

The Benefits
of Mobilizing
Enterprise Applications
with Handheld Devices

An Executive White Paper

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Executive Overview

Mobilizing enterprise applications can provide a significant competitive advantage to forward-thinking organizations. Handheld devices — including connected and wireless handheld devices — have successfully made the transition from being personal productivity tools for the professional consumer market to being enterprisewide and enterprise-deployed business solutions. Today, forward-looking organizations are deploying handheld devices to extend the functionality of mission-critical applications to internal users wherever and whenever they need it.

Sales professionals, customer support and service personnel, and internal help desk staff are all able to benefit from the mobility that an extended and totally mobile mission-critical solution can provide. Accessible, electronic versions of papers, checklists, and forms — provided via a device held in the palm of the hand — make a broad variety of tasks faster, more efficient, and ultimately less costly. Access to key data such as customer order information, inventory levels, and service information not only speed up routine processes such as order entry, but also enable the mobile professional to use this near-real-time or real-time information as an integral tool.

Organizations have extended enterprise applications through the use of handheld devices. These organizations are able to measure, in real and quantifiable terms, the impact that these deployments have had. Impact and improvement can be quantified in several ways: for a sales-focused product manufacturer, improvement is measured in terms of sales figures, customer satisfaction, and the management of customer order information. For a healthcare organization, improvements are measured in terms of quality of patient care and the efficiency with which care providers can do their jobs. For a government or municipal agency, improvement is measured in terms of cost and personnel savings, improved public safety, or employee satisfaction.

Aberdeen research has shown that, in almost all of the organizations that have deployed handheld devices and enterprise applications, the effectiveness and impact of using handheld devices to extend applications, tools, and data to the people that need it is real, quantifiable, and — in terms of return on investment (ROI) or payback — impressive. The immediate and measurable return to the enterprise both in financial terms and in organizational efficiency, effectiveness, and competitive advantage is compelling.

Although the quantifiable financial criteria are important, an enterprise that is evaluating a mobile solution will consider several criteria, in addition to ROI, during the evaluation and decision phases of selecting a mobile enterprise solution and solutions provider. In fact, based on Aberdeen's findings, enterprises consider the physical size of the handheld device, the form factor, the mobility and usability

of the device, and the simplicity of the user interface as the primary criteria for selecting one vendor's platform over another. Decision-making executives' familiarity with one brand of mobile device over another is also, frequently, a deciding factor. Finally, the enterprise's Information Technology (IT) organization is focused on the ease of implementing a particular device, the efficiency and "footprint" of its operating system software, its synchronization services, its security, and the availability of a broad range of add-on and third-party tools and applications.

Ultimately, these decision factors are measured against the financial criteria of profits, costs, and ROI; the total cost of ownership (TCO) of the device and its related software and service requirements should also be considered. The long-term cost associated with implementing handheld devices over the depreciable life of the device and the mobile solution is, in fact, rarely a decision factor, largely because the revenue and efficiency metrics, measured by ROI, are so impressive that TCO becomes a secondary consideration.

Palm, Inc., is the world's largest provider of handheld devices. It provides a majority of the hardware, operating system, and application solutions employed in mobile enterprise deployments globally. Increasingly, Palm III, Palm V, and Palm VII are the devices of choice in organizations and business enterprises that recognize the need for mobility with their enterprise applications. In conjunction with Palm, Aberdeen has conducted research to explore the key organizational, technical, and financial decision criteria frequently cited by organizations that have made the decision to deploy a mobile solution.

This Aberdeen *Executive White Paper* discusses the scope, types of enterprise applications, and data that are being extended to employees and executives through the deployment of mobile solutions — as well as the corresponding resulting business benefits that are part and parcel of the mobile solution. In addition, it presents the results of Aberdeen research into some recent deployments of mobile enterprise solutions, identifying the decision criteria that these organizations used to justify their projects, and the resulting quantitative and qualitative benefits that they have experienced. Finally, it touches on the reasons why these firms chose to build their mobile solutions around the Palm OS platform and Palm handheld devices.

