Summary of Wireless@kth small project: TSM MoM¹
Trusted Service Management - a Multitude of Multitudes

General and objectives of the project

Background
Mobile wallet applications based on Near Field Technology (NFC) has been discussed for some years. The emergence and adoption of mobile ticketing and payment services is the result of a combined service and business development. This development also involves a number of challenges related to cross-industry communication and creation of new business roles and collaboration between companies. The adoption of NFC based services is not only a matter of the number of NFC enabled phones, payment terminals, readers, etc. Equally important is how the market is organized when the new services are based on interaction between different types of industries or businesses. This is especially the case when companies, sectors and industries previously have not been involved or engaged in each other businesses or sectors.

A number of trails and pilot projects have been conducted with third party actors taking the role as trusted service manager (TSM). In these trials the actor taking the TSM role is part of a constellation usually involving one mobile network operator, one bank or credit card company, one service provider or a few merchants. These types of trials very well demonstrate the technical feasibility of the service and the value for end-users. However, the business feasibility of the services of these trials is more difficult to determine. One weakness of these kinds of trials is that they lack generalizations or implications for the business domains. However, in “real life” multiple service providers in the same business (hotels) would need to be included, and service providers of multiple sectors and types of services need to be included. The NFC based service(s) would also need to be offered to customers of all operators, and, in the case of financial transactions, to customers of many banks and credit card companies. Hence, the “real life” business environment of an actor taking a TSM role consists of a “multitude of multitudes”, or even many “multitude of multitudes”. ¹

Project objectives and activities
TSM operations with many banks, operators, and service providers supporting a variety of services from different sectors are in focus of the project. The project will identify needs, drivers and anti-drivers for establishment of TSM actor in the market for mobile payment and contactless services. Candidate roles and value networks that will enable a service provisioning at market with a “multitude of multitudes” will be proposed. The activities of the project include to

1. describe and group different types of TSM actors and business models
2. to interview actors that have been involved in NFC trails and pilot projects
3. make a first list of drivers and anti-drivers for different sectors and services

¹ project web site http://wireless.kth.se/TSM_MoM/
Project partners

**Academic partner: Stockholm School of Economics**
Besides Wireless@kth researchers at the Center for Information and Communication Research (CIC) at Stockholm School of Economics have participated led by Professor Per Andersson and Assistant Professor Christopher Rosenqvist, see http://www.hhs.se/CIC/Pages/default.aspx

**Industry partner: Giesecke & Devrient**
Giesecke & Devrient (G&D) is an international technology group that provides security technologies for banknotes, security documents, and ID systems as well as smartcard-based solutions for telecommunications, electronic payments, and mobile applications. G&D offers a complete range of solutions for mobile applications with open and interoperable structures that support all common SIM standards, mobile devices, and operator networks. The TSM Venyon is a part of G&D. G&D provides mobile network operators with high-availability solutions for efficiently managing and monitoring the mobile devices of their customers. This includes:
- Mobile device management, SIM OTA (Over-the-Air) and lifecycle management
- Secure eBanking using PKI-based, OTP-based or web-based solutions
- Managing SIM cards, devices, and applications for M2M applications
- Near Field Communication (NFC) applications for payments, bonus and prepaid programs, public transport, access control, proof of identity

Research results and findings

The main finding in the project is that the expected “multitude of multitudes” of actors, i.e. multiple types of actors from many sectors cannot be identified at the market. For NFC services it still seems like the dominating commercial setup of actors are “one bank-one operator- one service provider”. All the real cases provided by the project partner Giesecke & Devrient are of this type. If we compare with other types of services this is not the case;
- the credit card system can be used no matter what bank that issues credit card to consumers or acts as acquiring bank for merchants
- SMS payments using the mobile phone bill can be used no matter what operator you have (Sweden is from 2013 an exception since operators in most cases not are involved)

However, there are a number of NFC trials and large pilot projects where multiple actors participate. The most well-know is the Citizy project in Nice, France, where many banks and many operators have joined the project. The Citizy project is well researched within the TSM MoM project, see the MSc thesis report by Riikka Murto (including a rich set of direct interviews with stakeholders) and the ICMB 2013 conference paper.

