

The PDA Revolution is Here: Are You Ready?

A JOURNAL OF STRATEGY & BUSINESS TRANSFORMATION

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Introduction

While the world has been mesmerized by the internet revolution and has been singing songs of the productivity increases associated with the internet, a quiet revolution has been underway unnoticed by many with little press coverage. There are off-beat mentions of the "palm revolution" and how mobile hand-sets and appliances will change the way humanity surfs. However, not many have directly addressed the huge opportunity hand-helds offer in terms of harnessing increased productivity and reducing costs through out the enterprise. In this article, we will highlight some of these opportunities, identify some leaders in their industries who have deployed mobile applications on PDAs, briefly discuss some of the technological challenges that the PDA applications face versus traditional client server applications, and lastly leave you with some thoughts on key items to consider as you embark on your mission to harness the power of mobile apps to gain a competitive advantage against your competitors.

Hospitals: A mobile application

Ed is busy at work when he starts to feel dizzy and develops an abdominal ache. He accesses the MyHealth application running on his PDA and accesses the Schedule Appointment option. Ed's medical and insurance information in addition to his General Practitioner's information is stored on his PDA. The application asks Ed a couple of questions about his ailment, what he ate for lunch and recommends first aid he can take for temporary relief. The application also asks Ed to select the urgency of the doctor's visit. Taking this information and using Ed's calendar, the application logs in to the hospital's database, looks up the Doctor's schedule and sets the earliest appointment which works for both of them. The application also automatically fills out a appointment reason form for Ed indicating the trouble he is facing.

On the appointment date, when Ed walks into the Hospital, he checks in using the Infra red port by the receptionist's desk. The hospital server authenticates Ed and pulls up his old patient history and his appointment details and transmits it to the Doctor's PDA with a message that his patient has arrived. The doctor examines Ed and writes a prescription for him on his PDA which is delivered electronically to Ed's PDA and pharmacist.

As Ed is leaving after the visitation, he uses his e-wallet application to transfer the \$10 co-payment fee to the hospital. The application transfers the money but warns Ed that he only has \$5 worth of cash left on in his e-wallet. On the way to the pharmacy store to pick up his medication, Ed stops by his bank, plugs in his PDA on the cradle next to the ATM and transfers \$100 to his e-wallet. He then proceeds to the pharmacy, identifies himself using his PDA, pays for the medication and reaches back to his office all in time for his appointment with the company CIO.

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Why mobilize

If you thought that the mobile hospital example was nothing but a dream and far from reality, think again. E-physician.com has a product that enables a significant portion of the capabilities described above. Over 250 Rochester area physicians use Palm powered handhelds to instantly identify specialists, look up drug interactions and refer to treatment guidelines and HMO policies. (Blue Cross Blue Shield of the Rochester area – www.palm.com.) There is an entire web site called PDAMD.com that focuses on PDA applications for the healthcare industry. Examples abound of other players, some of which we will discuss briefly, who are harnessing the power PDA applications are creating to drive towards higher operational efficiencies and better customer experience.

The reasons for mobilization of your work force can be grouped into two central and overarching themes: A mobile workforce will help you i) Serve your customers better and ii) Serve your customers cheaper. As a result of increases in revenues and decreases in costs, PDA solutions add significantly to your bottom line and pay for themselves.

Serve the customer better:

Never before in the history of business have the customers wielded as much as power as they do today. For companies to be successful in today's information economy they will need to do much better than meeting customer's expectations. Those who will prevail will be the ones who delight the customer, creating needs where none exist and fulfilling them better than the others. Let's look at some opportunities that fall in this arena:

- Mobile Customer Relationship Management (m-CRM) -Most of the Fortune 500 companies have invested or have plans to invest millions of dollars in CRM packages in the coming years. By collating information from various customer touch points with the company and providing all the information about it's customers in the hands of the front line workers, CRM packages enable the company to provide it's customers with personalized. But, when your front line employees leave your premises to visit customer sites, often their connections to the central repositories of customer information which you have some collected and built are severed. Even in many cases, where they are armed with laptops, there are many circumstances where it is not reasonable to sit down and power up a notebook, ex. at a shipping and receiving dock or at a grocery store aisle. With Mobile CRM solutions offered by numerous CRM vendors in collaboration with PDA device manufactures, you can reclaim those connections. Your mobile workers must be able to access corporate data and applications at any time, at all customer touch points, in what ever service they are providing (Selling, Field service, Treatment, Service delivery or Training). Analysts International offers a good case study of one such deployment. (For more on Analysts International, visit – www.palm.com.) Today, its workforce has mobile access to a host of groupware, CRM applications and other core business systems. Earlier to access group databases, mo-

