Mobile Commerce: Beyond E-Commerce

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Abstract

Throughout the 1990s the introduction of the internet and ecommerce reshaped the way that businesses do business and the way that consumers interact with businesses. One clear example is the way that spending on advertising has begun to shift from traditional off-line media to online and digital media as advertisers have seen an opportunity to better connect with their target audience. IBM forecasts 22% growth in mobile, digital and interactive advertising format between 2006 and 2010 against 4% growth in traditional advertising formats. Mobile commerce, often referred to as m-commerce, builds on the advances made by e-commerce (such as automated, electronic processes) but makes interaction available to a wider audience in a more personalized way. There are currently over 3 billion mobile phones worldwide. It means that approximately 40% of the world's population currently carries a mobile phone. Mobile phone adoption continues to grow. By 2012, it is expected that there will be 5 billion mobile phones worldwide. In many developed countries mobile phone penetration is well above 90%, so saying "everyone has a mobile phone" is very close to reality. 'Brands and agencies are being forced to change their advertising strategies to engage with consumers and create a dialogue, rather than simply push messages to them'

Keywords

E-Commerce, M-Commerce, Internet Mobile Phones, Business Applications

I. Introduction

Mobile Commerce refers to wireless electronic commerce used for conducting commerce or business through a handy device like cellular phone or Personal Digital Assistant (PDAs)), a smartphone, or other emerging mobile equipment such as dashtop mobile devices. Mobile Commerce has been defined as follows: "Mobile Commerce is any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer-mediated networks with the help of an electronic device." It is also said that it is the next generation wireless e-commerce that needs no wire and plug-in devices. Mobile commerce is usually called as 'm-Commerce' in which user can do any sort of transaction including buying and selling of the goods, asking any services, transferring the ownership or rights, transacting and transferring the money by accessing wireless internet service on the mobile handset itself. The next generation of commerce would most probably be mobile commerce or m-commerce. Presuming its wide potential reach all major mobile handset manufacturing companies are making WAP enabled smart phones and providing the maximum wireless internet and web facilities covering personal, official and commerce requirement to pave the way of m-com.

Fig. 1:

II. Executive Summary

This is to demonstrate the reality of mobile commerce for businesses and consumers. It ties together three basic trends:

A. Consumers are Changing Their Behaviour and Expectations with Regard to Shopping and Brand Loyalty

• Mobile phones and the web are now allowing people to be more connected than ever- messages from other consumers are often more valued and trusted than messages fromcompanies.
• Consumers respond positively to businesses that take the time to understand their needs and offer excellent customer service. Mobile technology allows businesses to become more serviceoriented in what they do and to tailor what they provide to better meet the needs of individual consumers.

B. Businesses are Changing the Way They Do Business

• Businesses are looking for innovative ways to enter into a relationship with consumers. Technology is allowing a two-way dialogue between brand owners and consumers to be real.
• Businesses are also recognising the value of collaborating more closely with business partners and competitors. Sharing information about consumer behaviour and supply chain processes is of critical importance.
• Businesses are taking advantage of advances in technology to work faster, leaner and more intelligently. Small businesses are no longer at a disadvantage since complex business applications are available via the internet at low cost.

C. Mobile Phones are Enabling These Changes to Happen on a Global Scale

• There are over 3 billion mobile phones worldwide. This means that over 40% of the world's population carries a mobile phone, far more than use a computer or have access to the internet.In many developed countries, mobile phone penetration is above 90% and developing countries are catching up fast.
• Closer, more personalised relationships between businesses and consumers are possible via mobile phones.
• Emerging applications and services that add value to physical products and brands and go beyond limits previously imposed (such as extended packaging) already exist today on mobile phones.
• Existing business issues (such as inefficient couponing) can be resolved effectively using mobile technology.
• Convergence of different technologies on single devices that are available anywhere and anytime is allowing existing technologies (such as the internet) to evolve and extend their reach even further. Six business applications have been identified as particularly relevant in the supply and demand chain.
• Extended packaging: consumers access additional information about products through their mobile phone.
• Content purchase and delivery: digital products such as videos, games and music can be trialled and sold via mobile phones.
• Mobile coupons: mobile phones are used both to capture and redeem coupons and discounts.
• Authentication: mobile phones are used to check whether or not a product is genuine.

