

Dell™ Latitude™ ST integrated better into a typical healthcare environment



versus Apple® iPad® 2 and Samsung Galaxy Tab™ 10.1

Healthcare providers are looking to tablets to provide convenient, portable access to medical records as they meet with patients and to help them carry out everyday tasks, such as creating and printing official letters and taking notes. As medical practices decide which of the many tablets on the market will best meet their needs, they must consider functionality in these areas, particularly in light of any electronic medical record (EMR) system they are already using.

Tablets vary considerably in their ability to meet the requirements of those in a medical practice. We tested the following three tablets and their respective operating systems:

- Dell Latitude ST running Microsoft® Windows® 7 Professional
- Apple iPad 2 running iOS 5.0.1
- Samsung Galaxy Tab 10.1 running Google™ Android™ 3.2

In our tests in the Principled Technologies labs, the Dell Latitude ST running Microsoft Windows 7 Professional and preconfigured with Microsoft Office Professional 2010 outpaced its competitors. Compared to the Apple iPad 2 and the Samsung Galaxy Tab 10.1, the Dell Latitude ST integrated better with EMR systems and performed everyday tasks out of the box with no additional hardware or software necessary. These attributes make the Dell Latitude ST an excellent tablet choice for a medical practice.

A DAY IN THE LIFE

For doctors and other providers who spend their workdays moving from one examining room to another—and are accustomed to lugging around notebook systems—lightweight tablets are extremely attractive. The most useful tablet would allow providers to connect to their practice’s EMR system and to carry out a number of everyday tasks, such as taking freehand notes and writing and printing official letters for their patients.

At this point in the evolution of both EMR systems and tablet devices, it’s fair to say that things are in flux. Many practices have only recently made the shift to electronic medical records, and those who want to take advantage of the portability of tablets are looking for ways to integrate them into their existing systems. Tablets can work with EMR systems in three primary ways: by running the EMR software natively, by using a browser to access a Web-based EMR system, and by connecting remotely to a PC running the EMR.

Running EMR software natively



This approach is probably ideal—the same EMR you have been using on your desktop and notebook systems can run on your tablet device. In the case of a typical EMR such as the Windows-based eClinicalWorks, the Windows-based Dell Latitude ST tablet has a distinct advantage: it can run the program itself with full functionality. We worked with a medical practice that uses eClinicalWorks on desktop and notebook PCs. Its providers were able to quickly learn to use the Latitude ST, found the stylus to be very useful, and really appreciated the light weight of the Latitude ST. Like many EMRs, eClinicalWorks does not yet have a full-featured tablet version that would work on either the Apple iPad 2 or the Samsung Galaxy Tab 10.1.

Using a browser to access a Web-based EMR system



Some EMR systems are designed to be accessed through a Web browser. We tested one such program, Practice Fusion. At the time of our testing, only the Dell Latitude ST was able to connect to Practice Fusion directly through Internet Explorer. The other two tablets we tested were unable to access successfully Practice Fusion.

Connecting remotely to a PC that is running the EMR software



Most EMR systems can also be accessed from a tablet running a program such as LogMeIn (www.logmein.com) or GoToMyPC (www.gotomypc.com), which in turn accesses a dedicated PC running the actual EMR software. We found the user experience is not as smooth or seamless as with a dedicated program running natively on the tablet.

Creating and printing an official letter for a patient



Providers frequently write letters for patients to submit to their schools or employers. The Dell Latitude ST was able to access the practice's Microsoft Office template with letterhead, edit the text, and print the letter with no problems at all. The Apple iPad 2 and Samsung Galaxy Tab 10.1 required extra applications to complete these tasks and even then the results were unsatisfactory, because there were problems with formatting (the letterhead image was missing).

Taking notes



The Dell Latitude ST comes with a stylus that enables free-hand note-taking with no further purchases, downloads, or installation steps. Styluses did not come with the other tablets and had to be purchased separately. Even with the additional software and styluses, the Apple iPad 2 and Samsung Galaxy Tab 10.1 had issues whenever a hand accidentally touched the screen, while the Dell Latitude ST encountered no such issues. Not only does the Dell Latitude ST have built-in palm rejection, the factory stylus that accompanies it has built-in erase and right-click buttons, which the styluses we purchased for the other tablets did not have.

