Incorporating Mobile Commerce in Your Multi-Channel Strategy

By: Luis E Rodriguez and Michael Au

IBM

"By 2014, more than three billion of the world's adult population will be able to transact electronically via mobile and Internet technology"
– Gartner, Gartner's Top Predictions for IT Organizations and Users, 2010 and Beyond: A New Balance, December 2009

Introduction

The number of mobile web sites, mobile applications and mobile applications stores are growing at a staggering pace. By the end of 2010, consumers will have downloaded almost 6 billion mobile apps; up from 2.4 billion in 2009 (Mobile Applications Market Data, ABI Research, April 2010). This rapid adoption of mobile applications is being fueled by the increasing selection, brands, capabilities and storage capacity of smart phones, which had a 20% sales growth in 2009.

Consumers are upgrading their ordinary phones to Internet-enabled smart phones to make use of the new capabilities offered by mobile applications. Retailers are trying to meet customer demands for information and services, and seek opportunities to generate additional sales across all the channels; at the same time, they need to also understand the value and cost among mobile commerce implementation options, and determine how to best link new mobile initiatives to their overall customer strategy to avoid disjointed mobile efforts.
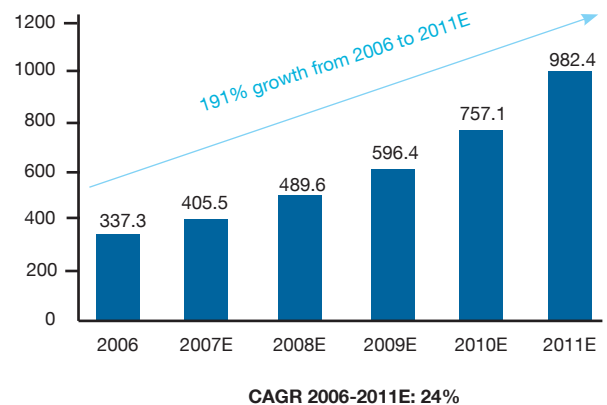
This white paper discusses the market opportunity in mobile commerce, the emerging mobile shopping scenarios, different mobile implementation options to provide a smarter shopping experience across channels and an overview of mobile commerce capabilities in IBM® WebSphere® Commerce Version 7.

Market Drivers

Independent reports from the ITU World Telecommunication, the United Nations and eMarketer show that there are more than 4.6 billion mobile subscribers worldwide (ITU World Telecommunication). This means more than half the world population has a mobile phone today; and close to a billion of these mobile users are accessing the Internet with their smart phones. This represents a 191% growth rate from 2006, with a Cumulative Average Growth Rate of 24% from 2006 through 2011 (IBM Institute for Business Value. 2009).

In the USA, the mobile market penetration is higher than 90%; where the average USA household has 1.7 mobile phones per person and this number is higher if there are GenY users at home. Penetration will near 100% by 2013, assuming a modest 2.7% annual growth rate in the number of mobile users through 2013 ("USA Mobile Phone Subscribers and Penetration, 2008-2013", eMarketer, May 2009). Mobile is quickly becoming a ubiquitous platform for messaging, music, video, social networking, web access and cross-channel shopping.

Worldwide Mobile Internet Users.

191% growth from 2006 to 2011E

2006	337.3
2007E	405.5
2008E	489.6
2009E	596.4
2010E	757.1
2011E	982.4

CAGR 2006-2011E: 24%

Source: IBM Institute for Business Value, 2009

The adoption and usage of the mobile Internet has reached a critical mass with the advent of the Apple® iPhone, Research In Motion® Blackberry, and smart phones running on Google® Android, Microsoft® Windows Mobile, or other mobile

operating systems. These devices are now delivering a compelling and user friendly mobile Internet experience. According to the Pew Research Center, every day more than 57 million Americans are accessing the web with their mobile handsets, and it will grow to 134 million by 2013. This "Mobile Momentum" has been possible thanks to ubiquitous wireless broadband coverage, affordable mobile data plans and hundreds of brands embracing the mobile channel.

