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Mobile Technologies Impacting the Way We Work

Sandra Auyer Jones

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Trends in a High Performing Workforce

- Real – Time Information
- Peer to Peer Comparison Data
- Supervisor Accountability Increase
- Reduce T&D Cost/Customer
- Safety Automation

Trends in Asset Management

- Sense and Respond
- Alerts
- Automated Tracking of Inventory
- Automatic Replenishing of Stock

Mobile Technologies

The use of new technologies, and resulting new processes are addressing the key concerns head on.

Intelligent Objects

RFID

Sensors

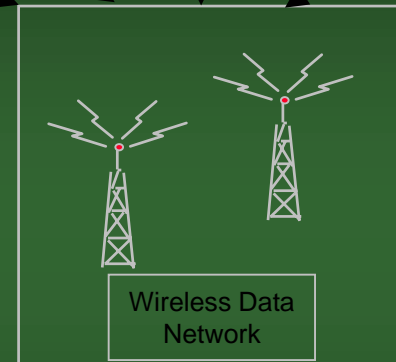
Display

Actuators



**Silent
Commerce**

Intelligent Workers



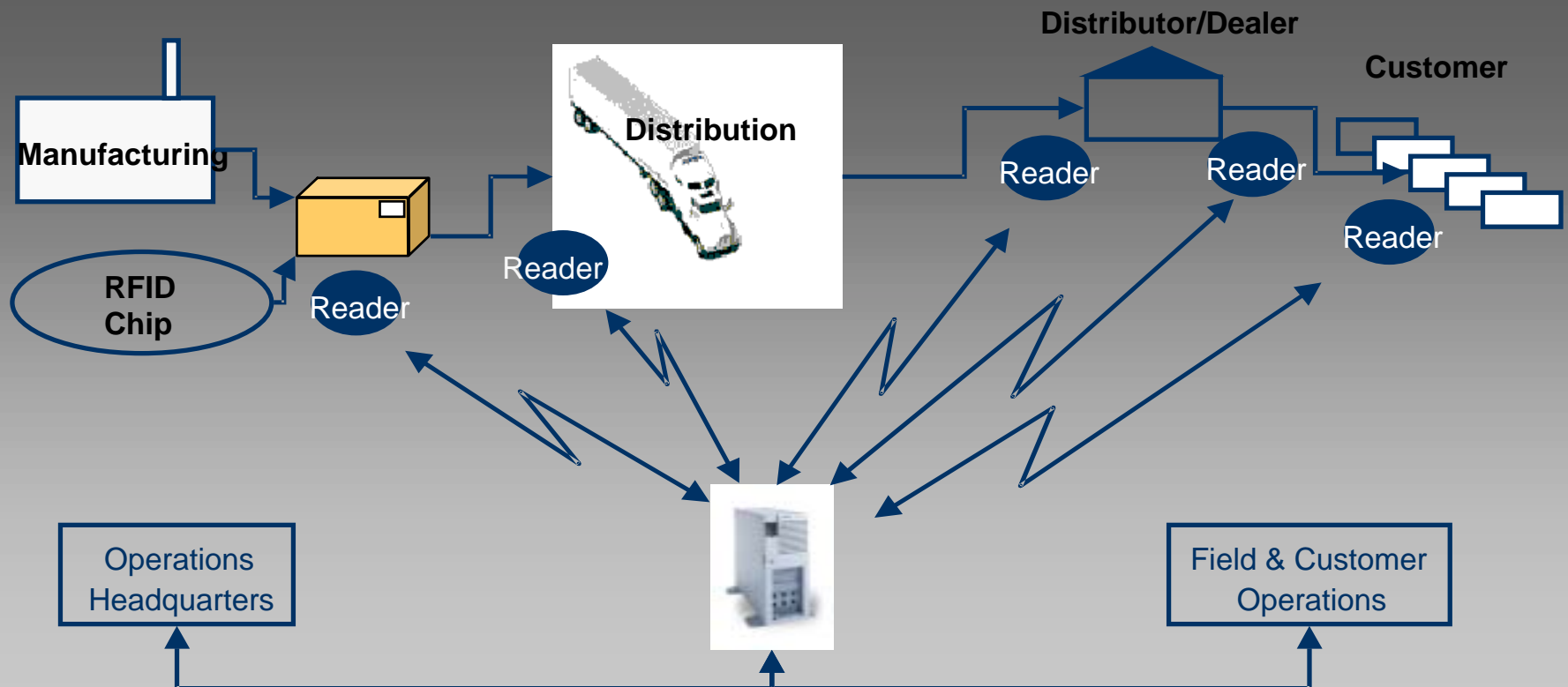
Application of RFID

Each type of deployment has a different benefit, requirement, timeframe and value proposition.

