



Frost & Sullivan assesses the ROI of Treo™ smartphones in the enterprise.

Executive summary: Treo smartphones drive productivity gains of mobile workers in organizations, yielding quantifiable benefits.

Over the past few years, the new social trend of increased employee mobility has caught the attention of many IT/data-com and voice managers. The advent of the mobile enterprise creates a challenge for companies to provide their workers with secure, ubiquitous access to their corporate networks and enable them to pick up their email or return a customer call while away from their desk.

A recent Frost & Sullivan study indicated that approximately 60 percent of businesses currently provide cellular handsets and service or reimburse their employees for wireless service. According to Frost & Sullivan, there has also been a corresponding increase in the usage of mobile voice and data applications. A smartphone can be the ideal delivery mechanism for these services, as it combines both the features of a wireless handset and the flexibility of a personal digital assistant (PDA) in a single device.

A smartphone can play a key role in:

- Driving employee productivity, by enabling workers to use their time away from the desk and the office more effectively.
- Significantly accelerating workflow by shortening the internal decision process and allowing employees to respond to internal email, voice calls, and voice mail faster.
- Enhancing customer satisfaction by shortening the response time to customer inquiries.
- Achieving additional cost savings by reducing or eliminating the need to spend on other hardware devices such as laptops, PDAs or 12-key cell phones.

Additional benefits include the convenience of having to carry only one device, the ubiquity of the service and the ease of having integrated voice and data capabilities. Moreover, a smartphone brand offering support for open interfaces and a variety of email infrastructures¹, can be instrumental in enabling third-party developers to create applications that can increase productivity (such as Field Force Management) and offer avenues for new revenues (such as Sales Force Automation).

This white paper, written by Frost & Sullivan and commissioned by Palm, discusses how a smartphone solution such as the Palm Treo smartphone can assist organizations in achieving the above noted gains. The findings are based on a smartphone end-user survey conducted by Frost & Sullivan on behalf of Palm.

The paper also presents a return on investment (ROI) model that can be used in making a business case supporting the deployment of the Palm Treo smartphone. The main benefit explored for the purposes of the ROI calculations was the increase in productivity due to the recovery of downtime. **Using estimates that were significantly more conservative than the data collected by the survey, the payback period obtained was less than two months.**

We briefly discuss other benefits of the Treo solution that survey participants reported—these include gains from workflow efficiency enhancements and savings from the likelihood that a Treo smartphone would replace PDAs, 12-key cell phones or laptops. In addition, we uncovered the appeal of the Treo smartphone as a perquisite, which contributes to overall employee satisfaction. Finally, our survey also showed that when given a choice, most end-users tend to opt for the Treo smartphone over other smartphones.

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¹ This includes support for the Palm OS and Windows Mobile operating systems and Exchange, Notes, and the BlackBerry Enterprise Server.

Introduction

Report layout

The first section introduces an ROI model demonstrating the advantages of the Palm® Treo™ smartphone. Inputs to the model are largely based on the responses to our research, in which we surveyed a total of 531 enterprise employees in the US holding either line of business (LoB) or IT positions.

Following this section, other benefits (some soft-dollar and others that could not be quantified and were not taken into account in our ROI model) of the solution are discussed, including some survey results demonstrating the appeal of the Palm Treo smartphone, and trending data on hardware that is being replaced by smartphones in enterprises.

The last part of the white paper highlights the benefits of an open platform such as the Treo and summarizes the key take-aways.

Survey methodology

Frost & Sullivan invited, by email, members of a national panel of business executives and IT professionals to complete a web-based survey in September 2005. All respondents were screened for their usage of a company-provided smartphone; we recruited only those who were employed in companies with more than 250 employees. A total of 531 respondents completed the survey by September 30, 2005.

Respondents who indicated a responsibility for IT management and administration within their companies completed a questionnaire that focused on the impact and performance of smartphones across the entire enterprise. Those whose company responsibilities pertain to line of business management and administration answered the questionnaire for their own experience and behavior.

A sample size of 531 provides a margin of error of $\pm 4.3\%$, 19 times out of 20. Of the total sample, 208 are IT professionals and 323 line of business managers and executives.

