Mobile Payments Gain New Momentum in Evolving US Market

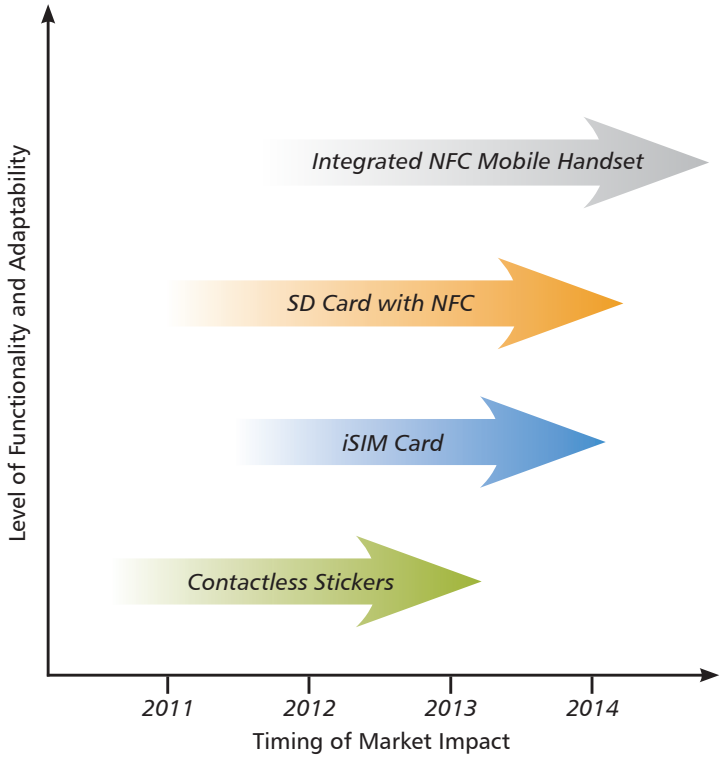
by Andy Castonguay and Nick Holland | August 2010

I. In the Face of an NFC Impasse, Mobile Payment Solutions Adapt and Expand

Despite market fragmentation, technological splits and battling business models, mobile transactions are gaining important momentum in the North American market. As a result of increasingly dynamic mobile users and an expanding base of smartphones, a growing array of payment mechanisms is reaching the market to take advantage of the power and flexibility of mobile devices.

Compared to international markets like Japan and Kenya, where mobile payments have become mainstream, the growth of mobile payments in North America has long been held captive by the dysfunctional morass of near-field communications (NFC) deployment strategies that have stalled due to adversarial negotiations among operators, payment card companies and retailers. Despite the slow pace of NFC adoption, innovative companies in the mobile payments space have established a number of competing technological payment options that have solid potential to impact the North American mobile market in the coming years (see Exhibit 1). These diverse technology options are designed to provide a solid level of functionality and will play an important role in helping shape consumer behavior and interest in mobile payments in the short-term future.

Exhibit 1: Primary Technologies in North American Mobile Payment Evolution
Source: Yankee Group, 2010



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At a macroeconomic level, market fragmentation among payment technologies is generally considered a detriment to the overall progression of the North American mobile payments market. While the growing array of payment approaches reflects an evolutionary stage in the market, until a unified standard is adopted, consumers will be forced to adapt and reconcile their various options. Regardless of which mobile payment standard or standards survive, North American consumers will soon encounter an array of mobile payment options they can adapt to their individual needs. In the midst of these changes, one thing is clear: This process will likely disrupt conventional business models for payments. The net result will be a markedly more active North American consumer base that will leverage the mobile phone's unique capabilities to shop, compare prices and ultimately pay for goods and services with accounts integrated into their mobile phones. Out of this diverse cadre of mobile payment solutions will emerge in the next few years a few key business models that will become the de facto standards for the region. Therefore, active and dynamic participation in these solutions will be strategically vital for companies that want to participate in this rapidly expanding field.

