

Mobilizing the engineering, construction and operations workforce

How mobile technology will transform the industry



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Consider this. The smartphone in your pocket is millions of times more powerful than NASA's combined computing capabilities when Apollo 11 first landed men on the moon in the 1960s.¹

The 20th century Apollo program technology, like computers and CAD, transformed the pencil and slide rule world of engineering, construction and operations (EC&O). Now, the digital era has arrived—and with it, the proliferation of smartphones and mobile technology.

“Mobility—combined with the phenomena of data and cloud—is transforming business and our industry in historic ways, allowing people to re-imagine work, industries and professions.”

—Ginni Rometty, Chair, President and CEO, IBM

You've likely seen how this mobile technology has changed communications, shopping, medicine and banking. As this technology becomes even more powerful and prevalent, it will revolutionize EC&O as well.

The reason is simple. While computers and CAD improved equipment and physical processes, digital era technologies empower your most valuable asset—your people.

The revolution has begun

Mobile devices are impacting businesses across industries. Modern taxis and buses often use mobile technology for location and fare calculation, and banking and booking hotels can be accomplished from the palm of your hand.

In some cases, entire industries are being transformed. Uber's use of mobile devices is transforming the public transportation industry, while journalism and media are being turned upside down by mobile's ability to capture and publish information instantaneously.

But for many, applying mobile to EC&O can seem like an insurmountable organizational challenge. Organizations and their workforces are geographically dispersed, often in physically challenging locations.

While EC&O projects may have massive budgets, the margins are typically small, which presents budgetary constraints. In addition, EC&O projects can be large and complex, requiring coordination with a variety of partners who are also globally dispersed.

Yet these challenges mirror those found in public transportation and media. The successful application of mobile technology to those industries shows that EC&O companies can also use these capabilities to better compete and improve their bottom line.

The reason—EC&O applications are already here. Mobile technology can streamline operations while reducing the infrastructure costs compared to purchasing and supporting existing technologies. The only hurdle is how quickly you can integrate mobile into your operations.



Figure 1. Mobile devices help field workers improve process efficiencies.

For example, a major generator of US power has already deployed mobile technology and realized improved process efficiencies. The company gave field users mobile devices with a robust architecture, fast performance and a simple, intuitive user interface (UI).

As a result, the company slashed the time spent on work process management. They achieved this dramatic reduction by completing tasks in the field, such as:

- Creating work requests
- Viewing and updating assigned work orders
- Capturing labor hours
- Adding failure reporting
- Issuing parts
- Capturing photos as attached documents

The bottom-line benefits of mobile in EC&O

The EC&O industry often involves large projects with large budgets—and the large risks associated with both. Therefore, even small improvements in productivity can produce substantial cost savings.

The application of mobile technology to EC&O has already demonstrated an ability to create productivity improvements that produce bottom-line results. And the implementation doesn't have to be complex.

For example, a leading European utility has provided field workers with mobile technology that integrates multiple SAP components with attendance and GPS tracking. By providing destination information directly to drivers, the system has dramatically reduced data entry errors.

The GPS-optimized directions also give drivers the most direct route between jobs. The result is better accountability and compliance, all while yielding nearly 20 percent productivity improvements.²

More than just drive time

With a little more creativity, mobile technology can give you even larger efficiencies. Another example is telecommunications field engineers. They use mobile devices powered by analytics to provide a collaboration platform and sales support tool.

Mobile lets them instantly establish real-time collaborations with remote expertise. These real-time collaborations allow field engineers to solve complex problems onsite, reducing repair and service times—and even multiple trips.

Obviously, this efficiency can allow the organization's field engineer staff to respond to more calls within a given work cycle. But they can also provide the customer with analytics-enabled suggestions and recommendations for additional services—further increasing revenues.

Another customer service application for mobile technology is keeping current customers happy. CenterPoint Energy, a large electric and natural gas utility serving several markets in the US, uses mobile to do just that.

CenterPoint Energy uses a mobile technology-based solution to support its Power Alert Service that maintains contact with registered consumers during electric power outages.³ The solution provides alerts using text, email or phone—depending on each customer's registered preference.

The supporting analytics provide estimated resolution times, confirm underlying causes and identify solutions. The result—mobile technology reduces customer service demands and improves customer satisfaction.

The mobile EC&O benefits you might miss

The benefits of mobile technology for EC&O extend to less obvious examples as well. These applications—and the rich user data collection they enable—can provide additional value, which can ultimately help increase your bottom line.

For example, German energy company RWE Generation mines up to 100 million tons of lignite a year for electricity generation. This process demands a fleet of excavators, spreaders and conveyors—all needing continuous maintenance to minimize mining activity interruption.

In collaboration with IBM and Apple, RWE developed and deployed a mobile app that lets field workers capture repair information virtually instantly. This app eases equipment issue identification and speeds task completion.

In addition, its field technicians have mobile access to near real-time updates of manuals, maintenance and operational history. When combined with GPS-based technology for monitoring and tracking field assets, the reduced equipment downtime and maintenance costs add up to increased return on investment (ROI).⁴

Bottom-line benefits from data everywhere

Real-time updates to documentation are not limited to equipment manuals and histories. Imagine the ability to create, populate and validate as-built site plans as your project is constructed—including digital construction photos.

Of course, such ability improves as-built plan accuracy. But it also gives maintenance and operations (M&O) personnel access to these plans through the same app. This access speeds future M&O work and allows onsite updates to the as-built plans to reflect any M&O changes.

