Towards a ubiquitous mobile payment solution: Exploring NFC mobile payment business models

A case study on Google Wallet and ISIS

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Abstract

Background: The mobile payment industry is an emerging and highly lucrative market. Different technologies, such as NFC, have emerged, creating excitement and resulting in more and more companies to join the movement. Despite the turmoil, NFC mobile payment systems have been lagging behind its expectation. Issues surrounding the business model have been accounted for the slow market progressions, among others. The need for stringent and rigorous analysis of business models of m-payment services has been also identified by academics based on the relevancy and lack of such studies. Thus, this thesis seeks to address this research gap.

Purpose: This thesis sets out to study NFC-enabled mobile payment approaches on the basis of business model thinking

Design/methodology/approach: First, the mobile payment ecosystem will be examined, with the purpose to expose the dynamics between different stakeholders in the ecosystem as well as the underlying issues surrounded on NFC mobile payments. Second, extant research on business models, and especially originating from the mobile service field, will be enquired to construct a business model framework appropriate for the study of NFC m-payments. Third, the resulting framework will be applied to test its usefulness and expose the particularities of NFC business models to deploy a ubiquitous m-payment solution.

Contribution: The research has produced two significant outcomes that contribute to the research of business models and NFC mobile payment. First, the author developed the novel Business Model for Mobile Payments framework, which has been derived from extant research on business models and tested on two case studies. The findings suggest the applicability of the framework to deal with the complexity and particular characteristics of NFC m-payments and related business issues. It considers a broad range of facets that are seen as highly relevant in the m-payment domain. Second, the author provides a grounded understanding of NFC m-payment business models, based the case study on two promising mobile payment initiatives, i.e. Google Wallet and ISIS.

Research limitations/implications: Limitations of this thesis are due to the explorative and qualitative approach, and are to be complemented by other approaches. Researchers and practitioners can use the framework to analyze mobile payment business models. In addition, it enables them to communicate and share understanding of the different aspects surrounding the design of business models.

Keywords NFC mobile payment, mobile wallet, business model

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List of Abbreviation

BM	Business Model
JV	Joint Venture
MNO	Mobile Network Operator
M-payment	Mobile Payment
M-wallet	Mobile Wallet
NFC	Near Field Communication
POS	Point of Sales
SE	Secure Element
TSM	Trusted Service Manager

