



portalplayer

Preface™:
Enabling Always On Applications in
Next Generation Notebooks

May 2006

Table of Contents

EXECUTIVE SUMMARY	3
NOTEBOOKS – THE EVOLVING USAGE MODEL	3
WINDOWS VISTA AND GADGETS - INFORMATION AT YOUR FINGERTIPS	4
GADGETS, SIDESHOW AND PREFACE	4
PREFACE - ENHANCING THE MOBILE LIFESTYLE	5
CONSUMERS FIND SIDESHOW A DESIRABLE FEATURE	7
SIDESHOW ADDS COMPELLING FUNCTIONALITY TO WINDOWS VISTA NOTEBOOKS	8
THE FUN FACTOR	8
PREFACE – THE OPTIMAL SIDESHOW PLATFORM	9
SUMMARY	9
GLOSSARY	10
TRADEMARKS	10

EXECUTIVE SUMMARY

In May, 2005, notebook computers outsold desktop computers for the first time, reflecting the coincidence of multiple trends. Personal content like music and pictures are increasingly digital, and consumers want to carry their libraries with them. Increased broadband penetration has coaxed more people onto the web for an expanded range of activities, while near ubiquitous wireless has increased the value of carrying a notebook for business and casual users.

Today, while sipping a latte at Starbucks, a notebook user can access the web at speeds that modem-bound desktops could only dream of a few short years ago, while listening to music and viewing pictures from their most recent vacation. Despite these significant usage model changes, notebook computers look startlingly similar to those introduced last century.

This will dramatically change when Microsoft® Windows Vista™ operating system ships in late 2006. According to *PC Magazine*, “Windows Vista’s sexiest mobility feature is what Microsoft calls SideShow,”ⁱ a secondary processor and display subsystem embedded in a notebook lid or contained in a detachable unit. SideShow will be driven by Windows Vista gadgets, which are mini-applications that can retrieve data from hard drives, the Internet or other online information stores. Gadgets provide instant access to personal and business information, like contacts, maps, stock quotes or other data, even when the notebook computer is off.

Preface™ is PortalPlayer’s new turnkey subsystem for adding multimedia-enabled SideShow displays to notebook computers. In addition to full support for Vista gadgets, Preface can play audio files, slide shows, and video with 50X to 100X longer music playback time than notebooks offer today.

PortalPlayer worked closely with Microsoft during the development of SideShow, and Preface is the first (and currently only) color screen, rich media enabled SideShow solution for notebooks. With Preface and Windows Vista’s new features, PortalPlayer will help produce new generations of power efficient, always on notebook computers with unparalleled convenience, connectivity and entertainment value.

NOTEBOOKS – THE EVOLVING USAGE MODEL

According to research firm Mintel Research, notebook sales surpassed desktop sales for the first time in May, 2005ⁱⁱ. There are multiple reasons.

First, unless you’re a video editor or PC gamer, a desktop computer offers little advantage over a notebook in terms of relevant functionality – notebooks are powerful enough, screens large and clear enough and disk space sufficient for most users. In addition, notebook prices have dropped significantly, eroding the desktop cost advantage.

Expanding wireless connectivity further increases the value of carrying a notebook around. With many businesses offering building or campus-wide wireless, workers can carry their notebooks into meetings or to the cafeteria and remain connected to email and enterprise systems.

By March 2006, over 43 million US Households enjoyed broadband Internet connectivityⁱⁱⁱ, and at least 10 million US Households had wireless LANs^{iv}. Over 100 cities are currently building municipal wireless infrastructures with over 1,000 more in the planning stages. Overall, this produces an environment

where a user almost always has a high speed connection, allowing their notebooks to serve as a digital hub for personal and business content.

At the same time, computers are more integral to our lifestyle. We don't shoot film anymore; we shoot digital files that we store on our notebooks and print locally or online. Legal music downloads have increased, and most computers have software that can rip CDs and create play lists. High bit rate streaming audio and video completes the computer's evolution into a multimedia entertainment center.

Steadily, computers in general and notebook computers in particular have become the hub for our personal content, our connecting point for friends and associates, and a primary source for entertainment and commerce.

That said, notebooks computers were initially designed to allow mobile workers to carry their work from one location to another. Today's consumers want a device that provides instant and persistent online access as they navigate through their day, and a power efficient playback platform for their entertainment. While mobility, connectivity and multimedia are clearly driving notebook demand, other than added wireless networking capabilities, the basic notebook looks, feels and operates much like those we carried ten years ago.

