WHITE PAPER

Considerations in Deploying and Managing a Mobile Fleet

A guide to help the mobile device purchase decision

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Introduction

According to VDC's Mobile and Wireless practice "device failure remains a critical issue for mobile computers with annual failure rates often exceeding 30%. With many mobile computers supporting mission-critical applications, the impact of failure on customer service, internal productivity, employee morale and ultimately lost revenues can be significant. Equipping mobile workers with the most appropriate device based on application and environment- and not upfront adoption cost-is absolutely critical." VDC July 2007

Are the premier industry analysts VDC and Aberdeen who report the expected failure rate of commercial handhelds compared to rugged devices can be as high as 4 to 1. As far back as 2003, a VDC Total Cost of Ownership (TCO) study found that downtime for mobile workers using commercial devices can be as much as 48% higher than for rugged users.

With these statistics in mind, there are certain considerations one should keep in mind before choosing a mobile device for enterprise applications. When building the business case, it is sometimes helpful to create a flow chart through the organization and follow the thread that adds time and costs required to manage the failure and add those break points to the total cost of the downtime. As the flow chart takes shape, it becomes clear that there are some obvious costs associated with downtime, including wages, lost productivity, spare units, parts and service. However, device failures can have more significant business specific opportunity costs that will affect the Return on Investment (ROI). Some cost-based considerations include:

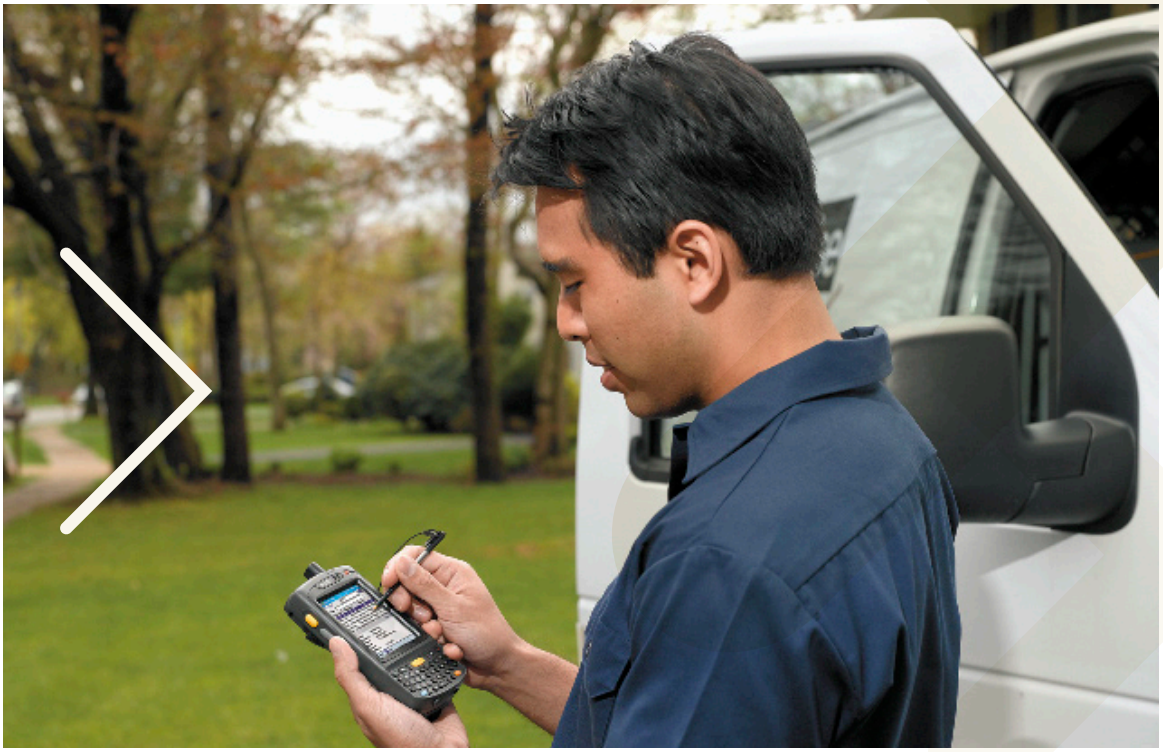
Key Performance Indicators (KPIs) and Specific Costs

- Wage Rates for IT
- Daily revenue target by mobile worker, total down-time in man-hours to manage failure

Cost of down-time impact to Customer Service, Sales and Brand Equity:

- Service level agreements
- First Call Resolution
- Increase Average Field Service Travel Time
- Increase Field Service Travel Distance
- Decrease in Service Technician Utilization Measurements
- Decrease in Field Service Equipment Utilization
- Decrease In Completed Repair Orders
- Increase in Mean Time To Repair of Customer equipment
- Service Profitability
- Average Daily Work Orders Completed

This white paper will outline the cost-based considerations one should think about when deciding upon a mobile device and provide a task list to help with the decision process around best-in-class performance for enterprise applications.