II. After Years of Stalemate, US Operators Attempt a Consolidated NFC Initiative

In North America, the progress toward nationwide NFC rollouts is not as advanced as in some European markets, but recent news points to strong progress among U.S. operators working to establish a consolidated NFC effort. After months of speculation, the industry journal NFC Times reported in late May 2010 that Tier 1 U.S. operators Verizon Wireless, AT&T and T-Mobile formed a joint venture to develop an NFC-based payment system that could offer a parallel transaction network to those already in place with Visa, MasterCard and American Express. The exact structure and strategy of the joint venture is indefinite, but guidance from operators suggests U.S. operators have abandoned efforts to reach a significant agreement with payment card companies to establish a single uniform approach to NFC deployment with the top card associations and have instead chosen to create their own path. In partnership with Barclays and payment card company Discover, the new joint venture could provide a powerful and competitive payment infrastructure that would allow for the swift deployment of integrated NFC mobile devices in the U.S. Regardless of the final outcome, the effort presents a strong challenge to the current set of players angling for position in the mobile payments ecosystem (see Exhibit 2).

Exhibit 2: Primary US Mobile Payment Players Continue to Jockey for Position

Source: Yankee Group, 2010

Players	Participants	Strategy	Pros and Cons
Payment Card Companies	MasterCard, Visa, American Express	Issue NFC stickers to complement contactless cards and develop app-based peer-to-peer payments and loyalty programs Provide infrastructure to mobile NFC payments over primary mobile networks	**Pros:** Preserves control of transaction fees, extends purchase base by creating new payment channel and displaces cash payments **Cons:** Strategy depends too strongly on operator cooperation and consumer adoption of either stickers and/or mobile NFC to ensure scale
Mobile Operators	Verizon Wireless, AT&T and T-Mobile; Sprint is still a wild card	Establish alternative payment system to existing payment card-controlled system	**Pros:** Offers participation in transaction revenue, plus billing fee revenue for carrier bill services and expansion of services base **Cons:** Increased risk of fraud, customer care costs and customer dissatisfaction
Payment Processors	First Data	NFC stickers, plus potential participation in new operator structure	**Pros:** Participation in new structure could generate potential increase in transactions processed and associated revenues, plus it diversifies its portfolio of revenue streams, decreasing exposure to payment card companies **Cons:** Increases risk in unproven carrier billing model and puts payment card relationships at potential risk

The creation of a new payment platform would help balance the carriers' desire for transaction fee revenue with retailers' interest in limiting their exposure to transaction fees from MasterCard, Visa and American Express. Long a point of contention between mobile operators and the payment card industry, the share of interchange fees will remain crucial in the development of new business models. While U.S. operators may still choose to work strategically with Visa, MasterCard and/or American Express through this process, retailers' interest in limiting the costs of mobile transactions provides a key driver for an operator-controlled NFC program to enter the market. An operator-backed payment effort using NFC must provide retailers with a better cost-benefit ratio than the payment card industry does. Should this effort reach fruition, it would represent one of the most remarkable market disruption strategies in recent history, shaking up the hegemony of the payment card giants and demonstrating the tremendous market power of the mobile industry as a collective bargaining body and an agent of market change.

Even with this potential progress, multi-party cooperation has historically been a tricky exercise within the North American mobile industry—one that North American operators have generally failed to execute successfully. Indeed, a payments joint venture made up of Canada's top three operators has yet to produce any significant market initiatives or changes in the few years since its inception. Therefore, if market history provides any indication, a joint venture among U.S. operators is not likely to succeed. However, the stakes are truly significant: If done correctly, the venture could transform payments and transactions in the U.S. It could be a powerful vehicle for expanding the role of mobile phones in the everyday lives of consumers and businesses and generate substantial accretive revenue for the operators. For this transformation to become reality, U.S. operators need to quickly adopt an approach that benefits the broader retail ecosystem and, by doing so, secure for themselves a key role in the future value chain of mobile payments.

