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The State of the Pen Tablet PC Market

Explains and illustrates the business aspects of the pen tablet computer market

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This paper explains and illustrates the business aspects of the pen tablet computer market (versus the technology aspects, which are covered in a separate paper). After reading this paper, the reader should be better equipped to make intelligent purchasing decisions about pen tablet computers.

The term "pen tablet computer" as used in this paper refers to a tablet form-factor computer that supports a stylus as a user interface device, has an LCD display measuring at least six inches diagonally, and runs either Windows® CE or full Windows (9x, NT-4, 2000 or XP-Pro). In terms of product categories, the pen tablet computers discussed in this white paper are typically called "CE tablets" and/or "pen tablets." (See Fujitsu's white paper entitled "Pen Computer Technology" for more information on pen computer categories and the technologies used to create a pen tablet computer.)

Markets and Applications for Pen Tablet Computers

Pen tablet computers exist for one simple reason: If you don't have a lap, you can't use a laptop (notebook). Pen tablet computers are basically notebooks for people who work while standing or walking around.

The first pen tablet computer (the GRiDPad) was invented by GRiD Systems in 1989, seven years after the invention of the notebook by the same company (the GRiD Compass, 1982). The application need that drove the creation of the first pen tablet computer was the desire to perform inspections with a portable computer rather than paper forms on a clipboard. It simply wasn't practical then to use a notebook to enter inspection information while walking around — and it still isn't today. Using a pen tablet computer allowed information to be entered directly into an on-screen form as the user performed the inspection. Data accuracy was improved because simple error checking could be performed in real-time by the pen tablet computer as the data was being entered. The resulting data file could be sent directly to the mainframe computer at headquarters, without the need to keypunch the data from paper forms. The major benefits of using a pen tablet computer for inspections were therefore quicker availability of the data and improved accuracy.

Today, 13 years later, the range of applications in which pen tablet computers are used has increased dramatically, but the basic idea is still the same. There is an ever-growing class of users who need to do "real computing" while they are truly mobile. Table 1 below lists over 35 different markets in which pen tablet computers are used today, along with typical applications for each market. Note that these are just representative applications; in some of the broader markets such as field service or healthcare, there are literally dozens of distinct applications that could be listed.

MARKET	TYPICAL PEN COMPUTER APPLICATION
Aerospace	Recording data on airplane engine testing in the field
Agriculture	Monitoring planting, fertilizing and harvesting with GPS
Automotive Repair	Completing customer workorders and selling more services
Automotive Auctions	Recording automotive auction sales via wireless LAN
Aviation (Commercial)	Calculating engine power settings just before takeoff
Aviation (Private)	Navigating and planning with an "electronic flight bag"
Construction	Inspecting highways and commercial buildings
Distribution and Wholesaling	Doing direct store delivery, also called "route accounting"
Department of Defense	Accessing and displaying information in helicopters at night
Emergency Medical Services	Recording data on ambulance patients
Entertainment and Media	Tracking and managing the logistics of a movie production
Federal Government Agencies	Completing insurance claims after a natural disaster (FEMA)
Field Engineering	Searching for oil and gas wells; doing mobile process control
Field Service	Completing workorders; finding parts; scheduling repairs
Finance	Trading options and commodities on the exchange floor
Forestry	Grading lumber-grade trees; assessing fire loading
Geodesy	Surveying, locating and servicing underground pipes
Healthcare (In-Building)	Matching bar-coded patients and medicines; assessing patients
Healthcare (Home)	Completing government paperwork for insurance
Hospitality	Checking in hotel guests at mobile registration counters
Insurance	Estimating auto damage; selling life insurance; assessing risks
Law Enforcement	Investigating accidents; checking license plates for violations
Legal	Accessing case histories or research material in court
Manufacturing	Doing process control or quality engineering on the floor
Mining	Recording data from a laser used to map the mine face
Public Safety	Performing fire safety inspections
Real Estate	Selling commercial real estate; accessing MLS
Recreation	Recording information on baseball games for use in scouting
Sales Force Automation	Analyzing competition; merchandising; supporting sales
State and Local Government	Doing property tax surveys; inspecting highways
Survey	Surveying consumers in malls regarding their buying habits
Telecommunications	Repairing telephone lines; planning new switching centers
Transportation (Ground)	Managing and optimizing delivery routes
Transportation (Commercial Air)	Servicing customers in airports with a mobile terminal
Transportation (Rail and Ocean)	Optimizing the loading of containers on a ship
Utilities (Electric, Gas, Water & Cable)	Collecting and accessing data for installations and repairs
Warehousing	Doing inventory surveys