The study included 167 Palm Treo smartphone users, 250 Blackberry users and 114 users of other brands of smartphones.

All currency figures in this report are US dollars.

A word about Frost & Sullivan

Frost & Sullivan is a global growth consulting company that partners with clients to support the development of innovative growth strategies. For more than 40 years, we have leveraged our comprehensive market expertise to serve an extensive clientele that includes Global 1000 companies, emerging companies, and the investment community.

Our consultants, market analysts, corporate trainers, account managers and customer support staff work together in providing growth consulting and corporate training solutions to clients in more than 50 countries around the world.

ROI model for the Palm Treo smartphone

In this section, we present the ROI (return on investment) model for the Palm Treo smartphone. In essence, this represents a cost-benefit analysis, taking into account both the expenditures (capital and operational) and the gains associated with deploying the Treo smartphone in a typical enterprise. The benefits attributed to the deployment and use of smartphones can be divided into two categories:

- Productivity gains due to using employee downtime (time away from the office desk, while traveling, waiting for meetings, and so forth) in a more effective manner.
- Faster turnaround time gains, allowing users to respond faster to their time sensitive emails and voice calls, which can be crucial in a multi-person project or in contributing to customer satisfaction.

The costs can be categorized in two groups: capital and operational expenditures (CAPEX and OPEX). CAPEX includes the cost of the Palm Treo smartphone and additional software. OPEX costs can be recurring (e.g., monthly airtime fee charged by a service provider for the Treo smartphone service and monthly IT support costs) or one-time costs (e.g., installation, training and documentation).

We will examine each of these factors in more detail in the following subsections.

Productivity gains

The amount of downtime (e.g., commuting to an office, waiting for a meeting or a plane, expecting someone at a hotel lobby) represents a subset of the total time spent away from the employee’s desk. Obviously, from a productivity enhancement standpoint, workers having profiles that entail a lot of time spent in places other than their desks (such as consultants, physicians, account or corporate executives) will tend to gain the most with having a smart handset such as the Treo™ smartphone.

“We wanted to provide our field sales and service force with a seamless way to stay connected to the people and information they need to do their jobs well. By giving them a phone and access to email and schedules using GoodLink, all in one device, the Treo has fundamentally changed the way they work.”

Dean Drogas, Chief Information Officer, Silicon Graphics, Inc.

Therefore, before evaluating the actual gains, it is important to consider what the mobility profiles for a typical enterprise look like. We can define six main work-place profiles:

People working mainly on site:

- *Desk workers:* work mostly behind their desks (e.g., software designers, operations, accounting).
- *On-site rovers:* work mainly at their desks, but sometimes roam in the company (e.g., administrative assistants).
- *Site wanderers:* desk-less people who typically spend most of their time roaming on-site (e.g., IT troubleshooter).

People working mainly off-site:

- *Teleworkers:* work remotely (from home or from a location away from the office) most of the time.
- *Off-site rovers:* work off-site mainly away from their offices, but sometimes at their desks (e.g., consultants).
- *Road warriors:* work mainly outside the company (e.g., account executive).
- *Global cruiser:* often travel between different company, or customer, locations (e.g., corporate executive).

Enterprises are increasing the number of telecommuters² (i.e., employees working away from the office) and most offices typically allocate a certain number of hot desks for visits from employees from other locations (off-site rovers that spend a percentage of their times in their facilities³).

Each of these work-place profiles has an average allocation of time spent at their desks or elsewhere. For instance, the administrative assistant may spend 70 percent of her time behind her desk, and the rest somewhere in the company (such as at the photocopying machine), or away (e.g., at an outside supplier location).

The mobility profiles for different categories of employees are illustrated in Figure 1, which also shows the approximate amount of time spent by these groups at their desks or elsewhere at other various locations.

	On-Site		Off-Site	
	At desk	Elsewhere	At desk	On the road
Desk Worker <i>Software designer</i>	90%	10%		
On-Site Rover <i>Admin. Assistant</i>	70%	30%		
Site Wanderer <i>IT Troubleshooter</i>	10%	90%		
Tele Worker <i>Remote agent</i>			100%	
Off-Site Rover <i>Consultant</i>			30%	70%
Road Warrior <i>Account Executive</i>			10%	90%
Global Cruiser <i>Corporate Executive</i>	25%	25%	25%	25%

Figure 1—Mobility profiles for a typical enterprise

Source: Frost & Sullivan

“We saw an immediate productivity benefit as soon as we distributed the Treos. They were getting at least 20 to 30 minutes back per day...it’s easy to justify the cost when you immediately see the benefits.”

