Innovative Use of Mobile Technology for Environmental Field Data Collection

Presented by:
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Agenda

- Introduction to ATL
- Technology Trends: Growth of mobile technology in the lab
- Integration with LIMS: How Does it Work?
- Case Study #1: Fairfax (VA) Water
- Case Study #2: City of Raleigh, NC
- Q & A

Accelerated Technology Laboratories

- >23 Years of Expertise in LIMS & Laboratory Automation
- Our LIMS solutions are installed in >575 laboratories with >50,000 users worldwide
- Environmental is our #1 market segment
- ISO 9001:2008 Certified
- ATL Advantage Program

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Technology Trends

Growth of mobile technology in the lab

Over the past few years, there has been growing adoption of mobile devices (tablets, hybrid laptop/tablets, rugged laptops, smartphones) for use with LIMS. Early adaptors include organizations who conduct sample testing in the field like water/wastewater utilities. Key reasons for this growth include:

- Use of mobile LIMS technology increases productivity of field technicians and lab staff
  - Elimination of paper processes
  - Real-time access of field testing results before technician returns to lab
- Recent advances in mobile technology
  - Better options for remote connectivity
  - More cost-effective and powerful hardware options available today
- Increased need for faster turnaround time and getting results beyond the lab

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Mobile Technology – Integration with LIMS

How does it work?

- Web application that leverages WiFi, 3G/4G/LTE cellular technology to facilitate real-time collection and delivery of field test data back to the LIMS in the laboratory.
- Key features
  - Conduct sample login at point of activity
  - Collect, assess and evaluate critical information instantly
  - Generate an electronic chain of custody
  - Automatically log GIS coordinates
  - Document images
  - Collectors can easily:
    - Organize the workplan
    - Run analysis
    - Capture field data
    - Instantly transmit with comments back to lab (or data will be saved and synced to the LIMS if disconnected from cellular network or WiFi)

Leveraging Mobile Technology to Increase Productivity and Data Quality, while Reducing Costs

Field Data Collection

Cloud

LIMS & Web Servers

Web Server

LIMS Server
Sample Master® / TITAN®
on SQL Server

Laboratory

Sample Accessioning

Data Analysis

Q/C & Reporting

Field collectors use mobile devices with the Sample Master®/ TITAN® iMobile Application, and data is instantly uploaded to the laboratory LIMS.

Prescheduled samples appear on the mobile device to notify collectors of their daily worklist, and non-routine samples may be added as needed.

GIS coordinates can automatically be recorded and new tests can be added from a drop down list.

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Mobile Technology – Integration with LIMS

What are the biggest benefits?

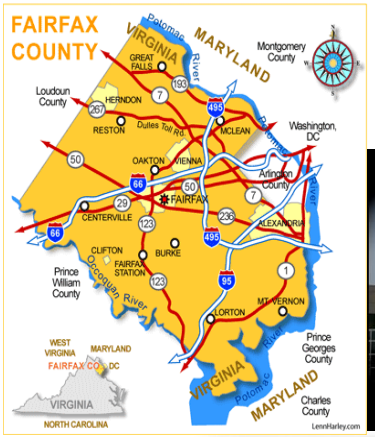
- Improved Data Quality
  - Elimination of data transcription errors
- Enhanced Productivity
  - iMobile increases individual productivity by eliminating data entry on paper forms – data is transmitted directly to the LIMS.
- Decreased Turnaround Time (TAT)
  - The ability to transmit field data in real-time means quicker response to customer complaints and higher customer satisfaction. Reduction in turnaround time is always a big winner.
- Enhanced communication with rest of lab staff
  - Real-time upload of field data allows staff at laboratory to see test results, sample site images before field collector returns to office. Data analysis and QC can begin asap.
- Location Flexibility
  - iMobile allows field data to be collected at the point of activity including GIS coordinates.
- Compelling Return on Investment (ROI)
  - Cost savings from reduced field collection work (save avg. of 25-35 minutes/day per collector) can have iMobile pay for itself in less than a year.

Mobile Technology – Integration with LIMS

What devices can I use?

