From Clipboards to PDA’s

(Personal Digital Assistant)

Joe Finn
Wonderware Midwest
Some History

Mobile Technology in Water & Wastewater

Other Mobile Devices

Application Examples

Use Case in Water/Wastewater
Evolution of the PDA

Apple Newton
Aug 1993

Sharp OZ-7000
1988

PDA
Feb 1993.
Bill Gates talks to University of Washington students about the Wallet PC
The Wallet PC …

…it's a futuristic device unlike today's personal digital assistants.

“… You have digital certificates. Digital money.”

“It has a global positioning thing in it, so you can see a map of where you are and where you might want to go.”

“It's our vision of the small, portable PC of, say, five years from now.” (~1999)

“A Wallet PC will be a pocket-size computer with a snapshot-size color screen that you will use in place of many essentials you carry around with you today -- money, keys, identification, credit cards, tickets -- as well as items that provide you with mobile information and communications, such as a watch, newspapers or other reading material, address and appointment books, photographs, calculator, portable telephone and pager.”

[Bill Gates, Huntsville Times, Feb 20, 1996
9 months before Windows CE 1.0 is released]

http://www.hpcfactor.com/reviews/editorial/walletpc/
Evolution of the PDA

- **NT 4.0 Terminal Server Edition**
  - 1998
- **WiFi 802.11b**
  - Oct 1999
- **Apple Newton**
  - Aug 1993
- **Sharp OZ-7000 personal organizer**
  - 1988
- **Cassiopeia Handheld PC**
  - Windows CE
  - Mar 1997
- **Palm Pilot**
  - Apr 2000
- **iPAQ pocket pc**
  - WiFi
  - Oct 1999
  - 2000

**Synchronization**

Software Solutions for Real-Time Success™
Convergence (of functionality)

the right information in the right place at the right time.
Other mobile devices: Larger, standard Operating Systems
Examples of Industrial versions of mobile hardware

► Intermec

► Motorola /Symbol
“Field Computing Applications and Wireless Technologies for Water Utilities report”.

A survey performed by awwaRF
Key Mobile Capabilities Important to the Water Industry (awwaRF survey)

- Improved customer service
- Better data quality, transparency, and control
- Enhanced overall visibility into field activities
- Reduced response time for unplanned activities
- Knowledge capture for succession planning
- Cost savings and efficiency in field activities
- Regulatory compliance and reporting

Going Mobile – Field Force Computing Improves Productivity
Percentage of Utilities in the Survey Deploying Wireless Technologies

- 42% No
- 58% Yes

Source: “Going Mobile. Field force computing improves productivity” Opflow magazine, Sep 2008
So – why NOT (go mobile) ?

► Security concerns
  ▪ *Although it is possible to have a secure implementation.*

► IT challenges
  ▪ *Although technology advances facilitate integration*

► Reluctance of staff
  ▪ *Positioning*
  ▪ *Training*
APPLICATIONS
Application: Alarms to your phone

Sending (SCADA) alarms to your pager and or cell phone has been around for many years.

Mobile-911
For WIN-911/PRO
Mobile personnel accessing SCADA applications remotely via Remote Desktop Protocol (RDP) sessions using dockable PCs in trucks or SmartPhones.
SmartGlance

SaaS . . .
*(Software As A Service)*
. . . to your iPhone.

SaaS = *Subscription based*
Application: SaaS Video (2:00)

SmartGlance
Application: SaaS Architecture

Company Data

- Upload Data
  - On-Demand (Manually using templates)
  - Real Time (Automatically using ready Connectors)
  - from Oracle, SAP, SQL, CRM, ERP and others

Secure Transaction
- Secured Transmission via SSL under HTTPS
- Formats: SOAP, POX, and JSON

SmartGlance Business Report Generator
- Secured Hosted Data Center
  - Login
    - Administrative Control Web Login

SmartGlance to View and Analyze Data

The diagram illustrates the flow of data from various sources into a secured business report generator, enabling real-time access and analysis through a mobile interface.
Application: Data Monitor

Watch your data via:

- Environmental Monitoring OPC Server
- Distributed Process Control OPC Server
- Building #1 PLC Utilities OPC Server
- Building Automation OPC Server
- ODBC Database
- Manufacturing Data Cloud

- Personal Portal
- Trends
- Smartphone E-mail
- MMS Text

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twitter
Ditch the plastic, pay with your phone

Cash, credit or iPhone? Here are a few of the growing number of ways your smartphone can replace your wallet.

Scan your phone

No more fumbling for your wallet when you want a latte. Starbucks' mobile app, available for the iPhone and BlackBerry, allows users to essentially replace their Starbucks card with their phone.

Download the app, enter in your Starbucks card number, and your phone will display a barcode that can be scanned at the checkout counter. Users can track their balance on their mobiles, but the real selling point is the ability to order and pay quickly — vital during a morning coffee rush. To reload the card, customers can link it to a debit, credit card or PayPal account.

Starbucks started testing mobile payments in September 2009 in a handful of Bay Area and Seattle shops. On Wednesday, it expanded the effort to all 6,800 of its stores throughout the U.S.