Although similar project are launched in other French cities we can conclude that Citizy did not result in any major breakthrough for NFC services. Transport ticketing was the most commonly used service and well adopted by consumers. However, the mobile payment services were not used at a large scale. A representative at Orange said a few hundred out of around 5000 test consumers regularly used the credit card payment service embedded in NFC enabled mobile phones. The number of merchants, restaurants etc was around 1000. It also turned out that credit card companies did not use the Citizy brand, they promoted their brands in parallel.

Our conclusion is that the actors and the markets are not yet ready for this type of cross-industry cooperation with cooperation between competitors. The existing business models still rules.
Publications
The research results in the project have been published in a number of papers; one journal paper, three conference papers, one book chapter and two MSc thesis project reports, see publication list. All publications are available at the project web site http://wireless.kth.se/TSM_MoM/?page_id=10

Other results and benefits
Contribution to research applications
The work in TSM MoM project has together with another Wireless@KTH project “Mobile P3” contributed to preparation of a number of research applications to Riksbankens Jubileumsfond, “Handelsbankens forskningsstiftelser” and Vinnova. The two last applications were successful and resulted in the MBT-MBT VInnova project (700 kSEK for 6 month) and a PhD student stipend from Handelsbanken (1 MSEK for 3 years of PhD studies).

Competence development and recruitment
The two master thesis students at SSE, Riikka Murto and Tatiana Apanasevic, both provided very good results and did show research skills and they have both been recruited as PhD students. Riikka is doing her PhD at SSE in the area of consumer aspects of mobile services and Tatiana is doing her PhD at KTH (Cos/ICT) in the area of mobile payment and NFC services.
In addition, Per Andersson has several times used the research findings and cases in education at KTH Executive School and in the Master programs for KTH and SSE students.

Resources and financials
The research funding was shared by Wireless@kth and Stockholm School of Economics. The low amount of resources consumed at KTH during 2011 is explained by the Vinnova funding for the project MBT-MBT running in parallel with TSM MoM. The Vinnova funding was available only until March 2012 and hence this funding was used first.

Ekonomisk redovisning projekt TSM MoM Agresso nr. 6469 org IFB

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Ekonomisk slutredovisning av Seed project TSM MoM
Wireless bidrag totalt: 500 000
Transfererat till HHS -225 000
Totalt förbrukat i projektet -274 255
Summa: 745
List of publications

All publications are available at the project web site http://wireless.kth.se/TSM_MoM/?page_id=10

Conference papers
Per Andersson, Jan Markendahl, Lars-Gunnar Mattsson,
“The role of global policy networks in service innovations – the case of NFC and turning the mobile into a wallet”, IMP Conference 2011, Glasgow, August 30 - September 3, 2011, pdf

Jan Markendahl, Per Andersson, Lars-Gunnar Mattsson,
“Can mobile eco-systems for technical innovations be standardized? – The case of mobile wallets and contactless communication”, 22nd European Regional ITS Conference, Budapest, 18-21 September, 2011, Pdf file available: pdf

Per Andersson, Jan Markendahl, Lars-Gunnar Mattsson, Christopher Rosenqvist;

Journal papers

Book chapters
P. Andersson, J. Markendahl, L.-G. Mattsson, ” Tjänsteinnovationer och marknadsomvandling – fallet mobila betalningar” (in Swedish), Kapitel 6 in I. Benson, J. Lind, E. Sjögren, F. Wijkström (editors); Morgondagens industri – Att sätta spelregler och flytta gränser, (EFI Yearbook 2011), Studentlitteratur

Master Thesis Reports

Tatiana Apanasevic, ”Obstacles and barriers to NFC pilots to enter commercialization stage”, Master thesis report KTH and Stockholm School of Economics, September 2012