

# CEI Application Helps Top Engineering Firm Cut Costs and Improve Quality Assurance



*Engineering experts Civil & Environmental Consultants bring in-office functionality to the field with multi-touch tablets and a custom app.*

## **Business Issue**

As part of its environmental and waste management practice, Civil & Environmental Consultants, Inc. (CEC), provides oversight and testing services for the installation of landfill liners. Historically, this process involved manually sketching the layout of the liner strips in a paper field book, then marking the location of each sample test and its result. Back at the office, the field data was manually entered into a series of spreadsheets. This meant that all data had to be recorded twice before reports could be created, wasting time and resources.

## **Solution**

To improve the process of gathering, testing, and analyzing liner field data, CEI worked closely with CEC engineers to develop a Windows-based application to automate field collection and reporting. Engineers use the app on multi-touch Windows tablets to illustrate and record liner designs, test points, and seam repairs on site. When back in range of the Internet, engineers upload the data to a central server and output the appropriate reports.

## **Results**

The CEI-developed field application helped CEC realize substantial savings in time and labor. Instead of field books, which could get ruined in inclement weather, engineers had a rugged, modern tablet on which to capture their data. Most importantly, the application improved quality assurance for the client, eliminating the unnecessary reentry of data and the error potential associated with reading and interpreting engineer handwriting.



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CEC engineers can use the multi-touch tablet app to collect, upload, and report on field data.



## About Civil & Environmental Consultants

Consistently ranked among the Top 500 Design Firms and Top 200 Environmental Firms by Engineering News-Record, CEC provides comprehensive market-oriented consulting services that advance client strategic business objectives. With nearly 800 employees and 18 locations across the United States, CEC is recognized for delivering innovative design solutions and integrated expertise in the primary practice areas of civil engineering, ecological sciences, environmental engineering and sciences, waste management, and water resources.

## About CEI

Since 1992, Computer Enterprises, Inc. (CEI) has delivered high quality software development solutions, specializing in Microsoft, Java, Open Source, and Mobile technologies, to companies of all sizes and industries across Ohio and the Mid-Atlantic. CEI's certified architects are industry-leading technologists with the experience to design, develop, deploy, and support solutions tailored to the unique needs of a client's business. Offering training and mentoring services ensures that value is extended into our customer's business and IT department.

## Details

After reviewing CEC's existing field collection and reporting process, CEI recommended an integrated hardware and software solution—one that could help CEC reduce redundancy and increase the quality of its client deliverables. The goal was to provide field engineers with a lightweight, durable Windows device with enough computing power to run a planned multi-touch application for collecting and uploading field data.

Once CEC and CEI agreed upon the appropriate device, CEI began the process of designing the custom application within the context of CEI's agile development framework. The foundation of this framework is an initial analysis phase to gather the high-level requirements of the application. Once these requirements were known, the framework's iterative development process took over and coding began.

As development progressed, CEI put each iteration of the application through end-to-end testing. These iterations were presented to the client for review and feedback, which kept CEI and CEC stakeholders involved throughout the process and enabled CEC to leverage the expertise of its in-house programmers. The final phase involved field testing with CEC engineers to ensure user acceptance of the completed solution.

**“The ability of engineers to collect and use field data on-site has revolutionized the way CEC delivers for our clients.”**

— Debora B. Thompson  
*Vice President, CEO*

Perhaps the most difficult requirement to meet was the ability of a user to sketch a map of the liner layout on the device. Because a sketch is a two-dimensional representation of a three-dimensional surface, the application had to be flexible enough to make everything fit. Conventional spatial data representations, such as GIS (Geographic Information System), were not enough. CEC needed the device and application to create a sketch the same way as a human hand. By developing the application to take advantage of Windows tablet multi-touch functionality, CEI effectively solved this key problem.

The end result made an effective replacement for field logbooks, saving engineers' time and effort while driving improved quality assurance for CEC's clients.