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Mobile sales team and managers had to start up their laptops and dial into firm's network. Since dial up was not always convenient, often meetings proceeded without data and decisions were postponed. Now all that information relevant to them is on their PDAs.

- Improve Quality of Service by reducing errors—Many front line employees despite the advances in automation and computing for one or more reasons, use paper forms to capture information. Errors creep up as this information is keyed into information systems leading to wrongly filled orders, delays and customer angst. In any operation where inspections are frequent, you will find that errors can be significantly be reduced by getting rid of paper and streamlining your processes. But more on that later in the next section on serving the customer cheaper. Healthcare offers a good example of an industry where errors can be fatal. Each year, more than 100,000 fatalities occur due to preventable medication errors; another approximately two million injuries occur due to mistakes in the medication process. Today, hospitals can deploy the Rx System developed by BD systems (www.bd.com) which allows healthcare providers to access vital information about medication dosage and potential drug/drug interactions before administering a drug.

Medication Mgmt Process	Ordering	Transcribing	Dispensing	Administering
Errors	Wrong Dose Wrong Drug Wrong Route Allergy, Drug Interaction	Wrong Dose Wrong Route Wrong Patient Wrong Time Wrong Drug	Wrong Dose Wrong Route Wrong Patient Wrong Time Primary Catch for Allergy, Drug Interaction	Wrong Patient Wrong Dose Wrong Drug Wrong Time
% of Errors	50 %	12 %	14 %	38 %
Intercept Rate	25 %	3 %	5 %	1 %
True Error Rate	25 %	9 %	9 %	37 %

Total annual cost of inefficiencies and errors equates to > \$4B—Source: www.bd.com

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- Respond to customer requests faster—In his paper “Time based competition”, George Stalk (Harvard Business Review, July 1988) argues that time has become a strategic source of competitive advantage in today’s world. Your ability to quickly respond to customer needs is a key measure of their satisfaction with your service. Often when your mobile employees are facing customers, they find themselves not armed with the existing inventory, pricing and other product specific information that the customer might be interested in. Often these requests get routed to sales support or engineering groups who collect this information (one or more week delays are frequent) and provide it to the customer. In the time that it takes you to respond, someone else better armed with this information could steal the customer away by giving the illusion of being more responsive when all they were, were better connected. You can arm your sales reps and other front line service employees with this information as well. One of the companies which has deployed an application to reduce response time is Fiat Credit France, (www.palm.com) which is the financial services arm of the global car giant fiat. Part of their product offering is a fairly complex but high value adding leasing offer called Formula which provides complementary services like extended guarantees, technical assistance, a replacement car for emergency use, an extended insurance policy and an option where Fiat guarantees to buy the car back at a prearranged value after 24 months. With so many variable affecting the offer, Sales Reps needed an unobtrusive way to access this complex information without leaving the customer, the car or the showroom floor. Today after the deployment of a form based application, they can access price and model list data, financing information and current promotions all at the touch of the button.
- Provide new value added services—The technology available today provides businesses with many ways to delight the customer and differentiate their product offering from the competition by providing value added services. Many players in the content distribution and financial services are already taking advantage of these and creating WAP version of their web-sites which can be served over mobile information appliances, ranging from cell phones to PDAs. Many companies have significantly reduced their customer service costs and made it easier for check account status and make payment arrangements over the web. Taking the web enablement one step further and providing the capability to access this data on PDA devices will allow you to move towards the outer circle of Levitt’s value enhancing product model. Fidelity investments and CNN are just some examples of how companies are using the mobile computing technologies to better serve their customer base and delight them. In fact, Fidelity is known to give its most valued customers with free Palm V IIs and internet enabled phones they can use to execute instant trades or check on their portfolios no matter where they are.