In today's digital, always connected and on-the-go age, consumers want to shop whenever and wherever they choose, and they expect to experience a consistent, relevant and timely interaction with their brand of choice, regardless of the channel they use. While social and mobile commerce channels have been gaining momentum in the past few years, they are not usually well integrated to provide a seamless shopping experience to consumers. Hence, retailers face the challenge to optimize their cross channel processes and deliver a single brand experience to their customers.

Understanding Mobile Users

Before selecting mobile platforms for deployment, retailers need to better understand how consumers are using their mobile phones; as well as the handsets and its capabilities. Finding the answers to the following questions will help formulate your mobile commerce strategy:

• Do our most valuable consumers use mobile for voice, data, or web browsing?
• What percentage of consumers use each of the above?
• How frequently do they use text messaging (SMS)?
• Do they prefer to read their email in their mobile while on-the-go, or in their desktop at home?
• How often do they use the mobile web, and what activities do they do while browsing?
• Do they visit social networks, such as Facebook or MySpace, from their mobile phone?
• What type of built-in mobile features do they use: GPS, Wi-Fi, built-in camera?
• What type of handset they own? Is it a smart-phone, such as the Apple iPhone, or the Blackberry® Curve; or is it a feature-

phone, such as the Motorola® Razr; or is it a voice-only phone, such as the TracFone®?

Since consumers replace their mobile phone on average every 1.5 to 2 years; retailers need to continually monitor the market share of mobile platforms in different geographies in order to adjust their mobile implementation plan over time. Many analysts expect consumers will replace their existing phones to newer and feature-richer 3G devices, in the next couple years. An independent research report predicts that by 2014, over 80% of the mobile phones being manufactured will be 3G smart phones, 18% will be feature-phones, and only 1% will be voice-only phones ("US Mobile Forecasts, 2009 To 2014," Forrester Research, Inc., November 6, 2009). In fact, many studies have shown that users are now using their mobile devices to send/receive text messages in their social communities, and are accessing the Internet to find information much more frequently than talking on their mobile phones.

US Mobile Phones By Technology
Source: Forrester. US Mobile Forecast, 2009 to 2014. Nov 6, 2009
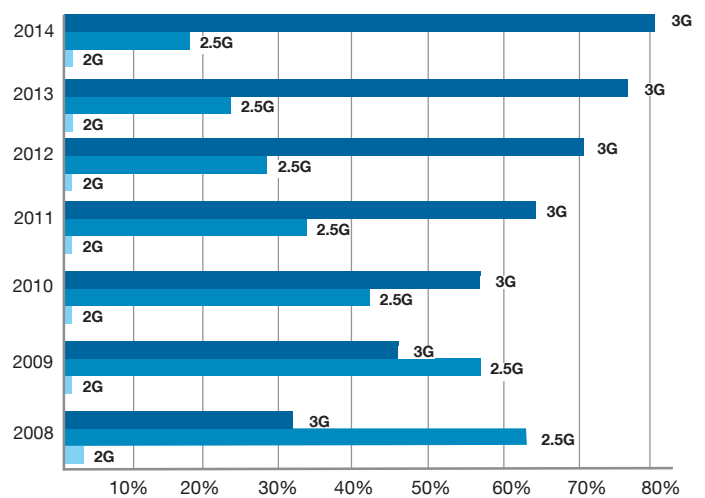
	2008	2009	2010	2011	2012	2013	2014
3G	32%	46%	57%	65%	71%	77%	81%
2.5G	65%	52%	42%	34%	28%	23%	18%
2G	3%	2%	1%	1%	1%	1%	1%

During last year's holiday season, more than half of mobile users around the world used their mobile phone as part of their shopping activities. Furthermore, GenY users were ahead of any other segment in their mobile use for shopping activities. They accessed mobile coupons 6.5 times more than Baby Boomers; and were 3 times more likely to have made a mobile purchase.

