

# Mobile Technology

## Allowing Utilities to Look into the Future without Abandoning Legacy Systems

By Cliff Adams, Xplore Technologies

Utilities are the epitome of field service and of workforce mobilization. They know better than many other industries the burden of paper-based processes and the burgeoning growth opportunities that are possible with a wider adoption of advanced technology systems. Though not perceived as fast innovators, utilities have in fact been long-time accelerators of mobile computer innovation. Believe it or not, the industry has actually been using mobile PC technologies for at least two decades, long before the first iPad came to market in 2010. Electric utilities played arguably the most influential role in the early design and development of the rugged tablet PC form factor that almost every global industry has become reliant on today. In fact, Sierra Pacific Power Company was confident in the power of mobile computers over 10 years before they gained mass market popularity. The electric utility (now part of NV Energy) was among the first companies worldwide to invest in the truly mobile, field-service ready computers in the late 1990s. They set a precedent for utility mobility and proved that the real-time capture of, and constant connectivity to, critical data sets in the field can deliver extraordinary efficiency to an industry charged with one of the most significant jobs on earth; powering our personal and professional lives.

### Finding a Mobile Computer Form Factor to Serve Field Service Personnel

It was evident at the very onset of pen-based tablet computing 20 years ago that utilities were going to be underserved by PC devices built for other business applications. Utilities' field service personnel are exposed to harsh environmental conditions on a daily basis, which means their tools, electronic or not are subjected to the same conditions. Besides the need to put worker safety first, especially in already hazardous locations, utilities need to ensure that neither the computer screen nor internal components will succumb to drop, water, or dust-induced damage. They also need a computer that's capable of being securely mounted in a vehicle or docked to an outside work station without extra care needed, even

if vibrations, shocks, or extreme temperatures are commonplace. Thus, the trend toward genuinely rugged devices with built-in military-grade resiliency began to gain steam from the beginning.

However, equipping an entire workforce with a viable, field-friendly ruggedized computing solution has never been as simple as adding an industrial strength frame, damage resistant display, or vibration-tolerant solid state drive (SSD) to any portable computer form factor. As an example, utilities need a device that can easily be carried and used in one hand when technicians are conducting inspections on underground transformers that require them to squeeze into tight crawl spaces or when they're elevated several feet in the sky installing new power lines from a bucket truck lift. That's why lightweight slate rugged tablets have always proven to be the most appealing form factor to utilities, especially those who pioneered the move towards truly mobile data systems.

Besides their built-in MIL-STD-810G certified, IP rated, and C1D2/C1Z2/ATEX compliant protection, rugged tablets are the only truly mobile computers that can perform the same, full computing-intensive tasks as a desktop. Laptops are portable, but too heavy and bulky to easily be used while walking and working and thus tend to be left in vehicles. However, tablets can be securely mounted in utility vehicles without taking up too much real estate, converted into a laptop-like setup with the addition of a wired or wireless keyboard for intensive data entry, and even serve as a full desktop setup in the office with full peripheral connectivity and the ability to plug in an external screen, mouse and keyboard if desired.

### Fine Tuning the Fundamental Mobile Workflows

While mobile tablet computers are well-designed to serve utilities, especially those trying to streamline their data systems into a centralized solution that can be used without issue in either the field, in the utility truck, or even at the office or technician's home, it's not enough to pick the "right" form factor. Utilities need to architect complete mobility solutions that align with the workflow the technology will support, as well as their established set of business practices, individual workforce design, and service models.

Testing and evaluating mobile technologies' performance with basic workflow applications, or what we call Automation 1.0,

allows risk-averse utilities to solidify their technology platform without severe consequences such as worker downtime or data entry errors. Many utilities tend to replace paper-based processes such as inspection checklist completion, work order dispatch, and installation manual reference with mobile-delivered digital versions first. Inventory management and maintenance scheduling are also easier with the real-time data available on mobile computers. Each of these mobile-centric workflows eliminates unnecessary truck roles and wasteful spending while improving overall operational and infrastructure performance off the bat.