By Laurie Segall, staff reporter

NEXT: Skip the lines at the ballgame
Application Use Case: Mobility in Water & Wastewater

- Best Practice Repository
- Mobile Field Applications
- Advanced Scheduling
- Reporting & Analytics
- Business Analyst - Tools
- Enterprise Ready Framework
Application Use Case: Mobility in Water & Wastewater

- Operations – Operator Rounds
- Maintenance / I & E – Inspections
- HSE – Safety and environmental rounds
- Learning – Learning on-the-job... reliably!
- Projects/Turnarounds – Status / details
- QA – Time stamped lab samples
Mobile devices are more than just remote browsers…

They are powerful computers in their own right.

Mobile computing is an opportunity.

- . . . to complement desktop computing,
- . . . to establish a new way of working
- . . . to leverage applications that can accelerate and sustain process improvements *rather* than moderately improving them by moving that same process from paper to mobile device. . .

. . . because you have a GPS, a bar code reader, RFID, a video player, historical data and step by step instructions in that mobile device!
Work Process – Configuration and Content

System Administration

SuperUsers

System Administration
User Rights

Creating Procedures
Managing Task Lists
Scheduling

Manual Work
Processes

Automated Work
Processes
Infrastructure for Work Management

Procedure Builder
- Intuitive Procedure Creation
- Tasks, Assets & Integrations
- Define Best Practices
- Define Workflow
Calendar view of scheduled procedures

Look Ahead (Current or Future Scheduled)

Look Behind (Completed, Overdue or Missed)

Drag & Drop Scheduling
Advanced Scheduling Options

Single or Recurring Schedules

Schedule to a Role or a Person

Schedule to a Shift or to a Rotating Crew

Make sure the Procedure is visible to the group you want

Schedule Start, End and Number of Times

Multiple Pattern Choices by Shift or by Crew
Individual Dates can be selected for exclusion from the schedule

Date Patterns can be excluded from the schedule
Advanced Scheduling Options

- Allow for early availability of the procedure
- Latency with new options including “End of Month”
- Overdue Flag available to help drive Field Worker and Supervision behavior
- Higher level permissions allow schedule locking
- Procedure Schedules can be configured as “Required”
Workload Balancing

Procedure Status
- Overdue
- Completed
- Active
- Missed
- New

Scheduled Number of Tasks

Time
- Estimated
- Actual
Crew Setup

Rotating Crew configurations are used to facilitate scheduling and reporting.

Rotation Patterns up to 366 days.

Create Rotating Shifts that match your current configuration.
System Administration

User Rights

SuperUsers

Creating Procedures
Managing Task Lists
Scheduling

Field Workers

Operator Rounds
Inspections
Work Requests

Manual Work Processes

Automated Work Processes

• Process Historian
• (OPC-hda)
• DCS

CMMS (SAP, Maximo, Tabware, etc)
Observation and Measurement

Operator is provided with a list of procedures
- Scheduled
- Filtered by Area & Role
- On Demand

Operator is presented with a list of tasks to answer
- Using defined pick-list
- Virtual keyboard
- Pen entry
- Peripheral devices
Focused Advice & Escalations

- Back Flush Motor Box Exchanger. Notify Shift Supervisor.

- Make note of any leaks and report to the HSE department at x4357

- Switch the Post Frac production into the 8’ leg of the HDU-1 line that goes to the Bird’s Nest by opening the one valve at this location. This valve is located on the platform and is labeled “SHCU line to HDU-1 line leg.”
Mobile Trend Graphs

- OPC-hda Trends are transferred to the computer automatically
- Zoom In / Zoom Out
- Select one or more tags to view
- Some trends are always available
Operator can review existing or create new notifications on the mobile computer

- Triggered from an Action
- Ad Hoc as required
- Reduces chance of duplicates
- Some lists come from your CMMS
- Some fields answered by the procedure or through integration with RFID tags
System Administration

- System Administration
- User Rights

SuperUsers

- Creating Procedures
- Managing Task Lists
- Scheduling

Field Workers

- Operator Rounds
- Inspections
- Work Requests

Manual Work Processes

- Automated Work Processes

Supervisors

- Process Historian
- (OPC-hda)
- DCS

CMMS (SAP, Maximo, Tabware, etc)

Review Rounds
- Approve Rounds
- Edit Field Data
Summary Report By User (Role)
- % Approved
- % Complete

Summary Report By Year and Month
Drill down to Status components by Procedure
Completed / In Progress Report

- Procedure Status
- Scheduled Role
- Scheduled Crew
- Expected Start
- Expected End
- Other
### Scheduled Report

- Procedure Status
- Scheduled Role
- Scheduled Crew
- Expected Start
- Expected End
- Other

![Screenshot of Auditor Plus – New Scheduled Procedure Report](image)
Procedure Details provide additional information
- Highlighted Exceptions
- Data Collection Details
- History graph
- Tabular History
Electronic Log Books Provide Shift Supervisors and Field Operators with Common View of Shift Relief Notes
System Administration
- User Rights
- CMMS (SAP, Maximo, Tabware, etc)

SuperUsers
- Creating Procedures
- Managing Task Lists
- Scheduling

Field Workers
- Operator Rounds
- Inspections
- Work Requests

Management
- Performance Monitoring
- Data Visualization
- KPI / Web Reports

Supervisors
- Process Historian
- DCS, OPC

Review Rounds
- Approve Rounds
- Edit Field Data
White Paper

“Game Changer – Visibility, Enablement and Process Innovation for a Mobile Workforce”

Available for download from
www.wonderware.com

OR

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Thank You