WINDOWS VISTA AND GADGETS - INFORMATION AT YOUR FINGERTIPS

According to www.microsoftgadgets.com, gadgets are a "new category of mini-applications designed to provide information, useful lookup, or enhance an application or service on your Windows PC or the Web." As of early May, 2006, there were 274 Sidebar gadgets available for download at www.microsoftgadgets.com, though that number is expected to grow (by way of comparison, there are over 1952 widgets for Apple's Dashboard, which has been available much longer). With just a few minor modifications, all of these gadgets will also will work on SideShow. Gadgets will perform a number of different functions, including data retrieval from enterprise and internet sources, providing alert and status messages, and personalized services and games. Under Windows Vista, gadgets are XML-based micro-applications that aggregate search results.

Most desktop computers will display gadgets in a dedicated pane in the main display called Sidebar, as can notebook computers when powered on. However, since most notebook users conserve battery life by powering down whenever possible, Microsoft added SideShow auxiliary displays to extend Vista's utility to notebook users.

GADGETS, SIDESHOW AND PREFACE



Specifically, SideShow is a hardware component that enables notebook vendors to include a secondary processor and display subsystem embedded in the notebook lid or in a detachable unit. Preface is PortalPlayer's turnkey subsystem for integrating SideShow functionality and rich audio, video and other functions into a notebook.

Preface includes a dual core processor, memory and local storage, so it can communicate with the notebook, then sync, store and

display data when the notebook is powered down. A typical LCD display would range from 2.2 – 2.8” with a resolution of 320x240 (QVGA), with Nand Flash memory for local storage.

Users control Preface with a key matrix of Left, Right, Up, Down, Select and Menu buttons or with capacitive touch pads. Biometric devices to secure access to both SideShow and the notebook are an option. A highly power-efficient architecture minimizes battery consumption, so a Preface-enabled SideShow display can run for hundreds of hours or more on a single charge for Always On access to content stored in the Preface subsystem.

Preface will display information retrieved by Windows Vista Sidebar gadgets that have been extended to take advantage of SideShow. Today gadgets can display text and bi apps in SideShow displays, such as calendars, emails, tasks, and other text rich applications. By enabling multimedia on SideShow, Preface extends the notebook user’s access to their personal content, supplying the missing link to broad spread adoption and success of the SideShow platform.

PREFACE - ENHANCING THE MOBILE LIFESTYLE

At a high level, Preface provides the following key benefits.

1. Entertainment

- Play music and video and display photo slideshows with notebook off
- Store and play Internet radio stations from notebook lid
- View web cams and sports clip gadgets
- Remotely control iTunes® and other popular applications
- Personalize notebook appearance

2. Saves Time

- Always on access to key information—no booting, no waiting
- Retrieve email or a schedule in seconds
- Access real time weather, travel itinerary updates, stock quotes, eBay bid timer—notification of what is important to you now

3. Convenient

- “At a glance” access while traveling or moving from between classes or meetings
- Bluetooth enables listening to music while notebook is in back pack.
- Gadgets in Windows Vista support “filtered” data mining enabling push technology to Preface.
- Gadgets and SideShow provide an open platform for innovation--cool new applications all the time.

4. Significant battery life improvements

- 50X to 100X improvement for music playback over typical notebook computer.
- 40% improvement when controlling PowerPoint from Preface.

To more fully explore these benefits; let’s examine the most common scenarios for using a Preface-equipped notebook.

LID DOWN/NOTEBOOK OFF/NO INTERNET CONNECTION

In this mode, the notebook is powered down, with no Internet connection. This is the most power efficient profile, perhaps employed while the user is commuting or at a client meeting. In this mode, the user can instantly access all data synchronized by gadgets in the Preface subsystem, which might include calendar, contact information or Outlook email, MapQuest maps, or MRP, CRM or supply chain data from enterprise systems.



In addition, in this mode, Preface will display any alarms triggered from its local data store, alerting the user about meetings and other scheduled events—something a notebook does not do when in a suspended state. Preface can also run mini-applications like a meeting timer or display an agenda.

For entertainment, Preface can play audio stored in its local flash memory or an external flash card, or display digital photographs and video. On a typical notebook battery, Preface should run for hundreds of hours between charges. Users can also display system status information like remaining battery life. Should the notebook fail to boot, users can access main system diagnostic

information to help isolate and repair the problem.

