The Latest Extreme Low Power, Windows Tablets Now Ready for the Enterprise

Apple iPad's Three Year Enterprise Advantage Marginalized

Abstract

The introduction of Apple's iPad sent shock waves through the industry as it redefined end user's expectations on design, battery life, simplicity, content and applications. Like PC purchases driven by end users and departments in the late 1980's, iPads first entered the enterprise through executives, departments and end users. Apple added basic enterprise features and let third parties add incremental support. At the time, enterprises did not have a viable alternative, so they started to test and deploy iPads even with the incremental cost, time and complexity. This paper looks at the latest generation of enterprise tablets from HP, Dell and Lenovo and assesses their value enterprise proposition versus Apple's iPad.

Historical Tablets Challenges in the Enterprise

Tablets in the enterprise have gained immensely in popularity over the last two years, driven by Apple's iPad, but they are not a new phenomenon. The first Microsoft Windows enterprise tablet was launched in 1991 by NCR with Windows for Pen Computing. What followed were multiple design iterations based on every successive version of Windows, including Windows XP PC Tablet Edition, Windows Vista, and Windows 7.

None of these Windows tablets over the 22 year span became popular or drove much volume within the 100s of millions of PCs. Motion Computing has had reasonable success in vertical markets due primarily to their ruggedness in harsh environments outside the office and through special designs for healthcare. Why didn't these Windows-based tablets ever improve in popularity?

Following were the key challenges that led to the lack of mass success of Windows-based tablets in the enterprise:

- *User Interface:* Since Windows for Pen Computing arrived in 1991 and Windows 7, the basic interface for the tablet was the same. Users needed a pen to best interact with the device. Windows was designed to be manipulated with a fine grain tool like a mouse, not a finger. Early versions required a tethered pen and did not even support palm rejection, which made user interaction more difficult. also, due to the thickness of the display, it was hard to orient accurately. The pen worked well in check-box and signature applications, but not much else. The pen was a major user interface stumbling block for mass adoption.

- *Dimensions and weight:* Most Windows tablets were very thick compared to today's iPad. They could easily be an inch thick, weigh nearly as much or more than a PC due to larger batteries and thick glass. This translated to the need for shoulder straps or special carrying handles. This made general productivity use inconvenient and awkward.
- *Battery Life:* Battery life is more important for an enterprise tablet than a notebook. This is for two reasons. First, if a tablet is used in a customer service environment, running out of batteries and plugging the device in is unacceptable. This could mean missing the sale or leaving the patient. Because these devices were basically PCs, their battery life was equivalent to the best PCs of their time. That meant users could get about two to three hours on a single charge. When they ran out, they either plugged in or replaced their battery.
- *Durability:* Tablets need to be more rugged than a notebook. This is driven by a few factors. First, many tablets are used in environments where dropping it means dropping on a pile of rocks or a cement floor versus the office carpet. Also, the likelihood of dropping it is higher because in vertical environments, users are holding it above a surface for the duration of their use. Design was a challenge too. Early tablets used real glass previous to Corning's Gorilla Glass. Because tablets had not keyboard to protect the display, they were more likely to be damaged if dropped.
- *Price:* All things equal, Windows tablets were much more expensive than their notebook brethren, priced between $1,500 and $3,000. This made sense because these tablets needed to be more rugged, used smaller components, used more expensive thermal solutions, needed a touch controller and of course the pen.

Looking back at the first 22 years of enterprise tablets, it is easy now to see why they did not enjoy widespread adoption. They were expensive, frustrating, and fragile devices.

iPads in the Enterprise

Looking at the shortcomings of previous Windows-based tablets compared to an iPad, it is easy to comprehend why iPads would be desirable by an executive, knowledge worker, or department head.The iPad addressed many of the shortcomings of early Windows tablets as it has a touch-optimized operating system and apps, is extremely thin and light, has impressive battery life and a low $499- $799 acquisition cost. The iPad does bring additional requirements to the enterprise and I address that later in this paper.

While Apple is traditionally very secretive in guarding information outside of sales data, the company has been very vocal on announcing just how many enterprises are evaluating or deploying the iPad. In fact, at many major public outings, Apple CEO Tim Cook has done just that. In Apple's Q2 2012 earnings call, Cook said the iPad was enjoying "rapid adoption" and the number of iPad tablets was than tripling among Fortune 500 companies. Cook went on to say that 94 percent of the Fortune 500 and 75 percent of the Global 500 testing or deploying iPads.

