



# Enterprise Handheld Mobile Solution TCO\*

## **White Paper: Palm and the Palm OS versus Pocket PC Mobile Solutions Deployment**

**May 2002**

**\* Total Cost of Ownership**

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# Palm OS® Versus Pocket PC Mobile Solutions Deployment

## **About The Gantry Group, LLC**

The Gantry Group is a strategic advisory and custom market intelligence firm that uses primary market research to help companies cost-effectively accelerate the successful market adoption of their products and services—online and offline. Through Gantry Group's market analysis, marketing testing, and ROI/TCO benchmarking service suites, Gantry Group has helped over 165 client companies drive sales, acquire new customers, increase brand equity, and increase customer lifetime value by better understanding and meeting customers' needs. Gantry Group creates customized market research studies using qualitative and quantitative techniques, including online and traditional surveys, focus groups, and one-on-one interviews. Gantry Group benchmarks a client company's opportunity, competitive landscape and ROI impact of the client's offering on its target market to distill a quantified value proposition that is crisply differentiated within a receptive market.

Today more than ever, companies are looking for near-term return on investment in this overall budget-constrained climate—and the sooner, the better. Successful solutions vendors must now use a much more analytical approach to selling. Customers want assurances that an investment will pay for itself over an acceptable time period—either by increasing the top line, decreasing operating expenses, or both.

The Total Cost of Ownership, or TCO, is a vital ingredient to any rigorous ROI calculation. TCO informs prospects and customers as to the economic benefits an offering brings AFTER they subtract out the cost of an offering. A TCO calculation requires a vendor to work closely with customers to discover underlying cost drivers that may not be apparent on the surface. A technology product for example, may require new infrastructure investments and the hiring of new skills that its operation may require. New business processes that must be put in place to accommodate a new system may require training and support. The lifetime of some technologies must be factored into TCO to reflect the replacement cost of new units when old ones fail.

The Gantry Group designs custom TCO and ROI studies to help companies communicate factual quantified value propositions to prospects and customers. Gantry Group first designs custom ROI and TCO tools to comprehensively profile the "impact" equation of a product or service offering within a company. Using this tool, Gantry Group then conducts online and in-person studies to consistently profile ROI/TCO across a carefully selected sample of participating companies. Gantry Group has equipped many product and service firms with credible TCO and ROI models that communicate value in the terms of the business metrics that customers and prospects use to access the performance of their own companies.

The executive team of seasoned business executives combines deep operations experience with proven strategic planning, research methodology and market intelligence to grapple with the most challenging business goals and problems. Gantry Group works with CEOs and senior marketing and sales executives in technology, financial services, health care and retail sectors. The company can be reached at 978-371-7557 or [www.gantrygroup.com](http://www.gantrygroup.com).

## Abstract

The first generation of *handheld devices* initially found enthusiastic acceptance as the perfect Personal Information Management (PIM) tool for the busy business professional. We've come along way since then! Today's *mobile computing devices* have transcended the early adopter personal gadget realm and entered the ranks of critical corporate infrastructure assets.

With an increasingly mobile and geographically dispersed workforce, mobile devices are now considered a key component of the connected enterprise. Mobile devices are an essential component of the next generation of automated enterprise workflows and business processes. Typical medium-to-large enterprise mobile solutions now involve over 500 mobile devices, synchronized to a centralized server to enable multi-user data exchange and unattended, transparent updates. The scale of mobile solutions, accompanied by the commensurate costs, has brought them onto the corporate financial radar screen. Most corporate executives are now scrutinizing mobile solution costs as they would with any other corporate infrastructure investment.

Palm™, Inc. ("Palm") retained Gantry Group to profile, probe and quantify the Total Cost of Ownership (TCO) associated with enterprise mobile solutions. The two leading mobile solution platforms were selected for the study: Palm OS®¹ and Pocket PC. A total of forty (40) enterprise sites with deployed mobile solutions were researched, recruited and interviewed for this study, evenly representing each platform (i.e. 20 Palm-OS solutions; 20 Pocket PC-based solutions).

Since no preexisting methodology framework for a mobile solution TCO study existed, Gantry Group developed a methodology that captured the many facets of mobile solution TCO. Gantry Group then designed and tested a highly parameterized TCO measurement tool that captured multiple cost components associated with buying, deploying, managing and supporting handheld devices. This tool enforced consistent TCO profiling of each enterprise interviewed within the study.