Having seen several examples in which businesses have used PDA technologies “to serve the customer better” let’s now investigate some of the ways in which this technology can enable you to do the above and at the same time drive operational efficiencies through your enterprise.

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Serve the customer cheaper

With the advances in computing power and emergence of new technologies, many tasks and processes which were manual can now be automated. Information exchange has become cheaper than ever and businesses are leveraging new supply chain technologies to streamline their business processes and develop closer linkages than ever with their suppliers and customers. But, despite that there are many operations and business processes which still rely on hand-written notes. Many decisions are still made with limited information when complete information could have been easily provided. Let's examine some of the possible avenues which will allow you to serve your customer cheaper or more efficiently.

- Remove redundancies/waste, and reduce re-work due to low error rates

There are many front end data collection type activities which continue to use paper forms. This data then is re-entered into information systems by support crew. Often this is done because the work environment (ex. shop or factory floor, inspection sites) are not amenable for laptop access or the workers are trained to use laptops. An area where this is especially rampant is in the insurance business. Today with PDA based systems, that data can automatically be captured in an electronic format and synced up with the central servers removing redundant data entry tasks and reducing the error rate. Progressive Insurance revolutionized the insurance industry with their 1800+ immediate response vehicles manned by connected front line workers who process the claims at the accident site itself. US Navy Carriers offer another enlightening case study of how PDA applications deployment have reduced rework. Traditionally, landing Signal Officers (LSOs) would scribble a grade and comments about each landing in spiral notebooks. Correcting errors consumed valuable time and distracted attention from the next incoming aircraft. After flight-deck duty was completed, the LSO had to manually type the details of every landing—up to 170 each day—into a desktop computer. A new Palm OS® application, allows the LSO to quickly choose a grade and enter comments for each landing directly on their PDAs. This information is directly fed to the desktop computer at the end of the day by synchronization. The application has allowed the Navy to save time, reduce errors, and allowed rapid feedback to pilots and instant analysis of pilot and squadron performance trends.

- Stream line processes

Businesses need to reevaluate activities embedded in their existing business processes which rely on paper based mechanisms for information transfer to see if there is a possibility to stream line them. Naval Medical Center Portsmouth (www.pdamd.com) provides a good example of an organization which has leveraged applications running on PDAs to stream line their business processes for preparing for the night shift. The transition process was pretty

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chaotic and relied heavily on hand written notes and verbal communications between the day and night staff. Today, the doctors use an application running on Palm II handhelds to capture and communicate complex patient data and instructions between the two teams. Now, doctors can easily beam or synchronize patients' complete medical histories and instructions to the overnight staff, giving them simple, mobile access to everything they need to know about their patients, from allergies to recent medical procedures.

- Compress cycle times

Capturing data electronically versus paper has another effect which is close to operation managers hearts. It helps compress cycle times since often in paper based data capturing operations, there are significant queues which build up in front of data entry operators and there are inherent time lags between manual data capture and it's transformation to the electronic format. A stark example of reduction in this cycle time can be found in the case of Volvo (www.palm.com). More than 12500 cars arrived into the United State at 4 four ports. Volvo inspectors used to record data on clipboards for up to 40 different items. The forms were hand separated and given to vendors for database entry. By the time the data was compiled, it was three weeks old. Now with the palm solution, the data collection and compilation is fully automated. Inspection points can be modified for a particular model or make of auto at any time without technical assistance. The solution completely eliminated manual data entry, overnight mailings, and need to update and print forms, reduced data turn-around time from as much as three weeks to 1 day.

- Make workers better informed.

Business decisions are never made with perfect information. Often there is significant ambiguity in which decisions are made. But, that does not mean that you should accept ambiguity when you have the means to provide your decision makers and negotiators with all the relevant information that is resident within your corporation. A good example of this information is the existing inventory information resident at different nodes of your supply chain. When negotiating deals with customers or suppliers about delivery lead times, this information could be crucial in your organization's ability to drive harder bargains or craft deal structures which are better for you. Gunn Automotive provides a good example of a company which has deployed a Palm OS based application to arm its sales managers with better inventory information when purchasing automobiles at weekly car auctions. This was a huge improvement from the past where they relied on reams of paper printouts listing their current inventory which was not only cumbersome to carry but very difficult to search through as well to find what they were looking for.