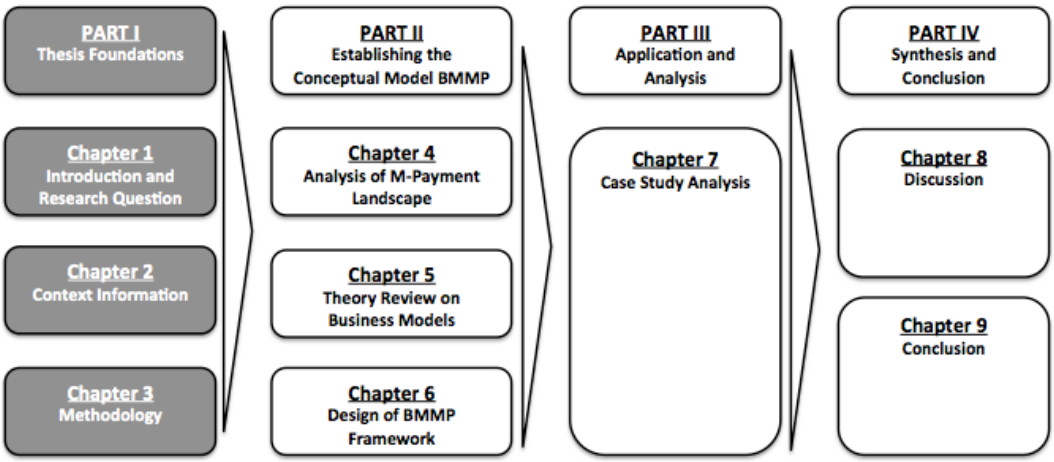
Glossary of mobile terms

App	Short and common name for mobile applications, apps provide proprietary services through a secure and easy to use program.
Mobile banking	Platforms that enable customers to access financial services (such as transfers, bill payments, balance information and investment options).
Mobile commerce	The use of wireless handheld devices, e.g. mobile phones or laptops, to conduct commercial transactions online. It includes activities such as mobile banking, mobile payment and similar.
Mobile payment	The process of using a hand-held device to pay for a product or service.
MNO	Mobile network operators are telecom companies with the proper radio spectrum licenses and infrastructure to deliver robust services to mobile phone subscribers.
NFC	Near Field Communications is a set of short-range wireless technologies that supports two-way communication of data such as banking information across short proximities.
POS	Location where a transaction occurs in exchange for goods or services.
Proximity Payments	Using a device or card with an integrated circuit chip, payment is made by bringing the device within 2 cm of an enabled POS terminal.
SE	A smart chip that ensures user authentication, authorization, and stores credentials; it houses confidential information.
TSM	Specific to mobile payments, the Trusted Service Manager enables service providers to distribute and manage contactless applications remotely by allowing access to the secure element in NFC-powered devices.

Thesis outline and introduction to part I – Thesis foundations

Part I – Thesis foundations – has three chapters. Chapter 1 provides the introduction into the thesis, outlines the motivation of the topic choice, and states the research objective. Chapter 2 continues with offering context information on mobile payments, especially on NFC. Lastly, Chapter 3 explains the methodological foundations of the thesis.

Figure 1: Thesis outline for Part 1



Source: author's creation

1 Introduction and research objective

1.1 Background

Over the past few years, mobile payments have been present like a storm on the horizon. They have generated a lot of heat and conversation, but yet have not reached with much energy. In fact, the first launch of mobile payments can be dated back in the late 1990s, somewhat fifteen years ago. Back then, Coca Cola introduced a limited number of vending machines that allowed customers to pay and vend a drink via text messaging (Gibbons, 2009). Since then, the mobile payment sphere has been subject to numerous approaches and initiatives by a number of different industry players. However, most of them tried and failed to reach mass market adoption (Dahlberg, Mallat, Ondrus, & Zmijewska, 2008). The wave of failures and slow market progression despite the lucrative promises damped the initial excitement towards mobile payment options. However, with the advancement of new technologies, such as near field communication (NFC) and the leap in global shipments for smartphones, mobile payments experiences a new boost in popularity.

Especially the rise of NFC technology created new excitement in the mobile payment industry due to its wide arrays of application, including payment options as well as ticketing, access control, data

sharing, marketing, and customer relation opportunities (MarketsandMarkets, 2012). This excitement materialized in a second wave of companies entering the mobile payment industry. Concretely, 200 pilots, trials, tests, and live services have been launched in more than 50 countries since 2008 (Richardson, 2012). It has been a period that is characterized by standardization efforts and NFC pilot projects in which intense research and development have been undertaken. Commercial launches emerged only in the last few years, with 2011 and 2012 being pivotal years. Many of the big mobile payment systems have finally started to roll out. A prominent example is Google Wallet, who initially piloted in two US cities in 2010 and then rolled out nationwide the following year. Another one is the much anticipated launch of ISIS, a joint venture of major US network operators, in October 2012.

The number of new entrants in the NFC sphere indicates the growing interest in the new billion-dollar industry. The market growth for NFC applications is expected to be exponential with growth in revenue from $7.7 billion in 2011 to $34.5 billion by 2016, at an projected CAGR of 35% during 2011 to 2016 (MarketsandMarkets, 2012). Juniper projections are more optimistic, suggesting a market size of $50 billion by 2014 (Purcell, 2011). However, claiming a stake in this lucrative industry is not an easy task. The traditional and established payment ecosystem is already complex. So, with new players entering the payment sphere, the new mobile payment ecosystem grows inherently in complexity (Galaski, Daley, Castonguay, & Lalka, 2011). The transition phase into the new payment era is characterized by uncertainty. Question marks are surrounded on issues such as technology, stakeholder's role division, and business models among others. Especially the latter is a crucial aspect and imposes challenges for stakeholders. Building the appropriate business model in coherence with the specifics of the complex ecosystem is regarded as one of the determining factors for the creation of a ubiquitous mobile payment solution.