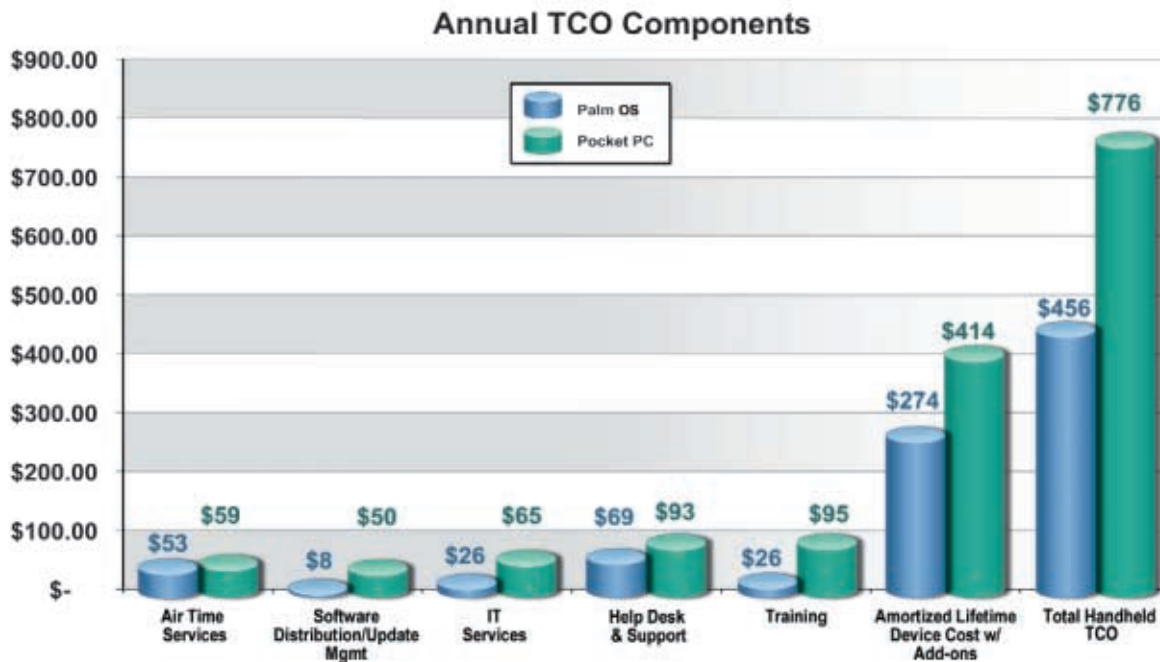
The findings from this study revealed that the annual lifetime amortized TCO for a Palm OS mobile device was \$456 in contrast to \$776 for a Pocket PC mobile device (See Table 1 and Figure 1). Palm OS devices were shown to bring a 41% cost savings over Pocket PC devices annually. Given that the published average total devices involved in a deployed enterprise solution is at least 500 devices, this represents an annual six figure cost savings of \$159,995 annually to the enterprise's bottom line.

**Table 1**

<b>TCO Cost Component Average Annualized Per Handheld</b>	<b>Palm OS</b>	<b>Pocket PC</b>	<b>% Difference</b>
Air Time Services	\$ 53.12	\$ 58.62	1%
Software Distribution & Update Mgmt.	\$ 7.99	\$ 50.00	84%
IT Services	\$ 25.55	\$ 65.19	61%
Help Desk & Support	\$ 68.51	\$ 93.00	26%
Training	\$ 26.32	\$ 95.19	72%
Amortized Lifetime Device Cost w/Add-ons	\$274.30	\$413.76	34%
<b>Total Handheld TCO</b>	<b>\$455.78</b>	<b>\$775.77</b>	<b>41%</b>

1. A spectrum of Palm OS-based devices were part of the sample used in this study. See Appendix 2

Figure 1



This significant cost difference was largely due to a gap in base device unit cost (see Table 2) and higher IT services and training costs associated with the Pocket PC devices. On average, the acquisition price of Palm OS devices was 52% less than Pocket PC devices: \$290.85 versus \$549.72. Training costs and IT Services for Pocket PC handhelds were 72% and 61% greater than Palm OS devices, respectively. And finally Software Distribution and Update Management costs were 84% higher for Pocket PC devices than Palm OS devices due to more frequent software updates and more lengthy update times.

Table 2

Device Profile Average Acquisition Price	Palm OS	Pocket PC	% Difference
Base Handheld Device Cost	\$290.85	\$549.72	52%
Total Add-ons: HW+SW	\$169.30	\$223.29	24%
Software Add-ons	\$ 50.80	\$107.95	53%
Hardware Add-ons	\$118.50	\$109.34	-8%
Total Handheld Device w/Add-ons	\$460.15	\$773.01	40%

## Background of TCO Study

### Market Trends

Mobile solutions are growing increasingly pervasive throughout enterprises of all sizes, as business processes and information management become ever more mobile. Handheld devices are reaching equal standing to the desktop PC as corporate computing continues to evolve to a server-centric model accessed through a variety of Internet-enabled devices—including handhelds. Many believe that handheld computing has now emerged as the next wave in corporate productivity tools for the global workforce. The growth of the mobile computing market is, in part, being driven by the transformation of the corporate environment into an extended, virtual enterprise supported by a highly mobile, geographically dispersed workforce requiring fast, easy remote access to networked resources and electronic communications.