Whether it's finger or digital pen input on the touchscreen, or voice input, or barcode/image capture, once field service personnel become comfortable with the mobile computer and finding their preferred data entry method, utilities' IT and leadership teams can confidently ask their technicians to use the mobile PC to complete daily tasks in entirety. They can then turn on new features, introduce new workflows, like making adjustments to security settings and on-screen software presentation, identify communications dead zones and tweak in-vehicle docking system designs based on feedback from the field.

### **Evolving Utility Environment Drives New Mobility Demands**

Clearly, the value proposition of mobile technologies – and rugged computers in particular – has long been solidified in the utility field service sector. So why does it seem that the true worth of complete workforce mobility is just now garnering due attention, 20 years later? While utilities have always pursued easy opportunities to increase accuracy and efficiency, as well as better asset manageability, there are several reasons why the timing is finally right for more widespread adoption of mobile computers and more extensive utilization of existing mobility systems. The number one being that society as a whole is now just as dependent on mobile devices as they are on the actual electricity. In some global regions, experts would argue that mobile devices are more prolific than power services are stable. So, while the technology landscape continues to evolve rapidly, mobile computers are no longer in their infancy or a continued novelty in global business. In fact, those utilities that don't invest beyond basic mobile PC applications fast enough to deliver Automation 2.0 capabilities to field service personnel may soon struggle to thrive at a much greater operational level for several reasons:

# 1

#### **Utilities are in the midst of a workforce transition.**

Older generations of workers, accustomed to paper-based documentation, are retiring and being replaced by a generation that was raised almost entirely on digital tech. Many of today's young utility professionals were expert users of the tablet PC long before they handwrote their first word. In order to create a productive workforce, and retain quality workers that expect advanced technology utilization, utilities are being forced to upgrade to highly mobile workflow infrastructure. Considering that utilities are also trying to accommodate a more transient workforce – increased reliance on contractors as well as more frequent employee turnover – the more extensive mobilization of business operations have added purpose. Utilities need a way to readily provide all field service personnel with complete access to back office systems and workflow applications without requiring frequent trips back to the office to complete work orders, submit maintenance and inspection reports, confirm inventory levels or participate in training. Time is money. The quicker a utility can dispatch the right people, information, and infrastructure to the field, the more effective they become at servicing customer calls, proactively maintaining infrastructure, and

resolving unplanned outage issues without consequence. Especially in an era when customer satisfaction with utilities is on a downward trend and competition is putting pressure on utilities to defend their service models. Thus the inherent value of rugged mobile computers that can not only serve as the central access point for in-field communications and data, but that can be monitored, updated, and managed remotely by utilities' IT departments.

# 2

#### **Infrastructure installation, maintenance, and repair records are no longer just captured and stored away for "in case" reference.**

The proper collection and mining of massive data sets can make or break utility operations. Predictive analytics is no longer used solely for competitive market or internal financial forecasting. Utilities are now reliant on readily available, and accurate, data to pre-empt equipment failures and proactively address issues that would have otherwise led to grid outages or communication disconnects with smart meters and other now-automated systems. Asset management is now based on well-informed and definitive decision making. For example, by understanding actual maintenance and upgrade cycles based on actual usage levels versus time-based estimates, utilities can more strategically prioritize inspection and repair tasks and allocate proper resources. Immediate, and often automatic, data entry at the time of an install, inspection, or repair leads to on-time and more complete reporting, which in turn leads to improved service – and customer service – quality.

# 3

#### **Real-time access to actionable data is becoming the standard expectation among utility workers and customers alike.**

To the point above, real-time asset monitoring and management requires uninterrupted connectivity between the mobile computer and the systems it supports, whether those are sensors installed along T&D lines, smart meters, fleet tracking devices, or video scopes used for remote infrastructure inspection. Real-time data distributed via mobile computers allow utility personnel located in the field, plant, office or en-route to their next call, to become immediately aware when equipment is under too much pressure or about to fail. Real-time alerts enable utilities to rebalance the load or dispatch repair crews proactively versus reactively to prevent customer service backlash or more significant financial losses. In short, mobile computers are really the only way that utilities can orchestrate extraordinary data collection and distribution processes, in real time. Mobility solutions, with a rugged computer at the core, advocate for constant collaboration and consultation between widely dispersed experts allow for the active pursuit of new residential and commercial revenue opportunities at the point of service.