HOW DO THE TABLETS COMPARE IN DETAIL?

To learn more about how different tablets fit into a medical practice environment, we tested the Dell, Apple, and Samsung tablets' abilities to access typical EMR systems and to handle other tasks. Overall, the Dell Latitude ST was able to complete tasks out of the box with a minimum of training, while the other tablets either could not access the EMR at all or required additional software. The Dell Latitude ST also offered easier ways to create and print patient letters and take handwritten notes.

Accessing and updating a patient's health record using EMR software natively

At present, most popular EMR systems do not currently make apps for the iPad and/or Android tablets. Of those that do, the apps frequently offer limited functionality, such as allowing the user to only view records, not to make changes to them.¹

Because the Latitude ST is basically a Windows computer, EMR systems that are also Windows based, as most are, can run natively on the tablet. This is not possible on the iPad 2 or the Galaxy Tab 10.1. Consequently, we were not able to test them natively running an EMR system.

To see what it would be like to use natively an EMR on a Dell Latitude ST, we took one to a medical practice. We installed the eClinicalWorks software (www.eclinicalworks.com/) on the tablet and asked a set of healthcare providers to use it over the course of a day seeing patients. When asked about the experience, the providers made the following comments:

¹ Despite enthusiasm from healthcare providers, hospitals are slow to adopt tablet systems.
<http://www.imedicalapps.com/2011/12/enthusiasm-healthcare-providers-hospitals-slow-adopt-tablet-systems/>

- “Learning to use the software was almost effortless.”
- “Using the stylus was very easy and intuitive.”
- “The tablet was so much lighter than the notebook system I’m used to, great for carrying into exam rooms.”

Accessing and updating a patient’s health record using a Web-based EMR system

This scenario tests the experience of a medical professional whose practice uses a Web-based EMR application, such as Practice Fusion. The task was to access and update a patient’s health record. With the Dell Latitude ST, this was a straightforward process: we simply used Internet Explorer (IE) to log into our Practice Fusion account.

When we attempted to access the Practice Fusion Web site with browsers on the iPad 2 and Galaxy Tab 10.1, we had difficulty. The iPad does not support Flash, which Practice Fusion requires. Using the Galaxy Tab standard browser, we encountered a problem entering our Practice Fusion account password. As soon as we entered one character, it disappeared from the screen.

The Dell Latitude ST had no issues accessing or using the Practice Fusion Web site. IE supports Flash, so all of the functionality of the Practice Fusion system was available. We were able to complete our test tasks smoothly.

Accessing and updating a patient’s health record connecting remotely to a PC running the EMR software

Because the Windows-based Dell Latitude ST can run EMR systems both natively and through a Web-based interface, a practice would have little reason to use it to connect remotely to a PC running EMR software. For the Apple iPad 2 and Samsung Galaxy Tab 10.1, however, which could run neither the native nor Web-based EMR, the remote access scenario provides a workaround that could be useful.

We set up a PC running Practice Fusion and installed a leading remote desktop application, GoToMyPC, to access it. We then installed the GoToMyPC app on both of the non-Windows tablets. We found that this solution made it possible to user Practice Fusion, but that the Practice Fusion interface felt awkward and sluggish at times.

For this scenario to work, a practice must set up and keep running at all times a separate PC; this requires space, uses power, and could be a source of additional work for IT staff.

Creating and printing an official note for a patient’s employer

This scenario simulates the experience of a medical professional whose patient’s employer requires an official note to excuse an absence. Accomplishing this task involves several steps:

1. Access the medical practice’s letterhead template file (Microsoft Word .docx), which is stored on the practice’s file server.
2. Save the template as a new file and edit it to reflect the patient’s name, address, medical condition, etc.
3. Print a hard copy of the new file for the patient to give to the employer.