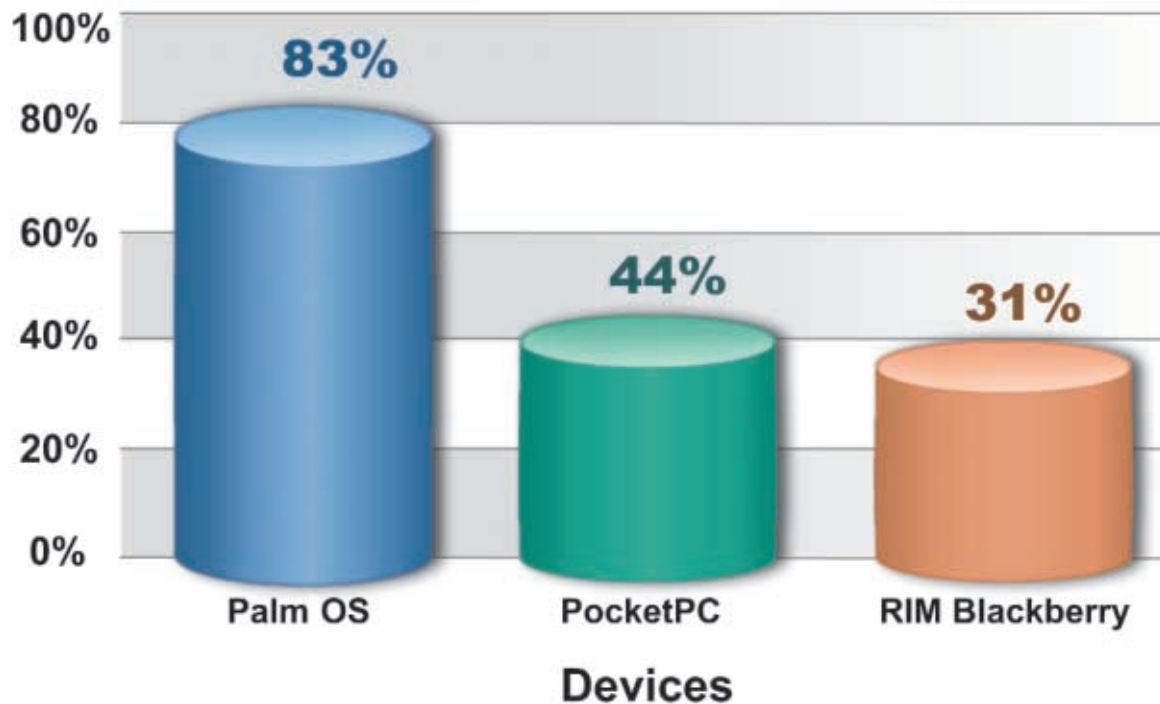
According to IDC, total worldwide handheld device shipments were over 12 million in 2001. Handheld device shipments are predicted to grow at a 34% CAGR between 2000-2005, to 44 million units, making this a \$13 billion dollar market by 2005. Enterprise adoption will be a driver for growth in this period, especially in 2003, as IT spending resumes to pre- slowdown levels.

### Palm™, Inc.— The Market Leader

Palm is a pioneer in mobile and wireless Internet solutions and the world leader in handheld computing with over 17 million Palm- branded handhelds sold as of April 2002.<sup>2</sup> Palm maintains a 50% share of the U.S market and a 42% share of the worldwide handheld market for the full year 2001.

Over 83% of U.S. enterprises choose Palm OS® as their platform for mobile solution development.

## U.S. Executive Mobile Platform Preference



Source: Jupiter/ERI Executive Survey (6/2001), (US only)

Among Fortune 1,000 companies, Palm OS has again proven to be the standard platform of choice with 85% of these enterprises that have a handheld standard showing Palm appearing on their procurement lists.<sup>3</sup>

2. IDC, Smart Handheld Devices: Holding Pattern, Dec 2001

3. Winn Technology Group, "Handhelds in the Enterprise", Summer 2001)

## Mobile Enterprise Solutions Trends

There is widespread adoption within a broad spectrum of industries for mobile devices. This TCO study tapped into enterprise experiences across the following industry sectors:

- Communications
- Construction
- Consumer Packaged Goods
- Distribution/Manufacturing
- Education
- Energy
- Financial Services
- Food & Beverage
- Government
- Healthcare/Pharma
- High Technology
- Professional Services
- Real Estate
- Recreation/Hospitality
- Security & Safety
- Transportation

The plethora of applications is too numerous to describe comprehensively, each tackling a particular business process, communication pathway, or knowledge collection/ dissemination problem within the enterprise. Many applications focus on facilitating data collection from the enterprise field force or customer/client base. A sampling of types of solutions in place at participating companies:

## Horizontal Applications

### Sales Force Automation

Sales force applications allow enterprises to remotely capture point-of-customer call information, making integrated, timely sales data accessible throughout the corporate management team and sales team via centralized corporate server synchronization.

### Field Force Automation

The transportation industry is equipping its driver fleets with mobile devices and infrared printers. By outfitting their fleets with mobile devices, the industry is streamlining their delivery and accounting processes.

## Vertical Applications

### Health Care

The health care industry is booming with mobile solution applications. Physicians and case managers can now capture health information at point of care. The clinical trial industry is being revolutionized by mobile solutions. Clinical trial participants can enter their health data and feedback through a mobile device with instantaneous upload to a centralized Internet Application that captures and analyzes data collected from thousands of participants multiple times each day. This approach increases field trial efficiency, cost effectiveness and accuracy for hospitals, pharmaceutical companies and medical device firms.

### Government

Local government is using handhelds to capture field information from remote government employees for animal control and tracking, Emergency Medical Services (EMS), marina management and traffic management.

### Education

University students, equipped with handhelds, may now place their book and supply orders remotely, communicate with faculty, access homework assignments and course content, and even view streaming video replays of lectures and sports events from their handhelds.

### **Palm OS® vs. Pocket PC**

With the rapid acceptance for handhelds in general, Palm™ has for some time been tracking its product sales and performance in the marketplace across a wide variety of industries and company sizes. No surprise, the largest competitor to the Palm OS is the Pocket PC from Microsoft. While Pocket PC is simply an operating system, several vendors offer handheld devices that run the Pocket PC, with Compaq's iPAQ being one of the most popular.