1.2 Motivation

The author's interest in the research of mobile payments is motivated by a number of reasons. Academically, the subject of mobile payments is an interesting, yet challenging field of study due to its infancy. It received only wider interest in the middle of the 2000s with more and more peer-reviewed papers being published (Dahlberg, Mallat, et al., 2008; Henrique, de Albuquerque, & Cernev, 2011). However, most of these studies focused on consumer adoption factors and market analyses (Dahlberg, Mallat, et al., 2008). Little attention has been given to issues of business models in the context of mobile payment (Pousttchi, Schiessler, & Wiedemann, 2008). However, challenges in developing and implementing an appropriate business model have been identified by practitioners as one the major

obstacles and reasons for the slow progression to mass market (Asmundson, Brodeur, Raskin, Shniderman, & Openshaw, 2011; M. Crowe, Rysman, & Stavins, 2010).

In addition, a lack of research is also evident for mobile payments dealing with NFC technology. Past research (e.g. Dahlberg, Huurros, & Ainamo, 2008; Ondrus & Pigneur, 2007) were focusing on m-payments enabled through other technologies such as SMS or WAP. These two aspects, the need to investigate m-payment systems in the light of business models, and enabled through NFC makes the thesis topic relevant.

1.3 Research Objective

The background and the research motivation section have highlighted the relevance and lack of research for NFC-enabled mobile payment solutions, especially in the context of business models. Thus, the main objective of this thesis is:

To study NFC-enabled mobile payment approaches on the basis of business model thinking.

In order to ensure a structured approach and reveal new knowledge, the authors adopts following logic. First, the mobile payment ecosystem will be examined, with the purpose to expose the dynamics between different stakeholders in the ecosystem as well as the underlying issues surrounded on NFC mobile payments. Second, extant research on business models, and especially originating from the mobile service field, will be examined to construct a business model framework appropriate for the study of NFC m-payments. Third, the resulting framework will be applied to test its usefulness and expose the particularities of NFC business models to deploy a ubiquitous m-payment solution.

1.4 Conclusion

This chapter has provided an introduction into topic of mobile payments, and outlined the research motivation of this these. Based on this, the author set his main objective and provided the logic of the thesis.

2 Context information on mobile payment and NFC

2.1 Chapter introduction

This chapter provides general context information on m-payments. First, a definition of mobile payments will be provided. Second, a categorizing of the different mobile payments approaches will be offered. Lastly, the enabling NFC technology for contactless m- payments with its benefits will be briefly elaborated.

2.2 Defining mobile payments

At present, there are a number of definitions for mobile payment, and almost as many ways of categorizing it (Boer & de Boer, 2010). Often, confusion and overlap are apparent between mobile payment, mobile banking, and the utilization of mobile devices to simply receive deliveries or order goods while paying through different means. This calls out for a clear and widely agreed definition and taxonomy. For the purpose of this thesis, the author adopts the definition proposed by (Pousttchi, 2008):

> "M-payments are defined as a type of payment transaction processing in which the payer uses mobile communication techniques in conjunction with mobile devices for initiation, authorization, or completion of payment."

In other words, it refers to any payment transactions, i.e. transfer of funds in exchange for a good or service, which is both initiated and confirmed with a mobile device. The payment transaction, whether in-store or remote, is executed on a mobile phone. On the other side, mobile banking describes platforms that allow consumers to access financial services, e.g. bill payments, transfers, investment options or balance information (Siegel, Schneiderreit, & Houseman, 2011).

2.3 Categories

The confusion of what is considered as a mobile payment is also reflected on the various types of solutions in the market. Each of these mobile payment approaches take a different approach and uses different enabling technologies (cf. Table 1). As mentioned, this thesis will focus on contactless payments powered by NFC. It describes any payment transactions that are done at point-of-sale; all transaction participants (sender and receiver) are in close-distance.

Table 1: Overview of mobile payment solutions

	Technology used	Purchase relationship	Charged to	Examples
Proximity	**Contactless payments**			
	• **NFC** • QR Codes	• C2B • B2B • P2P	• Credit card • Debit card • Prepaid account	• Google Wallet • ISIS • Starbucks
	Hybrid payment devices (out of scope)			
	• Mobile device becomes a card reader through a hardware extension	• C2B • B2B • P2P	• Credit card • Debit card	• Square • Payleven • Verifone PayWare • Intuit GoPayment
Remote	**Message or browser payments (out of scope)**			
	• SMS • USSD • Web	• C2B • B2B	• Network bill • Debit card • Credit card • Virtual pre-paid account (PayPal)	• M-Pesa • Obopay • Roshan
	Application based payments (out of scope)			
	• Mobile money transfers • Virtual currencies	• P2P • C2B	• Bank account • Prepaid virtual account • Credit card	• PayPal • Starbucks • Facebook credits • Zong