Understanding Cost-Based Considerations

Understanding these soft costs and being able to choose the best possible mobile computer for the target user and application is ultimately what will set apart organizations that are mobility innovators, and will ultimately enable those organizations to fully leverage mobile technology investments for true competitive advantage. However, organizations looking to cut expenditures will frequently opt for lower cost mobile computing hardware. In many cases this means the use of non-rugged mobile computer for applications that are better served by rugged devices. Given the high current rate of failure for non-rugged mobile computers, this refers to a broad collection of mission-critical enterprise mobility applications and not just deployments in the most extreme environments. While non-rugged mobile solutions typically have lower adoption costs, for many applications, they represent a much smaller percentage of TCO in comparison to rugged solutions. The table below outlines typical soft and hard costs associated with enterprise mobility applications.

SOFT COSTS		
Training Costs	**Operational Costs**	**Downtime Costs**
Initial User Training	System Maintenance, Standard Extended Replacement Programs Third Party or Internal Technical Support Hardware and Software Upgrades Application Management (Third Party or Internal) On-going Device Management Costs (Third Party or Internal)	Hardware Costs KPI Measurements

HARD COSTS		
Hardware Costs	**Software Costs**	**Development Costs**
Carrier Data Plan Platforms Peripherals	Upfront Fees License Fees (Application, Device Management, Custom Development)	Application design standard and customized integration to ERP staging of mobile devices

The biggest single ROI killer is downtime.

Downtime is defined as anytime that a device is not functioning at operational capacity thereby affecting the user's ability to complete their work. Downtime typically stems from device failures caused by incidents or exposure to environmental conditions similar to those used to measure ruggedness.

The table below illustrates the key performance indicator (KPI) metrics that can be associated with device downtime.

KPI METRICS IMPACTED BY DISPATCH OPERATIONS SERVICE		
	Decrease Average Field Service Travel Time	Minutes, Average of debriefed Field Service technician travel time
	Increased Average Field Service Travel Distance	Average of debriefed Field Service technician travel distance
	Decrease Completed Repair Orders	Repair Orders of status "Closed" with Close Date
	KPI for Operations Service Technician Utilization	Percentage of Field Service Engineer debriefed time over planned work time

This table illustrates how downtime affects many roles.

ROLE	RESULT OF FAILURE	POTENTIAL OPPORTUNITY COST
Technician	Unable To Work	Work Cancellation Unproductive Asset Cost Unproductive wage cost Customer Satisfaction Loss of revenue
Technician	Reschedule of Jobs	Re-dispatch of job ticket Overtime required to finish job
	Roll a "Truck" Second Time for Same Ticket	Cost per truck roll $265
Mobile IT Support Staff	Replace Device	Order new device from stock or supplier
	Provision Device Tasks	• Provision a device with or without user intervention. • Provide package persistence support (an application will be reinstalled if inadvertently removed) • Support capability to sequence multiple files/applications • Support capability for prompting user on install or silent installs • Support the execution, waiting, and deletion of an application, which is useful for running scripts • Packages to users/user groups/device groups/ platforms/Operating Systems/Versions • Support capability to distribute software packages based on device characteristics • Support capability to auto-deploy applications without requiring admin maintenance of packages • Perform pre-installation operations during software distribution: • Remotely view, kill or activate processes • Remotely view system information • Remotely reset (hard or soft) device • Issue remote commands to devices in real-time • Delete, copy, receive, and send file remotely
IT Help Desk Support Tasks	Hardware Inventory Support Tasks	• Hardware inventory in addition to software is inventoried upon connection to the home server. • Display (resolution, color depth) • Battery (capacity, chemistry, life) • Backup battery information • Memory and Usage of Memory • Communication Information • Last connect and disconnect times • Date/Time • Platform (OS version info (major, minor, build)) • Processor Information (architecture, type, speed, granularity, level, revision, count) • Owner (Name, Address, Phone, Notes) • Memory (Page info (size, count))

Typical tasks around device management in mobile fleets

The future scalability and operational endurance of a mobile device must also be considered. Implementing rugged hardware is a proactive strategy to protect against the cost of future failures. By implementing a consumer device with 'after thought" ruggedness bolted on, the enterprise is exposing itself to adopting a reactive strategy through which they will manage failures and their costly consequences as they arise, rather than trying to avoid them altogether. This reactive strategy has the net-affect of deferring the costs from the point of purchase over the lifetime of the unit.

The following check list can provide points of consideration from the IT department's point of view, as they work to support the many mobile devices that have been deployed to the field.