Still other industry players recognize the lucrative handheld computing evolution and are making significant investments in handheld computing platforms that compete with Palm. In order to preserve and sustain its leading position in the handheld market, Palm wishes to persuasively distinguish itself from the competition.

Palm has continually received high merits for its "ease of use" by analysts and the press. However, this important advantage has presented a problem for Palm in that this metric is amorphous and largely non-tangible. Therefore Palm has sought to define and execute a methodology for objectively and accurately *quantifying* the handheld "ease of use" metric within enterprise mobile solutions. In doing so, Palm has improved its understanding of its value proposition within the handheld enterprise market, enabling Palm to create an approach for its enterprise customers to consider the true cost of mobile solutions.

### **Objectives of the Study**

Palm contracted with the Gantry Group to accomplish the following objectives:

- Define a methodology to translate "ease of use" into a quantified enterprise handheld annual TCO.
- Design a primary enterprise research study that reaches a statistically valid sample of Central Decision Makers within deployed mobile solutions.
- Comparatively articulate the specific areas and levels of enterprise mobile solutions costs and/or savings afforded by the two leading handheld OS platforms.
- Calculate the annual average TCO per enterprise-owned handheld for Palm OS vs. Pocket PC.



## Methodology

To assist Palm™ with its undertaking to gain further insight into its “ease of use” value proposition, Gantry Group developed and executed a five (5) step approach:

1. Design a set of TCO algorithms that capture real annual costs inclusive of all attributes associated with a cost, and formulate this set of algorithms into a TCO calculator that credibly and accurately translates difficult-to-quantify costs into quantifiable numbers.
2. Identify and recruit forty (40) small-to-large enterprise sites, twenty (20) with Palm OS deployments and twenty (20) with Pocket PC deployments and interview individuals responsible for the selection, operation, maintenance, and training of handheld deployment projects.
3. Run forty (40) TCO models based on data obtained from these interviews.
4. Complete TCO profiles on each of the forty (40) interviewed companies.
5. Analyze comparative results.

In early 2002, Gantry Group began a primary research study to identify a balanced sample of enterprises that had deployed handheld applications based on either the Palm OS or Pocket PC platforms, spanning a range of company sizes and industries.

Since no preexisting methodology framework for a mobile solution TCO study existed, Gantry Group's first task was to develop a methodology that captured the many facets of mobile solution TCO. Gantry Group then designed and tested a highly parameterized TCO measurement tool that captured multiple cost components associated with buying, deploying and supporting handheld devices. The detailed methodology follows in the body of this White Paper. Gantry Group then researched the market space to identify 40 enterprise sites where handhelds had been deployed as part of a planned enterprise application that facilitated a particular business process (as opposed to individual purchases of handhelds for general PDA use). The study compared the handheld experiences of forty (40) enterprises, half with deployed Palm OS devices and the remaining twenty (20) sites with deployed Pocket devices.

Gantry Group conducted telephone interviews with heads of IT, business systems, and information services who were directly involved with the handheld selection process, application development and deployment within each of the forty (40) recruited sites, representing a balanced cross-section of small, medium, and large enterprises.

The Gantry Group interviews were based on systematically collecting specific quantitative metrics concerning the handheld deployment, and served as the mechanism to collect the input data for the TCO Calculation Tool. The interview was designed to obtain factual experiential information that could be used to confirm or disprove specific areas and levels of cost savings that benefit from ease of use.

Enterprise size ranged from small companies with annual revenues of less than \$50M, medium-sized companies with annual revenues between \$50M—\$250M, to large firms with revenues exceeding \$250M. A balanced set of approximately ten (10) large enterprises and ten (10) small/medium companies were recruited for each of the two handheld platforms being evaluated. Companies were uniquely selected for each vendor type such that no one enterprise was interviewed for both Palm OS and Pocket PC platform experience.

Interviews were conducted with individuals who had direct responsibility, experience and knowledge of the operation, use, selection, deployment, and maintenance of the enterprise handheld initiative. Position titles included heads of IT, information operations, systems managers, and even a few CEOs.

To prepare for the interviews Gantry Group developed a customized, proprietary tool for calculating handheld Total Cost of Ownership (TCO). In addition to the base cost of each device on a per unit basis, this handheld TCO model took into account the following contributing cost variables:

- Add-ons—Accessories & Software
- Lifecycle management (mean lifetime)
- Replacement units for broken/lost per year
- Air time Services (annual fees)
- Software Distribution/Update Management
- IT Services Costs
- Help Desk & Support
- Training

The outcome of each interview was a quantified profile of the annualized handheld TCO on a per handheld unit basis by industry, by company size, and by platform.

To supplement the quantitative data, Gantry Group interviewers also generated a comprehensive TCO profile of each company to provide further insight into platform selection rationale, likes and dislikes, preferences and strengths of each vendor's offering. The TCO profile documented corporate purchase guidelines for handheld devices, corporate synchronization policies, centralized server synchronization, and implementation or plans for implementation for wireless networking.

Companies selected for TCO profiling were required to have operational experience with a deployed mobile solution. In cases where the deployed solution used a Symbol handheld, the profiled data was excluded from the TCO analysis due to its exceptionally high cost. Further, profiles that revealed exceptionally high license fees for 3rd party mobile solution software were excluded from the TCO calculation.

## TCO Calculation Algorithms

The Gantry Group TCO Calculation tool aimed to quantify all possible cost components that comprise the annual cost of handheld ownership. The comprehensive calculations are described below.