David Lam, IT Director, Stephen S. Wise Temple, Los Angeles, CA

² The US Bureau of Labor Statistics currently defines a telecommuter as “an employee in a non-agricultural industry who worked at home during the survey week as part of their primary or secondary job”. The definition includes workers who are specifically compensated for the work they do at home, in addition to employees who take work home with them after hours.

³ Frost & Sullivan estimates there are roughly 45 million telecommuters in North America (2005), up from about 30 million in 2000.

In order to standardize the survey, and ensure respondent comprehension, we considered four employee categories: executive management, sales/field agents, professionals and other/managerial functions. The mobility profiles map these employee categories in the following manner:

- Executive management includes global cruisers.
- Sales and field agents can be classified as off-site rovers and road warriors.
- Professional occupations include site wanderers, desk workers and on-site rovers.
- Other /managerial functions include desk warriors, on-site rovers and teleworkers.

Survey respondents from each of these employee categories told us of the downtime they recovered daily (in minutes/day) because of their Treo™ smartphone. We were able to assign a monetary value to this increased productivity by using the median reported salaries for each of these categories, and making an assumption of the average number of hours worked per year.⁴ The results are in Table 1:

Function	Median Downtime Recovered (minutes per day)	Median Annual Salary	Average Productivity Gain (per year) ⁵
Executive Management	45	\$150,000	\$14,063
Sales / Field Agents	60	\$89,000	\$11,125
Professionals	30	\$80,000	\$5,000
Other / Managerial	30	\$80,000	\$5,000
Avg. for All Employees	41	\$99,750	\$8,572

Table 1 – Productivity gains due to recovery of downtime

Source: Frost & Sullivan Smartphone User Survey 2005

Palm Treo smartphone costs

In order to determine the ROI of the Palm Treo smartphone, we need to establish the total cost of ownership (TCO) of the solution. The costs associated with the Treo solution are tabulated below. Our assumption is that these costs are associated with a medium-sized enterprise having 100 users. It is important to highlight the fact that these costs are on the conservative side. For example, in some deployments around Exchange 2003, the Treo smartphone has no extra server, client access license (CAL), or monthly fees. The costs are tabulated in the following chart:

Cost Item	Yearly User Cost
Palm Treo smartphone	\$299
Additional Software	\$114
Carrier Voice and Data Service Charges (\$88/month)	\$1,056
IT Costs – maintenance / middleware	\$28
IT Costs – per user (one-time)	\$23
IT Costs – per user (ongoing)	\$94
Avg. for All Employees	\$1,614

Table 2 – Per user Palm Treo smartphone annual costs (for an enterprise with 100 users)

Source: Frost & Sullivan Smartphone User Survey 2005

In order to derive the above results, we made the following set of assumptions:

- The Palm Treo 650 smartphone costs \$299, although subsidies from carriers and discounts on enterprise contracts are already available that reduce the cost of the device. We also assumed that the investment would be amortized over a year rather than two years, which effectively increases the overall cost of the solution in the calculations.
- The cost of the email software is composed of both the cost of the third party email middleware server (\$1,500 for 100 users, or \$15 per user) and of the middleware client access license (CAL), which is assumed to be \$99 per user (this is actually a bit conservative, since the server capacity is actually equal to 500 users). Therefore, the total software cost on a per user basis is \$114 (\$99 + \$15). It should be noted that these estimates are conservative since enterprises can negotiate terms with their wireless email service provider — the costs we have shown in this document are on the high end.
- The average monthly carrier cost for the data/email Treo smartphone service is \$44.99 per user, which includes both the wireless data charge and the client fee. Also there is an extra cost of \$40 to \$45 per month for the voice costs (typically for around 1,000 to 1,200 minutes). Again, not all of this is incremental, but once more we are leaning on the conservative side. We assumed an average of about \$43 per month. Hence, the total monthly carrier spend is approximately \$88, which corresponds to an annual overall cost of \$1,056.
- IT costs are broken into 2 parts:
 1. Maintaining the middleware: A well-known middleware provider estimates 3 hours/month for 500 users. A more conservative approach would be to estimate 8 hours/month. And in our calculations we used 5 hours. For 100 employees, one server is needed, so 5 hours per month

