

White paper

## Top 5 Tips for Choosing Mobile Computers

Sorting through the smart phones, PDAs and ruggedized computers available for business use is no easy task. Dozens of manufacturers offer hundreds of devices in thousands of configurations, but only one may be best suited for your particular environment and workforce. Rather than trying to stay on top of all the products that are being introduced and discontinued, the technologies and features being added, plus available peripherals and software, enterprises can quickly cut down to a few viable options by following five basic tips:

1. Consider the environment and the user;
2. Stick to industry standards & certifications;
3. Simplify support;
4. Require flexibility;
5. Pay attention to power.

This white paper explains these tips and how they can be applied to assist the enterprise mobile computer selection process.

### 1. Consider the Environment and the User

The most important factor to find the right fit for an enterprise mobile computer is the environment in which it will be used. Failure rates for handheld devices vary widely, from 11 percent to 38 percent annually<sup>1</sup>, which is a reflection of how rugged the mobile computer is and how well it is suited for the specific usage environment. For example, a handheld that will land on a carpeted floor when it is dropped doesn't need to be as rugged as one that will land on concrete. Drops are the leading cause of damage to mobile computers and are the leading cause of resulting damage and downtime. To be considered rugged – and therefore reliable – mobile computers must be rated to repeatedly withstand at least five-foot drops to a non-yielding surface.

Understanding how the computer will be used is also very important. Not all work is performed the same, so observing how different workers go about their daily activities is worth the investment in time. These observations provide insight on how processes can be improved and which mobile computer features are desirable. For example, even a small, lightweight computer with keys can be awkward to use during processes that constantly require workers to lift or pull items, so voice/speech input would be valuable because it provides hands-free data entry so workers can keep their eyes and hands on the task. For operations where workers would benefit from being able to speak with supervisors or colleagues to quickly resolve issues, using a wireless voice-over-IP (VoIP) or push-to-talk (PTT) connection can be a great productivity aid. For frequent voice and speech use, it is important that mobile computers can support the necessary software and wired and wireless Bluetooth® headsets. Support for voice/speech, bar code and RFID reading, picture taking and other image capture, wireless printing and other tasks can all be built into mobile computers. By gaining insight into the actual work process, organizations can specify features to improve it.

It's important to choose devices that are convenient for workers to carry and use throughout the full shift. Reducing operator fatigue should improve productivity and device reliability. Overall size and weight are important, but choosing the best device isn't as simple as selecting the smallest and lightest. The shape of the computer, how its weight is distributed, and how easily workers with different sized hands can carry the device and access the keypad are important considerations that shouldn't be overlooked. Mobile computers with integrated bar code and RFID readers, radios and other peripherals may weigh more than those without, but they provide an ergonomic advantage because the worker doesn't have to carry and manage multiple devices.

### 2. Stick to Industry Standards & Certifications

Rugged mobile computers are specialized devices designed for collecting data and providing real-time information in non-office environments, but they should still adhere to enterprise standards for connectivity, security and development whenever possible. Specifying devices that meet these criteria will help keep down development, integration and support expenses, which can vary greatly and are a significant source of TCO.

Specifying devices with a Microsoft mobile operating system, particularly Windows Mobile®, is the best step organizations can take to keep development, implementation and support costs in check. Standardizing on the Microsoft environment gives organizations the widest choice of packaged software applications, ISVs, systems integrators, development tools and device management systems, plus provides a clear migration path for future upgrades and expansion. Devices with less-supported or proprietary operating systems and development environments are costlier to integrate and support and often require contracting specialized outside software development, which limits flexibility and can be expensive<sup>2</sup>.

Mobile computers should communicate with enterprise systems using standard connectivity and security. Security policies should not be adjusted or weakened to accommodate wireless mobile devices. Mobile computers are available that support a variety of standard wireless security protocols (including 802.11x, WPA2, FIPS, et al) and virtual private networks (VPNs) so security can be applied and managed consistently with that used for laptop and desktop computers. Organizations with wireless LAN backbones from Cisco Systems should specify CCX certification for their mobile devices to simplify integration and management and to benefit from the advanced features available in a Cisco environment. If wide-area wireless connectivity will be used, the mobile device maker should have partnerships with cellular carriers and offer devices certified for data and voice on the preferred network.

1 "Total Cost of Ownership (TCO) Models for Mobile Computing and Communications Platforms," VDC Research. July, 2007.

2 Gartner Inc. highlighted the advantage of using Microsoft operating systems in its "MarketScope for the 'Ruggedized' Handheld-Computer Market" report that was issued in December, 2008, which reads in part: "Gartner recommends that clients deploying applications on a ruggedized device primarily consider only Windows platforms to reduce project risk.... Other OS options represent a high degree of risk for buyers because of the small number of vendors producing those products. Gartner sees Research In Motion's BlackBerry OS in limited deployment using standard smartphone hardware in field service, CRM and hospitality for non ruggedized devices."

To further reduce development, integration and support costs, look for mobile device manufacturers that have partnerships or certified interfaces with your enterprise software provider. Mobile computers are available with built-in connectivity to SAP, Oracle, IBM and Microsoft back-end systems, plus many major warehouse management systems, field service solutions and other application software.

### **3. Simplify Support**

It is important not only to consider the workers who will use mobile computers, but those who will support them. Support-friendly features and compatibility with IT asset management and mobile device management systems help increase uptime and productivity while reducing support costs. Management features can be a major differentiator between consumer-oriented and enterprise-grade mobile devices. Because they are designed for large deployments (rather than for sale to individual consumers) enterprise mobile computers often have built-in features that streamline provisioning and deployment, enable remote, no-touch troubleshooting and configuration changes, and otherwise allow proactive management. Enterprise mobile computer suppliers also offer a range of deployment, support and maintenance services, and can be compared on their service response times, ability to support rollout schedules and other criteria.