The base calculation for Annual Average Lifetime Amortized TCO was:

- Annual Handheld TCO =
- Average Device Cost per handheld +
- Average Add-on Cost per handheld +
- Adjustment for mean unit lifetime and replacement costs +
- Annual Airtime Services cost per unit +
- Annual Software Distribution/Management cost per unit +
- Annual IT services cost per unit +
- Annual Help Desk trouble shooting and assistance costs per unit +
- Annual Training costs per unit

### Average Device Cost

Each individual provided unit cost data, which was averaged over the total number of units deployed if multiple models at different costs had been procured.

### Average Add-On Cost Per Handheld

Individuals were asked to provide data on all accessories—hardware and software—procured. The unit cost per add-on was then multiplied by the number of devices for which it was procured. The final average cost of add-ons per unit was determined by dividing the total cost of add-ons by the number of handheld units deployed—amortizing the add-on cost across all units in service.

- Add-ons for which data was requested included:
- Add-on Memory
- Hard Storage
- Add-on Batteries
- Wireless/Wired Modems
- Printer
- Folding Keyboards
- Bar code scanners
- Add-on Software (3rd party licensed packages only)
- Protective Cases
- Connectivity

When added to the average Base Unit Cost, this yielded the *Average Device Cost with Add-ons*.

### Adjustment for Mean Unit Lifetime and Replacements

Once the average cost of the handheld plus add-ons was calculated on a per unit basis (e.g. the upfront device procurement cost), the annualized device cost was determined by adjusting for mean lifetime of the units, plus the percentage of lost/stolen/or broken units that were replaced per year. To arrive at this figure, individuals were asked for the mean lifetime in years of the units. The average device procurement cost per unit was divided by the expected lifetime to generate an average cost per unit amortized over the lifetime to yield the *Average Annual Device Cost with Add-ons*.

Next, individuals were asked what percent of units required replacement annually due to loss, theft, or breakage. This yielded the additional unit cost of replaced units (plus add-ons), which was then added to the annualized TCO per unit already calculated. The result is the *Adjusted Annual Device Cost with Add-ons*.

### **Annual Airtime Services Cost Per Unit**

Data was collected to determine annual airtime services attributed to wireless email accounts, paging services, and voice services. Individuals provided the percent of handhelds with such services and the annual service cost per unit to reveal the Annual Average Airtime Services Cost per Unit.

### **Annual Software Distribution/Management Cost Per Unit**

Frequently hidden costs are associated with installation, updates and maintenance of OS software and applications. Individuals provided the annual frequency of software distribution, the percent handhelds affected, the hourly labor cost, the update time per unit, plus any software license update fees to generate the annual unit costs associated with software distribution and management on the handhelds.

### **Annual IT Services Cost Per Unit**

Similar to the annual software distribution and management costs, individuals provided frequency of IT services to fully provision handheld repair, installation/setup, and other service incidents, percent of handhelds involved, the average time per unit for these services, and hourly labor cost to generate the annual unit costs associated with IT services for handhelds.

### **Annual Help Desk Cost Per Unit**

Those companies with help desk support provided numbers of handheld related calls per year, the average length of call, and hourly labor cost to generate annual unit costs of help desk support for handhelds.

### **Annual Training Costs Per Unit**

Those companies offering training generally only provided handheld orientation and setup instruction. These companies provided the number of users trained annually, frequency of training, duration of classes, and associated hourly training labor costs. This generated the annual unit costs for training associated with handhelds.

## Study Findings & Conclusions

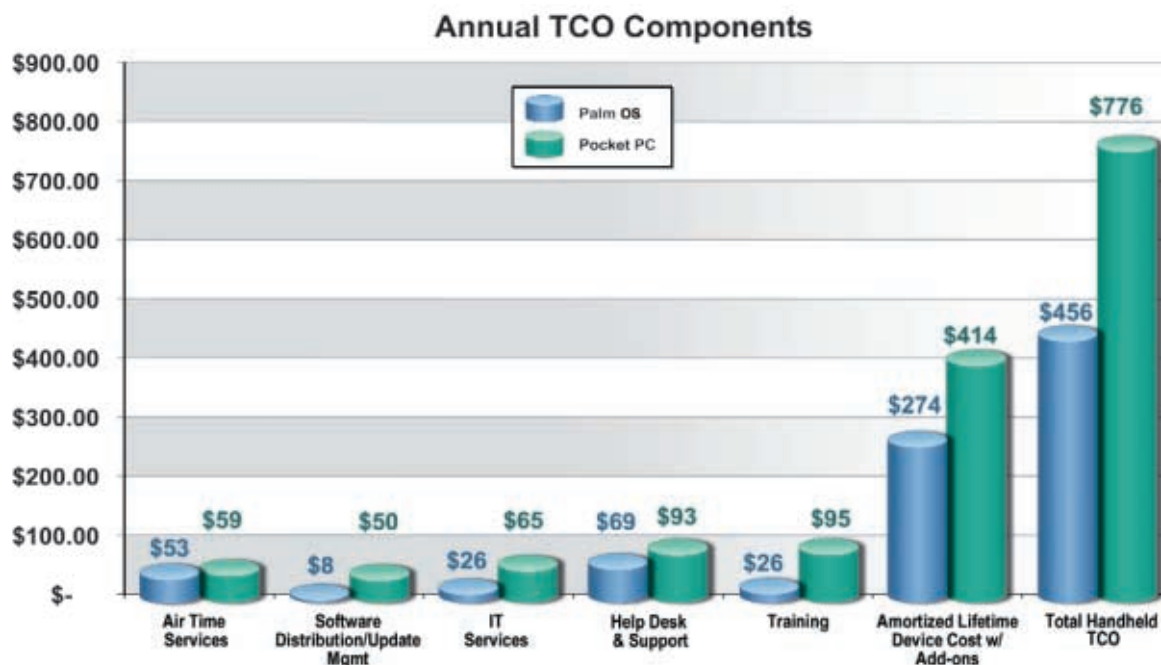
The single most significant finding of this Gantry Group TCO study was that overall annual handheld TCO is over 40% higher for Pocket PC-based enterprise deployments than for Palm OS® -based enterprise deployments (See Table 1 and Figure 1).