Table 1: Pen Computer Markets and Typical Applications

Vertical, Horizontal and Diagonal

Pen tablet computer applications are sometimes called "vertical," while notebook applications are sometimes called "horizontal." The term "vertical" refers to the fact that in most enterprise applications for pen tablet computers, all the users run the same applications and do similar activities. For example, pharmaceutical sales people using pen tablet computers typically run customized software that gives them the ability to quickly demonstrate the key benefits of a new drug (including showing a 30-second video), while walking down a hospital hallway with a doctor. Notebook users, on the other hand, tend

to use a wide ("horizontal") variety of productivity software, including Microsoft Office, photo editing tools, Internet metasearch tools, sketching tools, etc., while working at their desk.

Because today's pen tablet computers have all the power and capability of a notebook, enterprise users of pen tablet computers don't typically have a second computer. The tablet is their only computer, doing duty as both a mobile and a desktop computer. This has given rise to the concept of a "diagonal" user, who uses "vertical" applications during the core of the workday and "horizontal" applications at other times, such as in the evening. This is actually a result of the blurring between vertical and horizontal applications, which is causing these terms to fall into disuse. Instead, the term "corporate project-based application" is becoming a more common way of describing how pen tablet computers are typically used in the enterprise.

It's worth briefly addressing the question of why there isn't a large consumer market for pen tablet computers. There are a number of basic reasons, as follows:

- No current consumer software provides a compelling advantage when used with a pen.
- Relatively few consumers have a need to do real computing while standing or walking.
- Current Microsoft operating systems don't have built-in support for the pen.
- Handwriting recognition software still isn't good enough to totally replace the keyboard.
- There isn't a suitable distribution channel for selling pen tablet computers to consumers.
- Consumers are very price-sensitive and notebooks are cheaper due to very high volume.
- Pen tablet computer vendors are not organized to support end users.

The Microsoft® Tablet PC initiative may cause many of these factors to change, which may in turn eventually cause the emergence of a consumer market for pen tablet computers, but it is likely to take two to five years. (See the white paper entitled "Fujitsu and the Tablet PC" for more information on the Microsoft Tablet PC initiative.)

Characteristics of Corporate Project-Based Applications

Most corporate project-based applications for pen tablet computers share a common set of characteristics, as follows:

- Specialized or customized software is employed.
- Automation of a business process is the focus of the project.
- Return On Investment (ROI) is a primary consideration.
- Hundreds or thousands of pen tablet computers are involved.
- A significant amount of planning takes place before the rollout.
- Hardware and software support are required throughout the project life.
- Project implementation takes 6-24 months.
- Project life is about three years.
- A Value-Added Reseller (VAR) is involved.

Each of these characteristics is discussed in more detail in the following paragraphs.

Software

Most enterprise pen tablet computer projects start with selection of the software, not the hardware. It's the software that enables the business process improvement. The software usually determines the required characteristics of the hardware platform. Such specifications as display resolution, CPU horsepower, storage size, communications capability and connectivity are all dependent on the needs of the software. For example, if the software is written for a display with XGA resolution (1024x768 pixels) because the data being displayed is a very detailed patient record, then that quickly narrows down the range of acceptable hardware devices.

Software for corporate project-based applications comes from a wide variety of sources. The most common source is ISVs (Independent Software Vendors), companies which specialize in software for specific markets and applications. Hardware

suppliers such as Fujitsu, which maintain a wide range of partnerships with ISVs, often suggest appropriate ISVs to their enterprise prospects. (Since software is usually what enables the project, having strong software partnerships is an essential part of being in the pen tablet computer business.)

The application software often must be integrated into the corporate system. Typically this requires extending a portion of an existing corporate system out to the mobile platform. This usually involves access of the corporate database (typically hosted on the corporate network) by the application running on the pen tablet computer. An ISP is often used as the collection agent for the mobile application. Putting these pieces together can be a complex undertaking.

In corporate project-based applications of pen tablet computers, the end user receives value through customized, well-integrated, application-specific software. Without good application software there is no project. In contrast, enterprise notebook computer users receive value primarily through Microsoft Office Suite applications running on top of Microsoft's Network and Server applications. The differences are substantial.