Enterprise Business Applications: Front Office, Back Office

Enterprise applications encompass a broad range of software used to manage the internal and external operations of a business. Back-office applications focus primarily on providing functionality for internal operations. This category includes Enterprise Resource Planning (ERP) applications used to manage inventory levels, manufacturing processes and procedures, and all of the supply chain activities associated with procuring goods, services, or raw materials.

Back-office applications also provide functionality for financial and accounting management, human resources, and — through the use of more highly specialized

packaged or custom-developed applications — the industry-specific functionality required to support banking, healthcare, consumer packaged goods, and myriad other industries.

Front-office applications represent the customer-facing side of enterprise applications. These Customer Relationship Management (CRM) application suites support the activities of the external sales force, the call center, and customer service; they also enable the enterprise to provide all of the application functionality and data necessary to take orders, configure complex products, or provide effective service and support to customers.

These applications often utilize integration links to ERP or accounting applications and the information that is accessed through these applications. Because much of the activity of customer-facing or mobile professionals is dependent on timely and accurate access to information, this back-office repository of information is often needed to support sales or service professionals in the field. For a salesperson to take an order from a customer, for example, he or she needs access to the application or forms required to process the order and should, ideally, be able to process an inquiry against inventory levels and make a delivery commitment to a customer — all on the customer's site. The ultimate objective of implementing a handheld mobile selling solution is to increase the effectiveness and efficiency of the sales organization and to maximize customer satisfaction through these mobile operating efficiencies.

Applications developed to address vertical industries or specific industry functionality are also part of the enterprise application category. These applications often provide very specific functionality and address the needs of an industry and, in the case of custom-developed applications, of a single enterprise customer. Banking applications address the operational and CRM needs of a financial institution; however, the banking equivalent of ERP resides in complex transaction processing, risk management, and customer management applications.

Division-level applications — built to address the needs of departments within the enterprise or organization — are also critical to the effective functioning of almost every organization. These applications may capture patient information that is entered by physicians and used to effectively administer and manage patient care; or it may enable an automobile manufacturer to effectively manage maintenance and product quality. Although smaller in scope than the enterprisewide ERP or CRM applications, division-level applications are no less significant.

Inherent to many of these applications is the need for mobility. In this era of desktop systems and local area networking, it is easy to overlook the fact that many — in some organizations, a majority — of the company's key employees are not, in fact, chained to their desks. Unfortunately, technology has not always kept pace with the needs of business, and even given the rapid advances in computing, communications, and software technology most companies still revert to tools

such as paper, pen, and clipboard to support mobile workers. Laptop systems and cellular telephones can and do address some of these needs. However, the form factor — literally, the physical size — of a device such as a laptop and the difficulty and delay usually associated with starting up the operating system, opening the application, and finding the right information make this type of application and information access unsuitable for many tasks. Moreover, Wireless Application Protocol (WAP)-based cell phones suffer from ease-of-use and screen size limitations that restrict their practical utility for many applications.

Many of the functions associated with the mission-critical enterprise applications described above actually require mobility. The inability of the most common mobile computing device — the laptop PC — to address fundamental mobility, ergonomic, and ease-of-use requirements has spurred forward-thinking organizations to explore other alternatives. Ideally, these alternatives will enable the enterprise to extend critical applications and data to the individuals in the organization who need it most, regardless of their location.

Key Mobile Applications

As described previously, Enterprise Business Applications are generally segmented into two categories of functionality. CRM or front-office applications include sales force automation, customer service and support applications, marketing automation, and field service applications. By definition, these applications are customer-facing, and there is a high degree of awareness and sensitivity within the enterprise regarding the efficiency and utility of these applications. Solutions that are deployed to customer-facing professionals need to perform efficiently and effectively and should be easy-to-use.

Back-office applications, which support functionality such as inventory management, supply chain and procurement, and financial applications, as well as custom-developed or line-of-business applications are also critical to the enterprise. These enterprise applications are fundamental to the internal efficiencies of the firm, and they play a key role in providing information to the customer through integration with front-office applications.