Most Common Mobile Shopping Activities and Emerging Mobile Technologies

The mobile channel provides a new venue for consumers to make their shopping experience more engaging and easier, and it provides retailers an opportunity to increase sales, customer satisfaction and loyalty. Today, the most common multi-channel mobile shopping activities include ("Mobile Shopping Takes Hold Worldwide," eMarketer, January 20, 2010):

- Call to ask someone about a product I may purchase
- Text someone to get advice before purchasing a product
- Send a picture of a product I may purchase
- Access the mobile web to read product reviews or other product information
- Access the Internet from mobile phone to compare prices
- Use mobile phone to access the Internet to get coupons and special offers while shopping
- Check status of an order

Shoppers engaging most often in mobile shopping are in Asia-Pacific, particularly in Japan and South Korea, where 8 out of 10 shoppers have used their mobile phones for at least one of the above activities and are the most avid users of coupons, barcode scanning and mobile payment; while increasing numbers of shoppers in Europe and America are using their mobile phones for social activities, product research, and online and in-store purchases.

As consumers adopt the emerging mobile technologies for cross-channel shopping, retailers can capture the market opportunity by providing mobile commerce applications to promote their brands and products to consumers across all

channels, thereby increasing sales opportunities and customer loyalty. Scenarios supported by emerging mobile technologies may include ("Mobile in Retail. Getting your retail environment ready for mobile," GS1 MobileCom, 2010):

- **Location-Based Services** – Leverage GPS, Wi-Fi, Bluetooth, RFID, or other technologies to detect the shopper's location, with his/her permission, to find the nearest store, receive promotion information or coupons (via notification services) when passing by the store. These Geo-Web capabilities can not only be defined around stores, but they can also be defined inside a store to promote products within the store.
- **Self-Scanning** - Uses the camera in the phone to scan barcodes in 1D (UPC) or 2D (QR, Datamatrix, or other) formats on the store shelf, in-store signage, or printed catalog to connect directly to the retailer's web site for product information, promotions, or marketing campaigns.
- **Notification** – Consumers receive order status, product availability, marketing and promotion information via SMS, MMS, or direct mobile messaging such as the iPhone or Blackberry push notification services.
- **Digital Wallet** – Consumers can manage the following digital content on their mobile phones:
    - **Shopping Lists** – Add items by browsing the mobile website or by scanning 1D or 2D barcodes on the product label, and possibly share the list with others
    - **Gift Lists** – View and update a gift registry on the mobile phone while shopping in the store or online
    - **Coupons** – Organize coupons by issuers and expiration dates; and redeem them in the store or online
    - **Flyers** – Receive and manage weekly flyers in the digital wallet
- **Mobile Payment** – Pay by direct mobile billing, contactless Near Field Communications, pre-filled credit card or other payment information stored in the user profile.

Once retailers decide to embrace the mobile channel, they face the challenging decision to select the mobile platforms they will support. Should it be the Apple iPhone, or the RIM Blackberry, or an Android-based smart phone like the

T-Mobile® myTouch, Motorola® Backflip or Droid, or the HTC® Hero.

Although the iPhone is very successful in the USA, "it still currently represents less than 5% of the European mobile population" ("Mobile Strategy: Frequently Asked Questions," Forrester Research, Inc., October, 2009) and the Blackberry market share in the USA has remained unchanged in spite of the impressive 23% growth rate the iPhone had in 2009. In the USA, at the end of 2009, the Blackberry had almost double market share than iPhone; 42.1% vs. 25.4%, respectively (ComScore MobiLens. February 2010).

However, the number of ad requests coming from Apple devices (iPhone, iTouch, and now iPad) are almost 6 times what they are from Blackberry devices ("Mobile Internet: Where is Your Audience," Forrester Research, Inc., May 6, 2009) and this is in spite of Blackberry having more than double as many handsets in the market. The type and breath of

Market Share of Top Smart Phone Platforms

5.4%
9.0%
15.1%
42.1%
25.4%

- RIM
- Apple
- MicroSoft
- Google
- Palm
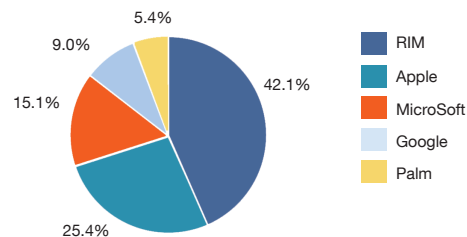
Source: comScore MobiLens, Feb. 2010.

mobile consumers retailers will be able to reach will depend on the mobile platform selected; so choosing the right mobile platforms is critical.