Business Process Automation

Enterprises buy pen tablet computers because they want to improve business processes. Pen tablet computer applications are typically aimed at meeting business goals such as the following:

- Selling more products per sales rep
- Improving customer satisfaction
- Handling more insurance claims per day
- Treating more patients without adding staff
- Servicing more stores in the same amount of time
- Getting data on the competition back to HQ faster
- Reducing the time required to repair a gas main

Pen tablet computer applications aren't about improving personal productivity, they're about improving business efficiency; this is practically a universal principle. Once an enterprise has found a way to meet a business goal through the use of pen tablet computers, it's rare for the enterprise to change to an alternate method. One reason is that there simply aren't many other ways of meeting the need for truly mobile computing. If enterprise workers or managers need to enter or access data that requires notebook-level computing capacity while they're standing or walking around, pen tablet computers are by far the best solution.

Sometimes the use of pen tablet computers in business process automation creates a strong competitive advantage for an enterprise. For example, Nabisco has a successful application in direct store delivery (DSD) for the consumer package goods (CPG) industry, employing thousands of pen tablet computers. The application accomplishes something that couldn't be done before. The up-to-date information that's available to Nabisco's sales reps allows them to guarantee the store that no out-of-stock situations will occur. Because the application gives Nabisco such a strong competitive advantage, they aren't willing to release any detailed information about it. This situation has become much more common in the last 3-5 years, since pen tablet computers have become a widely accepted tool for business process automation.

However, implementing pen tablet computers in a business process automation project doesn't always succeed. As is the case with any business process improvement project, many things can go wrong. With regard to pen tablet computer projects, some of the most common reasons for failure include the following:

- Setting unrealistic expectations regarding the benefits and the challenges
- Failure to involve the end users and their direct managers
- Lack of training on the software and hardware
- Poor software (insufficiently pen-centric) that's difficult to use in the field
- Lack of a clear division of responsibility between the enterprise and the VAR or Systems Integrator

Return On Investment

Most enterprises use ROI (Return On Investment) as one of the primary criteria for deciding whether or not to implement a pen tablet computer project. Since the basic application is improvement of a business process, it's only natural that the enterprise want to measure the improvement in economic terms. In the for-profit sector, calculating ROI can involve looking at how long it takes before the project recoups its cost and begins contributing dollars to the bottom line. For example, a pen tablet computer application in home healthcare that's focused on getting data submitted faster to Medicare can be measured by looking at how much quicker reimbursements (revenue) are received by the visiting nurse agency. In the non-profit or government sector, calculating ROI can involve looking at how long it takes before the project recoups its cost and begins decreasing the expense of the business process. For example, a pen tablet computer application used by the Federal Bureau of Labor Statistics to perform monthly surveys of the cost of labor (one of many standard Federal Government statistics) can be measured by comparing the current and previous costs of performing the survey.

Project Scope

Pen tablet computer projects tend to be a Fortune 1000 activity rather than a SOHO (Small Office/ Home Office) activity. Accordingly, it's very common for a pen tablet computer project to involve hundreds or thousands of computers. In most enterprises, only a percentage of the company's total number of employees are in truly mobile jobs (sales people, insurance estimators, inspectors, field engineers, etc.). These people are typically the focus of the project. The size of a typical project means that it isn't just a matter of drop-shipping a few notebooks to remote users; it's much more involved than that. It's one thing to equip 6,000 insurance sales people spread across the country with a system consisting of hardware, software and peripherals. It's another thing to successfully train them on how to use the system, and then ensure that the desired business results occur takes a substantial amount of planning, logistics support and project management. Once the project is in place and operating, there is always an ongoing need for hardware support (e.g., repairing or replacing broken computers), software support (e.g., solving communications problems), and user support (answering the thousands of questions that any large group of users is bound to ask). The degree to which the issues and needs of the project are anticipated in advance has a large effect on the ultimate success of the project. In this sense, a pen tablet computer project is no different than any other large process improvement project undertaken by the enterprise.

Project Duration

An enterprise pen tablet computer project typically goes through the following phases:
Table 2. Phases of a typical enterprise pen tablet computer project
The total time required for a project from the time evaluation first starts until it is in active use in the field ranges from 6 to 24 months. The actual time depends quite a bit on the particular market. For example, projects in healthcare tend to take much longer to develop and roll out than projects in sales force automation. An overall average startup time for a typical project is around one year.

