Will NFC revives mobile payment?

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A Brief History

Less than 2 weeks ago, the Infocomm Development Authority of Singapore (IDA) announced that major industry players have agreed to collaborate to establish an interoperable infrastructure to commercially deploy mobile payment using Near Field Communication (NFC) technology. Spearheaded by the IDA since Jan 08, the NFC Industry Roundtable comprising members from telcos, banks and payment service providers including MobileOne, SingTel, StarHub, DBS, OCBC, UOB, BCS, EZ-Link, NETS, MasterCard and Visa have agreed on an collaborative approach after more than a year of discussions. In addition, government agencies such as the Ministry of Finance, Monetary Authority of Singapore and Land Transport Authority were also involved.

Since late 2000, the IDA has been working hard to facilitate industry players and consumers to adopt mobile payment as the alternative payment mode in the island. More than a catalyst, the IDA initiated the first Call for Collaboration (CFC) for Mobile Payment Systems in May 2001. This CFC resulted in the formation of 4 consortiums comprising banks, telcos, mobile phone manufacturers, payment service providers and retailers to embark on 5 pilot projects involving some 7,000 consumers – as a whole, this was probably the largest commercial trial in the world at that time.

Notwithstanding the intensive publicity, high mobile penetration of mobile users, availability of the then "state-of-the-art" mobile phone sets, mobile security solutions, mobile business applications and commitments of the consortiums and the IDA; the one-year trial didn't achieve the ultimate desired result – sustainable commercial roll out of mobile payment as an alternative payment mode and mass consumer adoption. There were various valuable lessons learned and the interested reader could go to the IDA website to download the entire summary report on the CFC. [(1)]

While telcos begun to face the challenges of implementing 3G mobile infrastructures and their associated telecommunication services, banks that once offered mobile banking via SIM toolkit and WAP started to withdraw their mobile banking services since early 2002; citing low usage and customer adoption as the main reasons. In the same period, major mobile phone manufacturers attempted to develop electronic wallet as part of their mobile phone application and some collaborated with overseas banks and payment service providers such as Visa and MasterCard. None of these applications found inroads into Singapore or countries in the region. In 2005, OCBC launched its mobile banking services over the 3G network with one of the telcos and is still the only bank in Singapore that steadfastly believes in the potential and power of the combined platform of mobile communication and the internet.

Challenges Ahead to revive Mobile Payment

Industrial observers noted several reasons for the slow start of mobile payment and mobile commerce since 2002/03. Amongst the various reasons, the common ones that were often cited were the lack of collaboration amongst the various players; namely banks, telcos, payment service providers and mobile phone manufacturers - all parties wanted their lion share of what is known as "mind-share" or "wallet-share" of the customers, cumbersome user registration process, complicated steps to effect the payment transaction arising from security measures to protect the mobile users and the lack of motivation for users to switch to another payment option.

Having the benefits of implementing and managing Mobile Banking using SIM toolkit and WAP technology from 1999-2002 and the opportunity to be a key participant in the previous IDA CFC for Mobile Payment Systems from 2001-2003, I would like to highlight that many of the commercial and pilot implementation in the past were based on new mobile technology that were developed in that time. Besides the challenges of addressing evolving mobile technological issues in application development, infrastructure, mobile security and phone equipment, the implementers also have to tussle with legal framework governing mobile payment, different standards as well as educating customers to adopt new phone sets, new features and go through inconvenient user registration and authorisation processes to fulfill security requirements. These issues must be adequately reviewed and addressed before mobile payment can finally take off.

The recent IDA's effort to secure collaboration amongst the major industry players including regulatory bodies is commendable and is definitely a step in the right direction for the NFC mobile payment implementation. The introduction of the Singapore Standard for Contactless ePurse Application (known as SS 518 CEPAS) in end-Jun 2006 addressed the standard issues for all players so that a single standard that is inter-operable by all participants is now possible in Singapore. The issuance of the Guidelines for Stored Value Facility (SVF) by the MAS in Jun 2006 established the operating framework that governs the roles and responsibility of the 4 main players, namely User, Holder, Operator and Merchant. With this gazetted under the Payment Systems (Oversight) Act Chapter 222A, the legal issues are also addressed.

While standards and legal framework are set in motion, implementing this NFC-enabled mobile payment still requires successful execution of various key activities including setting up the necessary infrastructures to support NFC such as card readers, replacement and issuance of new cards, developing payment applications to use NFC, signing up of merchants to accept NFC enabled mobile payment and not to mention educating the mobile phone users. Above all, the solution must be commercially viable in a sustainable manner. While SS 518 provides opportunity for more market entrants into this payment arena to intensify competition for the benefits of consumers, it is left to be seen if the Singapore limited market size can support more players.

NFC as a technology has been adopted by various parties in the world including the GSM Association (GSMA) [(2)], Visa, Nokia and several banks in Canada, US and Spain back in Jun 2007 and MasterCard's PayPass in Nov 08. In Singapore, Ezlink and Starhub had completed their 6-month trial involving 1,000 NFC-enabled handsets in Apr 08. SingTel and NETS completed their internal NFC trial in Dec 07 and the public trial involving some 500 merchants was completed in Jan 09. However, a Dec 08 report by ABI Research [(3)] on Mobile Payment Technologies indicated that "NFC has developed more slowly than anticipated, and will not offer viable large-scale mobile payment solutions for at least 6 years. The report further noted that in the mean time, 3 existing technologies – SMS, mobile internet and downloadable mobile applications have the potential to deliver what NFC (so far) cannot."