Sources: adapted from (Verster, Botha, Davis, Kalan, & Burin, 2011)

2.4 NFC technology

NFC is a radio frequency/wireless connectivity technology that enables simple and safe two-way data transmission, usually up to four centimeters, between devices at a relatively low transfer rate (Deloitte, 2012). Consequently, it is not suitable for high-bandwidth applications such as video. However, it is ideal for exchanging small amounts of information with minimal power consumption and set-up time. In that regards, it outperforms other wireless technologies as Bluetooth or infrared. Other key benefits of NFC technology has been highlighted by (NFC-Forum, 2012), a non-profit industry association:

- **Intuitive**: NFC interactions require no more than a simple touch
- **Versatile**: NFC is ideally suited to the broadest range of industries, environments, and uses
- **Open and standards-based**: The underlying layers of NFC technology follow universally implemented ISO, ECMA, and ETSI standards
- **Inherently secure**: NFC transmissions are short range (from a touch to a few centimetres)
- **Interoperable**: NFC works with existing contactless card technologies
- **Security-ready**: NFC has built-in capabilities to support secure applications

2.5 Chapter conclusion

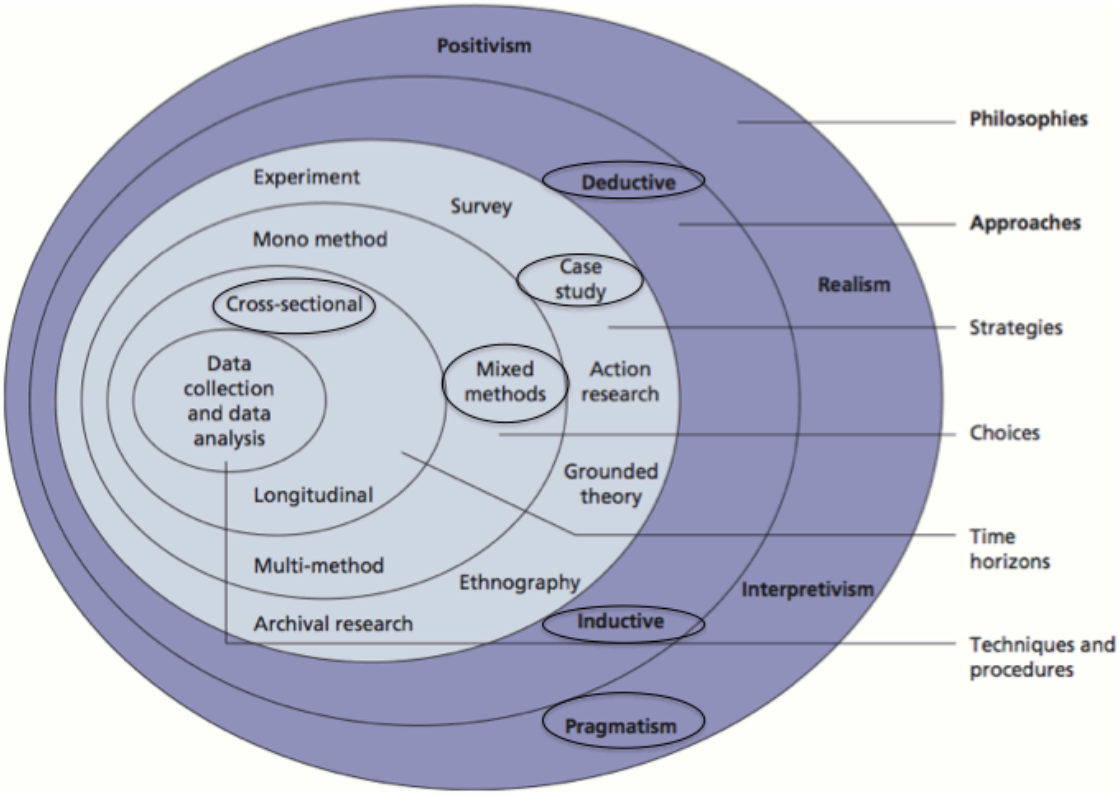
This chapter provided a definition of mobile payments, and distinguished between the different mobile payment approaches. Further, the enabling technology for contactless payments including its benefits has been outlined.

