



Goals for Technology

Business Need

- Increase application reach and range →
- Become customer-centric while tuning the supply chain →
- Rapid business-process change →
- Operate globally →
- Manage ROI →

Critical Problem

- 1) Scale to the enterprise and beyond
- 2) Integrate internal & external systems; unify enterprise data
- 3) Increase productivity and speed application delivery
- 4) Flexibility across languages, clients, configurations, etc.
- 5) Leverage current technology/ skills while investing for future

Benefits of Mobile Computing



- Expand the enterprise
 - Customers
 - Employees
- Mobile Client
- Common-intuitive user interface
- Reduces Employee Paperwork;
Increases “Wrench” Time --
ROI!
- Capture Data that is Currently
Lost
- Improved Customer Service
- Easy, simple administration



Why Mobile Computing



- Provide mobile computer access to crews
 - Use Docking, Dial-in, or Wireless
 - Client software on a mobile unit
 - Better data collection, create time cards, improved material usage capture, complete work orders remotely





“Due to better data recording, we have been able to prove the reliability of equipment and reduce preventive maintenance on cooling systems from monthly to quarterly.

Technicians are doing a better job of documenting what work has been done, additional work to be done, and material being used.”

Daniel Lockhart
CMMS Administrator
Hewlett-Packard

*Reprinted from Maintenance Technology
Magazine
December, 1998*

***“It’s all about wrench time. . . .
Since we deployed mobile, I can
report a 28% increase in
technician productivity.”***





■ Reduce

- Non-productive time
- Redundant work
- Redundant data entry
- Size of field crews



- Provide field employees with real-time access to all information
- Improve communications between divisions
- Increase access to decision-support data

Reduce Costs and Increase Infrastructure Reliability



- Analyze ‘repair versus replace’ decisions
 - Increase equipment life
 - Reduce repair costs
 - Reduce maintenance costs
- Improve safety
- Compare productivity and cost of in-house crews versus contractors





- Time Tracking
- Work Order Status Change
- Equipment Association to Work Order
- Equipment Transfer
- Meter Reading
- Inventory Counts
- Purchase Order Receipts
- Shop Stock Usage

Work Management 6:33

mobileFM™
Mobile computing solutions for the remote workforce from MAXIMUS

Quick Work Reques 6:36

Customer ALB-FAC <
 Region AZ <
 Facility PHX <
 Property PHX-ENG <
 Location 105 <
 Problem ALB20 <
 Title ALBUQUERQUE - <
 Equipment <

PM CheckPoints 5:38

PM Basic: HV001

Order No	Description
<input type="checkbox"/> 1	LUBRICATE UNSEALED
<input type="checkbox"/> 2	CHECK BELTS
<input type="checkbox"/> 3	CHECK BELT ALIGNMEN
<input type="checkbox"/> 4	INSPECT EF SUPERSTR
<input type="checkbox"/> 5	INSPECT GENERAL CON
<input type="checkbox"/> 6	CLEAN BOTH INTERIOR
<input type="checkbox"/> 7	CHECK MOTOR & FAN E

Notes Close Save/C

PD List 6:57

PO Code 50077
 Contractor BRENT
 Warehouse TED <
 Date Rec 5/24/04 <
 Description
 Pack Slip No
 Pack Slip Dt
 Ship Type

Time Card Detail 6:35

WR-020450090 PHS-001

Shop TED <
 Shop Person TED <
 Work Date 05/24/2004 <

Save/Close

Read Meters 9:52

Reading	Meter No	UI
	E-MTR1	KWH
	ERIC1	LB
	UTL-MTR-ERIC1	GAL

Cycle Count List 6:59

Warehouse TEST
 Schedule Date 3/1/04
 Desc BBB PART
 Count No 1
 Code A1
 Bin Loc BBB-01
 Part BBB
 QTY 0.0000
 UDM EA