LID DOWN/NOTEBOOK ON/INTERNET CONNECTION AVAILABLE

In this mode, the notebook is powered on and connected, but the lid is down, perhaps in a hotel room while the user is sleeping or for discretion during a client meeting. Preface can perform all functions in the previous scenario, but can also continually synch and update all gadget related data stores, updating personal and enterprise data, retrieving podcasts, RSS feeds and the like.

In this role, Preface can display new alerts triggered by the retrieved data, like flight delays and gate changes, meeting cancellations, stock and other financial movements or important emails, keeping the user discretely up to date. Preface can also choose and control the playback of streaming audio and video and podcasts, or display real time input from RSS feeds.

In addition, Preface can control applications running on the notebook like PowerPoint and Media Player, conserving power if the notebook isn't plugged in. For example, controlling PowerPoint playback on an external projector via Preface extends battery life by 35-40% since the primary display and backlight is off.

LID UP/NOTEBOOK ON/INTERNET AVAILABLE OR NOT

When the notebook lid is up, Preface becomes a true secondary display that can be used for a variety of purposes. For example, when sitting across from others at a meeting, a user could control PowerPoint with Preface, viewing a small image of the slide in the Preface display while the clients see the full image in the main display.

Or, the user could display an agenda, schedule or meeting timer that only he or she can see in Preface while others see PowerPoint slides or other information in the main display. If connected, the user can

display e-mail, schedule or other alerts in the Preface display while keeping the main display free for the meeting.

Beyond this, users can display pictures, emoticons or text on their SideShow display, personalizing their computers and providing a window into their current emotions. College students studying in the library can display their fraternity logo, or a smiley face emoticon, while young singles surfing the web at Starbucks can display their zodiac signs or post a “DO NOT DISTURB” message.

Overall, without Preface, notebook owners can play their music for about three to five hours; with Preface up to 100X longer. Without Preface, notebook users must wait two minutes to access their critical data, and must closely monitor battery life or have extra batteries on hand. With Preface, notebook users have instant access to their most relevant data for days at a time.

Without Preface, alarms and critical emails fall on deaf ears if your notebook isn’t running. With Preface, your computer is always on, alerts can always happen, and you’re always informed and up date.

CONSUMERS FIND SIDESHOW A DESIRABLE FEATURE

Though SideShow is still new and relatively unknown, early signs indicate that consumers will likely prefer notebooks with SideShow functionality.

Specifically, in a survey of 57 consumer and business notebook users conducted by Market Decisions Corporation for Microsoft, all 57 indicated that SideShow would be a positive differentiating feature when purchasing their notebook. As part of the survey, the responders chose one of three options; a notebook without SideShow that cost \$2,000, a notebook with SideShow embedded in the notebook lid for up to \$2,150 or a notebook with a detachable SideShow unit for up to \$2,300.

Sixteen responders choose the embedded lid option, while 41 choose the detachable unit. Notably, none of those surveyed chose the notebook without SideShow.

A more recent study by Microsoft indicates that SideShow is the number one feature out of 15 different hardware and software concepts that were presented in US, Europe and Asia. The detachable SideShow model was the winner and indicates that consumers would pay \$200 extra for a notebook with this option.

In addition, Preface’s two key benefits, instant access to data and longer battery life, clearly resonate with the analyst community. For example, Paul Thurrott from Windows IT Pro commented that “PortalPlayer says that Preface will add only a few dollars to the cost of each notebook, but that’s a small price to pay for what you get: Instant access to email, calendar items, IM messages, and other data. Sounds good to me.”^V

TechKnowledge analyst Mike Feibus is even more bullish. “Personal media displays will do more to enhance the usefulness of notebook PCs than Wi-Fi. With these displays, you’ll be able to use your notebook all day -- without a power cord.”^{VI}

SIDESHOW ADDS COMPELLING FUNCTIONALITY TO WINDOWS VISTA NOTEBOOKS

Beyond these favorable SideShow related comments, gadgets and Sidebar are emerging as potential blockbuster features in Windows Vista, key elements to Bill Gate's vision of "connecting people to the information they want."^{VII} Writing for the *Seattle Weekly*, Mary Jo Foley commented that "[Sidebar] hasn't grabbed a lot of headlines outside beta testing circles, but it could prove to be one of [Windows] Vista's biggest sleeper hits."^{VIII}

PC Magazine's Michael Miller added "The current set of gadgets that comes with Vista is fairly small. But I expect a lot of people will write small applications for this before [Windows] Vista ships. I like the concept a lot."^{IX}

Perhaps even more persuasive is the response in the user community. For example, after viewing a technology preview of Windows Vista and gadgets, Jody Kerr, Wells Fargo Systems Architect, described Sidebar as "killer" for enterprises. "It takes away the need for building a lot of large-scale Web applications when you can componentize them on the employee desktop."^X

THE FUN FACTOR

Last, but definitely not least, SideShow represents the most visible change to notebooks in years. This alone will help ensure that SideShow equipped notebooks get noticed, as they recently did in *Time Magazine*.^{XI}



Figure 1

Beyond this, SideShow's personalization options may also prove attractive to many users.