3 Research methodology

3.1 Chapter introduction

The objective of this section is to provide a detailed description of the applied research methodology. The author will follow the illustrative approach by Saunders, Lewis, and Thornhill (2009) to describe the utilized research methodology. They proposed the so-called six-layered research onion. Each of the layers with the adopted research approach (cf. Figure 2) will be elaborated in the following.

Figure 2: The applied research onion



Source: (Saunders, Lewis, & Thornhill, 2009)

3.2 Research philosophies

A research philosophy is a paradigm that depicts the manner one thinks about the nature of knowledge and its development. It contains central assumptions about the way individuals view the world (Saunders et al., 2009). The "ideal" research philosophy is depended on the particular research question(s) the researcher aims to answer. Saunders et al. (2009) highlight four dominant research philosophies, namely interpretivism, positivism, realism and pragmatism. They further analyze them according to their respective ontology (the nature of reality), epistemology (what comprises acceptable knowledge), axiology (the study of values and value judgments), and data collection method. It is out of

the scope to elaborate on the individual research philosophies. However, the author adopts the position of the pragmatist, which will be the subject of the next section.

3.2.1 The Pragmatic approach

The research objective takes a central role in the pragmatic approach. As such, pragmatists connect the choice of approach directly to the purpose of and the nature of the research question posed (Creswell, 2008). The approach comprises of adopting the method, which seem to be best suited to the research problem. Further, it involves not getting lost in a philosophical debate about which is the best approach. Consequently, researchers take the freedom to adopt any methods, procedures and techniques typically related to qualitative or quantitative research (Saunders et al., 2009). In fact, it is acceptable to work with variations within ontology, epistemology, axiology, and data collection techniques. They recognize that every method is subject to its limitations and that different approaches can complement each other. Table 2 highlights the pragmatist research philosophy along the four dimensions.

Table 2: The pragmatist research philosophy

Ontology	External, multiple, view chosen to best enable answering of research question
Epistemology	Either or both observable phenomena and subjective meanings can provide acceptable knowledge dependent upon the research question. Focus on practical applied research, integrating different perspectives to help interpret the data
Axiology	Values play a large role in interpreting results, the researcher adopting both objective and subjective points of view
Data collection techniques most frequently applied	Mixed or multiple method designs, quantitative and qualitative

Source: adopted from (Saunders et al., 2009)

3.3 Research approach

According to the structural and procedural requirements of the social sciences, a common distinction is made between an inductive and deductive approach. This thesis takes a mixed approach given its explorative nature. As such, the inductive approach is adopted to construct an appropriate and novel business model framework based on theory. The process begins with thinking or finding theories that fit the topic of interest. The inductive approach will then be taken to test and apply the developed business model framework in a relative new area of research, NFC mobile-payments. An inductive approach is appropriate for a topic that is relatively new, excited much debate, and on which there is only limited existing literature (Saunders et al., 2009). This dual approach allows the author to utilize the advantages of the deductive and inductive approach.

3.4 Research strategy

The research strategy is a plan of action that gives direction to the researchers efforts, so that the research can be conducted systematically rather than haphazardly. It provides a general plan for how to resolve the stated research question. Further, it will contain details on the type of data sources to be used, how to collect the data, and the constraints connected to it. Saunders et al. (2009:141) emphasizes that there is no research strategy that is inherently superior or inferior to any other. The applied research strategy adopts the case study method.

3.4.1 Case study

Given the multifaceted nature of mobile payments and its context-dependency, quantitative research strategies would not discover and address the particularities that are required in this exploratory study. As an exploratory study, the aim is to find patterns, ideas or hypotheses rather than testing or confirming them. Thus, the case study approach seems to be appropriate. Morris and Wood (1991) reason that case studies are valuable when the researcher's interest is to gain a thorough understanding of the context of the particular research field and the processes being enacted. Further, Saunders et al. (2009) argue that the case study approach helps to generate answers to the 'why?' as well as the 'what?' and 'how?' questions. Because of the ability to obtain complex details and novel understandings about the specific phenomenon of under investigation, the author adopts the case study approach.

