

The background features a glowing blue sphere on the right side, surrounded by a grid of binary code (0s and 1s) that recedes into the distance. The overall color scheme is dark blue with bright highlights from the sphere and grid.

CH2M HILL Industrial Control Systems Group Going Mobile: Opportunities and Implementation Strategies

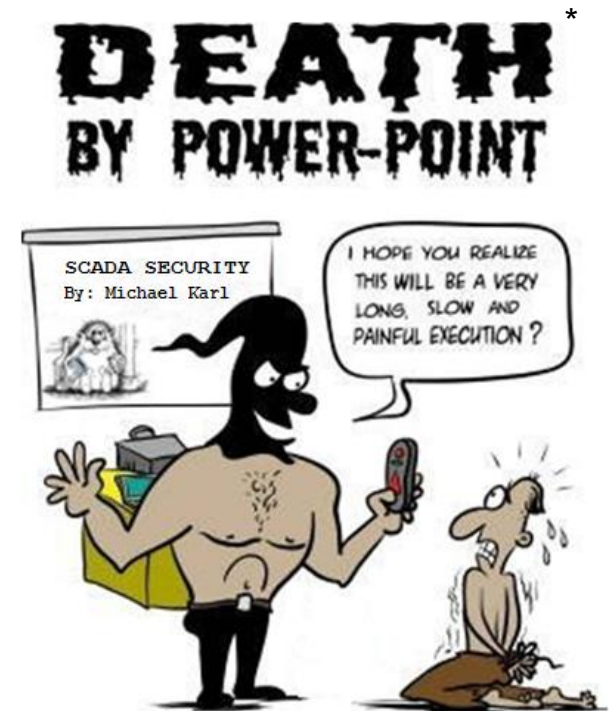
CH2MHILL.

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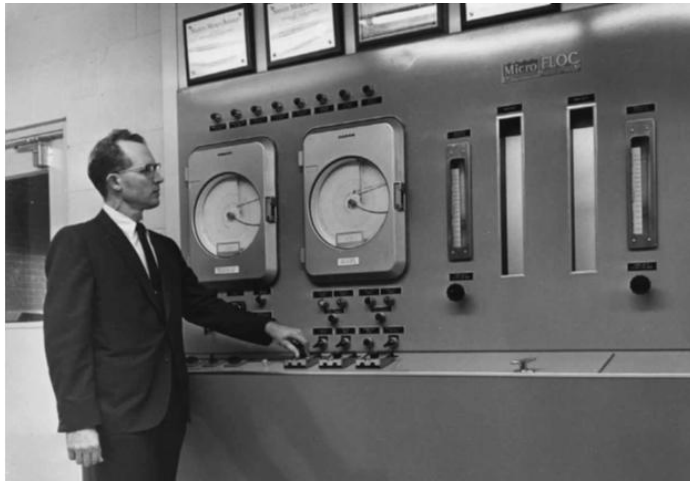
May, 2013

Agenda

- History of Utility's Automation
- Discussion of Mobile Computing
- Use Concepts
 - SCADA
 - GIS
 - Critical Event Management



CH2M HILL's Automation Group In Younger Days



Automation in the '50's
(MicroFLOC)



DCS Pre-Windows '80s
(Bailey)

Demand for Cost Efficiency Inspired Innovative Solutions



SCADA/DCS



Regional Controls



SCADA/DCS



Local HMI



Remote Access
(Dialup)



Tablets

Who's Heard of "the Cloud"?