PREFACE – THE OPTIMAL SIDESHOW PLATFORM

Preface adds two distinct functions to notebook computers. First is comprehensive SideShow support under Windows Vista. Second is a suite of “native” applications unique to Preface, most notably the personal media player functions delivered in the first generation silicon such as PortalPlayer’s Video Player and Photo Slide Show. As a supplier to notebook OEMs and ODMs, PortalPlayer has unique advantages in both SideShow support and native applications.

During SideShow’s development, PortalPlayer worked in tight cooperation with Microsoft, helping to co-define and debug various specifications and interfaces. Significantly, Microsoft’s testing of SideShow displays embedded in notebook lids were performed on Preface technology. This tight cooperation between PortalPlayer and Microsoft ensures that Preface offers comprehensive SideShow compatibility and support, and a seamless SideShow end user experience that no other IC vendor can match.

For native applications, PortalPlayer’s leadership in the personal media player market ensures best of breed audio quality, complete codec and Microsoft DRM support and a comprehensive, proven firmware development kit. PortalPlayer designed and manufactures the Preface processor and firmware, and writes all system and application software. This level of integration enables maximum power efficiency, allowing Preface to deliver the extended battery life that’s fundamental to SideShow’s value proposition.

Going forward, PortalPlayer’s technology roadmap will allow OEMs and ODMs to capitalize on their early investments and market successes. In 2007, this will include support for detachable devices with wireless connectivity for VoIP, data synchronization and stereo audio streaming applications, as well as Bluetooth stereo headsets. Subsequent Preface generations will drive the main notebook display, rather than an optional LCD, lowering parts costs while enabling always on access to data and dramatically reduced power consumption. These Preface-equipped notebooks will be able to play high resolution DVD or MPEG-2, H.264 and Windows Media Video files, while more than doubling the video playback hours between battery charges.

PortalPlayer has offices in San Jose, CA, Kirkland, WA, Taipei, Taiwan and Hyperbad, India, and provides local support for key ODM and OEM customers, ensuring a fast, efficient design cycle. PortalPlayer has forged relationships with suppliers of other key SideShow components, like Atrua, AuthenTec and Synaptics, to ensure that Preface fully supports each vendor’s respective technology. All of the necessary hardware interfaces, drivers and APIs are incorporated into the Preface platform, simplifying and shortening the design cycle.

SUMMARY

The notebook market is evolving, driven by new usage models that include the storage and playback of personal multimedia and expanded connectivity. Vista is changing the software landscape, with gadgets connecting people to the information they need, when they want it.

Preface enables OEMs and ODMs to produce SideShow equipped notebooks ideally suited to meet these changing requirements. As a key technology partner with Microsoft during the development of SideShow, and a market leading supplier to the personal media player market, PortalPlayer is uniquely qualified and positioned to supply turnkey SideShow solutions.

GLOSSARY

Gadgets – a new category of icon driven mini-applications that can serve multiple functions, including information retrieval, or a unique interaction with an application (like retrieving a day view from Outlook).

Personal media display – The category for secondary processors and display subsystems whether used in notebook lids, detachables, or other implementations including remote controls.

Preface – Preface is PortalPlayer's turnkey subsystem for integrating SideShow functionality and rich audio, video and other multimedia functions into a notebook.

Sidebar – A dedicated pane on the Windows Vista desktop for collecting and organizing Gadgets for easy access.

SideShow – An extension of Windows Vista that enables notebook vendors to add a secondary display to future designs.

Windows Vista – Microsoft's new operating system, scheduled to ship in late 2006.