Table 1

TCO Cost Component Average Annualized Per Handheld	Palm OS	Pocket PC	% Difference
Air Time Services	\$ 53.12	\$ 58.62	1%
Software Distribution & Update Mgmt.	\$ 7.99	\$ 50.00	84%
IT Services	\$ 25.55	\$ 65.19	61%
Help Desk & Support	\$ 68.51	\$ 93.00	26%
Training	\$ 26.32	\$ 95.19	72%
Amortized Lifetime Device Cost w/Add-ons	\$274.30	\$413.76	34%
Total Handheld TCO	\$455.78	\$775.77	41%

The calculated average annualized TCO per handheld for enterprises using Palm OS devices was \$456 compared with \$776 for the Pocket PC handhelds. These figures represent the annual total cost of ownership per device amortized over the mean lifetime of the unit and includes the per unit costs of add-on hardware and software (not in-house developed software), IT services, help desk and support, training, airtime charges, adjusted for average annual replacements due to loss and breakage.

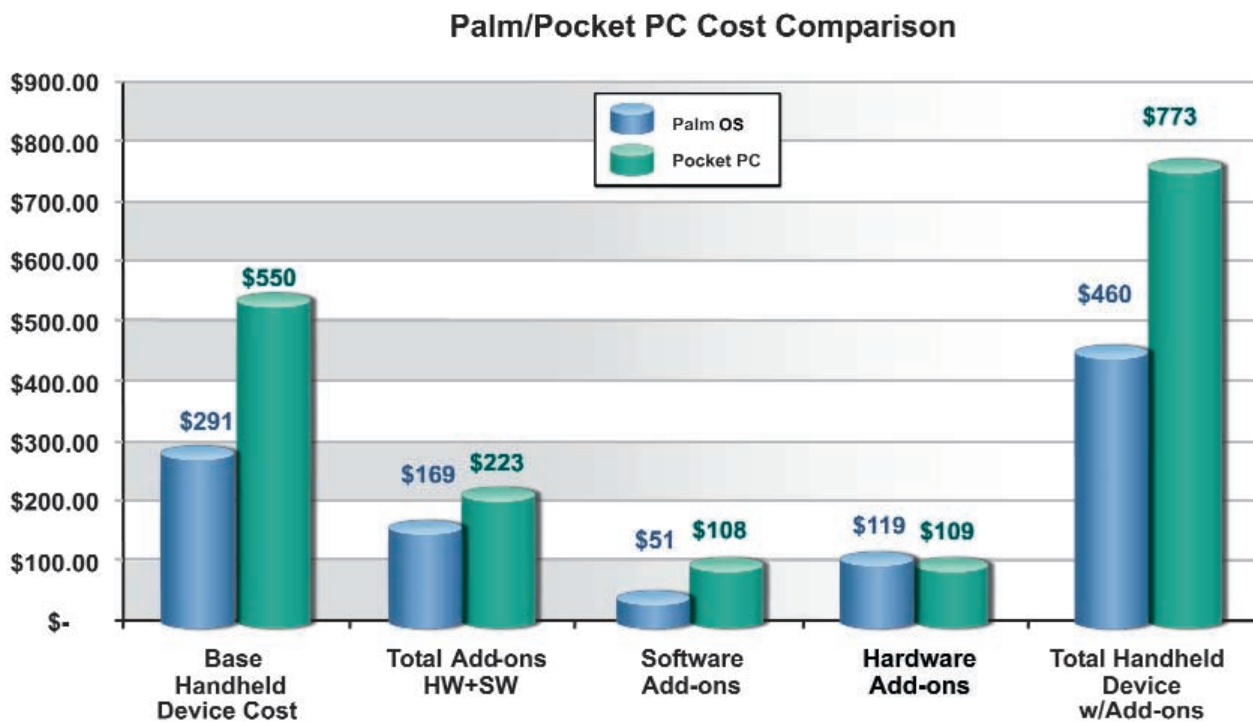
Figure 1



**Table 2**

<b>Device Profile Average Acquisition Price</b>	<b>Palm OS</b>	<b>Pocket PC</b>	<b>% Difference</b>
Base Handheld Device Cost	\$290.85	\$549.72	52%
Total Add-ons: HW+SW	\$169.30	\$223.29	24%
Software Add-ons	\$ 50.80	\$107.95	53%
Hardware Add-ons	\$118.50	\$109.34	-8%
Total Handheld Device w/Add-ons	\$460.15	\$773.01	40%

Table 2 and figure 2 depicts the cost comparisons of base units plus the cost of add-on hardware (accessories) and add-on software (where add-on software was considered to be any additional third party package not part of the standard handheld configuration), showing relatively small differences in the costs of accessories and add-on software. However, the average cost of software add-ons for Pocket PC devices was nearly twice that for Palm OS devices.