Characteristics	Mobile Web Application	Mobile Hybrid Application	Mobile Native Application	Mobile Transcoder Services
Distribution Model	Internet, Mobile browser	App store download	App store download	Internet, Mobile browser
Programming model & skills	Web	Web + Native	Native	N/A
Application Portability	High	Medium	None	N/A
Maintenance	Low	Medium	High	Low
Ability to Leverage Device features: • Geo-location • Offline storage • Address Book • Camera • Calendar • Accelerometer	HTML5 HTML5 No No No No	HTML5, API mapping HTML5, API mapping API mapping API mapping API mapping API mapping	Native API Native API Native API Native API Native API Native API	No No No No No No
UI layout & Navigation	Common, or device unique via device recognition	Device unique via CSS control + Native UI shell	Native to mobile device	Common across all mobile devices
Application Review by third party vendor	No	Depends on provider	Depends on provider	No
Application awareness	Internet search, Advertising	App Store search, Advertising	App Store search, Advertising	Internet search
Application icon	No. Access via bookmark	Yes, after download	Yes, after download	No. Access via bookmark
Application update	Transparent to users	Download by users (less frequent than Native applications)	Download by users	Transparent to users

Mobile Applications Support

Retailers can choose from a variety of mobile technologies to deploy a mobile store. They include: mobile web application, mobile hybrid application, mobile native application, or mobile transcoder solution.

The table on page 5 provides a summary of the characteristics among these options.

Mobile Web Application

A mobile web application is developed with the standard web programming model, such as JavaScript, HTML, or Cascading Style Sheets (CSS). The programming artifacts are the same as the main website for the desktop users, except that the content, UI layout and navigation flow are tailored for mobile users with smaller screen size and a subset of browser capabilities on the smart phones. For example, Flash animation is not recommended in the mobile store as the plug-in is not supported by some of the mobile browsers such as the iPhone Safari.

As the emerging W3C HTML5 standard is implemented in mobile browsers, mobile web applications will be able to leverage rich Internet applications (RIA) technologies such as GPS location detection, offline storage, drag & drop, native media playback, and 2D as well as 3D animation—which are otherwise supported by native mobile applications today. However, other device features, such as camera, accelerometer and address book information would still not be able to be provided in mobile web applications.

Mobile Native and Hybrid Applications

As the App Store distribution model becomes popular among the smart phone users, most of the mobile platform providers have now enabled their users to download device specific applications from the Internet, such as iPhone App Store, Android Market, Blackberry App World, Nokia Ovi Store, and others, with various degree of success in the market.

With this distribution model, application developers have to submit their finished applications to the platform provider for review to ensure that the applications follow the programming guidelines and the license agreement for the mobile platform.

These applications are called native applications as they are typically developed with the programming model and device specific functions for each mobile platform such as Objective C on iPhone, or Java on Blackberry and Android. The native applications can leverage all the device capabilities with unique UI look and feel for the platforms and access information in the server through web services. Native applications can perform better than Web applications, as data retrieval can be optimized for the device and network characteristics. Nevertheless, the start time or page rendering performance will be affected by the amount of data required by the application.

The problem with Native applications is that they are tied to a particular platform and must thus be written specifically for the target platform. Writing a native application requires specialized skills, which may not be transferable from one mobile platform to another. As the mobile platforms evolve and diversify over time, the development and maintenance cost can become significant.

A Hybrid application is an approach which takes advantages of both web and native applications. The idea is to deliver the web content in 'web views' through HTML, CSS and JavaScript and access the device capabilities, such as the address book or camera, via JavaScript to device API mapping. In addition, an application shell is developed to provide a platform-unique UI layout and navigation flow and to wrap around the web content in the application. All of the leading mobile platforms support this hybrid approach for the types of applications which would need frequent access to the Internet server for dynamic content.