However, there are certain limitations and criticisms attached to this strategy. For example, case studies take only a small data set into account, usually one or few companies, which may not offer the basis to establish the reliability of findings or make it difficult to generalize them. In addition, different researchers may have different interpretations of the same data, thus adding research bias into the equation. Although, the case study method may have an 'unscientific' feel to it, it is still a useful approach of exploring and challenging existing theory, as well as to provide a new source for new hypotheses (Saunders et al., 2009).

3.5 Research Choice

The fourth layer of the research onion depicts the researcher's choice to combine qualitative and quantitative techniques and procedures. Saunders et al. (2009) distinguished three main research choices: (a) mono method, (b) multi-method, and (c) mixed-method. The mono-method uses a single data collection technique and analysis procedure. In a multi-method more than one data collection technique and analysis procedure is adopted, but within a single paradigm, i.e. either within the quantitative or qualitative world view. Lastly, the mixed-method is a general term for the adoption of

both qualitative and quantitative data collection techniques and procedures. Methods that advocates plurality, i.e. multi- and mixed method, are progressively advocated within the research field of business and management (Curran & Blackburn, 2001).

In accordance with the subscribed pragmatic research philosophy, a multi-method research choice will be utilized. In specific, the author will adopt the multi-method for qualitative studies. As such, a combination of data from previous collected interviews and desk research will be used to answer the research question.

3.6 Time Horizon

In the fifth layer, Saunders et al. (2009) differentiates two different time horizons for research studies, i.e. cross-sectional and longitudinal studies. The former describes a study that is conducted at a specific time, similar to a snap shot. The latter depicts a study where the research is representation of events over a given time period, similar to a series of snapshots or a diary. Given the time constraint for the thesis, a cross-sectional study will be adopted

3.7 Research techniques and procedures

In the following, the author presents the research techniques and procedures for the three main parts of the thesis.

3.7.1 **Research techniques in Part II: Conceptual Model**

In order to construct the novel Business Model for Mobile Payment (BMMP) - framework, existing literature on NFC mobile payment and business models have been reviewed. Especially the former field depicts a relatively new area of research. Thus, most of the academic literature stems from conference proceedings on mobile payments. This literature review on mobile payments was further enhanced and supplement from other secondary data such as reports, whitepapers, and presentations by various analyst firms, industry associations, and other mobile payment participants. The business model review focused on studies that proposed a BM ontology or comprehensive framework, especially in the field of mobile services. Based on these reviews, the author proposes the BMMP framework. The validity and efficacy of this framework is tested and applied on two case studies, i.e. Google Wallet and ISIS.

3.7.2 **Research techniques in Part III: Application and Analysis**

As previously mentioned, this thesis departs on an exploratory study based on qualitative research. In order to collect primary data thirty key personnel (13 from Google, 17 from ISIS) in senior and executive positions were contacted through LinkedIn. However the response rate was disappointing, which led to a change in the data collection strategy. As such, the author used previously collected primary data, i.e. interviews, Q&A sessions, panel discussions, and live presentations with those contacted key personnel, which were publically available. The author acknowledges the potential weakness of this alternative approach, thus implements certain criteria to counter them. Fist, only rich-media data sources from audio and video recordings or fully published transcribed interviews, i.e. not edited or summarized, were considered. This accommodates the originality and authenticity of the data. Second, since those primary data were collected for a different purpose and may pose issues of comparability over time, the authors filtered them for its relevancy based on topics and up-to-datedness. In total, seventeen previously collected and relevant primary data sources (cf. **Table 3)** were used and matched based on the topics and the elements of the developed BMMP framework. In order to ensure the construct validity, which refers to establishing the correct operational measures for the concepts being studied, the author adopt the data triangulation method, as suggested by (Yin, 1994). Thus, two or more independent sources of data were used to corroborate research findings within this thesis. These stem from various secondary resources, directly from the case companies, or from their partners, independent publications, or industry associations. Based on this data collection process, the novel BMMP framework will be applied and validated.