PROJECT PHASE	DURATION
Application software evaluation, selection, customization and integration	1-6 months
Hardware evaluation and selection	1 month
Field pilot test	1-3 months
Review of pilot test, followed by go/no-go decision	1 month
Project rollout	2-12 months
Active project life	30-36 months

Table 2. Phases of a typical enterprise pen tablet computer project.

This time scale means that the typical product lifecycle for a pen tablet computer must be considerably longer than that of a notebook. In the notebook world, products are expected to change every 3-6 months; in the pen tablet computer world, product lifecycles this short would be a severe handicap for an enterprise trying to equip an entire workforce with one consistent set of hardware. Nevertheless, it's common for the rollout of a project to use a newer generation pen tablet than the one that was available when the project was first considered. It's also common for hardware to be upgraded or replaced during the project's active life as needs expand and additional functionality is added to the application. For this reason, it is absolutely critical to make sure that the selected pen tablet supplier can be relied upon to produce multiple generations of product. Starting a corporate project-based application with a new vendor's first pen tablet product is a very risky undertaking.

The one constant in the pen tablet computer business over the last 10 years has been Fujitsu. Everything else has changed. The applications have broadened drastically, the technology has improved substantially, and pen tablets have gone from a curiosity to an accepted tool for business process automation. In the past 10 years, Fujitsu has developed 17 generations of pen tablet computers. In the process, Fujitsu has become the world leader in pen tablet computers.

Product lifecycles for Fujitsu pen tablet computers are usually minimum 12-18 months for new models, the active sales life of a product is typically two years, and the total product support life approaches five years. Fujitsu's product warranty length is three years. All of these numbers match up well with the durations listed in Table 2.

The Role of the VAR or Systems Integrator

Often enterprises utilize a VAR or Systems Integrator for pen tablet computer projects. Fujitsu works with literally hundreds of companies to create mobility solutions. The key to their involvement is their value-add. With VARs and Systems Integrators the fact that they are a reseller — i.e., that they resell the pen tablet computer hardware to the enterprise — is often almost incidental; the value they add to the project is the essence of their usefulness. They create a complete solution to fit a specific need. This can involve a wide range of activities, such as:

- Loading software from a "gold master" onto every computer
- Writing application-specific documentation for users
- Creating a customized training video
- Conducting a train-the-trainer class for enterprise support personnel
- Working with a case vendor to develop a customized case with pockets for peripherals
- Developing a mobile cart, particularly for in-building healthcare applications
- Developing specialized utility software programs to meet enterprise needs
- Integrating LAN and/or WAN wireless communications hardware
- Solving difficult hardware and software integration problems
- Assisting in the selection of portable barcode scanners, printers, and other peripherals
- Providing 24x7 telephone help desk support for the enterprise's end users
- Managing hardware support logistics for the enterprise
- Maintaining a hardware loaner pool for rapid turnaround system replacement
- Enabling asset management by loading each user's identification data onto the system
- Leading the planning effort for the rollout
- Coordinating schedule information with the software supplier
- Physically integrating the entire solution
- Surveying users after rollout to determine what they like and don't like

VARs and Systems Integrators often specialize by market and application; their knowledge of the tricks and pitfalls of implementing a pen tablet computer application can be an invaluable resource. The combination of Fujitsu's in-depth knowledge of pen tablet computer hardware and operating systems and the partners' in-depth knowledge of systems integration maximizes the enterprise's probability of success when implementing pen tablet computer projects.

Summary

Pen tablet computers are notebooks for people who work while standing or walking around. They are used in a wide range of applications, from aerospace to warehousing. Because today's pen tablet computers have all the power and capability of a notebook, enterprise users of pen tablet computers don't typically have a second computer.

Most corporate project-based applications for pen tablet computers share some common characteristics. The two key characteristics are the following:

1. Specialized or custom software is employed
2. Automation of a business process is the focus of the project

Software, typically provided by an Independent Software Vendor (ISV), drives the selection of hardware. Sometimes the use of pen tablet computers in business process automation can become an extremely strong competitive advantage to an enterprise. The combination of Fujitsu's in-depth knowledge of pen tablet computer hardware combined with a partner's in-depth knowledge of systems integration maximizes the enterprise's probability of success when implementing pen tablet computer projects.