• Re-ordering: Mobile phones are used to reorder products with orders sent to the supplier in a standard format.
• Mobile self-scanning: consumers in supermarkets use their mobile phone (rather than a device supplied by the supermarket) to scan products as they do their shopping.

These opportunities and what mobile commerce will look like in the future depend on the creation of an open and neutral infrastructure trusted by both businesses and consumers to enable a fast and easy adoption of the technology, to reduce the cost of the initial investment for businesses and to facilitate innovation and to allow interoperability between all technology components across applications and geographical locations.

III. Mobile Commerce Overview: Why Mobile is Changing the Way Business Happens

A. How Mobile Phones Have Changed Our Lives

Over the past 10 years mobile phones have changed the way that we live and work. What is the nature of this change? On the one hand, it's a change in pesonal freedom. The mobile phone seems to give us more power as individuals to do what we want and be who we want to be. Many people considermobile phones as extensions of themselves. This is shown by the wide variety of mobile phones available and the myriad ways of transforming each phone into a truly personal device. These days it's more likely that you'll forget your keys than your mobile phone when you leave home in the morning. As technology advances, mobile phones are able to be used to extend the reach of the person and delegate many functions that would previously have been more time consuming or would have to be carried out in person. As individuals, we expect to be able to do things whenever we want to and mobile phones are core devices enabling this expectation to be fulfilled. This means that there is a fundamental shift in our perception of space and time - of what is possible where and when. On the other hand, mobile phones are connecting people more than ever before and becoming new glue holding together social interactions and relationships. A mobile phone makes us available to others, be they businesses or individuals, 24 hours a day, 7 days a week. This is an enormous break with the past, when we needed to know where a person was in order to contact them. It gives enormous opportunities for businesses to really connect with and understand consumers and for consumers to have more meaningful relationships with businesses.

B. The Mobile Industry

There are currently over 3 billion mobile phones worldwide (Informa, Nov 2007). How can we make sense of this huge figure? It means that approximately 40% of the world's population currently carries a mobile phone. Mobile phone adoption continues to grow. By 2012, it is expected that there will be 5 billion mobile phones worldwide. In many developed countries mobile phone penetration is well above 90%, so saying "everyone has a mobile phone'" is very close to reality.It's more likely that you'll forget your keys than your mobile phone when you leave home in the morning. On average, mobile phones are replaced every 18 months (2006, Semiconductor Industry Association). In some markets, such as Japan and Korea, mobile phones are replaced as often as every 6 months amongst certain consumers. This means that new technology becomes adopted extremely quickly (normally within 2 replacement cycles). As of May 2007,
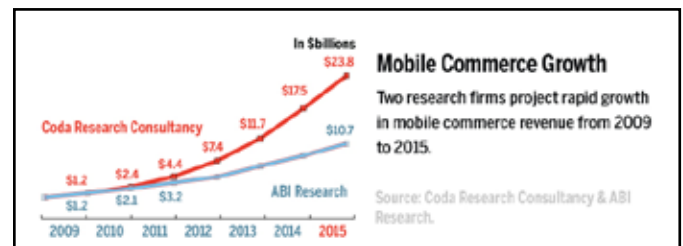

Fig. 2:

already 1 billion camera phones had been sold, an incredible number given camera phones were only introduced in 2001. SMS has been another success story for the mobile industry. Text messaging is the most widely used data application worldwide. According to the TNS Mobile Trends Guide 2006, 72% of all mobile subscribers were active users of SMS. Adoption has been rapid,with mobile subscribers in some countries sending up to 10 text messages per day. The International Telecommunications Union (ITU) estimate that annual SMS revenue is close to $100 billion.
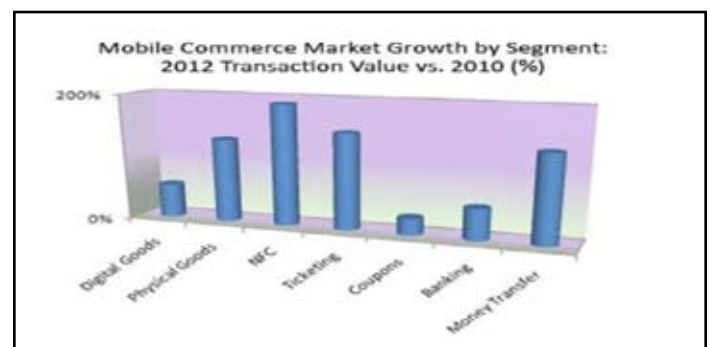