E-Packaging Deployment			
	Simple	Closed	Open
Benefits	<ul style="list-style-type: none"> • Product monitoring • Anti-counterfeiting • Anti-diverting • Product tracking 	<ul style="list-style-type: none"> • VMI • Supply chain visibility • Automated check-in • Automated quality control 	<ul style="list-style-type: none"> • Supply chain integration • Automate Supply Chain • Integrated manufacturing and supply chain
System Requirements	<ul style="list-style-type: none"> • Coded chip • Single Database • Handheld readers • Can be stand alone system 	<ul style="list-style-type: none"> • Single Database • Own Standards • Integration with legacy systems 	<ul style="list-style-type: none"> • Multiple database • Data transfer between numerous companies • Open standards • Integration with legacy systems
Timeframe	<ul style="list-style-type: none"> • Can be done today and quickly 	<ul style="list-style-type: none"> • Can be done today, requires longer time for integration 	<ul style="list-style-type: none"> • Requires agreement and participation of numerous parties: 1-3 years out.
Value Proposition	<ul style="list-style-type: none"> • Simple and relatively easy to quantify and capture 	<ul style="list-style-type: none"> • Able to identify, harder to capture 	<ul style="list-style-type: none"> • Able to identify, can be difficult to allocate to each participant.

Application of RFID

With readers at key points along the supply chain, partners have a clear view of the movement and inventory in the system with greater granularity.



Application of Wearable Computing & Sensors

Safety is improved by the ability to enforce policies and procedures from anywhere, as well as be “hands-free”.

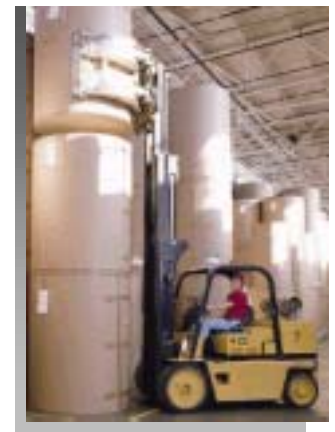


Wearable Services Platform - Worker safety is enhanced when an individual can use voice commands while viewing a miniature computer screen to generate transactions in a back office application.

With sensors, we now have a much more granular level of data: from tracking the location, temperature or humidity of a package, to determining how many are in stock virtually.



For example, an individual pallet being picked up by a worker can now be smarter --communicating to nearby parties-- about its contents, its handling conditions and its destination.



Application of Mobile Computing



7:30 AM

- ❑ Maint workers arrive in shop. Crew supervisor hands out job assignments.



7:50 AM

- ❑ Crew reviews work package, Foreman conducts tailgate. Crew verify procedures.



8:15 AM

- ❑ Crew picks up parts, Foreman gets works start authorization.



4:00 PM

- ❑ Crew completes job, returns to shop. Foreman documents work completion.



9:00 AM

- ❑ Foreman joins crew at work site in containment.



8:30 AM

- ❑ Crew goes to RCA, dresses out, obtains dosimetry and verifies RWP.

Application of Mobile Computing

Mobile provides a way to reduce or eliminate lost time around the plant.



7:30 AM

☐ Maint workers arrive in shop. Crew supervisor hands out job assignments.



- ☐ Work Package Reviews
- ☐ Job Briefings
- ☐ Issuing Parts & Materials
- ☐ Work Start Authorization
- ☐ Tag-Out Verification
- ☐ Procedure Conflicts
- ☐ Incorrect Parts
- ☐ Engineering Decisions
- ☐ QA Hold Points



4:00 PM

☐ Crew completes job and returns to shop. Crew documents work completion.

☐ Worker picks up preman work start authorization.



☐ Worker performs containment.

☐ Worker goes to RCA, obtains dosimetry and verifies RWP.

Application of Mobile Computing

Together, these technologies expedite existing processes, and develop a safer work environment.

- Receive and Complete Work Orders**
 - Work Assignments / Schedule
 - Work Order Details
 - Work Completion Information
- View / Update Configuration Data**
 - Facility Locations
 - P&ID's / Drawings
- Ready to Work Status**
 - System Status
 - Clearance / Safety Tag Information
 - Radiological Information
- Manage Materials**
 - View Material Inventory Levels
 - View Material Delivery Status
 - Material Ordering / Supply Chain
- Create New Work**
 - Follow-On Work
 - New / Related Work
- View / Update Asset Information**
 - Maintenance / Inspection History
 - Asset Condition
 - Readings and Results
 - ALARA/Dose Updates
- Office Automation and Productivity**
 - E-Mail and Paging
 - Schedule Updates
 - Crew Assignments

Application of Mobile Computing

Introducing mobile capabilities inside a nuclear unit can dramatically increase “wrench time”.