Explosion in Mobile devices



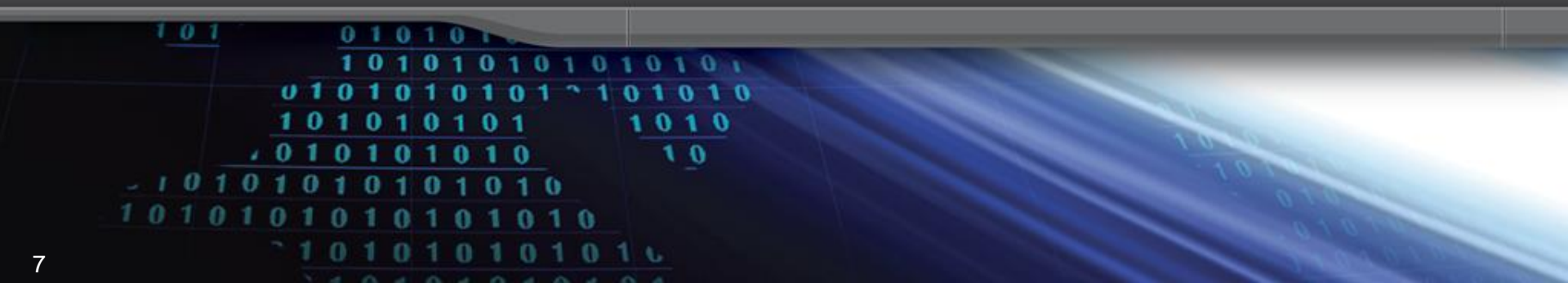
Enterprise Applications



Note: Images courtesy of Apple App Store



Live Demo Section





Mobile GIS – Case Study



Implementing a mobile solution...

Summary of Best Practices

1. Understand business objectives
2. Document existing and proposed workflows
3. Assess data needed to support business objectives
 - Consider legacy databases and forms
 - Minimize the need for comments
 - Simplify data forms when possible – w/o impact to use
 - Put some time into establishing “pick lists”
4. Plan on a minimum of 3 stages for deployment
 - Proof of Concept
 - Pilot
 - Production

Plan the full lifecycle of data management => Quality Control, Backup...

Overview of Field Work

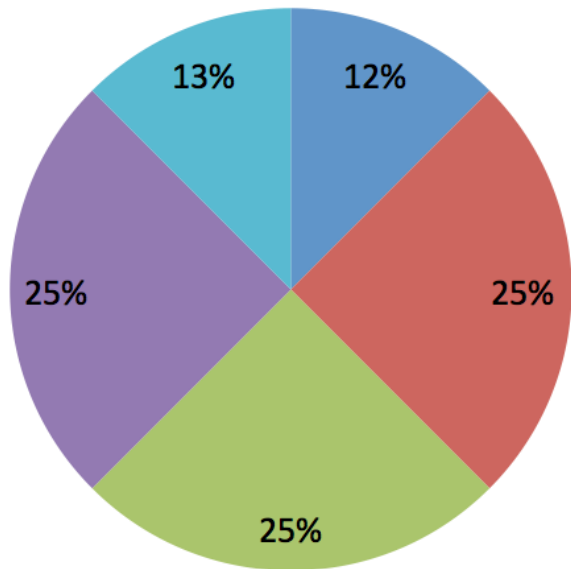
- Building Inspections
- Manhole Inspections
- Smoke Testing
- Dye Testing
- CCTV Inspection
- Catch Basin Inspections