Cancel Save Next Cancel List

File Misc Help File Filter-Off Misc Help



Perceptions of mobility are changing

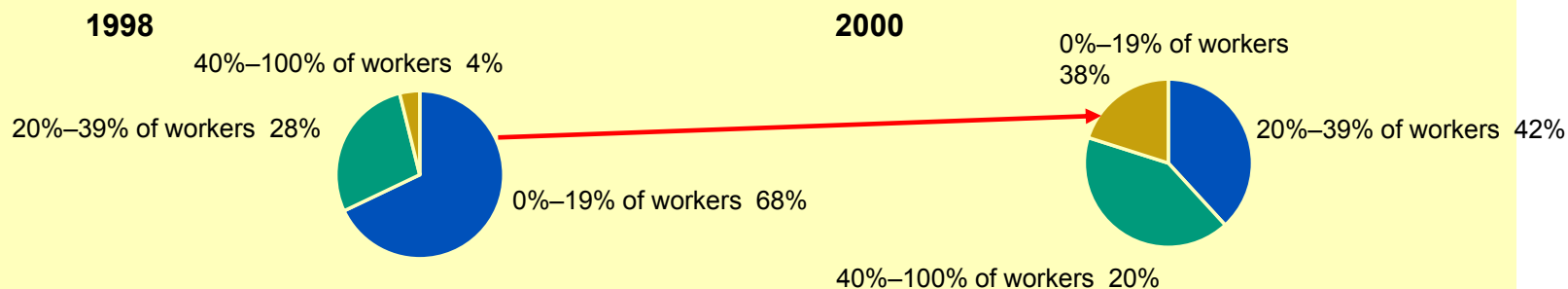
Enterprises increasingly perceive their workers to be mobile

Just 2 years ago, mobility meant “guys in vans”
... now it means away from your desk

Mobility occurs both inside and outside the confines of the enterprise walls

What percentage of the enterprise workforce is mobile?

Percent of 50 Fortune 1,000 companies interviewed



Source: Forrester Research, Inc.



Case Study: US Navy - Pax River

NAS Patuxent River Case Study



- Located at the mouth of the Patuxent River in Maryland
- Primary Mission: Naval Flight Test Operations
- 8.7 million square feet of facilities & 935 buildings
- 78.6 miles of roadway and 11.7 miles of shoreline
- 12,055 assets/equipment



Located at the mouth of the Patuxent River (65 miles south-east of the Pentagon, 90 air miles from the fleet in Norfolk), the station overlooks the picturesque Chesapeake Bay and occupies approximately 7,950 acres on Cedar Point