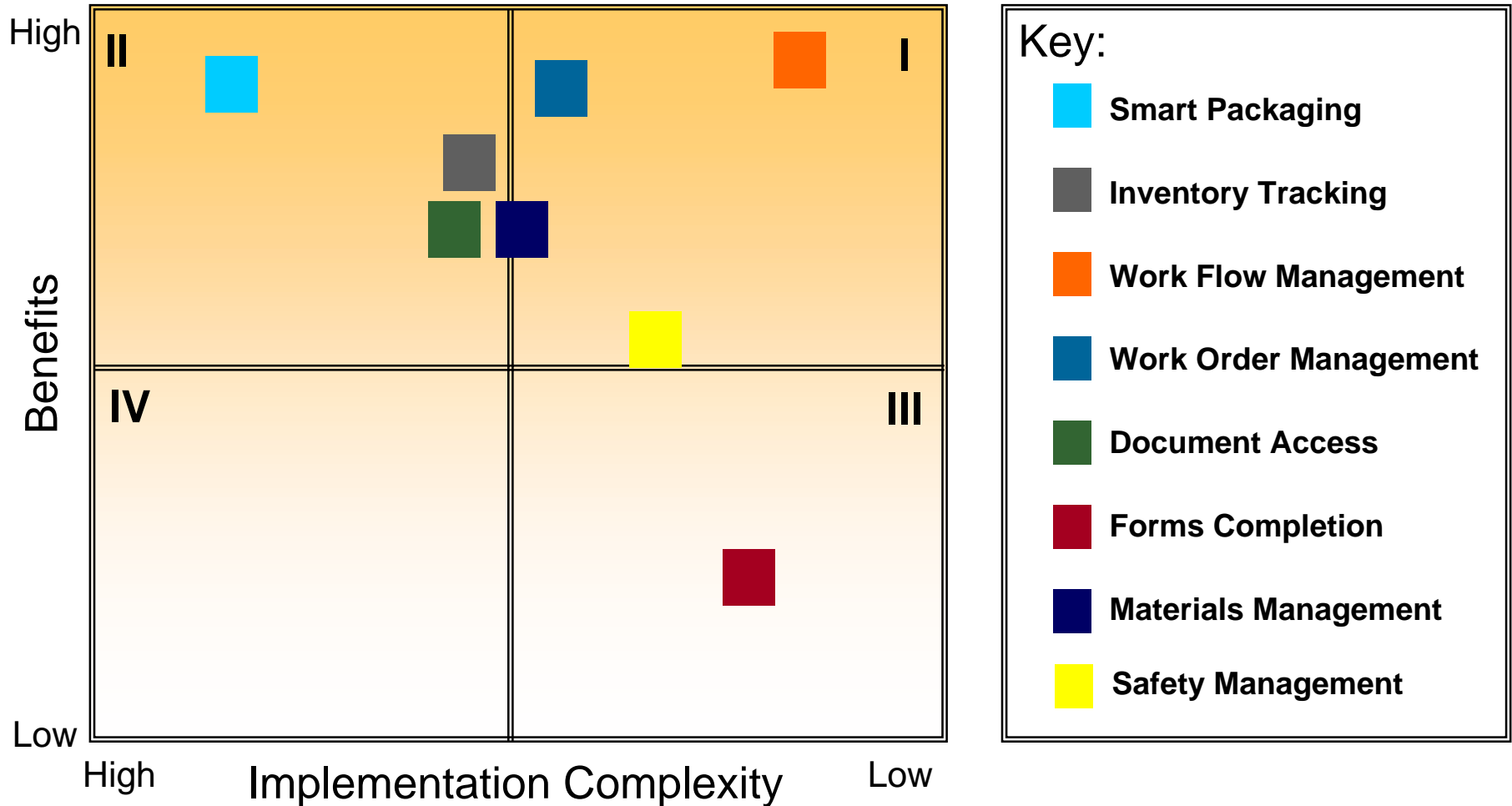
Nuclear Plant Mobile Work Force – Estimated Minutes Saved Per Workday

Mobile Worker	Work Flow Mgt	Work Order Mgt	Procedure Access	P&ID Access	Material Mgt	Total
Maintenance Craft		20-30	20-40	15-20	20-30	75-120
Maintenance Supv	10-20	20-30	20-40	10-20	10-20	70-130
System Engineer	10-20	5-10	20-40	20-30	10-20	65-120
Eng Technician		20-30	20-40	20-30	10-20	70-120
Planner		20-30				20-30
Work Week Mgr	10-15	30-60				40-75
Project Mgr	30-60	5-10				35-70
Admin/Clerical	15-25	5-10	10-20	10-20	5-10	45-85
Total						420-750

- ❑ This increase in productivity can save a typical 2 Unit Plant \$4-6 Million annually in non-outage labor costs. Savings for a 30-day outage would be \$2-3 Million.

Evaluating the Alternatives

Mobile solutions can be done incrementally, so that savings can fuel the development of further capabilities.



Choosing a Successful Approach

Key Success Factors for Launching any Mobile Initiative



- ❑ Establish an open, flexible and scalable mobile architecture
- ❑ Identify the processes with the highest mobile potential
- ❑ Prepare the organization for change

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Questions & Answers