⁴ We assumed that on average, employees have a five-day workweek and work 40 hours per week. Assuming also that they work 48 weeks per year, this implies 1,920 hours worked per year.
⁵ To obtain the average productivity gain per year, we assumed that an employee's annual salary reflects their productivity. (E.g., across all employees surveyed, the median annual salary was \$99,750, which translates to ~\$52/hour since we are assuming 1,920 hours worked/year). So the value of the median downtime recovered is the annual downtime recovered (in hours) multiplied by hourly earnings.

multiplied by the average IT worker salary per hour (\$90,000 divided by 48 weeks/year, 40 hours/ week, or \$46.88) divided by the total number of employees (100) and annualized (i.e., multiplying the result by 12) yields a total middleware maintenance cost of about \$28 per user per year.

2. Per user:

- (a) One-time: initial set-up/training charges/user of 30 minutes per user. For the 100-employee case, the number of minutes needs to be converted to the hours (i.e., divided by 60) and that needs to be multiplied by the average IT worker salary per hour (\$46.88, as defined above). This yields a cost of \$23 per user per year.
- (b) Ongoing support of 10 minutes/month per user (typical range: 4-15). The monthly support for 100 employees can be determined as follows: the ongoing support time requirement needs to be converted to hours (i.e., divided by 60) and that in turn needs to be multiplied by the average IT worker salary per hour (\$46.88) and the end result is roughly \$94 per user per year.

Determining the Palm® Treo™ smartphone ROI

In order to determine the ROI for the Treo smartphone, we need to total the benefits (only downtime recovery was considered) and translate them from a yearly to a daily basis to get more granularity. Recall the productivity gains estimated in the previous section:

Benefit Item	Annual Value
Productivity gains (due to downtime recovery)	\$8,572

Table 3 – Palm Treo smartphone annual benefit per user (for a 100-user enterprise based on the survey)

Source: Frost & Sullivan Smartphone User Survey 2005

Dividing the annual costs per user (determined to be \$1,614 in the previous section) by the total daily benefit yields a payback period of less than 46 days for the Treo smartphone solution.

Notice that these calculations were based on the median salary of our survey sample, which was \$99,750. We have performed some additional sensitivity analysis to determine how the payback period varies according to the average employee salary (assuming the same 41 minutes per day in recovered downtime) and the average installation size (which will change the Palm Treo smartphone costs). The results are presented in Table 4:

# Employees	Employee Total Annual Compensation							
	\$50,000	\$60,000	\$70,000	\$80,000	\$90,000	\$100,000	\$110,000	\$120,000
50	93	77	66	58	51	46	42	39
100	90	75	64	56	50	45	41	38
150	89	74	64	56	50	45	41	37
250	89	74	63	55	49	44	40	37
500	89	74	63	55	49	44	40	37
1,000	88	74	63	55	49	44	40	37

Table 4 – Treo smartphone payback period (in days) by employee compensation and deployment size

Source: Frost & Sullivan Smartphone User Survey 2005

“The Treo smartphone and PensEra’s TimeKM play a critical role in supporting our lawyers’ mobile work style helping us increase productivity, serve our clients better and ultimately achieve complete return on investment within just 20 days per deployment.”

Justin Hectus, Director of Information, Keesal, Young and Logan

Palm Treo smartphone benefits not quantified in the ROI model

In this section, we examine other benefits, many of which are tangible and that readers might want to include in their own ROI calculations.

Reduction in spending on alternative hardware

First, we found in our survey that when asked how they are using the smartphone, respondents often mentioned that the Treo smartphone is used to replace PDAs and 12-key cellular phones. Some participants also indicated that the Treo smartphone sometimes replaces even a laptop computer. This is illustrated in Figure 2.