Given the high profile of these enterprise applications, as well as the impact these application areas are likely to have on customers and operations, key mobile solutions often focus on front- and back-office functional application areas (Table 1).

Although this list is not comprehensive, and new application areas are continually opening up, these application areas all share a number of common attributes. These applications benefit from the extension of functionality to a handheld device; they involve a customer interaction, either directly or indirectly; and all deal with assets, orders, or transactions that have a high monetary value — and hence a relatively high ROI justification — associated with extending application mobility. For example, the ability to take a customer order directly and immediately during a customer meeting helps a salesperson process that transaction more quickly and

efficiently. Of much more importance, however, is the salesperson's ability to check an inventory level for availability of a particular product or component and guarantee the delivery of a component to the customer at the time of order. In addition to enhancing immediate customer satisfaction, the enterprise is able to manage its inventory level more efficiently, reducing the financial investment in inventory, which, in turn, drops immediately to the bottom line. The enterprise is also able to ship and then invoice the customer more quickly, which has an immediate — and measurable — impact on cash flow and the availability of capital. Once captured and measured, the benefits of this relatively simple example quickly add up to a compelling ROI-based decision on the part of the enterprise.

Table 1: Typical Mobile Enterprise Applications

Front-Office Applications	
Sales Force Automation	Calendar and contact management Order entry and order management Lead management and distribution Point of sale (POS) Pricing and configuration
Customer Support	Call dispatch, reporting, and tracking Customer tracking and management Technical support guides and documentation Signature and approval management
Field Service	Field service call dispatch, reporting, and tracking Logistics management Parts and spares management and ordering Parts inventory management Field manuals, guides, and knowledge tools
Back-Office and Vertical Applications	
ERP and Operations	Asset tracking and inventory management Parts and logistics management Order entry and procurement management Financial management and tracking
Help Desk	Problem tracking and resolution Call dispatch and reporting Internal asset and inventory management
Vertical Applications	Healthcare: Patient tracking and reporting Pharmaceuticals: Samples and signature management Retail and POS: Order, inventory, and cash management

Source: Aberdeen Group, August 2000

Mobile Enterprise Applications in Practice: Aberdeen Research

A number of business, technical, and organizational issues are considered before a company deploys a mobile solution. It would be relatively easy to extrapolate from other enterprise application deployments what the decision criteria for deploying a mobile enterprise application include and what the relative priority of these criteria would or should be. These types of assumptions might be simple to make, but they would also be misleading and, at worst, inaccurate.

Mobile solutions are a relatively recent occurrence in IT and, as such, may have unique characteristics, capabilities, and cost justifications. Furthermore, mobile solutions have been made possible by recent breakthroughs in technology and wireless communications, as well as by advances in the mobile device itself. Therefore, the mobile solution itself enables a new level and type of functionality, and little is known about the role that functionality itself plays vis-à-vis other quantifiable decision criteria. Enterprises that are considering the deployment of these technologies are likely to consider a different set of criteria when evaluating mobile solutions than when choosing to deploy established technology.

To fully understand the criteria that are considered before making a decision to roll out a mobile solution, Aberdeen conducted a research project in conjunction with Palm, Inc. This study was conducted to understand and identify any specific financial models such as ROI or TCO that were used as key parts of the decision process. This section focuses on the research methodology Aberdeen employed to understand more about these questions, and it discusses the specific findings and key trends that were uncovered as part of the project.

Research and Methodology

Our research was based on an established Aberdeen methodology that relies on a one-on-one interview process designed to identify the key trends, decision criteria, and characteristics associated with new or emerging technologies. Because emerging technologies often do not have large populations of end-users on which to base very large research initiatives, the focused interview has proven to be an accurate and time-effective way to understand emerging technology markets.