As the results of the Singapore NFC trials by the 2 groups have not been announced, we are unable to assess if there are differences in consumer behaviour and other local factors compared to those trials carried out elsewhere. Nonetheless, it is worthwhile mentioning that introducing new technological solution requires significant investments and resources and in good economic climate, most organizations will be able to support such initiatives so that they can be in the forefront of competition. Given the current economic situation, there will be challenges trying to secure funding for investments in new technology and establishment of new business model.

Are there other options?

Do What We Know Best

According to the IDA website [4], there are 6.34 mil mobile phone subscriptions (comprising both 2G and 3G) as at end-Dec 2008 which translates to a mobile penetration of 131%; amongst the highest in the world. Over a 3 year period, mobile phone subscription grew by 149% but SMS volume (Dec 2005 to Dec 2008) grew by 159% confirming an increasing trend in SMS usage.

Now, let's list some perspective (and personal observation):

- Sms is a well established technology across multiple communication platforms (the first sms was reported to be transmitted back in 1992)
- All mobile phone in the market supports sms
- Sms is an internationally accepted mode of person-to-person text messaging and there is increasing trend of usage around the world (in the recent 7-day Chinese New Year period, a total of 10 Billion sms were sent by mobile phone users in China)
- Notwithstanding its limitation, sms has been used in numerous mobile application such as sms alert, ring tone download, survey and polling, one-time password to enhance internet security, location search, directory search, sms-chatting, sms-advertising, just to name a few
- In the MRT, if the students are not talking to each other, they are likely to be doing one or more of the 3 things; listening to music, playing on their portable playstation or smsing their friends

If the majority of the 6 mil mobile users in Singapore are familiar with sms, is there not a business case to use sms to secure the initial foothold to drive mobile retail payment in the micro-payment space?

Alarm bells are ringing for financial institutions, payment service providers, regulators and even some parents over this suggestion for the following reasons:

- Sms payment is a telco-centric model so banks and payment service providers are concern about losing mind and wallet share of their customers if this payment mode takes off eventually
- Regulators are concerned about security or the lack of it for authorizing payment via the sms mode
- Telcos themselves may be concerned over possibility of non-recovery of funds from post-paid mobile customers arising from sms payment in the previous months
- Parents whom are mostly paying for their children mobile phone plans could be concerned about excessive charging to the phone bills arising from indiscrete sms payment

While these are valid concerns, there are various benefits for exploring the viability of the sms micro-payment option.

Firstly, sms is already well used and understood by the majority of the mobile phone users especially the students and the young to matured adult population so customer education is no longer a major hurdle. Secondly, the sms infrastructure is well established and in some cases, expanding the bandwidth to meet higher demand becomes marginal cost to the telcos. Sms is a known technology and there are many mobile application developers who know how to develop application on it so integrating the sms-payment into existing check-out terminals at retail stores could be comparatively straightforward. There is no need to replace existing SIM card or for the user to upgrade or buy new phone set. Telco's existing billing system can be retained as the addition of this sms-payment is another line item in the monthly bill.

If the micro-payment using sms becomes popular, hopefully banks could see reduction in the volume of frequent small cash withdrawals at their ATMs which will lead to lower operating costs. Lastly, in this current situation, organizations and individuals are looking at how to spend less to get more.

One of the key obstacles that will throw this option out quickly is the issue on security. While it is a very important consideration, many online/mobile banking and e-payment implementation often resulted in having too many stringent security layers added over a simple transaction that makes the initial process no longer feasible.

To overcome this, the interested operator could start small by limiting the amount per sms transaction, limit per day as well as the total amount of non-telco services on the bill for that month. For instance, say not more than $20 per transaction, $50 per day limit and a maximum of $150 per month as exposure control mechanism. Such restrictions and other measures appropriately implemented will make it not commercially attractive for hackers or ill-intended parties to exploit the system.

Simple and Cheap ≠ Low Quality

Another area of possible contention is that given the republic's international reputation as an innovative and technological advanced island, adopting dated telecommunication technology such as sms seems to be out-of-place. Several years ago when two factor authentication solutions for internet banking was still been evaluated, I proposed a simple, cheaper and reasonably secured "bingo" card (paper based) solution but the proposal was not considered because of its simplicity and non-high tech appeal. Of course, the security level of a paper-based card with 10 rows and 7 columns cannot be compared with that of hardware token that can randomly generate 6 or 8-digit every minute. However, the paper-based card cost only a fraction of a hardware token and depending on the frequency and usage of the customers; it can present a reasonably effective security solution on top of the static PIN.

Whether the sms-micro payment initiative will eventually takes off much depends on whether there are parties who are innovative, courageous and believe in leveraging on tried and tested technology to deliver cost effective mobile payment solution with security level that is commensurate with the intended transaction value.

(1) Download IDA CFC Report:
http://www.ida.gov.sg/doc/programmes/programmes_level3/programmes/mobile%20payment/M-Payments_CFC_Report_March_2003.pdf

(2) GSMA is a global trade body for 700 mobile phone operators in over 200 countries in the world and GSMA has embarked on 2 initiatives to further explore the usage of NFC for mobile communication

(3) An overview of the report by ABI research can be found at the following url:
http://www.abiresearch.com/products/market_research/Mobile_Money_Services

(4) IDA-Statistics on Telecom Services for 2008 (Jul - Dec):
http://www.ida.gov.sg/Publications/20080904150745.aspx

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