- iMobile is platform independent. It runs on almost any smartphone, tablet or laptop with an Internet browser and a constant Internet connection (3G/4G/LTE cellular, WiFi, “Hotspot” cellular solution).
- Some suggested devices include:
  - Apple iPhone / iPad
  - Samsung (Android OS)
  - Microsoft Surface Pro

CASE STUDY: Fairfax Water



- Fairfax County Water Authority is the main water company in northern Virginia.
- Serves nearly 1.7 million people in northern Virginia who depend on Fairfax Water for superior drinking water.
- The laboratory supports two treatment plants with a 167 MGD average production with a 345 MGD capacity. They also have two sources of raw water, the Potomac River and the Occoquan Reservoir.
- The laboratory holds multiple certifications and employs 21 full time analysts, chemists, microbiologists, field collectors and managers that analyze the water for over 350 different analytes.

Fairfax Water

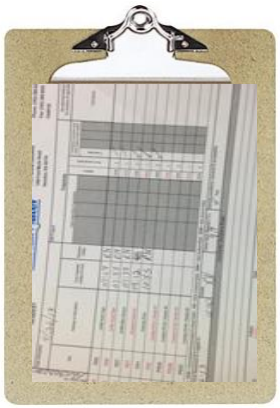
Needs Assessment

- Ease of use of the software and devices was a concern, since the collectors varied in age and technical expertise. The proposed solution had to be as simple as the paper forms that the team was familiar with.
- Other considerations:
  - Network Connectivity/Security/Access
  - Tablet functionality (what brand?)
  - Cost of the software LIMS/iMobile
  - Integration with the LIMS scheduling functionality
  - Software, hardware, data plans, updates
  - Support and maintenance

Environmental Field Collection

- Large Service Area
  - Reservoirs
  - Wells
  - Rivers & Streams
- In-Plant Faucets
- Water Main Breaks
- Hydrants
- Ponds, Lakes, Ocean
- Customer Complaints

Conventional Field Data Collection



- Paper forms are filled out in the field – legible?
- Returned to the laboratory with the sample
- The field information and test results are keyed into the LIMS (opportunity for errors to be introduced).

Going Paperless

Expected Benefits:

- Transcription errors virtually eliminated
- Data captures are date/time stamped – transmitted to lab in real time
- GIS Coordinates are automatically captured
- Increased data availability – faster, better data
- COC automatically printed upon return to laboratory

Unexpected Benefits

- Staff have access to SOPs in field
- GPS for navigation to sites
- Email to send photos or video taken on tablet back to laboratory
- Video conferencing capabilities
- Access to other useful applications on the tablet (Calculator, Skype, Unit conversions)

Compelling Return on Investment (ROI)

- Resource savings (avg. 60 min per day per person) x 6 field personnel = 6 hours/day time saved.
- Fairfax Water recouped cost of mobile solution within 6 months on labor savings alone.
- That includes cost of software, hardware, implementation.

Business impact of mobile technology

Increased efficiency. Elimination of paper forms and the time lag in the time that it took to return the forms to the laboratory and to transcribe, store and manage them.

Faster TAT. Uploading field data in real time back to the lab allowed analysts to get started immediately. Result was faster turnaround time.

Enhanced Data Quality. Maximize resources. Eliminate transcription errors from dual entry (transcribing the paper data into the LIMS).

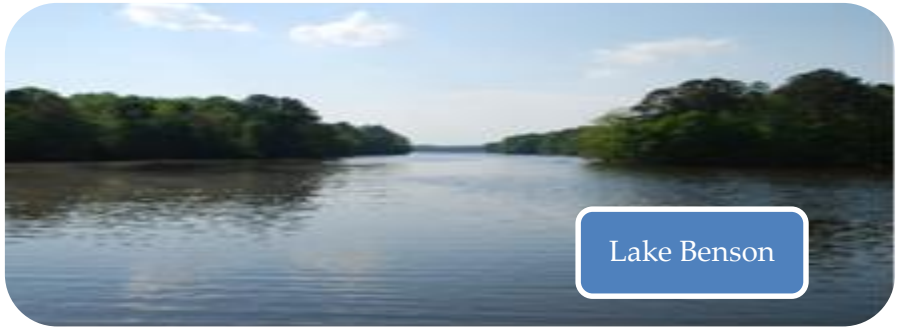
Pre-scheduled samples so that collectors know exactly what samples are required to be collected each day and also what tests need to be performed.