III. Among Competing Technologies, NFC Continues to Hold the Greatest Potential

Among existing technologies being contemplated and used for mobile payments, integrated NFC holds the greatest promise to dynamically combine commercial mobile payments, content discovery, ticketing services and customer loyalty programs. The North American mobile market has a strong history of introducing competing technological standards and business models that challenge or prevent the broader overall advancement of the ecosystem. True to historical form, North America's NFC evolution has lagged due to competing ambitions of nearly every potential ecosystem participant, from operators to issuing banks. A prime example of a technological solution in search of a problem to solve, the deployment of NFC-enabled handsets has been limited for the better part of the last decade by core business model disagreements between operators and the payment card industry, not technological readiness or design.

At the core of the business model debate is the tremendous potential of transaction fees generated by potentially millions of consumers using their NFC-enabled phones as a method of payment. The primary issue of the stalemate has been the competing objectives of payment card companies, which are looking to expand their business without sacrificing their transaction fees, and mobile operators, which are hoping to secure a portion of transaction fees as a potentially lucrative new revenue stream. Without such a new revenue stream, mobile operators say it would be difficult to justify the additional costs involved with provisioning significant volumes of NFC-enabled phones. With or without equitable agreements between operators and payment card associations, the forward march of NFC will continue despite the potentially fragmented approaches adopted by key players.

Yankee Group's forecast for NFC adoption and devices is based on the conservative premise that the major ecosystem stakeholders will struggle to establish common ground. However, should these players succeed in reaching a unifying strategy, the adoption curve could become much more aggressive. If Tier 1 operators were to broadly implement NFC across their device portfolios, the natural replacement cycle of mobile devices would drive NFC penetration to a critical mass within three years. As illustrated in Exhibit 3, the North American mobile market generates a large volume of devices and an aggressive replacement cycle that could quickly alter the mobile device landscape as well as the overall payments market.

An additional catalyst to mobile payment adoption is the growing demand for payment services among the expanding base of smartphone users in North America. While most working models of NFC phones from OEMs are designed using feature-phone-level devices, Yankee Group's consumer research in North America indicates that smartphone users will likely become the trendsetters with regard to NFC usage. When we asked consumers with mobile data packages (an increasingly mandatory aspect of smartphone ownership) whether they are interested in mobile payments, the resounding response is in the affirmative. In fact, the 40 percent of survey respondents who say they use the mobile Internet monthly, weekly or daily are far more likely to have completed a mobile payment in the last three months compared with those who use the mobile Internet less frequently. And 64 percent of this target market say they are willing to pay a premium for the ability to make mobile payments. Consequently, consumer demand for mobile payment services will likely rise in step with the expanding market of smartphone users.

One of the primary pillars of an NFC ecosystem is the deployment of a ubiquitous network of NFC readers at point-of-sale (PoS) terminals for retailers and merchants. Despite early NFC deployment initiatives by such prominent enterprises as McDonald's, CVS and Walgreens, the overall penetration of NFC readers at U.S. cash registers is still less than sufficient to support a rapid expansion of NFC-based payments. This will change in 2010, as the payment card industry is requiring all merchants to adopt new security software and compliance rules. Since PoS terminal manufacturers including Hyperion, Verifone and ViVOtech began to integrate NFC as a standard component of most new terminals in 2008, the upgrade cycle of PoS terminals will help expand the penetration of NFC/contactless readers in the North American retail market.

Exhibit 3: North American Device Market Could Facilitate Swift NFC Adoption

Source: Yankee Group, 2010

	2009	2010	2011	2012	2013
Total Number of Subscribers (millions)	307.6	315.1	321.2	325.5	328.3
Devices Sold (millions)	129.7	133.5	160.3	163.4	173.2
Advanced OS Phones (millions)	22.3	27.3	41.5	42.3	61.9
NFC-Enabled Devices (millions)	0	.164	1.5	6.1	13.4
Percentage of Consumers Upgrading per Year	48.7%	52.6%	54.0%	56.2%	57.0%

Case in Point: French NFC Effort Highlights Potential Ecosystem Structure for North America

In May, the first "pre-commercial" deployment of a complete NFC ecosystem was launched in Nice, France. One notable feature of the Nice NFC deployment that could be instructive to North American market players is the well-defined roles and value propositions for each stakeholder—the merchant/transit provider, the bank, the card network, the mobile operator, the mass transit company, the trusted service manager (TSM) and, most of all, the end-user. As Exhibit 4 outlines, this model creates no disintermediation—mobile operators are not billing for transactions to a mobile account, banks are not attempting to bypass operators and retailers are using traditional card brands for billing rather than alternative payment networks.