Of the three tablets, only the Dell Latitude ST had no issues accessing, editing, and printing the file out of the box. The Apple iPad 2 and Samsung Galaxy Tab 10.1 were unable to access the shared

template document without first installing a file browsing app, and both had issues with the template’s edit fields and Letterhead.

The Dell Latitude ST had no issues printing to the Dell 1350cnw color laser printer we used in our testing, and no problems with formatting. In contrast, for the other two tablets to print to this printer required not only installing a third-party application, but also a separate Windows computer to be running at all times to allow access to the printer. Even then, the third-party print-sharing application did not print the template formatted correctly.

Figure 1 summarizes the applications the three tablets needed to perform this complex task and Figure 2 shows the steps we took to perform the task.

	Dell Latitude ST	Apple iPad 2	Samsung Galaxy Tab 10.1
Accessing the file server	Tablet, being Windows based, had this functionality built in.	We had to download the FileBrowser app.	We had to download the ES File Explorer app.
Editing the file	Tablet was preconfigured with Microsoft Office Professional 2010.	We had to download the Quickoffice Pro HD app.	Tablet was preconfigured with Quickoffice® Pro HD.
Printing the file	Tablet could print to this networked printer out of the box.	We had to download the PrintCentral Pro app. Also, a Windows computer had to be running at all times to allow access to the printer.	We had to download the PrinterShare Premium app. Also, a Windows computer had to be running at all times to allow access to the printer.

Figure 1: Apps needed to create and print an official note for a patient’s employer.

Creating and printing an official note for a patient’s employer		
Dell Latitude ST	Apple iPad 2	Samsung Galaxy Tab 10.1
Setting up tablet to access the shared file template		
Note: This step was unnecessary on the Dell Latitude ST because it has this functionality out of the box.	<ol style="list-style-type: none"> 1. On the tablet, go to the Apple App store. 2. Search for the FileBrowser app. 3. Touch Install to download and install the app. 4. Search for the Quickoffice Pro HD app. 5. Touch Install to download and install the app. 	<ol style="list-style-type: none"> 1. On the tablet, go to the Android Marketplace. 2. Search for the ES File Explorer app. 3. Touch Install to download and install the app.
Issues encountered		
None	<ol style="list-style-type: none"> 1. The Apple iPad 2 was unable to natively access the file share. 	<ol style="list-style-type: none"> 1. The Samsung Galaxy Tab 10.1 was unable to natively access the file share.

Creating and printing an official note for a patient's employer		
Dell Latitude ST	Apple iPad 2	Samsung Galaxy Tab 10.1
Using the tablet to access the shared file template		
<ol style="list-style-type: none"> 1. Open Windows Explorer and type the path to the shared file directory. 2. Enter username and password. 	<ol style="list-style-type: none"> 1. Open the FileBrowser application. 2. Click the + icon under Locations. 3. Enter the path of the shared file directory and the username and password, and click Save. 4. Touch the newly created Location to open the file share. 	<ol style="list-style-type: none"> 1. Open the ES File Explorer application. 2. From the top left dropdown menu, select LAN. 3. Click New and select Server. 4. Enter the file server IP address and enter username and password. 5. Touch the newly created location to open the file share.
Editing the file template		
<ol style="list-style-type: none"> 1. Use Microsoft Office Word to edit the template file. 	<ol style="list-style-type: none"> 1. Use Quickoffice HD Pro to edit the template file. 	<ol style="list-style-type: none"> 1. Use Quickoffice HD Pro to edit the template file.
Issues encountered		
None	<ol style="list-style-type: none"> 1. The letterhead logo and medical practice name were not shown. 2. The template's "Edit fields" such as name, address, etc. were shown as gibberish that looked similar to Chinese characters. 	<ol style="list-style-type: none"> 1. The letterhead logo was not shown. 2. The template's "Edit fields" such as name, address, etc. were shown as blank empty spaces.
Printing the file to any networked printer		
<ol style="list-style-type: none"> 1. Select Start→Devices and Printers. 2. Select Add a Printer. 3. Select Add a network, wireless or Bluetooth printer. 4. Select The printer that I want isn't listed. 5. Select Add a printer using TCIP/IP address or a hostname, and click Next. 6. Enter the IP address for the printer, and click Next. 7. Select the printer, and click Next. 8. At the Printer Sharing screen, leave the default option of sharing the printer, and click Next. 9. Click Finish when the setup is complete. 	<ol style="list-style-type: none"> 1. On a Windows computer that has access to the network printer, go to http://mobile.eurosmartz.com and download the WePrint software. 2. Install the WePrint software onto the Windows machine by double-clicking the WePrint executable. 3. Click Install. 4. At the license agreement, click Agree. 5. Click OK, to launch WePrint. 6. When WePrint launches, accept the default settings, and click OK. 7. Choose a folder to use for file sharing, and click OK. 8. On the tablet, open the PrintCentral Pro app. 9. Select and open the Getting Started-Test Print file.txt. 10. Select the Print button at the top 	<ol style="list-style-type: none"> 1. On a Windows computer that has access to the network printer, go to www.printershare.com and download the Windows PrinterShare software. 2. Install the PrinterShare software onto the Windows machine, by double-clicking the PrinterShare executable. 3. At the Welcome screen, click Next. 4. Accept the license agreement, and click Next. 5. Accept the default Setup path, and click Next. 6. Click Install. 7. Check the box to Start PrinterShare Console, and click Finish. 8. Click Next to install Bonjour. 9. Click Finish when Bonjour installs.