IT Tasks Supporting Hardware

- Device provisioning with or without user intervention
- Device provisioning over USB and serial connections
- Life-cycle application management
- Package-persistence support (an application will be reinstalled if inadvertently removed)
- Sequence multiple files/applications
- Prompt user on install or silent installs
- Execute, wait, and delete an application, which is useful for running scripts
- Assign software packages to users/user groups/ device groups/platforms/OSs/Versions of OSs
- Distribute software packages based on device characteristics
- Auto-deploy applications without requiring admin maintenance of packages
- **Perform pre-installation operations during software distribution:**
  - High level of optimizations for OTA delivery of applications and patches
  - Support for all standard files supported by each OS (CAB files, XML files, etc)
  - Log of Attempts, Successes, and Failures
  - Full Coverage Reporting
- **Perform update operations during software distribution:**
  - New updates are automatically applied
  - Multiple versions of application can be managed
  - Further special rules can be applied if updating from V1.0 to V3.0 vs. V2.0 to V3.0
  - Incremental updates can be applied based on file differencing technique
- **Perform post-installation operations during software distribution:**
  - Applications can be uninstalled or removed
  - Registry settings can be deleted
  - Files can be deleted/updated
  - Several devices can be provisioned simultaneously limited only by hardware configurations
  - Performance Management
  - Tracks device discovery date/time
  - Tracks inventory collection dates/times. With these data sets, administrators can generate reports showing how fast the battery is losing power and if it needs to be replaced
  - Battery Performance Tracking

IT Support Questions for Software and Application Management

> Will the new software applications and incremental enhancements to the existing software base on the mobile device be distributed over the air (OTA) to the device or via LAN?

> Will the IT Support Desk and software tools solution leverage any network technology to distribute software and applications OTA to the device?

IT Support tasks for supporting Mobile Devices

> Create flexible and configurable deployment packages

> Assign to devices, users or groups

> Perform pre- and post-operations during software distribution

> Distribute multiple, sequenced files within a single package

> Define flexible rules within the deployment package

> Apply new registry values to the device before or after deploying files

> Offer persistent package deployment on devices

> Check for available RAM, registry keys, dependent files, OS version, etc., prior to deployment

> Support checksum/restart for optimal file delivery

> Ability to automatically update applications OTA without requiring user input

> Ability to silently perform update in the background

> Device plug-in architecture-enabled third-party applications to bootstrap

> Multiple versions of application can be managed

> Special rules and sequences can be applied if updating from V1.0 to V3.0 vs. V2.0 to V3.0

> Incremental updates can be applied based on file differencing technique

> Segments large files for staggered delivery to optimize network bandwidth

7 things to look for in a handheld computer for workforce mobility

> Light weight and a small form factor

> Multi-mode capability for the office and the field

> Ergonomic design for comfort during intense scanning

> Bright display that is visible in a variety of lighting

> Remote device management

> Versatility and accessories that extend functionality

> Rugged design that withstands rigorous use

Aberdeen June 2008 Data Points

Best-in-Class Performance

In a 2008 research survey of 160 professionals, Aberdeen benchmarked key service delivery performance criteria to distinguish best-in-class companies. These firms revealed the following performance results:

- 86% current performance in meeting promised response times
- 86% current service efficiency performance in first –time fix
- 9% decrease in mean time to repair over the last year
- 71% current performance in workforce utilization

Competitive Maturity Assessment

Survey results show that the firms enjoying best-in-class performance are:

- Two times as likely as all other to optimize service schedules in real-time
- Three times as likely as all others to provide their senior executives with on-demand visibility into service performance
- Nearly two times as likely as all others to use service performance data to continuously evaluate and adjust service plans and forecasts
- Nearly three times as likely as all others to leverage mobile field service applications to facilitate field-base data access for their mobile technicians

Fast Field Service Facts Aberdeen 2008 Study

- **Avg. cost per truck roll $265**
- **55% of customer calls still require a service dispatch**
- **1.5 average number of follow-up dispatches required when issues not resolved on a first-time basis**
- **67% of customers expect service response within 12 hours**
- **86% success in meeting promised service response windows by Best-in-Class compared to 67% for all other firms**
- **86% performance in first –time fix for leading service firms compared to 55% for all other firms**
- **17% increase in technician productivity for leading service organizations over the last year**

Conclusion

Selecting the right device for your mobile fleet can be a daunting task, with application requirements and the outdoor environment as key areas to consider when researching mobile devices. In field service applications, mobile devices need to have the specifications that will ensure exposure to the elements as well as drops to concrete, accidental spills and more. Be sure to check the specifications for the devices you are considering, and in your research, consider Motorola as your Enterprise Mobility solutions provider.

About Motorola's Enterprise Mobility Solutions

When it comes to enterprise mobility, Motorola provides dependable rugged devices you need to streamline your fleet operations. As an industry leader, we offer the proven expertise and technology you need to achieve maximum value and a fast return on investment. Our true end-to-end mobility solutions include: a comprehensive portfolio of mobile devices with extensive wireless communications capabilities — designed for enterprise use; a portfolio of wireless private wide area and local area network infrastructure; a partner channel delivering best-in class applications; and a complete range of pre-and post-deployment services to help get and keep your enterprise mobility solution up and running at peak performance every day of the year.

For more information

To find out more about Motorola's full line of rugged mobile computers, and how enterprise-class devices can improve your fleet operations, please visit us on the web at www.motorola.com/business or access our global contact directory at motorola.com/enterprise/contactus

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