Whether the Nice initiative is successful is yet to be determined. Recent history is littered with payment initiatives that worked fine in a pilot setting, but failed miserably when released in the wild. With such well-defined roles, the Nice initiative at least appears to have addressed the major obstacle of "What's in it for me?" for stakeholders, and it is expected to lead to a national rollout of the technology.

IV. Alternatives to Integrated NFC Sparking Innovation and Consumer Behavioral Shift

In the face of the long-standing impasse between operators and the payment card industry, many mobility and payment players have chosen to create a "bridge" between existing consumer behavior and business models using NFC stickers. Issuing banks will be able to work directly with their merchant customers or with the card associations to distribute various types of contactless technology—ranging from SD cards containing contactless sticker functionality to 2-D bar codes to plain old contactless stickers—to end-consumers. Although certain business model issues still exist, the ability of alternative technologies to offer a payment mechanism while also potentially disrupting strong players in the value chain makes them an intriguing option among the diverse mobile payment options in 2010.

Exhibit 4: Benefits of NFC Deployment for Ecosystem Stakeholders
Source: Orange, Gemalto and Yankee Group, 2010

Stakeholder	Value Proposition
Merchant	Increased volume and value of card transactions
	Reduced cash handling costs
	Real-time coupons and loyalty promotions to devices
Transit Operator	Reduced cash handling costs
	Reduced ticketing costs
Banks	New, novel way of paying
	Increased share of small-value transactions
Card Networks	Retention of interchange fees for small-value transactions
	New, novel way of paying
MNOs	Handset sales
	SIM rental revenue
Trusted Service Manager	Revenues from activation and secure management of card data on SIM
Mobile Subscriber	New and innovative means of interacting with the physical environment
	Faster and more convenient way of transacting

NFC-Enabled SD Cards Target Highly Prized Smartphone Customers

This solution, primarily championed by Tyfone, is capitalizing on the number of mobile devices containing a microSD card slot already in the marketplace today. The growing penetration of microSD cards in smartphones and top-tier quick messaging devices makes this solution one of the best-positioned technologies for adoption. Increasingly, consumers are accustomed to SD card solutions for music and media files. Adding payment capabilities represents an important enhancement to the microSD-enabled devices of a growing number of consumers. But the most important value of an SD card solution is that a business model problem does not exist. Consumers are already conditioned to pay for SD cards, so with the falling cost of memory, integration of an NFC/contactless component could be done at minimal cost to the end-consumer. Depending on where the contactless chip and antennae are positioned, and as long as performance is not degraded, SD cards can sidestep some of the business model problems of other NFC solutions, including the added costs and logistics of embedding the technology in mobile devices (see Exhibit 5).

Exhibit 5: SD Cards Are Inexpensive but Could Cause Usage Problems
Source: Yankee Group, 2010

NFC-Enabled SD Cards

Strengths	Weaknesses
• Cards utilize existing device architecture commonplace in the majority of mobile handsets. • SD cards are inexpensive; NFC could piggyback on existing memory cards to provide dual functionality of contactless interface and memory. • Banks may like that the model of issuing credit and debit cards could still remain somewhat under their control.	• SD cards are not embedded in the device and are likely to be single-function. Multiple-application deployment/ partitioning could be problematic. • If cards are placed in devices not designed for NFC interoperability, problems could result in terms of usage. A bad user experience could affect NFC adoption.