**Figure 2**

### Primary Cost Drivers

The primary cost components that make up the \$320 difference (Palm OS® TCO is about 59% of Pocket PC TCO) in annual handheld TCO between Palm OS and Pocket PC devices are:

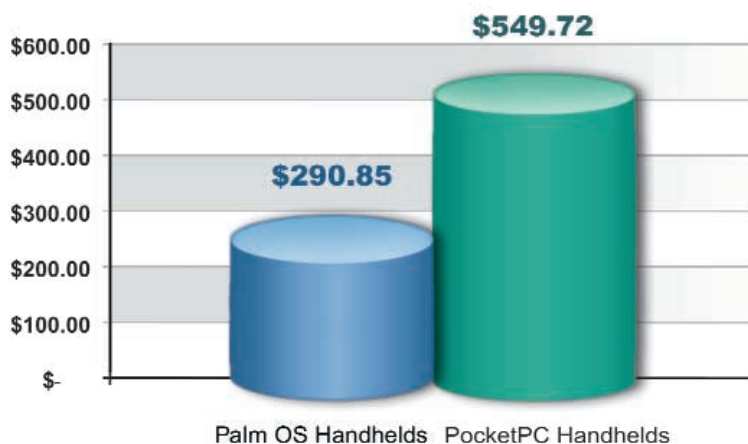
- Higher unit base cost;
- Greater need for IT services;
- Higher software distribution and management costs;
- Increased need for training.

The mean lifetime was nearly identical for both types of device, as was the annual replacement rate from loss, theft and breakage.

### Lower Unit Base Cost

The base unit cost of a Palm OS handheld device was on average 52% less than a Pocket PC device. Fully loaded with add-on software and hardware accessories, Palm OS devices were 40% less than its Pocket PC counterpart. Many enterprise study participants remarked that an important factor in their handheld device decision process was the device cost.

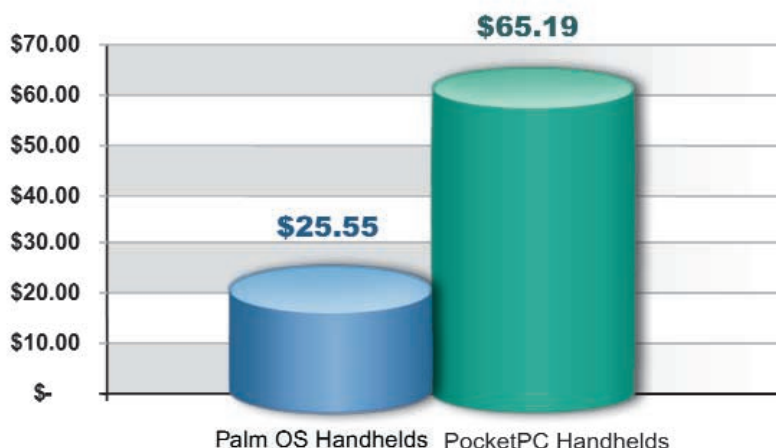
### Average Base Device Cost



### Less Need for IT Services

While mean device lifetime and annual breakage rates were similar for both handheld platforms, Pocket PC mobile solutions required more frequent reinstallations/set-ups, data recovery and general service depot request.