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Technological challenges

Hopefully, by this time you are convinced that the PDA opportunity is worth exploring to see if there are significant gains that you can achieve. However, here are some of the technological challenges that you need to be aware of as you decide whether or not the PDA solution is for you.

Security :

Adopting a hand held computing solution for your work force asks for a higher level of security than the IT departments in many organizations are used to. In addition to being extremely susceptible to loss and theft, restricting access to corporate data and applications to hostiles becomes particularly since the hand helds will most often be used in an uncontrolled setting. Till not so long back, the only security that the Palm OS offered was locking access via a password and private record protection(records were flagged as private and one could not see them unless you unlocked them by a password). Data was not stored encrypted and so hackers could access it if they managed to access the device. But, with the rising interest in PDA solutions, many vendors are coming up robust security solutions which not only control user access but also provide on-device encryption. In addition, complete enterprise and security management solutions are offered by well renowned and known companies like Computer Associates, IBM Tivoli, and Xcellent to name a few. (For complete details on how to Securing the hand-held environment from an enterprise perspective, visit www.palm.com).

Power Management :

While developing applications for the hand held environment, your developers will have be extra cognizant of the severe power restrictions, handhelds face. With the battery being the single source of power, a power hungry application can undermine the value of portability by causing users to recharge frequently or carry spare batteries. As far as possible, complex computing operations should be designed to be carried out by the server with the client application left to display the information and do simple queries. If the hand held is going to have wireless capability, due to the asymmetric nature of the cost of communication between the mobile host and the stationary host, application architects should explore broadcasting solutions where the stationary host broadcasts the most updated information to the hand held device and ensures that the hand held has the complete information it needs. Further, using local memory in the form of swappable memory sticks which many PDAs are supporting today might be better than polling the wireless network for information.

Integration with backend/legacy systems:

Most of the gains we have talked about in this article come from an electronic mode of data capture versus a paper or form based mode. However, to fully exploit those gains, integration of these mobile applications

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with backend/legacy systems is key. As any systems integrator will tell you, this is a fairly complex task especially if you will have multiple applications supported on your hand-held. Whether you develop dedicated interfaces for each of your applications or go for a middleware solution enabling your legacy applications to exchange data with other applications, you will have to make some hard choices. Often these choices will be also driven by the other IT projects underway and by the overall direction of your firm towards IT applications.

Asset Management, Configuration Management and Software Distribution:

Organizations have sophisticated software solutions which handle the functions of Asset Management, Configuration Management and Software Distribution. In addition, by restricting users from being able to install applications on corporate laptops and desktops, IT organizations have a good handle on the inventory levels, makes and models, network settings, installed software and data backups. Client software upgrades are often handled through enterprise software when users log on to the network and do not need individual machine upgrades. Hand held devices being most of the time not connected to the network and in addition outside in a uncontrolled environment pose significant challenges. There are many tools and software packages from renowned vendors like Computer Associates available which make these a breeze. However, you will have to make a choice between going with a single vendor versus using "best of the breed" multiple vendor approach.

Next Steps Things to consider when deciding to go mobile

This article should serve as a call for action for all business unit managers to unleash a witch hunt to identify all areas where waste can be reduced and transform existing business processes to leverage PDA enabled productivity gains. Even though, the previous sections discussed the opportunities of revenue enhancement- "serving the customers better" and cost savings- "serving the customers cheaper" as stand-alone, taking them as such would be living in the old paradigm where companies had to make strategic choices about whether they wanted to embrace customer intimacy strategies or operational excellence strategies. In "Blown to Bits" (Boston Consulting Group), authors Philip Evans and Thomas Wurster make an excellent case of how the traditional richness-reach trade-offs have been blown away and the impacts this has on the businesses today. Business managers need to take a similar mindset when evaluating each of your business processes and operations against these two criterion.