Table 3: Overview of previously collected primary data sources used for this thesis

Company	Name	Position	Type	Topic
ISIS	Ed Busby	CCO	Video panel discussion	Value Service, Value Architecture
ISIS	Michael Abbott	CEO	Transcribed Interview	Value Service, Value Architecture, Value Network, Value Finance
ISIS	Ryan Hughes	CMO	Video Interview	Value Service
ISIS	Jaymee Johnson	Head of Marketing	Transcribed Interview	Overview of ISIS's activity, Value Finance
ISIS	Jaymee Johnson	Head of Marketing	Transcribed Interview	General ISIS, Challenges, Technology, Future
ISIS	Jim Stapleton	Head of Sales and Account MGMT	Transcribed Interview	Challenges and Solution of NFC mobile wallet
ISIS	Jim Stapleton	see above	Video Interview	Market insight (different solutions, timeline, challenges)
ISIS	Jim Stapleton	see above	Video Interview	Value Service, Value Network
ISIS	John Theiss	VP, merchant sales	Transcribed Interview	Value Service, Value Architecture
ISIS	Tony Sebetti	Director, POS and Payment Alliance	Video Interview	latest Development of ISIS, Value Service
ISIS	Michael Grannan	Devices and Enabling Technology Leader	Video Interview	Digital Wallet Rollout
ISIS	Susan Novell	VP of Market Launch	Transcribed Interview	Insight and perspective on m-wallet
ISIS	Nan Edwards	City Development Manager	Video Interview	Value Service, Value Network, Value Architecture
Google	Osama Bedier	VP Google Wallet and payments	Transcribed Interview	Value Service, Value Finance
Google	Osama Bedier	see above	Video Interview	Google's Wallet Opportunity, Value Network, Value Architecture
Google	Osama Bedier, Google Wallet engineers, and executives from Google's partners	see above	Video Launch Presentation	Value Service, Value Architecture, Value Network, Value Finance
Google	Robin Dua	Head of product management, consumer payments wallet	Video Q&A	Value Service, Value Architecture, Value Finance

Source: author's creation

3.7.3 Research techniques in Part IV: Synthesis and Conclusion

The final part of the thesis seeks to create new knowledge by adopting an inductive approach. Thus, the emphasis will be on using the findings of the analyses from earlier parts to synthesize and distinguish the wider implications and applicability of this research.

3.8 Delimitation

The thesis has three limitations, which are outlined below:

1) Mobile payment scope

   Though there are numerous mobile payment approaches (cf. Chapter 2), the scope of this thesis is set for NFC enabled m-payments. This was motivated by the lack of research in this field and the need to contribute to close this gap.

2) Geographical scope

   This thesis focuses only on m-payment initiatives deployed in the U.S. due to their context-dependency. Different markets have different market structures and different legal frameworks that affect the efficient deployment of m-payment systems. The failure of NTT DoCoMo's to extend its successful NFC m-payment services beyond its national borders has elucidates the case (Ozcan & Santos, 2010).

3) Timing of NFC mobile wallet approaches

   Due infancy of the payment industry and the relatively short market presence of NFC m-payment solutions, participants are still experimenting with a variety of business models so as to conquer profitable and sustainable positions in the industry. Thus, findings of this research would more likely represent a momentary snapshot in the development process of a ubiquitous m-payment system.

