HTML5

An opportunity for innovation

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The battle between PCs and mobile devices has tilted in favor of mobiles. It’s an irreversible trend. Smart phone costs are coming down, mobile networks have become faster and, most significantly, access costs have been falling. A study by Canalys in early 2012 showed the extent of the shift.

Smart phone shipments grew by 62.7 percent in 2011 over 2010. During the same period, total client PCs grew 14.8 percent. In sheer numbers, 2011 saw 487.7 million smart phones shipped versus 414.6 million PC shipments. In terms of processing power, smart phones are blowing past all previous benchmarks.

Qualcomm’s new dual-core Snapdragon S4 mobile chip clocked at 1.5GHz and flaunts architecture that supports up to four CPUs. Naturally, everyone wants to build applications that can run on these devices that seem to be on technological steroids. There’s one major roadblock: the number of operating systems across mobile devices. But the growing popularity of web-based smart phones and the complexities of dealing with multiple OS is enticing developers to think about, and aggressively adopt, HTML5 as a solution.

The rapid growth in mobile operating systems that range from iOS, Android, Symbian, BlackBerry OS, Windows Mobile, webOS, Bada, BREW etc has left the market fragmented. For developers this has added complexity.

Replicating and testing apps across devices and operating systems to ensure it fits end-user requirements has two agonizing implications: the development effort will be time consuming and costs could become prohibitive. That’s the price to pay for the absence of a single standard. The need for an alternative approach is clear. Could that be in the form of HTML5?

There is considerable curiosity around HTML5. Its ability to stitch together the fragmented mobile OS market holds an alluring promise. With industries such as travel, transportation, hospitality, banking, financial services, insurance, media, entertainment, retail chains and consumer packaged goods becoming leading adopters of HTML5, it is hardly surprising that HTML5 has come in for widespread attention. Its ability to deliver location aware and context aware content along with the capability to use features such as cameras and accelerometers is helping these industries develop new capabilities. The big hitters in the mobile space are lining up to support HTML5. Mobile Safari has led the way with the biggest adoption.

HTML5’s strength is that it eliminates plugin dependencies (such as Flash and Silverlight), without sacrificing interactivity. Technologies like Flash were developed for the PC era to deliver a rich user experience. In a mobile environment they put a question mark over security and reliability. From a user perspective, they place an inordinate strain on battery life because of software rather than hardware decoding, making them inappropriate for mobiles. Developers love HTML5 because it lets them run full-fledged applications from within the browser regardless of OS. An HTML5 application automatically leverages device features via JavaScript interfaces. As an example, this allows the application to adjust page displays based on the device, without code changes.

The headline implication is easy to grasp: HTML5 provides a cost effective alternative to native applications and developers can ship their apps to stores without the current (read: stringent and time consuming) app store approvals. The underlying currents are equally interesting. Organizations can leverage existing web development skills, as HTML5 is backward compatible (read: reuse available code), lowering cost of mobile-enabling the business. This advantage could very well further fuel the adoption of mobile devices over the next few years.
The anatomy of HTML5

The fact that HTML5 liberates apps from mobile OS constrains without sacrificing a rich user experience ensures that developers can go faster to market with a “write it once, use it anywhere” approach.

In this context it may be worth bringing a slightly different way of thinking to the development: the proliferation of OS-dependent apps has been steadily leading to a restrictive, walled-garden approach by mobile manufacturers and app stores. This is in conflict with the nature of the web that is largely intended to be “open”. HTML5 has the positive effect of introducing a new open standard that will reshape the contours of the industry.

We believe that going forward, 98% of browsers will begin to implement HTML5. The driver for the growth is going to be user experience (see Anatomy of HTML5 below). Rich Internet Applications (RIA) deliver compelling visualizations, dynamic navigation control, unified communication, resizable views and effects, bi-directional audio/video, offline w/data sync etc. HTML5 aims to replace all those features and add considerable firepower to browsers with its ability to do away with plugins, deliver higher security (than plugins) and a rich, immersive experience.