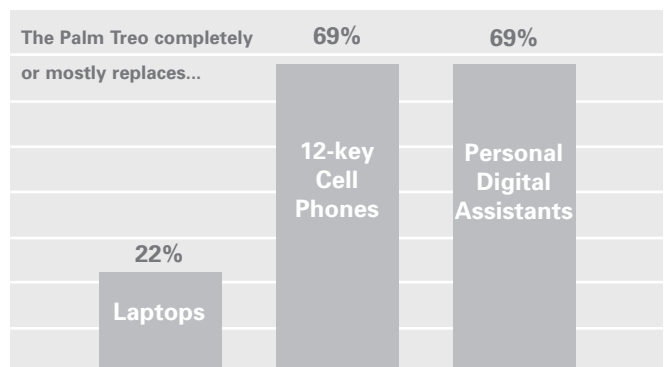


Figure 2 – How employees are utilizing the Treo smartphone

Source: Frost & Sullivan Smartphone User Survey 2005

The above result suggests that there could be yet another factor taken into consideration for the purposes of an ROI calculation, namely, whether or not the Treo™ smartphone will be used as a replacement for a laptop, cell phone or PDA. Still, it is difficult to quantify this substitutive effect, as a Treo smartphone could replace a laptop only in certain instances, whereas it could potentially replace a 12-key cell phone or a PDA on a permanent basis. Moreover, survey participants could choose multiple responses for this question, which further increases the complexity of quantifying the impact. That said, it is something that could be taken into account for a specific ROI model for an enterprise that has, for instance, already fully depreciated its workforce mobile handsets. Another way of looking at this is to consider the cost avoidance factor, as a Treo smartphone can also make the acquisition of new PDAs a superfluous exercise.

Faster turnaround gains

The survey also tracked the number of time-sensitive communications (emails, voice calls and voice mail) that Treo smartphone users were able to respond to as a result of being always connected. In order to quantify the benefit of increased responsiveness, we multiplied the percentage of time-sensitive communication (emails and voice calls received per day) by the volume of these messages, and then assigned dollar values for each communication type (emails and voice messages).

Although this is a real benefit that is mentioned by most users, we realize that readers will want to quantify it in different ways. Hence, we did not account for this benefit in our payback period calculations. For illustration purposes only, we present the table below, which assumes that the time-sensitive voice call is more valuable, on average, than the time-sensitive email.

Function	# of emails received	% sensitive emails	% of calls received	% sensitive calls	% sensitive interactions
Executive Management	83	42	27	46	47
Sales / Field Agents	87	43	39	47	56
Professionals	69	36	22	40	33
Other / Managerial	58	32	23	35	27
Avg. for All Employees	74	38	28	42	40

Table 5 – Time sensitive communication (per day)

Source: Frost & Sullivan Smartphone User Survey 2005

Fast Turnaround Time Gains	Value of sensitive email		Value of sensitive calls	
	\$1	\$2	\$3	\$6
Function	Faster Turnaround Gain (yr.)		Faster Turnaround Gain (yr.)	
Executive Management	\$8,433	\$16,867	\$8,725	\$17,449
Sales	\$9,024	\$18,048	\$13,015	\$26,030
Professionals	\$5,882	\$11,764	\$6,345	\$12,690
Other Managerial	\$4,497	\$8,994	\$5,691	\$11,382
Avg. for All Employees	\$6,833	\$13,666	\$8,270	\$16,540

Table 6 – Faster turnaround time gains (per year⁶)

Source: Frost & Sullivan Smartphone User Survey 2005

Workflow efficiency gains

Owning a Treo smartphone allows workers to respond faster to customer inquiries, make final adjustments to a proposal or give input to a group project. Our survey participants recognized these benefits, and quantified the gain in workflow efficiency as follows:

Function	Workflow Efficiency Gain
Executive Management	25%
Sales	29%
Professionals	23%
Other / managerial	21%
Avg. for All Employees	24%

Table 7 – Workflow efficiency gains using Treo smartphones

Source: Frost & Sullivan Smartphone User Survey 2005

Treo smartphones seen as an employee perk

Another important, albeit less tangible benefit, is the impact Treo smartphones have on employee satisfaction. In our survey, we found more than 80% of Treo smartphone users were very satisfied with their device, higher than for competing devices. In addition, we found that 85% of Treo smartphone users agreed that their device represents a valuable employee perk.