Enhanced communication. Work with field collection team and share images when required of sampling sites, water main breaks, or other images of interest.

CASE STUDY: City of Raleigh, NC

- Two Water Treatment Plants
- 52 MGD average production
- 102 MGD capacity
- 175,000 customers

Dual Sources



CASE STUDY: City of Raleigh, NC

- 10 full-time laboratory staff
- 129,000 tests performed annually
- 40,000 samples collected annually

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Before Integration of Mobile Technology to LIMS

- Signatures required for verification
- Write test results in field, enter data at lab
- Labor intensive
- Laboratory had to wait for collectors to return to lab and manually enter results into LIMS

After Integration…

- Sample location's GPS coordinates, date, and time are recorded (no need for signatures)
- Enter data in the field (real time data generated)

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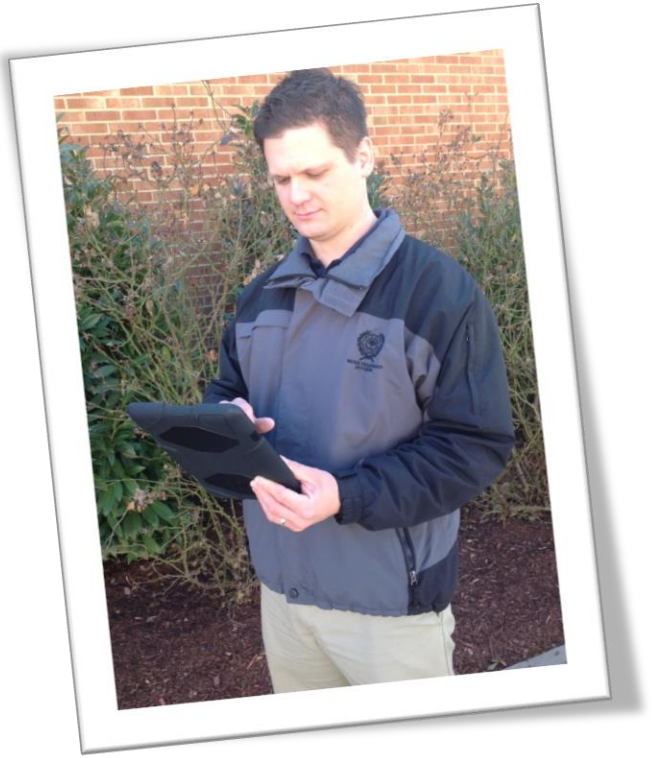
Mobile Technology Video Testimonial



Andrew Lake
City of Raleigh

City of Raleigh – iMobile Benefits Summary

- Data transcription errors are eliminated.
- Field data can be accessed in real-time by all LIMS users in the lab.
- GPS capability in tablet allows exact sample location to be recorded in GIS system.
- Tablet can also take images of sampling location and send back to lab for review by management.
- Other City of Raleigh departments are using mobile solution
  - Record water main breaks
  - Fire hydrant repair
  - Customer complaints
- Return on investment (ROI) is significant:
  - Using mobile solution has resulted in saving 25-35 minutes/day per field colle
  - The ROI was calculated to be between 8-10 months.

Hear What Our Customers Say:

"The mobile solution has allowed our laboratory immediate access to field data (saving time), eliminated dual entry from paper forms (saving money), and increased our data quality."

V.B., Laboratory Manager
City of Raleigh, NC

"The field collectors are now equipped with state of the art tools to better do their jobs, provide real-time data to the laboratory while reducing costs."

J.Y. , LIMS Administrator
Fairfax Water, VA

THANK YOU!

- I want to thank our customers who made the case study portion of our presentation possible.
  - Fairfax Water (Joe Yorke, Melissa Billman and the Fairfax team)
  - City of Raleigh (Vannessa Barnes, Andrew Lake and the City of Raleigh team)
- Stop by Booth #29 during the Conference so we can talk about how mobile technology can make a difference in your organization

NEMC

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