# 4

#### **A growing dependency on Graphic Information System (GIS) data exists.**

Utilities were among the first to gain value from GIS and have always benefited from mapping capabilities with workflow visualization becoming more prevalent today. Massive volumes of geolocation data are now documented in the field in real-time and distributed to the mobile computer touch screens of planners, installers, and plant managers. Dispatchers leverage the data to accurately pinpoint offline assets and route diagnostic crews. Field technicians use the info to safely maintain and repair equipment. Engineers and architects use it to plan infrastructure



expansion or replacement projects. However, image-dense GIS data requires, at a minimum, the power of Intel's Core-Series processors. Consumer devices equipped with lower power CPUs struggle to capture and deliver the GIS data at the level necessary for improved operational efficiency. Rugged manufacturers, on the other hand, are very involved in the advancement of GIS-capable mobile computers and the industry-wide synchronization of hardware and software components for GIS applications.

# 5

## **Smart grid is redefining, and in some cases reducing, the role of mobile technologies in daily utility tasks.**

The automation of many network monitoring and control stations has reduced truck roles, but that doesn't mean mobile computers' role in field service has been reduced or completely retired from grid management workflows as well. They're just being used in more meaningful ways. For example, instead of serving as a limited function task-order tool, rugged tablets are now being used to bridge the data and communications gaps between field, plant, and home office teams. They have become the centralized routing and interpretation tool for critical data – such as automatic notifications that are sent to plant managers, who can then use the mobile device to control grid systems remotely. The automatic notification of system outages aids in real-time data analysis and decision making, allowing the dispatch of the right people and equipment to the right location immediately, leading to faster diagnostic and resolution.

However, in a few instances, mobile computer use is dwindling due to the combination of automated smart grid technologies and mobile workflow automation solutions. Meter reading is one. With the installation of smart meters, utilities no longer need someone going door to door to collect usage data or initiate billing processes. That being said, utilities still rely greatly on mobile devices for the proper installation of those smart meters. In fact, rugged tablets play an important role in the more accurate documentation of customer's installed equipment. Instead of manually typing in a smart meter's model name, serial number, and location at the point of service, the technician can use the tablet's barcode scanner to automatically capture those details with complete accuracy and even take a picture of the installed asset to attach to the customer record for reference in case a future service call comes in about the meter. Customer service representatives located in a call center can visually inspect the meter, retrieve detailed data about the equipment, and help troubleshoot issues without ever rolling a truck.

But the convergence of legacy and emerging technology systems doesn't start or stop with smart grid. Neither does the cost and time savings realized by current day investments in future-proof mobile computers. Utilities will only become more dependent on mobile technologies that allow for greater workflow automation, real-time analytics and decision making, and better efficiency across all lines of business. This includes the Internet of Things, introduction of new wireless networks, and next-gen automation solutions. Utilities must be smart about the mobile technologies they adopt today if they want to avoid the productivity losses that come with frequent technology obsolescence.

## **What Is "Old" Can Be Made New Again**

Ask any utility IT professional and they'll likely agree: The best mobile PC solutions are the ones that maintain their fundamental form factor for years, but are more than capable of bridging legacy and emerging back office systems, software, and peripherals. Utilities, which have always been hyper focused on sustainable business practices, don't benefit from buying new mobile computers, upgrading software, or replacing accessories such as in-vehicle docks every year or two. That's why consumer or commercial-grade tablets, laptops, and handhelds have never served utilities well and reach more than double the Total Cost of Ownership (TCO) than rugged devices.

Utilities' resounding commitment to rugged computers – even as other data systems are retired – is proof that safe, secure, scalable and fundamentally sound mobile PC infrastructure can remain highly relevant for years without complete solution replacement or technology reinvestment needed. To achieve platform stability, utilities should invest in mobile computers with high quality processors and expandable storage and memory, a variety of I/O connectivity options, and operating system upgradeability. Then, it won't matter if you need specific technology capabilities to complete new projects or you just need a better way of completing the same tasks that have been central to utility operations for decades. Your entire mobile solution will be ready to adapt, and you'll start to really see unexpected levels of ROI.

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