Contactless Stickers Are Gaining Ground Due to Simplicity

Of current-generation bridging technologies, contactless stickers have gained the greatest amount of publicity and commercial adoption in the U.S. The concept is very straightforward: Attach a sticker containing the necessary contactless chip technology to a mobile phone or other form factor, and the device can then interact with existing contactless architecture. Stickers can be used in open-loop systems, such as making retail payments with the Visa or MasterCard payment networks, or in closed-loop situations, such as university campuses or mass transit networks. Vendors offering this technology include First Data Corporation, ViVOtech, Inside Contactless and Bling Nation. Considered a bridging strategy by proponents, contactless stickers provide users with an experience that emulates a few core characteristics of the payments process facilitated by a mobile device with fully integrated NFC. While lacking the interactive and dynamic capabilities of a truly integrated NFC device, contactless stickers allow issuers to give clients a "tap and go" payment approach with mobile phones without the complexity or cost of providing an NFC mobile phone. As highlighted in Exhibit 6, stickers allow consumers to leverage the growing number of cash registers and PoS card readers that accept contactless payments in a simple, single-function approach.

Exhibit 6: Even with Limited Functionality Potential, Contactless Stickers Help Bridge the NFC Gap
Source: Yankee Group, 2010

Contactless Stickers

Strengths	Weaknesses
• Stickers receive a high degree of backing from card issuers, payment brands, contactless hardware manufacturers. • The usage case is simple: Attach sticker and use as a "card" where accepted.	• One card, one use: Each card issuer would require a separate sticker to be issued. There is therefore a simple issue of available real estate on the back of mobile devices. • End-users have shown reluctance to deface their handsets with a sticker that may also be an invitation for theft.

Case Study: BMO Bank of Montreal Leads Trial of Contactless Stickers

In November 2009, BMO Bank of Montreal's research and development executives initiated a controlled trial to test the efficacy of and customer reaction to contactless/NFC payments and to give its IT team and partners a chance to learn the back-office realities of the technology and process (see Exhibit 7).

BMO's research and development chose the sticker form factor over integrated mobile phone, key fobs, credit card and SIM card formats due to its simplicity. To add interactive functionality to the trial, BMO employed MasterCard's inControl application to generate instantaneous e-mail alerts to the smartphones of trial participants for each purchase made with the stickers. BMO reported that trial participants generated both a greater average number of transactions and an increased average "basket size" of transaction value compared with their normal card purchase behavior. From the participants' perspective, users particularly noted improved speed of transactions when using stickers (less than 10 seconds) compared to the average 22 seconds typically associated with a chip and PIN payment, the primary form of card payment in Canada. Bank officials noted the sticker's convenient form factor, speedier transactions and dynamic purchase alerts as the key elements in generating the overall favorable reviews from trial users. While BMO executives view contactless stickers as a bridge technology on the road to NFC, they also view the flexibility and performance of the inControl software combined with the improved spending behavior as extremely positive characteristics of the contactless solution and a favorable indicator of future mobile payments acceptance. While a truly integrated mobile NFC offering would allow companies to reach the largest swath of consumers, the BMO trial demonstrates that mobile data connectivity and performance is improving at such a rapid pace that an integrated NFC chip in a handset is no longer the only approach to providing robust payment, loyalty and couponing solutions.

iSIM Solution Provides NFC Functionality to Existing GSM Device Base

Motorola's ultra-thin (0.4 mm thick), wafer-like iSIM card is geared toward existing GSM phones that support NFC and non-NFC applications. With Motorola iSIM, financial service providers can issue their security tokens "into" their customers' mobile phones and offer financial services in a trusted environment that is not tied to a particular mobile operator (see Exhibit 8 on the next page). The iSIM actually fits between the SIM card and the phone, allowing financial service providers to manage the life cycle of the security tokens, including issuing, cancellation and renewal. While the versions currently being tested in the Chinese market only allow issuers to attach a single account to the iSIM, future versions will allow for multiple accounts and mobile wallet functionality. The current technology has an important limitation in the U.S. market, however, in that it cannot work with the CDMA phones issued in the U.S., since they do not contain SIM cards.