Creating and printing an official note for a patient's employer		
Dell Latitude ST	Apple iPad 2	Samsung Galaxy Tab 10.1
	<p>right.</p> <p>11. Select the WePrint shared printer option.</p>	<p>10. Select the printer that is to be shared from the list shown under local printers, and click Share.</p> <p>11. On the tablet, open the PrinterShare app.</p> <p>12. Click the list option at the bottom of the screen, and select Nearby Printers.</p> <p>13. When the shared printer is detected, select it.</p>
Issues encountered		
None	<ol style="list-style-type: none"> When we tried to print from Quickoffice HD Pro a message appeared that said, "No AirPrint Printers Found." We were unable to print to our networked test printer using the built-in application drivers. To get Print Central Pro to work with our networked test printer, it was necessary to (1) install WePrint software on a Windows computer that could connect to the network printer and (2) make sure this computer was always running to allow access to the printer. We had to open and print the documents using the Print Central Pro application. We could not print from Quickoffice. Formatting issue: The edited name, address, etc. that was done in Quickoffice was missing. Formatting issue: The date was missing. Formatting issue: The letterhead medical practice's logo was missing. Formatting issue: There was a line going across the top of the page and down the left side. 	<ol style="list-style-type: none"> When we tried to print from Quickoffice HD Pro a message appeared that said, "You can only print on Samsung printer. Continue?" We were unable to print to our networked test printer using the built-in application drivers. To get PrinterShare to work with our networked test printer, it was necessary to (1) install PrinterShare software on a Windows computer that could connect to the network printer and (2) make sure this computer was always running to allow access to the printer. We had to open and print the documents using the PrinterShare application. We could not print from Quickoffice. Formatting issue: The edited name, address, etc. that was done in Quickoffice was missing. Formatting issue: When the template was printed out the day's numerical date was printed on top of the month.

Figure 2: Steps and issues with each tablet for creating and printing an official note.

Taking free-hand notes

This scenario simulates the experience of a medical professional who is taking free-hand notes during a patient visit. The Dell Latitude ST comes with a stylus that enables free-hand note-taking with no further purchases, downloads, or installation steps. The other tablets did not come with styluses, so were unable to complete this test out of box—additional purchases were required to achieve the same functionality. Figure 3 summarizes the apps and hardware the three tablets needed to perform this task.

	Dell Latitude ST	Apple iPad 2	Samsung Galaxy Tab 10.1
Apps	Microsoft OneNote was pre-installed.	We had to download Penultimate.	We had to download Quill.
Styluses	N-Trig DuoSense stylus was included with tablet.	We had to purchase Pogo Sketch+ Stylus.	We had to purchase the Galaxy Tab Conductive Stylus.

Figure 3: Apps and styluses needed to take freehand notes.