Choosing devices with a stable operating system and integrated support capability also provides flexibility for large rollouts, where it is common for some users to receive their mobile computers a year or even longer after the first group deployed. Changes to applications and device configurations are inevitable, so standardized systems and remote management capability are key to keeping mobile device populations consistent and optimized.

Remote management is especially important for mobile devices deployed for field based and other off-premise operations because workers do not have ready access to spare equipment. Productivity losses can be very high if devices or applications lock up or fail to work in those environments. Therefore, there is strong value in the ability of IT support staff to remotely troubleshoot devices, so they can be returned to service without having to be returned to a central service location. Some mobile management systems even predict when batteries will fail, so replacements can be installed proactively. Mobile management systems can also lock down devices to prevent unauthorized data transfer and prevent non-business Web browsing, phone calls and e-mailing.

### **4. Require Flexibility**

Rugged mobile computers can withstand drops, shocks, humidity, heat, cold, rain, snow and even occasional vandalism, but often they can't survive a change of mind or business requirements. The leading reason mobile computers used in industrial, retail, distribution and service environments are replaced is not damage or device failure. Instead, most mobile computers are replaced because they are considered technologically obsolete and can't support desired information systems, software applications or business processes. To avoid this unnecessary expense, it is important to select mobile computers that can change with the organization and provide a platform for future enhancements.

Some of the reasons devices are replaced prematurely are that work processes change, additional communication is desired (e.g. wireless LAN, WWAN or Bluetooth®) but there is no integrated radio or available expansion capability, or because application changes or security updates can't efficiently be distributed to devices. Many of these problems can be avoided by following the previous tips about operating systems, standards and support, but peripheral issues require more consideration.

Bluetooth connectivity in the mobile computer provides powerful protection against obsolescence when peripheral needs change. Enterprises don't always know the types of peripherals their future operations will require, so it is hard to plan device requirements around them. Bluetooth makes it easy by providing a flexible, standard interface for integrating thousands of different peripheral devices. For example, one of the most common changes to operations is to implement mobile printing after mobile computers have been rolled out. Mobile printers for warehouse, field service and other enterprise operations have Bluetooth interfaces, so they can be easily integrated at any time. Besides mobile printers, Bluetooth connectivity is built into bar code readers, headsets for both VoIP telephony and voice/speech-directed systems, scales, sensors, GPS receivers, computer docking stations and many other peripherals that serve enterprise needs.

Many organizations transition from traditional bar code reading to more sophisticated and varied means of image capture. These include reading 2D bar codes on parts and shipping labels and replacing bar code-only readers with devices that can capture customer signatures for proof of delivery, take digital images to document delivery, pickup or maintenance conditions, and even to perform document imaging for electronic document processing. Mobile imagers integrated into mobile computers can perform all these functions, plus read 1D and 2D bar codes. Integrated imaging provides flexibility to meet a variety of data and image capture needs without requiring separate peripheral devices. Many business that use RFID began with a limited deployment (such as for tracking a specific type of asset or shipment) then expand RFID use to more of their operations. In these situations, handheld computers that are field-upgradeable to read and write RFID tags and labels are highly advantageous because they can leverage prior investments without requiring all new equipment.

Changes to software applications or preferred business processes can also create new requirements for mobile computers. For example, in an effort to improve productivity an operation may want to move to voice-directed processes for their picking operations. If so, the mobile computer needs to support a headset (either via Bluetooth or an available interface port) and may need software extensions to enable audio and speech features. Using wireless LANs to give workers push-to-talk and VoIP functionality creates similar requirements. Adoption of these and other technologies and processes is growing, so the need for flexible mobile computer platforms is growing accordingly.

## 5. Pay Attention to Power

Scanning and imaging, data collection and processing, wireless communication and other enterprise mobile computing activities all draw power from the device battery. Power management is a very important (and often overlooked) feature of mobile computers because it directly impacts uptime and user productivity and acceptance. Power management should be evaluated beyond what's on the spec sheet. Organizations should develop usage models that outline how much the mobile computers will be used and which capabilities (e.g. bar code reading, wireless communication) will be used so power requirements and performance results from pilots or other testing can be factored into the mobile device selection.

Expected battery life is only a starting point for comparing mobile computers. Differentiating factors include whether data is lost if the device loses power, how quickly batteries are recharged, whether the charging dock prevents overcharging (overcharging causes batteries to lose capacity more quickly), the maximum number of times batteries can be recharged, whether the mobile computer provides intelligent power management to limit its battery consumption, and if extended-life batteries are available.

## Conclusion

Many mobile computers can quickly be ruled out from consideration because they lack the battery power to last the length of a shift, or lack the staying power to remain reliable throughout a three-to-five year life cycle. Features like rugged construction, well supported operating systems, standard interfaces, remote management support and flexible peripherals provide value by protecting organizations from having to replace their mobile computers prematurely. By understanding how these features differentiate devices, and by carefully considering the environment in which mobile computers will be used, organizations will be able to determine which specific models will provide the most value.

Intermec offers a complete range of mobile computers to meet enterprise needs. We have been developing ruggedized mobile computers and data collection equipment for more than 40 years and have successfully integrated hundreds of thousands of devices into demanding industrial, warehouse, field service, delivery, logistics, retail and other environments. Intermec mobile computers are rugged enough for years of service in challenging environments and are flexible enough to support new peripherals, software applications and business processes as they are developed.

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