⁶ One year is assumed as 240 working days on average.

Other key takeaways

Another important finding from the survey is that while end-users are frequently not given an option to select their preferred mobile communications device, in those instances in which end-users can choose their smartphone, Palm edged its competitors for being the preferred choice, achieving 43 percent of the total respondents, more than any other competitor.

Primary reasons mobile professionals are choosing Treo™ smartphones

Power and convenience: Queuing up for a flight, waiting in a lobby, it's not always convenient to pull out a notebook and start it up. Real productivity begins with an always-on device to make calls, handle email, send messages and turn "downtime into found time." Responsiveness, decision-making and competitiveness all benefit significantly from Palm's combination of power and convenience.

Choice of OS: By offering a choice of open, business-ready operating systems, both technical and business decision makers are able to agree on what is most important in mobilizing an enterprise; that is, simplicity, security, and user satisfaction.

Both Palm OS and Windows Mobile platforms offer open OS environments specifically tailored by Palm to deliver the best mobile experience with non-compromising hardware and software integration, easy navigation, and secure configuration. Both platforms also work seamlessly with existing email, enterprise applications and IT infrastructure.

Business-ready Applications: At present, there are thousands of Palm software applications available from third-party partners in finance, insurance, real estate, health care, education, sales force automation and IT management. The result is the ability to mobilize enterprise data now, and the opportunity to leverage a vast community of developers to expand custom enterprise solutions to the wireless realm.

Finally, the Treo smartphone offers a high degree of flexibility in several ways. Flexibility in terms of the backend email server systems that the Treo smartphone can connect to, and flexibility in the operating systems supported. For servers, there are Treo solutions for all versions of Microsoft Exchange/Outlook, for Lotus Domino/Notes and for GroupWise. Palm has also announced a client for the BlackBerry Enterprise Server via BlackBerry Connect™ (BBC) for the Treo 650 smartphone. Palm has also shown flexibility to its end-users by supporting platforms such as the Palm OS and Windows Mobile 5.0.

The BBC solution on the Treo smartphone represents the fusion between the superior Treo smartphone form factor and the popular BlackBerry push technology. Frost & Sullivan believes that this combination will enable Palm to establish the Treo smartphone as the BBC-enabled device of choice. The Microsoft initiative is geared towards increasing the Treo smartphone addressable market and also positions the product to tap the large Windows Mobile developer community for the creation of applications. With this three-pronged approach, Palm is offering customers an ample portfolio of handsets that can cater to various needs, a flexibility that is currently unparalleled in the smartphone marketplace.

"With TurboApps running on Palm handhelds and smartphones, our agents have access to the applications necessary to get the job done. Being able to process applications quicker with fewer mistakes is a win for clients, agents and the company."

Tom Swift, Executive Vice President of Field Technology, Primerica

Summary

In this white paper, we examined an ROI (return on investment) model for the Palm® Treo™ smartphone. Our approach was conservative, focusing only on the downtime recovery gains and using somewhat higher cost estimates in our calculations. Still, our survey participants reported significant productivity improvements because of downtime recovery, as a result of which we obtained a fairly quick payback period of less than two months.

We also presented some other benefits of the Treo smartphone solution that were widely reported by our survey participants but may be more difficult to quantify. These include workflow efficiency gains, the impact of being able to respond

more quickly to critical, time-sensitive communications and the ability to reduce expenditures on other hardware such as PDAs, 12-key cell phones and even laptops (in some instances). Our research also indicated that, when given a choice, more enterprise employees would opt for a Treo smartphone than for any other competing product.

Finally, we also highlighted the flexibility of the Treo smartphone, which offers unmatched support for third-party operating systems. This, coupled with the fact that more end-users tend to opt for the Treo smartphone than any other brand, will strongly position Palm in its quest to be the smartphone brand name of choice for both the consumer and the enterprise markets.

This paper is part of the ongoing coverage of worldwide information and communications technologies markets by Frost & Sullivan (www.frost.com), an international growth consulting company. Working closely with our clients, we use advanced market research methods to identify and analyze the critical market challenges they must address to become successful competitors in their industry.



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