Those are impressive stats when taken at face value. What would be more helpful, though, is for Apple to declare the exact amount of the number of enterprise shipments. While specific enterprise sales numbers aren't available from Apple, there is access to "deals" that have been publicized. SAP even has a running tally on Forbes of the largest iPad deployments. Readers should be careful in interpreting this data as it typically measure the forecasted deal size which is rarely the real number, which is typically lower and over many years.

D) Additional Requirements for iPad Enterprise Rollouts

Consumer and enterprise requirements are quite different on security, deployment, manageability, uptime, support, training, and the total cost of ownership. Every single Fortune 1,000 company has developed and invested in staff, resources, process, software and services to manage every element of those variables above.

Just because an enterprise wants to deploy iPads doesn't mean that they can skip any step in the process. Therefore, enterprises who want to deploy iPads must have a duplicate method to manage iPad security, deployment, management, service, support and training. Some of these are leveraged by phones but not many. This translates int o increased investments in time, resources and complexity. To highlight what I mean, let me use some very simple examples.

- *Security:* In a typical Windows enterprise deployment, IT already has the tools to encrypt device storage with BitLocker, restrict apps installed, and provide conditional access to confidential data through group policies. When IT rolls out iPads, they need to buy additional software, hardware or services to accomplish the same thing.
- *Software:* By the iPad's short lifespan, all proprietary enterprise apps that the user needs to run on their tablet needs to be rewritten, as those apps were written in Windows or DOS. These are apps that give access to areas like human resources, manufacturing, point of sale, and financial data. Some apps that access services based on SAP, for example, are a matter of modifying the shell for iOS, but it is still new software development.

  Productivity software is another matter. Microsoft Office is the enterprise gold standard for productivity and while rumored, the iPad run it. This means users need to buy and learn how to use these new office productivity applications. There are issues with these apps. Typically they don't support even some of the most basic features like annotating or macros. Also, there is not a 100% visual translation between Office file formats and the iPad alternatives and content frequently looks different, particularly in Word and Powerpoint. This creates more work getting those files to look like they are intended and also can lead to communication challenges because workers are looking at different content with the same file name. This is why so many people export to a PDF format if they want iPad viewing.

- *Peripheral Compatibility:* The iPad was designed for simplicity, and one way simplicity was achieved was by limiting supported hardware peripherals and eliminating ports. This poses a challenge in the enterprise which has invested capital in peripherals. These are peripherals like laser printers, receipt printers, scanners, card swipers, fingerprint authentication, and smart cards. There are different ways to accomplish these with the iPad but it either involves purchase of a new peripheral or some kind of inefficient workaround.
- *Management:* Once iPads are secured and deployed, they need to be managed. For PCs, most enterprises have already adopted Microsoft's SCCM (System Center Configuration Manager), Windows InTune or another tool they've been using for years. Anything additional for use with iPads adds investigation and research time, test, training and deployment resources.
- *Repair:* The iPad was primarily designed for consumers, secondarily for businesses, and design trade-offs were made that negatively impact repair. Anecdotally, we have all either experienced breaking an iPad ourselves or knowing someone who has broken one. It can be as simple as dropping it. The challenge with the iPad 3 and beyond designs is that the display is not serviceable. This means when an enterprise iPad display cracks, it gets thrown away or alternatively is fixed by a small, independent fixit shop. This also applies to the iPad's circuit board and battery. The battery is of particular challenge in that the device use will outweigh the battery longevity. IT does not like to throw away hardware and they do not like to throw away their iPads either.

Enterprise IT can and are deploying iPads but are doing so at an increased cost, time and complexity than PCs.

Disruptive Enterprise Tablet Technologies

Enterprise has made the sacrifices above to get the benefits of the iPad because since iPad inception, a viable alternative did not exist. Two technologies are now available that will disrupt iPad tablet dominance in the enterprise, Intel's Atom Processor Z2760, code named "Clover Trail", and Microsoft Windows 8 Operating System.

Microsoft Windows 8

Windows 8 maintains compatibility with Windows 7 software, services and hardware peripherals. It added support for USB 3, Secure Boot with UEFI, built-in virus and malware protection, and new refresh functionality. Windows 8 operates both in a tablet-optimized mode with Metro-style apps and in desktop mode with traditional apps used with keyboard and mouse. Windows 8 has been available to enterprises, developers and OEMs since approximately since September 2011 and was released to manufacturing a year later in August, 2012.

