanded in terms of speed, features and functionality. Today's systems incorporate Wi-Fi and mobile broadband, dual and longer life batteries, indoor and outdoor optimized displays, digital cameras, RFID and optional barcode scanners, smart card and biometric fingerprint readers, GPS, and high-fidelity voice and sound input devices. Rugged tablets also incorporate a shock mounted hard drive and combined accelerometer designed to detect drops and shocks in order to reduce the possibility of data loss.

Along with hardware advances, field-optimized software for tablet PCs uniquely suited to the AEC market has also begun to emerge. For instance, Bluebeam Software develops solutions to help users create, view, markup and edit PDFs of drawings and other documents while in the field.

The ongoing demand is in part driven by what FIATECH, an organization that studies the technology needs of the construction industry, calls the "Intelligent and Automated Construction Jobsite." As part of its Technology Roadmap, FIATECH outlines the need for effective information display devices, project progress, personnel movement monitoring and facility usage, site monitoring systems and much more (http://fiatech.org/tech-roadmap/roadmap-elements/element4.html).

The following case study shows how tablets and Bluebeam's software have come together to create greater efficiency on a large resort project.

Case Study: A Digital Voice in the Field

The almost $500 million Terranea oceanfront resort is a 102-acre property situated along the southern California coastline in Rancho Palos Verdes. This property, managed by Destination Hotels and built by Turner Construction, features a 360-room hotel with 30 suites, 20 bungalows, 50 ocean view casitas and 32 villas. It also includes 135,000 square feet of indoor meeting and event space, a 25,000-square-foot destination spa, three swimming pools, three restaurants and a Todd Eckenrode-designed par three golf course.

Entrance to Terranea Resort—Rancho Palos Verdes, California

As the project drew closer to its opening date in June 2009, the owner called on project architects to verify quality and completeness. With just six months to go, the team gathered base drawings for the hotel and ancillary buildings, and then began the punch review process on the job site by recording punch items on these drawings.

Erica Lee, an architect on the project, recalls, "The sheer magnitude of a hospitality job of this size and caliber was daunting. Not only were timeliness and accuracy imperative, I knew I also needed a mobile solution so I could maneuver about the entire site without sacrificing access to the vast library of drawings and specifications required to record information clearly and concisely."

Lee selected the Rugged J3400 tablet PC from Motion Computing equipped with Bluebeam PDF Revu.

Bluebeam, a tablet PC compatible PDF editor designed for the construction industry, allows users to quickly convert CAD files and other documents to PDF and edit PDFs with industry-standard markup tools.

For the Terranea resort project, Lee stored PDF copies of the entire set of design documents and specifications on the tablet hard drive. To automate the punch documentation process, she used Bluebeam to create PDF templates, such as hotel room floor plans, and custom punch symbols that were saved in Bluebeam's exclusive Tool Chest. This feature allowed Lee to select a symbol and place it on the PDF easily with the use of the tablet pen.

"Bluebeam's PDF editing solution provided all the tools needed for punch, and its tablet PC compatibility made it possible to complete the job digitally." adds Lee. "Along with Bluebeam, I needed a light, yet rugged tablet PC. I liked the J3400 because it was rugged enough to survive the bumps and jolts common on a jobsite, yet light enough to hang off my shoulder for an entire day with an indoor/outdoor screen for visibility throughout. I could not have done this job in the time allowed without the combination of the PC and Bluebeam PDF Revu. The combination made the entire process very smooth." Lee promptly finished the punch process, and the completion rate on the first back check was 90 percent. The Terranea oceanfront resort opened on time in June 2009.

Sasha Reed, Director of Account Services for Bluebeam, says, "Mobility is always an issue in the building and construction industry, as is the frequent time lag between the office and field. Until recently, large rolls of paper drawings were a common sight. We saw the tablet PC as an ideal vehicle to move digital drawings from the office to the field with clarity, ease and speed. Since first introducing tablet integration in 2006, using Revu with tablet PCs has only become more and more popular among our users."

Since then, an increasing number of Bluebeam users, from architects to contractors, have begun to take advantage of Bluebeam PDF Revu on the tablet PC to translate traditional office activities to the field.

"The tablet PC will continue to change the face of the industry," predicts Reed. "With it, our users are able to create an office in any environment. There's no longer a divide between the team in the field and the office staff. Superintendents, in particular, are picking up the tool very quickly. They're technology savvy and are finding that tablet PCs give them a voice in the field."

Ocean view at Terranea Resort—Rancho Palos Verdes, California

Going Forward

According to VDC Research's Krebs in the latest Construction Research Note, Mobile & Wireless Solutions in Construction, investments in mobile & wireless solutions have provided real and measurable benefits for construction operations, including:

- Improvements in worker productivity: 30.1%
- Reduced operating costs: 14.1%
- Increased sales/revenues: 13.6%

Going forward, there is much opportunity for building and construction organizations to seek new technologies, including mobile and rugged tablet PCs and tailored software applications, to improve operational performance. In 2010, look for ever more advanced, purpose-built tablet PC devices for jobsite computing that incorporate increasingly rugged designs in lighter weight packages with enhanced integrated features and more power.

About Motion Computing

Motion Computing is a leading provider of integrated mobile computing solutions, combining world-class products with services customized for the unique needs of target vertical markets. The company's enhanced line of rugged tablet PCs, mobile point of care solutions and accessories are designed to increase mobile productivity while providing portability, security, power and versatility.

Motion Mobility Solutions offers a complete portfolio of products, services and support that helps ensure a successful mobile deployment for increased productivity, reducing project risk while delivering a more rapid return on investment. For more information, visit www.motioncomputing.com.