The content of the application should determine the type of application that works best. Obviously, games work best as native applications as they often use heavy graphics and benefit

from not having to access Internet resources frequently. However, mobile commerce should be supported by mobile web or hybrid applications as the majority of the application content, such as product information and order status, are relatively dynamic and should be delivered as web content rendered by the eCommerce server.

The following diagram illustrates a sample hybrid application for WebSphere Commerce:

Customizable branding, color, theme

Scrolling feature products. Users tap product image to view details

Users tap to view products by category

Tap bar to access common functions (Home, Store Locator, Wish List, Shopping Cart)

"More" to access additional functions (Search, Product Comparison, My Account, etc.)

Smart phone UI shell

Common business logic & JSP templates across multiple smart phones

Smart phone UI shell

Hybrid applications take advantage of both web and native applications. It leverages common logic in web views, while also leveraging smart phone hardware and software capabilities

Mobile Transcoding Services

Alternatively, retailers may engage third party managed services to extend ('transcode') the output of their main Web site to other display formats to cover a broader set of non smart phones with limited browser or native device

capabilities; these are commonly called feature phones. This solution is typically employed by the retailers as a tactical quick-to-market implementation.

Because the regular web content is not written specifically for mobile phones, it might not display properly on the mobile phones. Hence, the third party managed services help solve the problem by converting selected areas of desktop web store content to a mobile-ready format for the selected mobile devices, including feature phones with limited browser capabilities and other protocol support such as WAP or i-mode. Some other third party managed services may simply re-direct all mobile requests to a separate system, and therefore require the retailer to provide the web service interface for the third party managed mobile server to access the product catalog information and other transactional data, such as order status, from the retailer's main website.

The major limitation with this approach is that the transcoder services would not leverage the advanced capabilities and user experience offered by the latest generation of smart phones. In addition, the marketing and merchandising managers would not be able to use integrated business tools to manage marketing campaigns and sales catalog across channels, but instead rely on the third party services to manage the business rules for their mobile users which may result in disjointed views of the same cross channel customers.

Another consideration is the Service Level of Agreement for the third party managed services provider. As the mobile Internet traffic increases exponentially, the third party system infrastructure system must be able to handle the mobile browsing and transaction volume experienced by the retailers.

WebSphere Commerce Mobile Solution

Foreseeing the growth in mobile Internet users and the importance of mobile commerce, IBM introduced an integrated mobile commerce solution as part of WebSphere Commerce Version 7. The mobile commerce solution extends WebSphere Commerce vision of being the customer
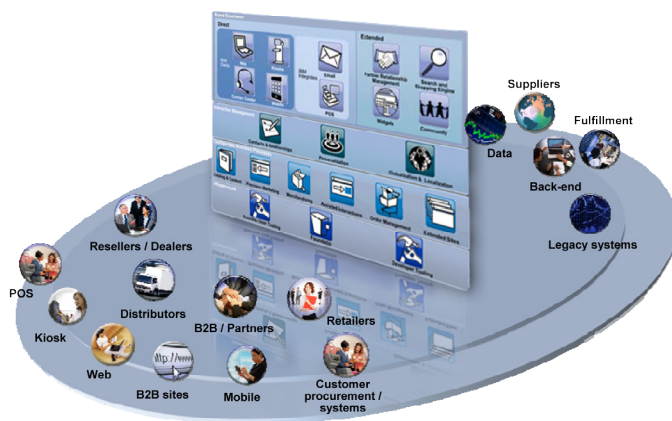
WebSphere Commerce – Customer Interaction Platform

interaction platform to provide a single view of customers across all channels and touch points. So shoppers can buy, fulfill and service anytime and anywhere, online, in-the-store or call center, and now on their mobile phones.
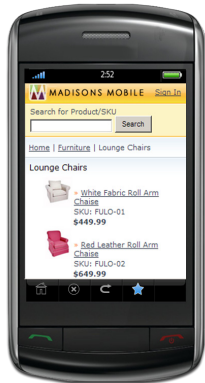
The mobile commerce solution in WebSphere Commerce extends the customer profile, purchase history, order information, catalog, business user tooling and Precision Marketing available to the web channel; thus, creating a tight relationship between mCommerce and eCommerce. This allows retailers to deliver consistent product and pricing information, as well as inventory visibility across channels. Furthermore, marketers can target catalog content, marketing campaigns, and promotions specifically to mobile consumers.