Figure 4 shows the steps we followed to take free-hand notes, and the issues we encountered in our tests. Even with the additional software and styluses, the Apple iPad 2 and Galaxy Tab 10.1 had issues if a hand accidentally touched the screen, while the Dell Latitude ST encountered no such issues. Not only does the Dell Latitude ST have built-in palm rejection, the factory stylus that accompanies it has erase and right-click buttons built into the stylus, which the styluses we purchased for the other tablets did not have.

Taking free-hand notes		
Dell Latitude ST (2 steps)	Apple iPad 2 (2 steps)	Samsung Galaxy Tab 10.1 (2 steps)
<ol style="list-style-type: none"> 1. Open Microsoft OneNote. 2. Start taking notes. 	<ol style="list-style-type: none"> 1. Open Penultimate. 2. Start taking notes. 	<ol style="list-style-type: none"> 1. Open Quill. 2. Start taking notes.
Issues encountered		
None	<ol style="list-style-type: none"> 1. While writing, we received a warning that the iPad “Multitasking Gestures” for switching between apps can interfere with writing in Penultimate if you rest your wrist on the screen. It recommended disabling the Multitasking Gestures in the iPad settings. 	<ol style="list-style-type: none"> 1. If our hand rested on the screen, the application would not write. 2. Even when we enabled the “palm shield” setting the application would not write if our palm rested on the screen.

Figure 4: Taking free-hand notes steps and issues for each tablet.

CONCLUSION

Based on our tests, the Dell Latitude ST would integrate much more easily into a typical medical practice than the Apple iPad 2 and Samsung Galaxy Tab 10.1. By allowing healthcare professionals to perform common tasks out of the box without the need for additional software and hardware, the Dell Latitude ST reduces cost and complexity. For medical practices hoping to integrate tablets into their everyday routines, the Dell Latitude ST offers substantial advantages over its competitors.

APPENDIX A – TEST TABLET CONFIGURATION

Figure 5 provides detailed configuration information for the tablets we tested.

System	Dell Latitude ST	Apple iPad 2	Samsung Galaxy Tab 10.1
General			
Number of processor packages	1	1	1
Number of cores per processor	1	2	2
Number of hardware threads per core	2	1	1
System dimensions (length x width x height)	10.6" x 7.3" x 0.59"	9.5" x 7.3" x 0.34"	10.1" x 6.8" x 0.34"
System weight	1 lb. 8 oz.	1 lb. 3 oz.	1 lb. 3 oz.
CPU			
Vendor	Intel®	Apple	NVIDIA®
Model number	Atom™ Z670	A5	Tegra® 2
Core frequency (GHz)	1.5	1	1
L1 cache	24 KB + 32 KB	32 KB + 32 KB	32 KB + 32 KB
L2 cache	512 KB	1 MB	1 MB
Memory module(s)			
Amount of RAM	2 GB	512 MB	1 GB
Type	DDR2-800 MHz	DDR2-533 MHz	DDR2-667 MHz
Hard disk			
Vendor and model number	Samsung PM810 SSD	Flash storage	Flash storage
Size (GB)	32	32	32
Operating system			
Name	Microsoft Windows 7 Professional	Apple iOS 5.0.1	Google Android 3.2 Honeycomb
Graphics			
Vendor and model number	Intel GMA 600	PowerVR SGX543MP2	NVIDIA Tegra 250 T20
Resolution	1,280 x 800	1,024 x 768	1,280 x 800
Display			
LCD type	WXGA Wide Viewing Angle LED with chemically strengthened glass, Pen & Touch Input	LED-backlit glossy widescreen Multi-Touch display with IPS technology	WXGA TFT LCD
Screen size (inches)	10.1	9.7	10.1
Battery			
Type	Built-in Lithium Ion	Built-in Lithium Ion	Built-in Lithium Ion
Rated Watt hours	30	25	25

Figure 5: Configuration information for the tablets we tested.

ABOUT PRINCIPLED TECHNOLOGIES



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Tablet functionality in a healthcare environment:

Dell Latitude ST, Apple iPad 2, and Samsung Galaxy Tab 10.1

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