The benefits of mobile technology can directly impact employee safety as well. Naturally, GPS technology can help protect field personnel while working in remote locations and bad weather. But there are more direct examples.



Figure 2. Mobile access to equipment maintenance information improves efficiency and reduces unplanned downtime.

A major US industrial company has teamed with IBM on a research project that takes advantage of mobile technology. The solution gathers data from wearable sensors on employees and environmental sensors in the field.

Based on the information gathered, the solution uses mobile technology to identify and report virtually every anomaly and potential risk in near real time—directly to the worker, manager or both. It can report specific dangers to proactively prevent workplace accidents or send an injury alert when an accident occurs.

The future is now

Technology has always driven advancements in EC&O. However, in the digital era, mobile technology will revolutionize not only equipment—it will transform business interactions. It's already doing it for some.

Global building materials company CEMEX has teamed with IBM and Apple to digitally reinvent business operations across its construction industry ecosystem. The effort includes digital experience design, digital process reinvention, agile delivery, dev-ops implementation and business process operation.

CEMEX is leveraging Mobile at Scale for iOS to design, develop, deploy and maintain a suite of custom made-for-business apps for customers in more than 50 countries. This digital transformation will fundamentally change how foremen, field operations managers, cement masons, concrete finishers, truck drivers and other construction professionals do their jobs and interact with the company.

Looking further, EC&O companies who have teamed with IBM can also take advantage of integrated IBM® Watson® capabilities. The Watson cognitive computing platform allows EC&O mobile solutions to think like a human—recognize patterns, understand context and anticipate the future.

And the predictive analytics Watson deploys analyze data and provide insights, such as anticipated equipment downtime, parts failures or shipment delays. So the potential for mobile to provide massive direct and indirect ROI is not a future promise. Instead, you can discover these possibilities today.

Why IBM?

Like CEMEX, EC&O companies worldwide have teamed with IBM to transform their enterprise with mobile technology. They recognize our experience with the challenging environments, low margins and multiple partners that make up the engineering, construction and operations environments.

They also know that with over 5,000 trained mobile professionals, IBM is at the forefront of mobile enterprise innovation. In fact, we have secured more than 4,300 patents in mobile, social, security and data analytics—and have incorporated that knowledge into IBM MobileFirst™ solutions.⁵

“IBM’s complete portfolio, paired with a strong partner and services organization, gives it the breadth to tackle most customer challenges.”

—The Forrester Wave: Enterprise Mobile Management, Q4 2015⁸

Further, IBM’s exclusive relationship with Apple combines these powerful enterprise solutions with the iOS user experience to create empowered employees. This relationship gives you a single interface to two global companies who are committed to helping you realize the benefits of mobile technology.

Our extensive knowledge and relationships are just two reasons why Gartner has named IBM a Magic Quadrant leader for Enterprise Mobility Management Suites for five consecutive years.⁶ It’s also why Gartner has named IBM a Magic Quadrant leader for Mobile Application Development Platforms for four consecutive years—and a leader in five additional Magic Quadrants related to mobile.⁷

Forrester has also named IBM a leader in enterprise mobile management—the only company to receive the highest scores in all three rating categories.⁹ Their 25-criteria evaluation is further supported by IDC’s declaration that IBM is a worldwide leader for mobile application development and testing consulting services.¹⁰

For more information

To learn more about how IBM can help transform your EC&O business with mobile technology, please connect with Desmond Conlon at +44 23 9228 9738 or by email at DConlon@ie.ibm.com.

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⁵ Apple and IBM Press Release, *Apple and IBM Forge Global Partnership to Transform Enterprise Mobility*, July 15, 2014, <https://www-03.ibm.com/press/us/en/pressrelease/44370.wss>

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⁷ Phil Buckellow, *IBM named a leader in Gartner Magic Quadrant for mobile application development platforms four years in a row*, Mobile Business Insights, June 15, 2016, <http://mobilebusinessinsights.com/2016/06/ibm-named-a-leader-in-gartner-magic-quadrant-for-mobile-application-development-platforms-four-years-in-a-row/>

⁸ Christian Kane, *The Forrester Wave: Enterprise Mobile Management, Q4 2015*, December 4, 2015

⁹ IBM Press Release, *IBM Recognized as a Leader in Enterprise Mobile Management*, December 14, 2015, <http://www-03.ibm.com/press/us/en/pressrelease/48481.wss>

¹⁰ IBM Press Release, *IBM Named a Worldwide Leader in IDC MarketScape for Mobile Application Development and Testing Consulting Services*, December 22, 2014. <http://www.prnewswire.com/news-releases/ibm-named-a-worldwide-leader-in-idc-marketscape-for-mobile-application-development-and-testing-consulting-services-300012962.html>



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¹ ZME Science, *Your smartphone is millions of times more powerful than all of NASA's combined computing in 1969*, accessed October 25, 2016, <http://www.zmescience.com/research/technology/smartphone-power-compared-to-apollo-432/>

² IBM Institute of Business Value, *Mobilizing the utility workforce*, February 2016. <http://www-01.ibm.com/common/ssi/cgi-bin/ssialias?subtype=XB&infotype=PM&htmlfid=GBE03721USEN&attachment=GBE03721USEN.PDF>

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⁴ IBM Institute for Business Value. *Return on mobile*. July 2016. <https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=GBE03761USEN>



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