NAS Patuxent River Case Study



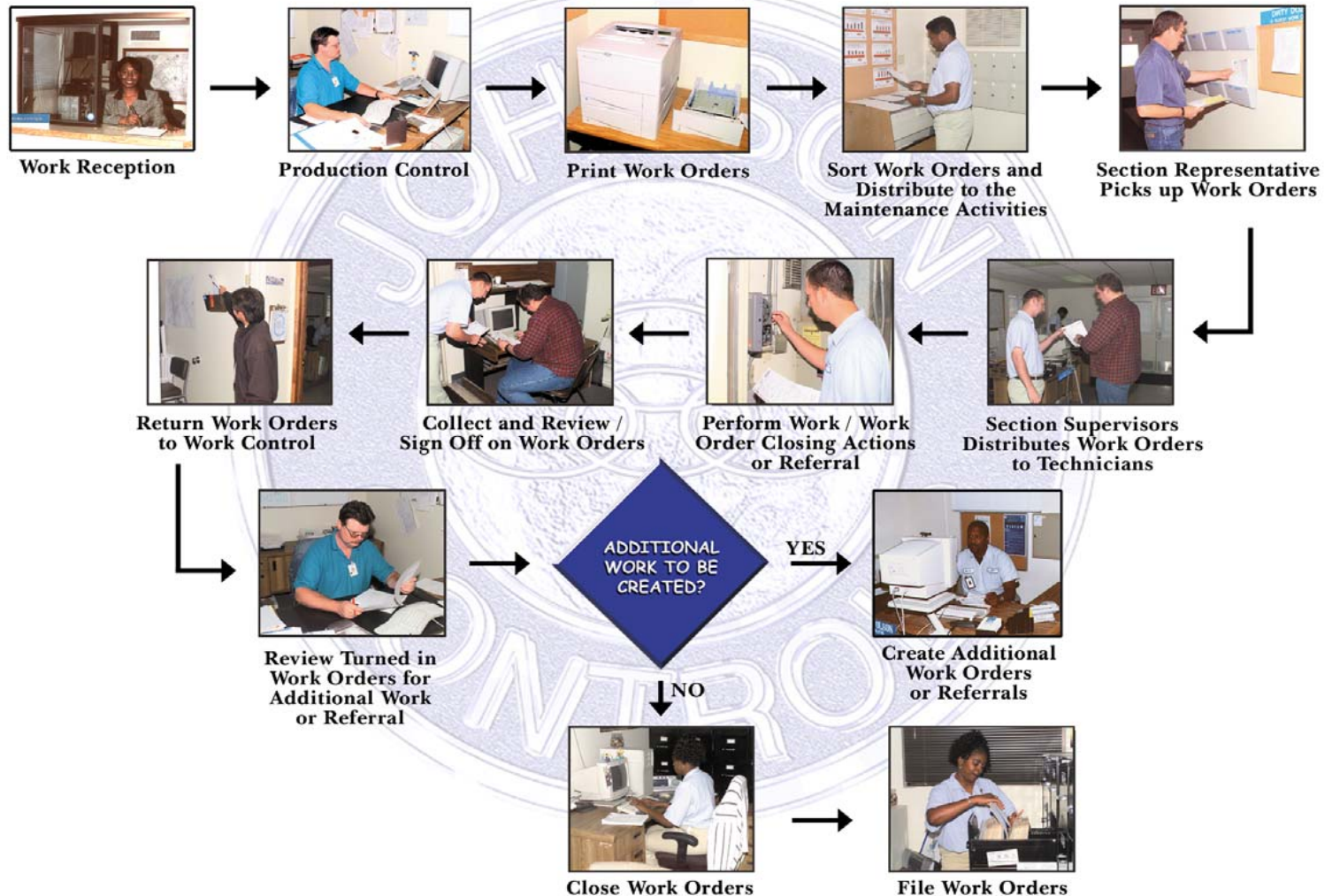
- Service Contractor procured, installed, and configured all network and file server hardware/software
- Installed and configured of CMMS including legacy data conversion
- Designed and set up project web site
- Developed required customer and management reports
- Installed and configured Mobile
 - Technician training session 2 hours
 - One day of use, fluent in use of Mobile
- Developed integration with customer legacy system
- Testing
- User Training
- Full Production

**Rapid Implementation is Enabled by
Standard Processes and Short Training
Cycle for Technicians**



The Way it Used to Be

Work Order Process (13 STEPS)





The Way it is Now

INNOVATIVE WORK ORDER PROCESS (6 STEPS)





Pax River Results

- Moved 30% of Service Repair staff to PM crew
- Eliminated 2 Service Desk Dispatchers
- Reduced “Lost Work Orders” - Customer billings were lost for “free” work
- Individual Technician productivity increased 15%
- Reduced process steps from 13 to 6
- Follow-up work is immediately recorded
- Eliminated data entry at end of work shifts
- Eliminated paper work orders and paper timesheets
- Increased customer satisfaction
- Increased employee morale

Challenges of deploying effective mobile solutions



- Adapting the presentation for each mobile device and personalizing it for each user
- Creating solutions that perform both in and out of network coverage
- Rapid integration to existing enterprise systems with flexible configuration capabilities
- Ability to manage the solution end-to-end
- Security
- Keeping pace with technology change



- As the web created a paradigm shift that drove enhanced definition of an enterprise's business logic, so to does mobile technology
- Mobile solutions create new capabilities that are a function of device, user, time, and location - leading to new functionality, processes and rules

The screenshot displays the 'Work Request Management' application window. The main window shows a detailed view of a work request with the following data:

- Customer:** TUCSON BIOLOGY DEPARTMENT
- Org:** BIO-TCS
- Entry Date:** 11/24/1998 17:18
- Login:** JCARR
- Category:** SRV
- Status:** 10-OPEN
- Region:** NM
- Facility:** ALB
- Property:** NM316
- Location:** 201A
- Work Req:** 981004
- Type:** M
- Fy:** 1998
- Title:** A/C OUT IN BIO LAB
- Due:** 11/26/1998 00:00:00
- Phase:** 001
- Est. Start:** 11/24/1998 17:33:41
- Est. End:** 11/26/1998 0:00:00
- Desc:** A/C OUT IN BIO LAB
- Problem:** [Dropdown]
- Priority:** 2
- Status:** 30-AWMAT
- Shop:** SANTA FE
- Contract:** [Dropdown]

Overlaid on the main window are three smaller windows:

- Work Request List:** A table listing work requests with columns for Work Req and Title.
- WR\Phase List:** A table listing work requests and their phases.
- Phase Detail:** A detailed view of a specific phase.

The 'Work Request List' window contains the following data:

Work Req	Title
087604	SNOW RE
087640	ICB CONV
087642	SETUP/BF
088346	FIRST RE
088902	SNOW RE
088903	TEDS

The 'WR\Phase List' window contains the following data:

Work Request	Phase
088903	001
088902	001
088346	001
087642	002
087640	001
087604	001

The 'Phase Detail' window shows details for phase 001:

- WR/PHS:** 020450090 / 001
- Desc:** PM PHASE ONE
- Problem:** [Dropdown]
- Status:** 20-ASSIGN
- Shop:** TED

At the bottom of the interface, there are several buttons: 'More', 'Start', 'Stop', 'Complete', 'Transfer', and 'Close'. A 'File Filter-Off Misc Help' bar is visible at the bottom of the application windows.



Mobile Return on Investment

Assumptions

Total Number of Technicians	65
High Concurrent Head Count of Technicians	30
Will Technician's share devices? (Yes or No)	yes
Annual Number of Work Days for a Technician	240
Burden Rate of Technician	\$25 per hour
Fully loaded labor rate of Data Entry Person	\$15 per hour
Number of FM Enterprise Work Orders Per Year	25,000
Cost of a single Palmtop Computer	\$700
Cost for the MobileFM Server Hardware	\$3,000
Cost of a single MobileFM license	\$1,500
Cost of the 1st Year's SMP (for a single MobileFM license)	\$300
Professional Services Needed to Deploy	\$12,500

Current Process: Technician submits paper work orders that are entered by an administrator/supervisor/clerk

Work Order Close Out: Clerk/Supervisor/Administrator

		Daily Efforts
Time to print/collate work orders	0.5 Minutes	0.8 Hours
Time to collect/pickup work orders	0.5 Minutes	0.8 Hours
Time to Close out a work order	1.5 Minutes	2.3 Hours
Total Time Per Work Order	2.5 Minutes	3.8 Hours
Work Order Processed	20,000 WO's Per Year	91 WO's per Day



Mobile Return on Investment

Annual Work Order Close-out Savings			\$ 12,500.00
Technician Standard times for work	Current Effort	Effort using MobileFM	
Collating Paper Work Orders at the start of the shift	5.0 Minutes	5.0 Minutes	
Manual Entry on Paper Work Order	5.0 Minutes	1.0 Minutes	
Travel Time to return for new Work Orders during the day	15.0 Minutes	0.0 Minutes	
Day end review of Work Orders	30.0 Minutes	5.0 Minutes	
Day end entry of Time Card	10.0 Minutes	0.1 Minutes	
Total Time Per Day	65 Minutes	11 Minutes	
Cost per Day per Technician	\$27.08	\$4.60	
Cost per Day for Work Force	\$1,760.42	\$299.27	
Cost per year for Work Force	\$422,500.00	\$71,825.00	
Annual Technician Paperwork Savings			\$ 350,675.00
Annual Savings per Technician			\$ 5,395.00
MobileFM Solution Cost			
Number of Devices Deployed		30	
Software License Cost	\$	45,000.00	
Year 1 Support & Maintenance	\$	9,000.00	
Hardware Cost (Server and Handhelds)	\$	24,000.00	
Implementation and Training Services	\$	12,000.00	
Total Cost	\$	90,000.00	
Project Payback Time (in Months)			3.1



QUESTIONS?