The shape of things to come

According to ABI Research, there will be 2.1 billion mobile devices that will have HTML5 browsers by 2016, up from barely 109 million in 2010. But the sheer possibilities being presented by HTML5, ahead of its 2014 target date for complete specifications by the W3C, is already providing it traction. Many businesses are moving towards a mobile-first approach towards their web development. The focus is on smaller form factors, multi-touch interfaces and entirely new ways to zoom, scroll and interact with information leveraging GPS, accelerometers, sensors and cameras. These are exciting times for the developer community and, for once, even for enterprises who have struggled to make sense of mobile devices, form factors and a bewildering variety of operating systems and network technologies. With HTML5 they can create mobile applications that work across devices in addition to the apps meeting user expectations of performance.
HTML5 lends itself to bringing interactivity to data on mobile devices. For example, using HTML5, Wipro has:

- Created a banking application with interactive charting capability for some of the leading banks in the US. Written on top of a pure JavaScript library, the application is capable of displaying the data in different charting formats such as a pie, bar, line, area etc and includes the ability to filter data or switch between formats.

- An offline tablet based learning application that allows rich media to be synced and played from an iPad. This is an immersive mobile application created using a high-performance cross-platform JavaScript framework bringing learning content right to the user’s mobile browser, allowing media to be played without the use of any plugins. The framework is powerful and delivers smooth scrolling, animation and transition, adjusting to the display characteristics of each device and switching from landscape to portrait in an instant. The app performance is similar to that of a native app.

- A mobile CRM application for employees on the move. The application allows users to submit travel requests right from their smart phones, which the supervisors can then receive and approve or reject from their smart phone, gaining a tremendous productivity boost by not being tied to their traditional workstations for routine administrative tasks.

The possibilities offered by HTML5 are wide ranging and create an entirely new paradigm for data usage. A coffee chain, for example, could use a mobile device’s GPS data to provide location-aware information like where the closest outlet is to the user and exactly how far it is.

A real estate application can use either an image from the camera or the GPS location to provide data on property values, availability for sale/rent, mortgage values etc. Barcodes can be scanned using the phone camera to provide product information.

There are several examples of organizations that claim to have harvested the benefits of HTML5. For instance, LinkedIn says it has increased speed between 2-10 times based on the feature accessed using HTML5.

Facebook is experimenting with Web Storage to give them more control over how CSS and JavaScript are cached. The Facebook experiment aims at lowering bandwidth usage. YouTube is running an opt-in trial of HTML5 video instead of using the ready-for-retirement Flash plugin. Netflix created a custom build of WebKit for PS3 and its PS3 app was created in HTML5.
However, in all this there is one caveat. Mobile device vendors make some device functionality such as cameras or the address book available only to native applications. Mobile browser based application have to work harder to gain access to these features! Access is gained through a JavaScript bridge, which is available only to hybrid applications. Hybrid applications are mobile web applications wrapped in a native shell. And since they are wrapped in a native shell, these applications require installation and can be hosted in various application stores for users to download and install. A hybrid application technically comprises of some web-based functionality, which could range from 1 to 100%.

Are you a candidate for HTML5?

Technology convergence between the web and mobile has gained impetus in the first half of 2012. Browsers are picking up momentum with the adoption of HTML5 specification. Mobile application developers are working to manage the challenges posed by multiple OS. Businesses are finding ways to leverage HTML5. The question is: is your business ready for HTML5?

Sooner or later, your customers, partners and employees will want the rich experience that HTML5 can deliver. If you’ve not considered HTML5 as part of your technology roadmap, now is a good time to include it as part of IT strategy. The argument against HTML5 adoption pivots around a single fact – that the standard is not frozen. But, our experience says that in an environment where HTML5 is solving the complexity of going mobile, there really isn’t sufficient reason to delay adoption. Don’t wait for the specs or for the technology to fully mature. We live in an iterative world and your HTML5 strategy should be flexible and adaptive.

The HTML5 roadmap – many twists, but one direction

There are three cornerstones that your business must consider:

1. Mobile web: Ensure that HTML5 is incorporated progressively in your web strategy to support all mobile device features and form factors. The key is to stay in sync with technological developments.
2. Hybrid approach: Create hybrid mobile apps for features that are not accessible via HTML5 but can be accessed through JavaScript support. This allows you to leverage complete device functionality.
3. Native apps: Examine the need for native apps that leverage a mobile platform’s inherent strengths and unique specialized features to deliver an outstanding user experience.

Before you begin on the HTML5 journey, identify the features and devices that are critical to your business. The next step is to validate HTML5 browser support and design to meet the expectations of your users. Aiming existing deployments is not the best strategy – developing specifically to meet your needs will ensure higher usability and ROI. Once this is done, create a HTML5 mobile web or hybrid apps that can be hosted in an app store.

HTML5 is not a choice. It is an imperative. More precisely we believe it is an opportunity. HTML5 may be difficult to corral. But with the assistance of the right partners, you could be innovating around it right now rather than find that competition has gone ahead to adopt HTML5 and you are caught by surprise.
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