Comparison of Levels of Effort for Old and New Processes

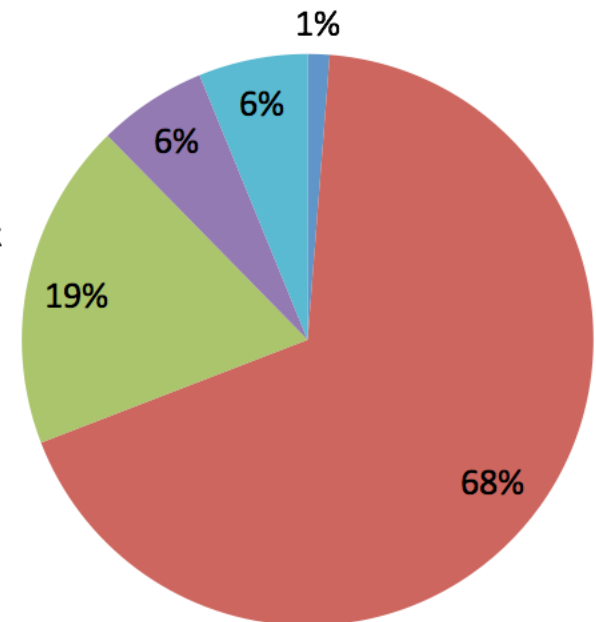
Catch Basin Inspection Time Allocation

Paper based inspections



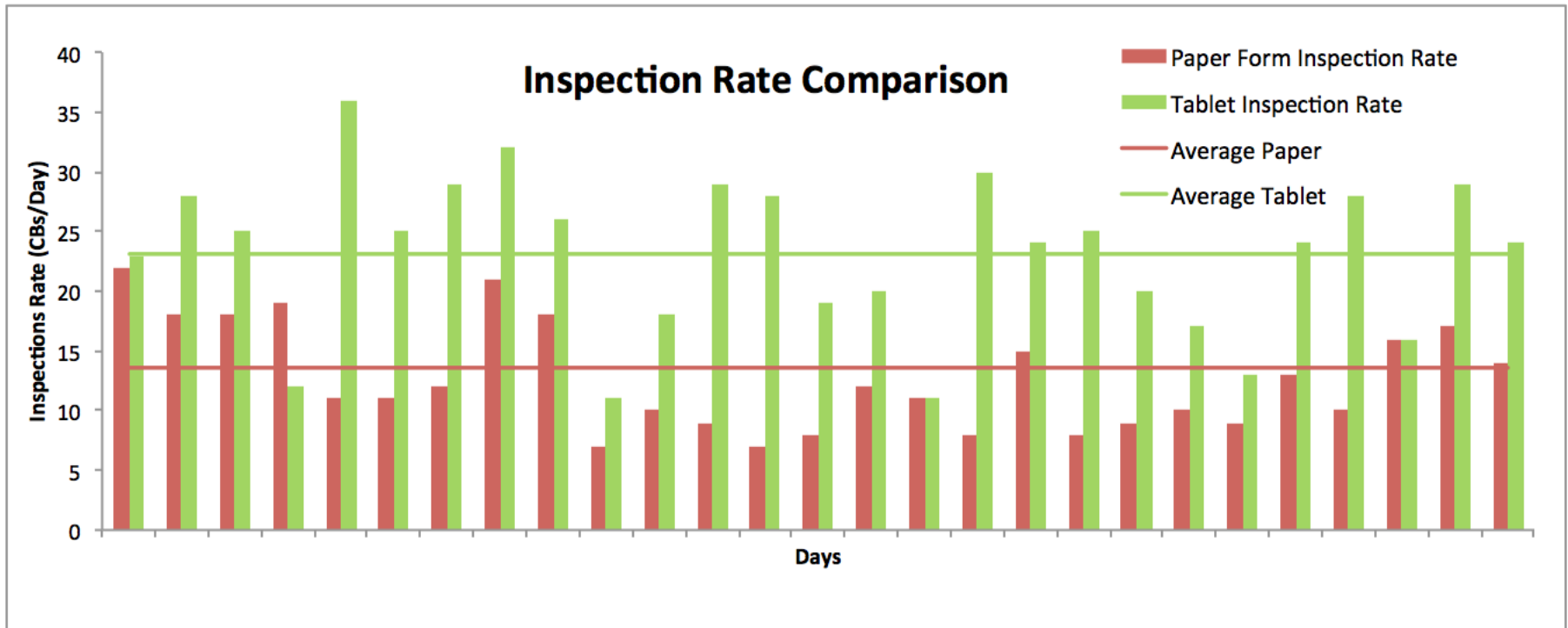
- 50% office work
- 50% field work

Tablet based inspections



- 7% office work
- 93% field work

Comparison of Inspection Rates for Old and New Process



- Average inspection rate for paper: 14 /day
- Average inspection rate for tablet: 23 /day

Summary of Findings

1. Proved that rapid deployment of mobile technologies for field data collection is possible
2. Smart phones can work as well as tablets – most people already have one
3. Wide variety of out of the box applications designed to support field data collection
4. Wide variety of data connection options - 3g/4g live, tethering, WiFi sync, asynchronous, eMail...
5. Converting from paper to electronic data collection provides a large ROI for our customers

Lessons Learned

- A 3G or 4G connection is needed to perform work using this architecture – AT&T had better coverage
- Technical support was key during the pilot phase to address code errors and system issues
- iOS was more reliable than the Android version of ArcGIS Mobile
- Field work is difficult during moderate to heavy rain – touch screen responsiveness affected

Final Thoughts

- Mobile applications solve many problems
- Without proper implementation you have many risks
- Evaluating proper levels of security is important
- Technology is moving at an incredible speed



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