The mobile solution leverages the power of WebSphere Commerce mobile application framework with intelligent device and browser detection and routing capability; i.e., a shopper will enter the same web store address in his mobile phone as she would do in her desktop computer and it will correctly access and render the store in the device.

The mobile starter store provided in WebSphere Commerce Version 7 is a mobile web application which is optimized for common mobile HTML Web browsers with a minimum display resolution of 240 x 320 pixels, which are typically supported by the latest mobile platforms, such as smart phones from RIM, Apple, Motorola, HTC, and Nokia. The mobile web store model also leverages some of the emerging HTML5 features, such as Geo-location API to provide GPS-based store locator capability. The mobile starter store can also be used as the common base to develop WebSphere Commerce mobile hybrid applications for the popular mobile platforms, such as iPhone, Android and others.

The mobile commerce solution provides a rich set of features, which include:

- Sales catalog, marketing & promotion targeted to mobile users
- Persistent shopping cart which follows the shopper, regardless of touch point being used
- Mobile Store homepage with eMarketing Spots with ability to display content targeted to mobile users
- Side-by-side product comparison
- Wish list and email to contacts in the mobile address book
- Buy on mobile / pickup in store with inventory visibility across channels; available through integration to a Distributed Order Management system
- Store locator via ZIP code, city, or current GPS coordinates; as well as map with directions from current location to selected store location; available through a common API to integrate with Google Maps, MapQuest, Blackberry Map, and others
- User Registration with opt-in feature for marketing and coupons via SMS or email
- SMS text messaging to deliver personalized marketing and coupon promotions, order confirmation and status, alerts, store events and more
- Digital Wallet and Coupons to redeem online or at the store
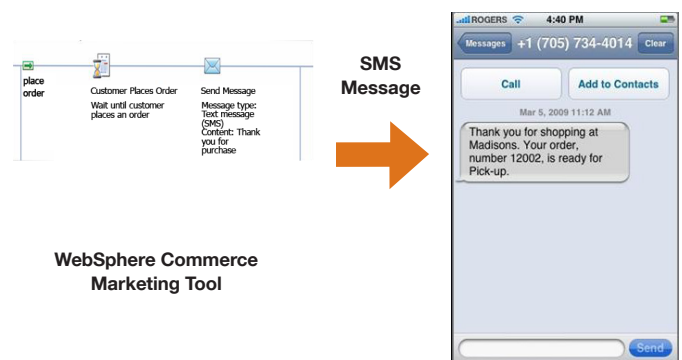
Mobile Web Store

Mobile Web Store

Mobile Catalog, Marketing and Promotions

Business users manage their catalog, Precision Marketing and promotions for diverse touch points (including web, mobile, contact center, kiosk and POS) via a common business user tooling; namely, the IBM Management Center for WebSphere Commerce. This greatly reduces the overhead, learning curve, and deployment time, while also creating a consistent brand image across multiple touch points and channels.

The Management Center catalog tool allows merchandisers to use a common product catalog across all customer touch points, or optionally create a sales catalog specifically for the mobile channel to promote products targeted to mobile users.

The Management Center marketing tool allows marketers to create rules for the mobile store to promote products targeted to mobile shoppers on predefined screen areas, called e-Marketing Spots.

The Cross-Channel Precision Marketing engine allows marketers to build and follow a dialog with a customer segment, or individual shoppers, by delivering contextual, targeted marketing messages to keep consumers loyal to the brand as they cross multiple channels. It can sense trigger events like abandoned cart, order placement, social media participation, and take actions to target shoppers with offers such as mobile SMS text messages or targeted product cross-sells and up-sells.