Fig. 3:

C. Mobile Phones: Revolutionary Devices

Mobile phones are central to the lives of most people in developed countries and are growing in importance in less developed countries. Since their mainstream adoption in the 1990s, they have remained primarily communication devices. We use mobile phones to talk to other people and we carry mobile phones with us so that other people can talk to us.
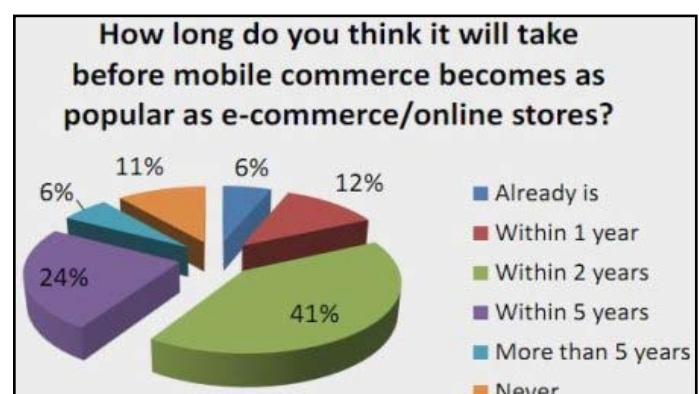

Fig. 4:

However, the situation is changing. Mobile phone manufacturers have developed mobile devices that can serve many functions beyond voice communication such as taking photos and listening to music. Mobile network operators are offering services that give greater value to subscribers, such as portable email for business users. Mobile phones are now equipped with cameras

with the potential to turn them into portable bar code scanners. Handset manufacturers are developing RFID chips that can turn mobile phones into mobile wallets able to carry and exchange electronic money securely and engage in other transactions with RFID readers in the physical world.The combination of more powerful mobile devices, more innovative mobile operators and change in the mobile network infrastructure (such as 3G networks able to carry large amounts of data at high speed as broadband connections do for computers) is setting the stage for an enormous change in a already fast-moving sector. Mobile devices are fast becoming the place where numerous technologies meet and create applications that are useful for both consumers and businesses across the globe. The mobile phone of the future is a device that enables users to communicate, connect, transact and innovate. In most markets, phones with the characteristics below are already becoming available: Acces to internet via a PC (millions), 850 Acces to internet via a mobile device (millions), 750 Billions of users

IV. Mobile Commerce Overview: Why Mobile is Changing the Way Business Happens

1. A communicative Device
The mobile phone will continue to be a device that is used to communicate with others.
Although this may be extended beyond voice to instant messaging and email, it is important not to forget communication is a central strength of mobile devices. As it becomes easier and cheaper to transfer larger amounts of data, sharing photos and videos with others will further extend this role.

2. A Connective Device
Mobile phones enable people to connect to other sources of data anytime, anywhere. This is what is happening with mobile email. As data on the web becomes more structured, mobile devices will become more and more powerful as entry points to tasks that have moved from offline to online but are currently still only available through fixed computers.

3. A Transactional Device
Mobile phones are ideal devices to be used for payments and transactions. There are a wide range of applications that aim to transform the mobile phone into an electronic wallet that can be used as a payment device.

4. An Intelligent Device
Mobile phones are a place where multiple applications can meet and fuse. Mobile devices that integrate a phone, a camera, a location finder (GPS) and a connection to the internet make it possible for a user to request context-dependent information such as finding out where a store selling a product they want to buy is located. As usage increases, mobile phones can become agents of change, tools that facilitate connecting things in the physical world to information about them in the digital world.