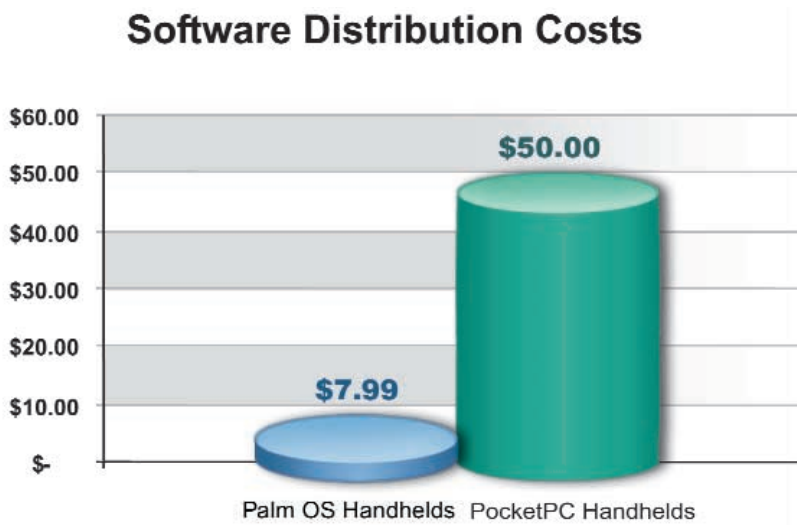
### IT Services Costs





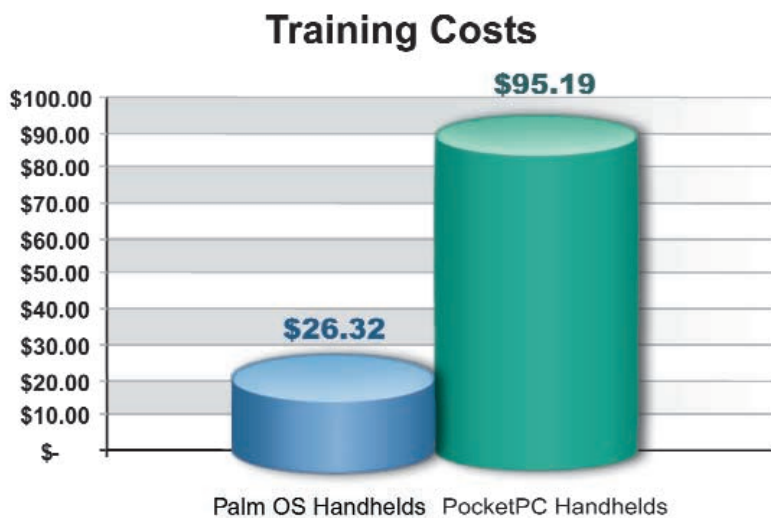
### Lower Software Distribution & Management Costs

Palm OS® Software Distribution Costs were lower due to the significantly higher frequency of operating system and application updates, in general, performed for Pocket PC mobile solutions.



### Less Need for Training

Pocket PC-based users consistently remarked that their applications running on Pocket PC devices were complex, sophisticated, and data intensive. These attributes are consistent with the greater need for IT services (3x more for Pocket PC) for set-up and orientation, trouble-shooting and data recovery, and time to become proficient. Some Pocket PC users noted frequent needs for application updates due to highly advanced functionality which would tax the IT services group for software distribution and version control.





## **Other Key Study Findings**

### **Corporate Purchasing Guidelines**

The study revealed that handhelds are rapidly growing in perception as “real” corporate assets. Over 70% of the enterprises (85% Palm OS®; 70% Pocket PC) participating in the study have Corporate Purchasing Guidelines and Mandates in place. When used for enterprise applications handheld configuration is now selected on a mobile solution requirements basis, and not selected based on personal preference.

### **Synchronization Policy**

Enterprise Synchronization has become a strategic issue. Over 75% (Palm OS 85%; Pocket PC 75%) of the enterprises in the study had plans for or deployed a formal corporate Synchronization Policy. Mobile data synchronization in the enterprise is no longer a 1-to-1 (handheld-to-PC) problem. The one handheld-one cradle configuration is destined to become passé and will no longer be the dominant synchronization device. Infrared synchronization supported by an infrared hub infrastructure is being used as a means to implement effortless multi-user synchronization (Palm OS 15%; Pocket PC 30%).

### **Centralized Server Synchronization**

Over 85% of enterprises participating in this study (90% Palm OS; 85% Pocket PC) used a centralized corporate server as the means for collecting and disseminating business knowledge. Many of these servers were hosted by Managed Service Providers, capturing remote data via IP. Multi-user simultaneous synchronization was a top issue for enterprises with deployed mobile solutions on either platform.

## APPENDIX A: Aggregated Enterprise Data

Implementation Attribute Summary	Palm OS Handhelds	Pocket PC Handhelds
Corp. Purchasing Guidelines Established	85%	70%
Corporate Synchronization Policy Established	80%	60%
Corporate Synchronization Policy Planned	5%	15%
Enterprise Centralized Server Synchronization	90%	85%
Wireless/IR Synch Updates	15%	30%
Wired Modem (IP) Synch Updates	25%	25%
Wireless Printing	15%	5%

*\* Includes Outlier Profiles*

Average Annual Handheld Related Costs	Palm OS HandHelds	Pocket PC HandHelds
Number of Devices	572	248
Base Unit Cost	\$290.85	\$549.72
HW/SW Add-	\$169.30	\$223.29
HW Add-ons/device	\$118.50	\$109.34
SW Add-ons/device	\$50.80	\$107.95
Total Unit Cost W/ Add	\$460.15	\$773.01
<b>Average Annual TCO Components</b>		
Air Time Services	\$53.12	\$58.62
Software Distribution/Updates	\$7.99	\$50.00
IT Services	\$25.55	\$65.19
Help Desk & Support	\$68.51	\$93.00
Training	\$26.32	\$95.19
Mean Lifetime	2.5 years	2.6 years
Annual Loss Rate	6%	6%
Amortized Lifetime Cost W/ Add	\$274.30	\$413.76
<b>Average Annual Handheld TCO</b>	<b>\$455.78</b>	<b>\$775.77</b>

*\* Outlier Profiles Removed*

## APPENDIX B: Deployed Device Profile

<b>Palm OS Deployed Device Profile</b>	<b>Palm OS Branded Devices</b>	<b>Other Palm OS Devices*</b>	<b>Total</b>
Total Enterprise Devices Deployed	7,579	3,795	10,874
Average Devices Deployed per Enterprise Mobile Solution	572	200	-
% Total Devices Deployed	65%	35%	100%

\* Includes Handspring Visor/Treo, TRG Pro; Excludes Symbol

<b>Pocket PC Deployed Device Profile</b>	<b>Compaq IPaq Devices</b>	<b>Other Pocket PC Devices</b>	<b>Total</b>
Total Enterprise Devices Deployed	3,135	1,307	4,466
Average Devices Deployed per Enterprise Mobile Solution	248	73	-
% Total Devices Deployed	70%	30%	100%

\* Includes Casio Cassiopeia, Vadem (Clio), HP Jornada; Excludes Symbol