Marketing & Promotions

WebSphere Commerce Marketing Tool

SMS Message

WebSphere Commerce Marketing Tool
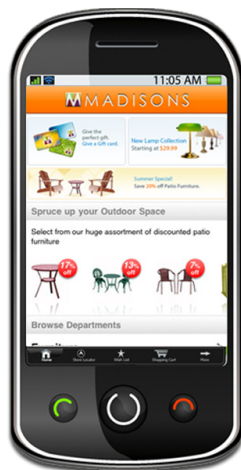
WebSphere Commerce Mobile Application Framework

The mobile application framework in WebSphere Commerce Version 7 enables retailers to deliver dynamic web content through JavaScript, HTML and CSS via a mobile web application. Furthermore, it is also able to leverage native smart phone functions by invoking the device API in mobile hybrid applications.

The mobile runtime framework provides configuration settings to identify device types and user agents in order to load the mobile store pages with device specific layout and navigation flow provided in CSS. As a result, shoppers can bookmark the same retailer web site URL address regardless of whether the shoppers are accessing the site via desktop or mobile browsers.

As shown in the following diagram, when a mobile shopper types the URL address of the retailer's website (1), the runtime framework detects the incoming request and renders the mobile store pages for the mobile browser. If the shopper downloads the retailer's hybrid application from an App Store (2), the runtime framework will recognize this and load a different CSS to provide the UI layout and navigational flow specific to that device.

Using the WebSphere Commerce Mobile Application Framework, retailers can develop a common mobile store for a mobile web application and a hybrid application as they

implement their mobile strategy to meet consumer demand for mobile solutions.

There can be potentially significant development and maintenance cost savings with this approach because majority of the code assets can be shared across the mobile web application and the hybrid application, and it is important to note that WebSphere Commerce can also support native mobile applications if retailers choose to develop native applications for their customers.

Summary

The mobile channel is the most personal touch point available to retailers and can be used effectively to strengthen the bond between a brand and its consumers; and a smart phone is the only device that delivers always-on web access with a personalized experience leveraging identity, purchase history, time and location. Hence, it is the ideal device to deliver relevant content and marketing messages to the selected consumers, at the right time, and at the right location, when leveraging location-based technologies.

However, in spite of the popularity of Apple's App Store and its native apps, a brand will be able to reach a larger number of its customers with a mobile web application solution due to its portability and compatibility across multiple smart phones, its ease of discovery by consumers through Internet searches and its ease of publishing since a mobile web application does not typically require App Store distribution, and updating the application does not require consumer action.

The mobile commerce solution introduced by IBM as part of WebSphere Commerce Version 7, provides a seamless

integration between the Mobile channel and other channels supported by retailers; such as the Web, Contact Center, Kiosk, or Point-of-Sale. The versatility and power of the IBM mobile commerce solution stems from its ability to leverage the customer profile, purchase history, order information, catalog, business user tooling and precision marketing available to the web channel; thus, creating a tight relationship between mCommerce and eCommerce without having to replicate catalogs, promotions, or marketing campaigns. This allows retailers to deliver consistent brand experience with uniform product and pricing information, as well as inventory visibility across channels. Furthermore, retailers have the flexibility to target catalog content, campaigns or promotions only to consumers using the mobile channel.

The impressive growth and adoption rate experienced by mobile commerce will continue for the next five years. This growth is being fueled by the ubiquitous wireless broadband coverage and affordable "all you can eat" wireless data plans; as well as by the success of the Apple iPhone, the Android-based smart phones, and the availability of application stores being deployed by smart phone vendors, wireless carriers and operating system providers.

The power of mobile commerce lies in its ability to influence multichannel transactions with a device that is always on and always with us, and the IBM WebSphere Commerce mobile commerce solution allows retailers to develop relevant and intimate relationships with its customers as they seamlessly traverse channels.

Further Reading
For more information on IBM WebSphere Commerce, please visit www.ibm.com/websphere/commerce/ or contact your IBM sales representative.

For additional details on developing a cross-channel solution with WebSphere Commerce, please refer to the redbook: "Building Multichannel Applications with WebSphere Commerce"

For the technical details on developing WebSphere Commerce mobile applications, please refer to "Building mobile applications for WebSphere Commerce using the hybrid application programming model" in the IBM DeveloperWorks.

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