Here is one of the potential many approaches you as business manager can take to "untether your corporation" (Untethering the Enterprise- Joe Manget, David Dean, Mark Gilbert, Boston Consulting Group)

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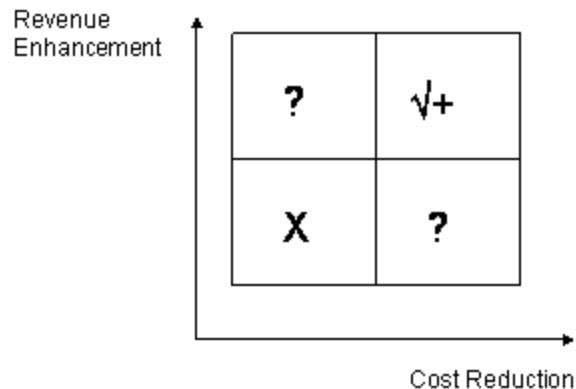
Step 1:

Deploy a multi-functional PDA applications champion team comprising of business unit managers and IT managers to

- Develop a clear high level mission statement for the effort.
- Develop criteria for selecting areas where the PDA deployment efforts make sense.
- Develop a communications strategy to introduce the concept to the workforce and energize them to actively look for such opportunities.
- Set up a 2 level incentive structures to give base-level rewards to those employees who come up with innovative ideas and a higher-level rewards for those ideas which eventually get implemented.
- Act as the PMO for the individual "mobilizing" efforts.

Step 2:

For each of the ideas that you receive, classify them into whether they offer opportunities for both Revenue Enhancement and Cost reduction or one of the two.



Clearly the ideas, applications that fall in the top right quadrants are your big hitters and the ones which you need to focus on first. This approach will also ensure that non-genuine opportunities i.e. those that might not offer big enough cost reductions or revenue enhancement get weeded out early in the process. Which group of ideas you look at next will depend on your overall industry and firm dynamics and how elastic the demand you face is. For example, if you are in a low margin business and significant competitive advantages can be had from cost cutting, you might want to explore opportunities in the rightmost lower quadrant first.

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Step 3:

Choose the level of connectivity you would like your PDA solution to have to the enterprise data. The options range from 100 % real time wireless connectivity to only batch connectivity using HotSync[®] or other comparable technologies. There are costs and benefits associated with each of these and there is no Black and White answer to what you should go with. Further, unlike a common misconception, even if you go with the wireless solution, you should perform due diligence to choose the level of wireless technology (2G, 2.5G or 3G) you go with. You do not have to wait for 3G technology to start harnessing the gains from PDA applications. Most of the applications we talked about in the previous sections, in fact did not have wireless data access and relied primarily on batch synchronizations.

Step 4:

Develop business cases for each of the opportunities, that clear your pre-screening at two levels— one at the individual project level to analyze the cash flows associated with the project and another at the firm level that looks at these projects collectively to harness economies of scale that could be leveraged across the business units. Choose an appropriate cost of capital to reflect the risks associated with these potential cash flows. This step is critical for you as a business manager to be able to quantify each of these opportunities in terms of the gross benefits they offer. Step 5 will give you the costs you will need to undertake to reap these benefits.

Step 5:

Having developed the benefits side of the model, it is now time for developing the cost side of the model. And what better way to do so, than by asking different vendors to quote you what it will cost you to implement these solutions. Having done previous implementations and projects quite similar to embark on, they will be able to give you better information about the costs associated than people in your organization. At this point you will now have a complete picture of both the benefits and the costs associated with these projects.

Step 6:

It is time to now choose your Service Providers (Systems integrator and vendor partners) to help you implement these projects. Make sure that when evaluating the contenders, you look not just at the price, but also at their past experience, their references, their capabilities in terms of future product/technology enhancements and their experiences with business process redesigns.

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Step 7:

Choose one/two applications for it and go for it.

Conclusion

Palm based devices have opened a new frontier in technological efficiency and effectiveness which the current business leaders better not ignore. Further, the PDA revolution is not just an IT revolution but one that will affect each and every aspect of your business. Those who take the pioneering steps will gain a competitive advantage over their peers and fundamentally change the landscape. Businesses should thus seize the initiative and embrace the handheld computing environment to serve their customers faster, cheaper and better