The research initiative for this study consisted of a series of interviews with users of enterprise applications that had deployed mobile solutions using the Palm OS platform and Palm devices. The questions and discussion criteria that were developed for the research initiative focused on several key criteria:

- The type of mobile solution that was deployed using the Palm handheld device;
- The functional, operational, and human factors considered in evaluating and deciding on all of the components of the mobile solution;

- The financial criteria used to evaluate the project, including any ROI, payback, or TCO models that were developed or used as part of the decision-making process; and
- The range of handheld devices that user organizations considered and evaluated, and why the Palm device was ultimately selected.

The primary focus of the research initiative was to gain an understanding of the role that financial criteria and justification — in particular, the role of ROI and TCO models — played in the final decision to deploy mobile solutions.

Results and Key Findings

Several key conclusions were drawn from the research interviews. Somewhat surprisingly, Aberdeen discovered that the financial justification of a mobile solution was a secondary, and sometimes even a tertiary, consideration to the enterprise's decision of whether to move forward with a mobile application deployment. Instead, Aberdeen research revealed several facts:

- The value of a mobile solution to the enterprise is based on the mobility and ease-of-use of the handheld device, the platform, and the unique ability of the solution to extend the functionality and mobility of mission-critical enterprise applications or enterprise data. Specifically, the primary focus of the enterprise should be on the application itself and on the need of the enterprise to extend that application and specific functionality to mobile users. As a result, device ease-of-use, physical size and ergonomics, and the functionality of the application when used with a handheld device are the key decision criteria to consider when evaluating a mobile solution.
- The technical overhead and impact of implementing handheld devices on the enterprise infrastructure need to be carefully considered, and should be a key part of the decision criteria to implement handheld devices. Several companies interviewed raised the issue of the “footprint” of the device — a reference to the size of the device operating system — as well as the communications protocols required to integrate the mobile device into the corporate hardware, communications network, security, and applications environment.
- Ease-of-use and the simplicity of the operating system and user interface, as well as the ergonomics and size of the mobile device itself, are key parts of the decision process. Executives should be very focused on the ability of the device to be used by both professional and non-professional workers as well as ease-of-use as primary considerations.
- The familiarity of executive decision-makers with the handheld device should also play a key role. In almost all of the companies interviewed, executives chose to use a handheld device with which they were already

familiar and that represented, in some cases, a formal or de facto standard within the enterprise. This familiarity can and will have an impact on the adoption of the handheld devices within the enterprise and, ultimately, on the ROI.

- The financial justification of the mobile solutions should be an important consideration and will be impacted directly by the ergonomic, ease-of-use, and “footprint” issues discussed previously. The investment made by the enterprise in handheld devices, packaged applications or custom applications development, and training or implementation costs will be, in most cases, easily justified. Financial models focusing on ROI will be, in almost all cases, developed and used to support mobile enterprise initiatives. However, the financial justification is likely to be a valid point in the decision to move forward with the implementation of a mobile solution.
- Feedback solicited during the research project revealed that TCO is not a high-priority management concern or decision criterion at this stage of development of the mobile enterprise applications market — and is not likely to become a key factor within the next 18 months.

Why Palm-Based Solutions Were Selected

This research was conducted among firms that have mobilized key enterprise applications using Palm devices. Its primary objective was to uncover the decision criteria that influenced the companies’ mobile initiatives. Firms that have implemented Windows CE or laptop-based solutions were not interviewed — partly because these organizations are relatively scarce. As an ancillary benefit of the research, Aberdeen uncovered some consistent themes as to why Palm-based solutions have been implemented.

Although it is not the most important selection criterion, perhaps the chief reason that Palm devices were considered was that they were already used by and familiar to both implementers and prospective users. Respondents generally felt that this familiarity would greatly facilitate the adoption of the new mobile solutions.

Secondly, Palm devices were broadly preferred for their form factor, ergonomics, and ease-of-use. For example, their small physical size, ease-of-use, and battery life were perceived as relative advantages over alternative devices such as Windows CE and laptop alternatives. Moreover, Palm’s overall software functionality — including the size, efficiency, and enterprise impact of the Palm OS, applications, and user interfaces — was appreciated. Issues included the relatively modest size of the Palm OS and applications, the excellent provisions for security, the systems management, and the relative ease of interfacing with the enterprise’s existing data infrastructures.