Intel Atom Processor Z2760

Intel announced the Atom Processor Z2760 in September 2012 after a three year development cycle and after ODMs and OEMs received first samples a year prior. The Atom Z2760 uses a custom, two core, four thread design based on the

"Penwell" core, used in Intel-based smartphones. It is based on the X86 instruction set and therefore will run the latest Windows 8 Metro-style and all Windows 7 applications.

To the surprise of many in the industry, independent reviewers like AnandTech showed that at a minimum, the Z2760 provided at least the same system performance per watt and in some use cases, surpassed iPads. This was best exemplified in Anand Lal Shimpi's analysis entitled, "*The x86 Power Myth Busted: In Depth Clover Trail Power Analysis.*" It showed that Atom Z2760 tablets provide *better* battery life versus the iPad 4 in web browsing. We recommend that enterprises do their own battery life tests for their planned use cases and deployments.

New Breed of Enterprise Tablets

Through the combination of Intel Clover Trail and Windows 8, HP, Dell and Lenovo have created tablets that take the best the consumer elements of the iPad and adds to it enterprise features IT wants in their next generation tablets. We will break down the comparison, variable by variable.

Design and Display

Apple iPad 4	9.4mm thin, 652g, aluminum design, 9.7", **2048x1536 resolution,** 4:3 ratio
Dell Latitude 10	10.5mm thin, 658g, magnesium alloy design, 10.1", 1366x768 resolution, 16:9 ratio
HP ElitePad 900	**9.2mm thin**, 630g, aluminum design compliant with **Mil-Spec 810g**, 10.1", 1280x800 resolution, 16:10 ratio
Lenovo ThinkPad Tablet 2	9.8mm thin, **565g**, plastic design compliant with **Mil-Spec 810f**, 10.1", 1366x768 resolution, 16:10 ratio

Bottom Line: *The new breed of enterprise tablets can be configured thinner and lighter, are more durable and are as design conscious as the iPad 4. Displays are larger with lower resolution and PPI (Pixels Per Inch).*

Battery and Battery Life

Apple iPad 4	Apple replaceable, 42.5Whr; Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
Dell Latitude 10	**End user replaceable,** 30Whr/**60Whr**; Up to 10/**20 hours** browsing the web. Battery life doubles with high capacity battery option.
HP ElitePad 900	Enterprise replaceable/end user replaceable, 25Whr/50Whr; Up to 10/**20 hours** battery life. Battery life doubles with Smart Jacket.

Lenovo ThinkPad Tablet 2	Enterprise replaceable, 30Whr; 25 days Connected Standby, 150 MP3 playback, 10hrs Video streaming

Bottom Line: *The new breed of enterprise tablets base battery life is competitive and can be configured to last twice as long as the iPad 4. (Note: Battery figures are displayed as standard/optional. HP has fixture for enterprises to quickly replace display and PCB.)*

Expandability

Apple iPad 4	Std.- mini jack, Lightning Adapter- camera, SD camera reader, VGA, HDMI
Dell Latitude 10	Std.- mini jack, dock, USB, SD **Dock- 4xUSB, HDMI, RJ45 10/100/1000**
HP ElitePad 900	Std.- mini jack, dock **Expansion Jacket- 2xUSB, HDMI, HCSD** Dock-4xUSB, HDMI, VGA, RJ45 10/100 Adapters- SD, USB, HDMI/VGA, RJ45, Serial
Lenovo ThinkPad Tablet 2	**Std.- USB, miniHDMI, microSD, docking, mini jack** Dock- 3xUSB, HDMI, audio, mic, RJ45 10/100 Adapter- VGA

Bottom Line: *The new breed of enterprise tablets provides more baseline expandability and even more expandability with optional manufacturer-supported accessories.*

OEM Supported Enterprise Features

Apple iPad 4	Std.- Encryption, Sandboxing, App Signing, Data Protection Classes, VPN, EAS, Digital Certificates. Many features require MDM.
Dell Latitude 10	**Std.- TPM 1.2 or Intel PTT, optional fingerprint and smart card reader, Intel PTT, Dell Data Protection & Encryption, Dell KACE, Chassis lock, Active Directory, Domain Join, multi-user login, VPN, EAS, SCCM**
HP ElitePad 900	**Std.- HP Client Security, Security Manager, Credential Manager, VPN, Password Manager, Device Access manager, Computrace, SpareKey, Drive Encryption, HP BIOS Settings, Active Directory, Domain Join, multi-user login, VPN, EAS, SCCM, TPM**
Lenovo ThinkPad Tablet 2	**Std.- Image Ultra Builder, System Migration Assistant, Hardware Password Manager, Secure Data Disposal, Rescue and Recover, BitLocker, Applocker, TPM, Computrace, Active Directory, Domain Join, multi-user login, VPN, EAS, SCCM, TPM**