E. Mobile Commerce: Beyond E-Commerce

Fig. 5:

Throughout the 1990s the introduction of the internet and ecommerce reshaped the way that businesses do business and the way that consumers interact with businesses. Businesses took the opportunity to automate many processes that before would have been handled manually, from ordering to customer service. One clear example is the way that spending on advertising has begun to shift from traditional off-line media to online and digital media as advertisers have seen an opportunity to better connect with their target audience. IBM forecasts 22% growth in mobile, digital and interactive advertising formats between 2006 and 2010 against 4% growth in traditional advertising formats Mobile commerce, often referred to as mcommerce, builds on the advances made by ecommerce (such as automated, electronic processes) but makes interaction available to a wider audience in a more personalised way.Like any emerging market, there are many propositions about how to use this technology. Some organisations adopt an aggressive policy and want to get something moving as fast as possible whilst others adopt a wait-and-see approach. As a result, proprietary solutions are developed that make integration with existing systems or by multiple partners complex and costly. At the same time, multiple solutions create a complex landscape for businesses and consumers alike-making it difficult to choose which solution to use.The other difference between ecommerce and m-commerce is the opportunity to connect information with objects in a more direct way than has been possible until now. This is the world predicted by the Internet of Things, a report published by the International Telecommunications Union (ITU) in 2005, where objects have a life and history of their own that we can use to our advantage. The mobile phone can be the tool that connects the physical and virtual world. At the base of this vision is the ability to identify objects uniquely. GS1, with over 30 years experience developing identification standards for the supply chain that have been adopted globally, clearly has a role to play here. In this context, mobile phones are enablers of an cInternet of Things. What is special about mobile phones is the fact that they have massive adoption globally. Many more people have access to a mobile phone that to a computers and this means that m-commerce has the opportunity to connect not just big businesses but also small business and consumers on a massive scale. In this sense, mobile phones have the potential to bridge the digital divide and allow organizations and individuals to reach out to one another more easily than ever before.We're moving into a world where digital goods are becoming as important as physical goods. Due to the internet, value is created not just by goods themselves but

by the exchanges of those goods.Organisations that can facilitate that exchange (for example by creating communities of users with similar interests) have a significant competitive advantage in this networked world. Furthermore, these communities can be leveraged to increase sales of physical goods through more engaged users.We know we can't predict the future. This document is a way to reflect on the future together and to stimulate ideas about how to shape it.

V. Mobile Marketing: Towards Personalisation

Mobile marketing has the potential to fundamentally change the way consumer marketing occurs.Instead of a campaign-based approach, there is a shift towards a dialogue where consumers are willing to share information and marketeers are able to make use of that information in a more valuable way. Over time, businesses build up a relationship with consumers in which each considers the other as a trusted party. Four key factors distinguish mobile marketing from other more traditional forms of marketing:

A. Permission-Based

Unlike the interruption model that characterises television advertising, direct mail and other forms of mass marketing, consumers need to give their permission before being marketed to.

B. Targeted

By agreeing to share information about themselves and their buying habits, consumers allow businesses to improve the relevancy of the offers they send out.

C. "Live"

Because of the nature of mobile phones, responses can be processed to give realtime visibility of reaction to specific offers.

D. Two-Way

Using mobile devices, consumers can not only respond to offers but also request specific types of information or interest (for example, offers related to a brand or a category) as well as sharing information with their peers. Mobile has remained a much more trusted channel than email. Very strict rules have regulated marketing to mobile phones. As a result, unsolicited communication (spam) is not a problem in the same way that it is for email. The main aspect that differentiates mobile marketing from other channels is the ability to send the right message to the right person at the right time and so trigger a better response rate. Even though other channels can reach highly targeted groups, there is little control over time. Mobile marketing can target a supermarket shopper as they are entering the supermarket or a person going out to a bar when they are likely to be thinking of buying a drink. This time dimension enhances the effectiveness of mobile campaigns compared to other channels. For these new approaches to be successful, consumer trust and confidence should be an integral part any campaign.

VI. Business Applications: What's Possible and How?

This section gives an overview of the current and potential applications of mobile commerce.

A. Advertising & Promotion

Fig. 6:

1. Key Concept

advertising and promotional information is sent direct to mobile phones.
A consumer is in a shop. She is interested in a newcosmetic product but hesitates to buy. She noticesshe can view an advertisement for the product by taking the picture of the bar code. She does this and views the advertisementA consumer notices a billboard advertising for a handbag while walking down the street. By moving closer and activating the Bluetooth function of its phone, she is able to download a coupon to get 30% off the product in any shop today. She does this and receives the coupon in an electronic format on her mobile phone. This bar code will be read by an reader at the cash desk if she buys the product. She then uses her phone to find the location of the nearest shop.