TRADEMARKS

Forward-Looking Statements

Except for the historical information contained herein, the matters set forth in this white paper, including, but not limited to, statements regarding the availability of Windows Vista and Windows SideShow, the availability of notebook computers with Preface technology platform functionality, the timing of the introduction of notebook computers containing the Preface technology platform, stimulating increased demand for next generation notebook designs, the creation of new SideShow applets and gadgets, and the anticipated performance of implementations of the Preface technology platform are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Words such as "expect," "believes," "anticipates," "plans," "expects," "will," "designed to," "forward" and similar expressions are intended to identify forward-looking statements. These statements are not guarantees of future performance. Actual results could differ materially from those discussed in these forward-looking statements as a result of risks and uncertainties, including, among others, the market for notebook computers with Preface technology platform capabilities, manufacturing and supply risks, the timing and introduction of Windows Vista and Windows SideShow products, the acceptance of PortalPlayer's Preface technology platform by notebook computer manufacturers, and other risks and uncertainties detailed in PortalPlayer's quarterly report on Form 10-Q for the quarter ended September 30, 2005 and from time to time in PortalPlayer's SEC filings. These forward-looking statements speak only as of the date hereof. PortalPlayer does not undertake any obligation to update forward-looking statements.

Preface is the trademark of PortalPlayer, Inc. Microsoft, Windows Vista, Outlook and PowerPoint are the trademarks or registered trademarks of Microsoft. All other trademarks are property of their respective owners.

© 2006 PortalPlayer, Inc.

ⁱ Clyman, John. "Why You Want Vista Now; Because You're Mobile." PC Magazine. 19 April 2006. 11 May 2006 < <http://www.pcmag.com/article2/0,1895,1950672,00.asp>>.

ⁱⁱ Bhavnani, Sam. "Notebook Sales Surpass Desktops in May 2005." Current Analysis Press Release. 3 June 2005. 11 May 2006 <http://www.currentanalysis.com/files/CA_NotebooksVDesktops062005.62273811.09.pdf>

ⁱⁱⁱ "Study: 43M U.S. households have broadband Internet." South Florida Business Journal. 31 March 2006. 11 May 2006 <http://www.bizjournals.com/southflorida/stories/2006/03/27/daily50.html?from_rss=1>

^{iv} "Ultrawideband Challenges WI-FI in Fight for Wireless Consumers (10/27)." Appliance Design. 27 Oct. 2005. 11 May 2006. <http://www.appliancedesign.com/CDA/Archives/087c83054ea38010VgnVCM100000f932a8c0_____>

^v Thurrott, Paul. "PortalPlayer Builds Hardware for Vista's Sideshow Feature." WindowsITPro. 3 Feb. 2006. 11 May 11, 2006 <http://www.windowsitpro.com/Windows/Article/ArticleID/49287/Windows_49287.html>

^{vi} Takahashi, Dean. "PortalPlayer takes a Leap." The Mercury News. 14 March 2006. 11 May 2006 <<http://www.mercurynews.com/mld/mercurynews/14095696.htm>>

^{vii} McCue, Andy. "Gates shows off Windows Vista and Office 12." Silicon.com. 13 Sept. 2005. 11 May 2006 <<http://software.silicon.com/os/0,39024651,39152249,00.htm>>

^{viii} Foley, Mary Jo. "Microsoft's Big Bet: Win With the Web." Seattle Weekly. 15 March 2006. 11 May 2006 <<http://www.seattleweekly.com/news/0611/microsoft-vista.php>>

^{ix} Miller, Michael. "Vista 5308: All The Features Are In." PC Magazine. 22 Feb. 2006. 11 May 2006 <<http://blog.pcmag.com/blogs/miller/archive/2006/02/22/78.aspx>>

^x Krill, Paul. "Vista Preview to Feature Sidebar, Gadgets." PC World. 2 Feb. 2006. 11 May 2006 <<http://www.pcworld.com/news/article/0,aid,124597,00.asp>>

^{xi} "What's Next in Gadgets." Time Magazine. 20 March 2006. 11 May 2006 <http://www.time.com/time/photoessays/2006/next_gadgets/11.html>

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH PORTALPLAYER PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS OR TECHNOLOGY IS GRANTED BY THIS DOCUMENT. EXCEPT AS MAY BE PROVIDED IN ANY CUSTOMER AGREEMENT WITH PORTALPLAYER, PORTALPLAYER ASSUMES NO LIABILITY WHATSOEVER, AND DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO USE OF PORTALPLAYER PRODUCTS OR PRODUCTS OF THIRD PARTIES REFERENCED HEREIN INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

PortalPlayer may make any changes to its product descriptions and specifications at any time, without notice. The information contained herein is provided for informational purposes only.



portalplayer