Thirdly, respondents revealed that the Palm environment offered major advantages when considering the availability of application solutions, third-party development tools and components, and experienced systems integration or software developers — all major considerations helping to guarantee the enterprise's investment in a mission-critical mobile solution. Several respondents also noted that the relative ease with which wireless mobile deployments could be rolled out using a Palm-based solution was a factor in their decisions.

One of the advantages of conducting research among a client's users is that Aberdeen often receives negative feedback that users are reluctant to give directly to the vendor. In this context, it is noteworthy that we heard no second-guessing of our respondents' decisions to base their mobile solutions on use of the Palm platform. Rather, the consistent message was that getting the solutions up and running was easy and that, where measurements were taken, they paid for themselves in less than six months. For a representative list of responses compiled as part of Aberdeen's RAMP (Rapid Accurate Market Positioning) research initiative, see Table 2.

Table 2: Representative RAMP Interview Data

Industry	Application	Key Decision Criteria/Benefits	ROI/Break-Even Point
Consumer Products	<ul style="list-style-type: none">• SFA, order management, and inventory control	<ul style="list-style-type: none">• Size, mobility, and ergonomics of handheld device• POS and bar scanner capabilities	<ul style="list-style-type: none">• No analysis done• SFA/POS system required as mission-critical
Automotive Manufacturer	<ul style="list-style-type: none">• Quality control and Point of Entry (PoE) inspection	<ul style="list-style-type: none">• Size, mobility, and ergonomics	<ul style="list-style-type: none">• Less than six months
Mail and Package Delivery Services	<ul style="list-style-type: none">• Tracking and exception management	<ul style="list-style-type: none">• Mobility, ease-of-use	<ul style="list-style-type: none">• ROI: 1,400%• Break-even: Less than six months
Emergency Medical Treatment	<ul style="list-style-type: none">• Capturing patient information and other vital information	<ul style="list-style-type: none">• Mobility, size, durability, and ease-of-use	<ul style="list-style-type: none">• No analysis done• Deployment decision based on need for speed and accuracy in capturing patient information
Brokerage and Financial Services	<ul style="list-style-type: none">• Internal support and help desk	<ul style="list-style-type: none">• Mobility and speed of device• Efficiency of operating system and applications	<ul style="list-style-type: none">• No formal analysis done• Break-even: estimated at less than six months• ROI: "straightforward"

Source: Aberdeen Group, August 2000

Aberdeen Conclusions

Aberdeen has reached the following conclusions regarding the compelling business reasons for extending business applications and mobile solutions:

- Application functionality, usability, and mobility should be the primary decision factors in evaluating mobile enterprise solutions. The ease-of-use of the device itself and previous experience or familiarity by executives or decision-makers with the device are likely to play significant roles in the decision-making process.
- Technical considerations, including the integration of the mobile device operating system and communications overhead on the enterprise infrastructure, are also key issues and should be evaluated carefully.

Financial evaluation models — specifically, ROI calculations — should play a role in the decision-making process only after considerations of functionality and technical compatibility have been addressed. Handheld devices will play an increasingly important role in the enterprise, and the rate of deployment of these devices will increase rapidly over the next two to three years. Functionality, mobility, and ease-of-use play significant — if not dominant — roles in the decision-making process, indicating that size, simplicity, and ergonomics are as significant to the enterprise user as to the consumer.

As wireless capabilities become more ubiquitous and standardized, wireless handheld devices will play an increasingly important role in the enterprise. The ability to access key information, data, and application services in real time through wireless handheld devices will significantly impact CRM, ERP, and enterprise business applications.

Forward-thinking companies already realize the potential impact and ROI that mobile solutions can bring to their organizations and are working to partner with the leaders — and in particular with Palm Inc. — in this rapidly emerging category. Based on Aberdeen's research, mobile enterprise applications are able to provide a compelling ROI and can position the enterprise to take advantage of what is potentially a significant competitive advantage.

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