B. Store Location

1. Key Concept

a map is displayed on a mobile phone showing where consumers can buy a product. A consumer is visiting the website for a product he likes. He is intrigued by a bar code on the web page.Information next to the bar code explains that by scanning the bar code with his mobile phone he can save a link to a web page that will show a map of where that product is available in relation to where he and his mobile phone are. Next time he's in town, he uses his phone to consult the map and is presented with different options for finding the product.

C. In-Store Navigation

1. Key Concept

consumers find products more easily when in a shopA consumer comes into a store is scans an RFID tag to turn their phone into a shopping assistant. They can now search for any product in the store and know exactly where it is (aisle, shelf), how much it costs, and any other information necessary to make a purchasing decision.

D. Comparison Shopping

1. Key Concept

consumers use their mobile phone to access information about product characteristics and price for related products A consumer is in a shop. She uses her mobile phone to access a web-based comparison shopping application. By scanning a bar code on a product, she is able to see the price of this product in different shops in her area. Having seen that the product is reasonably priced, she decided to buy it.Using a similar set-up, consumers could also access test results from consumer organisations or customer reviews.

E. Authentication

1. Key Concept

mobile phones are used to check whether or not a product is genuineA consumer is watching television. She sees a news report about a counterfeit pharmaceutical product. Using her mobile phone, she scans a bar code on the product packaging. She connects automatically to a anticounterfeiting application that checks the product's authenticity and tells her that the product is genuine.

F. Payment

Fig. 7:

1. Key Concept

mobile phones are able to make payment anywhere, anytime. A consumer walks into a small shop to buy a newspaper. By moving here mobile phone close to an RFID-enabled device on the cash desk, payment is deducted from a supply of electronic money stored on her mobile phone. At a vending machine, a consumer can buy a canned drink by moving there phone close to an RFIDenabled phone reader. Payment is deducted from the person's mobile phone bill. A consumer pays his bills by simply scanning the barcode on the bill and using his mobile phone to process payment

G. Ticketing

1. Key Concept

mobile phones are used to distribute and redeem tickets A concert-goer buys concert tickets online. When she pays she gives her credit card number. A unique bar code is sent by SMS to her

mobile phone. She gains entry to the concert by showing the bar code to a reader at the entrance. A traveller needs to take a metro train. He has bought an electronic ticket that has automatically credited ten journeys to his mobile phone. At the ticket barrier, he moves his mobile phone close to an RFID-reader which deducts one journey from his account as the gate opens.

VII. Evolution of M-Commerce

Despite of huge popularity of mobile commerce, it is yet in the initial stage and can be further expand in to all the fields, which affect the human life. The assumption of mobile commerce is not so young as it mushroomed so early from adopting this technology.

It initially begins with the use of wireless POS (Point Of Sale) swipe terminals and has since then made its way into cellular phones and PDA's (Personal Digital Assistants). The first enabling m-commerce technologies were presented through Wireless Application Protocol (WAP) and i-mode mobile Internet service. WAP builds on digital phone technology and first emerged on 2.5 G phone technology that allowed users to browse the Internet. This technology cemented the way of m-commerce, which has strongly developed on 3G-phone technology. The future of m-Commerce seems extremely bright because several experiments are going on to introduce the upgraded version of mobile likely to emerged with the evolution of 4G mobile technology.

References

[1] Tiwari, Rajnish, Buse, Stephan, Herstatt, Cornelius (Sept-Oct 2006),"From electronic to mobile commerce: opportunites through technology convergence for business services", Asia Pacific Tech Monitor, (New Delhi, (India), 23 (5), pp. 38–45. [Online] Available: http://www.global-innovation.net/publications/PDF/APTM2006.pdf.

[2] Troutman, Marci, Timpson, Steve,"Effective Optimization of Web Sites for Mobile Access: the transition from eCommerce to M-Commerce", Journal of Interactive Advertising, Vol. 9 (1), pp. 65–70, 2008.

[3] [Online] Available: www.roseindia.net/services/m-commerce/mobile-commerce.shtml mobile commerce.

[4] What isn't going to happen in 2008 (ABI Research, 2007).

[5] [Online] Available: http://www.searchmobilecomputing.techtarget.com/definition/m-commerce

[6] [Online] Available: www.gvsu.edu/ssb/ijec/ journal of electronic commerce

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