Exhibit 7: Details of BMO Bank of Montreal's Contactless Sticker Trial
Source: Yankee Group, 2010

Primary Project Sponsor	BMO Bank of Montreal
Trial Partners	Research In Motion, MasterCard, Inside Contactless and Giesecke & Devrient
Trial Time Period	Nov. 1, 2009 – Jan. 31, 2010
Number of Participants	120
PayPass Sticker Trial Parameters	Per-transaction limit: $50; daily limit: $200

Exhibit 8: Motorola iSIM Transforms Existing Devices, But Opportunities Are Limited
Source: Yankee Group, 2010

iSIM

Strengths	Weaknesses
• Existing GSM devices can be retrofit to become NFC enabled. • As with an SD card solution, iSIM allows a bank to continue issuance of a "card."	• Only existing GSM devices can be retrofit in the North American market, as the region's CDMA handsets do not contain SIM cards. • As with contactless stickers, it is a one-card-per-device offering, drastically limiting usage scenarios for mobile wallet opportunities.

2-D Bar Codes Create a Multifaceted Tool for Businesses to Engage Customers

Produced under many different brand names, 2-D bar codes have had significant success in other markets—notably Southeast Asia, where they are commonly used for loyalty, couponing and retail payments. In the U.S., the technology has yet to become mainstream, but it is a leading tool among the growing field of mobile coupon services (see Exhibit 9). While older phones may not have sufficient light and screen resolution to support the technology, current-generation smartphones have no such problems and most future smart feature phones will also have the screen technology to be compatible with 2-D bar codes. In fact, Yankee Group surveys indicate interest in mobile coupons has reached levels greater than 70 percent of survey respondents in the U.S., indicating that it is fast becoming a service suitable for the addition of mobile payments. There have been some notable pilots, and vendors include mFoundry, Scanbuy and Microsoft.

Exhibit 9: 2-D Bar Codes Are Appealing, But Have Some Technical Glitches
Source: Yankee Group, 2010

2-D Bar Codes

Strengths	Weaknesses
• As a purely software-based solution, bar codes don't require handset upgrades or issuing of tokens equivalent to physical cards. • The technology requires minimal investment from retailers to upgrade PoS terminals, depending on age of current-generation equipment. • As software, many separate 2-D cards (in fact, an almost infinite number) can be stored on a single device, meaning usage is not necessarily limited to transactions with a specific retailer or bank.	• Reading 2-D bar codes from the display of mobile devices has some technical glitches. While current-generation smartphones may have sufficient light and screen resolution, older or less sophisticated devices may be ill equipped. • Given the payments industry's momentum toward contactless and NFC solutions, retailers are unlikely to embrace a system that is not a stepping stone to such solutions, but an entirely parallel path.

V. Conclusions

Although multiple competing intermediary technologies can approach the functionality of NFC-embedded handsets, such solutions are invariably limited by the static nature of the token, irrespective of whether it is on a sticker, an SD card or a SIM add-on. The only solution that can best replicate much of the dynamic nature of NFC is the 2-D bar code. Indeed, bar codes may survive in the U.S. on a parallel path to NFC as an inexpensive means of adding informational tags on low-cost printed media, a usage case in which an NFC chip could be prohibitively expensive. However, as a payment mechanism, it is in direct competition to NFC and is unlikely to survive in the long term once NFC gains critical mass in the North American market.

Even though the short-term deployment of NFC handsets is highly dependent on the success of the coalition of Tier 1 mobile operators in the U.S., the growth of competing solutions provides added impetus for operators to develop their NFC solution quickly to benefit from the growing consumer demand for mobile transactions. The speed with which the Nice NFC deployment gains traction and moves to national rollout will be a bellwether for the viability of bridging solutions in North America, as well as their shelf life.

The window of opportunity for operators to define the parameters of the mobile transaction space is shrinking as competing solutions are gaining in both number and sophistication. The confluence of these factors and growing consumer demand for mobile payment services underscores the compelling case for mobile transactions becoming an important growth trend in the North American mobile market, especially once Tier 1 operators establish a cohesive market strategy. Whether the path is paved primarily by bridge technologies or by NFC, the shift to mobile transactions will become a fundamental element in the lives of mobile users and create a crucial point of interaction between consumers and their mobile operators, banks and retailers.

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