Bottom Line: *The new breed of enterprise tablets provides the same comprehensive PC enterprise features deployed and already in use by enterprises. While the iPad provides many new features, enterprise must evaluate, deploy, train IT and purchase new*

tools. Domain Join and Active Directory are not supported on the iPad.

Software, IDE, and Hardware Compatibility

Apple iPad 4	iOS; iOS apps via touch and keyboard; new apps typically developed with Apple Xcode; camera kit, Apple AirPlay certified wireless printers
Dell Latitude 10 HP ElitePad 900 Lenovo Tablet	Windows 7 and 8; Metro-style, Windows, DOS apps via touch, mouse, keyboard, trackpad, and pen; new apps typically developed with MS Visual Basic 2013; over 1M compatible peripherals

Bottom Line: The new breed of enterprise tablets supports new touch-based scenarios with known IDE (integrated development environment) while supporting full backward compatibility with legacy peripherals and software. iPads require new apps written with new IDEs and do not support legacy OSX apps and hardware.

Typical Configured List Price (64GB/WiFi) with OEM supported Peripherals

Apple iPad 4	$799 plus mgmt tools and training- $699 plus $49 Smart Case; $49 HDMI
Dell Latitude 10	$688 plus MLM- $649 with Windows 8 Pro plus $39 Soft Touch Case
HP ElitePad 900	$959 plus MLM- With **Dock, Expansion Jacket** and Windows 8 Pro
Lenovo ThinkPad Tablet 2	$779 plus MLM- $679 with **Pen and Digitizer** plus $50 Windows 8 Pro, $49 Slim Case

Bottom Line: *Enterprises will not pay more to acquire the new breed of Windows tablets and when factoring in additional new management tools, iPads cost more. (Note: Enterprises rarely pay list price.)*

F) Conclusion and Call to Action

Apple's iPad ushered in a new breed of tablet computing that captured the imagination of consumers and businesses and reshaped the entire computing industry. Introduced in 2010, the iPad had a three year head start in the enterprise where it was the only choice for a reasonably-priced, thin tablet with exceptional battery life. Driven by executives, end users and departments, enterprises evaluated, piloted, and deployed iPads in measured numbers and dealt with the new expenses and processes that came with them.

Since then, Microsoft and Intel introduced Windows 8 and Clover Trail technologies that enabled OEMs to develop and deliver a new breed of tablets that simultaneously met the end user *and* enterprise IT's needs. End users want style, simplicity and convenience and IT needs security, provisioning, manageability, deployment, support and service that is consistent with their current infrastructure for the lowest lifecycle cost.

Enterprise tablets now exist that provide the best of both worlds between end user and IT, which puts the Apple in a precarious position of needing to add more robust enterprise features. Until that point, Moor Insights & Strategy recommends enterprises re-evaluate their iPad pilots and deployments. Enterprises should immediately evaluate the latest enterprise tablet offerings from HP, Dell and Lenovo and make their decisions on future deployments incorporating those additional options.

Resources

- Apple iPad in Business IT Center, Apple
- Apple iPad 4 Specifications, Apple
- Windows InTune, Microsoft
- Microsoft System Center Configuration Manager, Microsoft
- HP ElitePad 900 Specifications, HP
- Lenovo Thinkpad Tablet 2 Specifications, Lenovo
- Dell Latitude 10 Specifications, Dell
- Tablets in large enterprises: Dell Latitude 10 with Windows 8 vs. Apple iPad, Principled Technologies
- Tablets in healthcare: Dell Latitude 10 with Windows 8 vs. Apple iPad, Principled Technologies
- Tablets in schools: Dell Latitude 10 essentials configuration with Windows 8 vs. Apple iPad, Principled Technologies
- Tablets in the Enterprise: Comparing the Total Cost of Ownership, Principled Technologies

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Author
Patrick Moorhead, Principal Analyst and contributions from Paul Teich, analyst at Moor Insights & Strategy

Inquiries
Please contact us at the email address above if you would like to discuss this report and Moor Insights & Strategy will promptly respond.

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