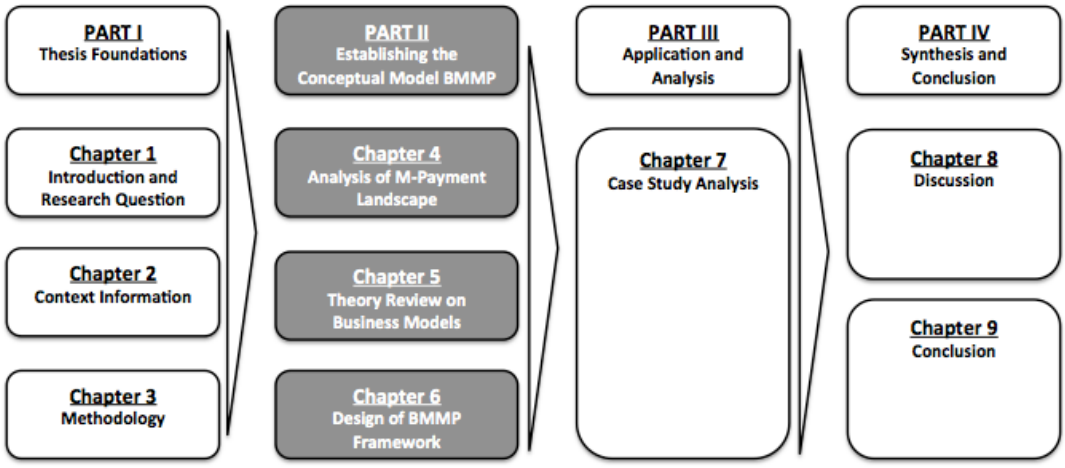
3.9 Chapter Conclusion

This chapter presented the adopted research methodology of the thesis. In order to fulfill the research objective, the author takes a pragmatic approach utilizing qualitative data, as well as a mix of deductive and inductive methods of logic. The used methods is influenced by the tenets of the case study research, as the author departs on a exploratory study, in which the goal is to create new knowledge in a relatively young research area. In addition the research techniques and procedures were highlighted for each of the thesis parts. Finally, the limitations of the thesis were outlined.

Introduction to part II – Establishing the Business Model for Mobile Payments

Part II – Establishing the Business Model for Mobile Payments – has three chapters and covers the development of a conceptual model for the analysis of NFC-powered mobile payments (cf. Figure 3). Chapter 4 provides an overall analysis of the mobile payments sphere in the context of NFC. Then, chapter 5 continues with a review of the literature on business models, and more specific with existing business model frameworks for mobile services. Thereafter, chapter 6 synthesizes the previous two chapters and proposed a novel business model for (NFC) mobile payment.

Figure 3: Thesis outline for Part II



Source: author's creation

4 NFC enabled mobile payment

4.1 Chapter introduction

This chapter will provide an in-depth analysis of the mobile payment sphere in the context of NFC. As such this chapter is divided into three parts. The first part (section 4.2 and 4.3) will discuss the specifics of mobile payment ecosystem by providing an overview of the complex and changing new payment ecosystem including an analysis of the stakeholders with their roles and motivation. The second part highlights the some of the challenges of broad adoption of NFC m-payments. Finally, it will then be followed with a key debate on NFC, i.e. the significance of the location of the SE and it influence on the power distribution in the payment ecosystem.

4.2 The mobile payment ecosystem

The term ecosystem originated from biology, but has been used across different fields of studies, such as in a business context. There, it can be referred as a loose network of stakeholders that affect, and are

affected by the creation and delivery of target firm's own offerings (Iansati & Levien, 2004). It implies the inherent mutual dependencies between actors in the ecosystem, especially in regards to resources. This is also apparent in the case of mobile payments. As it will be discussed subsequently, the mobile payment ecosystem consist of numerous actors from different backgrounds with diverse resources and competencies which are relevant in initiating, processing, and regulating payment transactions as well as redefining boundaries (Deloitte, 2010). This may suggest the convergence of the m-payment ecosystem from others, i.e. an amalgamation of the financial-, mobile-, and retail ecosystem. Thus, the complexity of mobile payments is characterized by the multitude of participants from different ecosystems, myriad of payment options, overlapping or non-existent regulatory frameworks and evolving consumer choice. Changes in one part of the ecosystem, e.g. new fees, regulations or entrants, may have ripple effect across the whole ecosystem as different players adjust and adapt to the new competitive landscape. This is best exemplified in the evolution of the traditional payment ecosystem, triggered by the emergence of m-payment. The reconfiguration of the value system have forced traditional players to reconsider their business model (Siegel et al., 2011). It has also left them questioning about their future role in the new m-payment value system. Studies conducted by Deloitte (Siegel et al., 2011) indicate that players across the value system are trying to quickly consolidate their position and capture larger parts of the revenue stream. Consequently, it makes sense to inquire into the different stakeholder's role and motivation in more depth.

4.3 Stakeholders: role and motivation

As previously highlighted, the emergence of mobile payments have let new players into the payments arena, increasing the complexity of an already complex ecosystem. These new entrants have different incentives and are potentially seeking to gain larger parts in the ecosystem pie. On top, each of the stakeholders, incumbents as well as newcomers, have their own ideas about how mobile payments should be developed and implemented. This creates potential conflicts and barriers (cf. section 4.5) for the development of a ubiquitous, interoperable solution for mobile payments (Contini et al., 2011). Thus, it is necessary to understand each of the stakeholders' role and opportunities in the m- payment ecosystem. This section provides a overview of the key stakeholders (cf. Table 4), in terms of their motivation, role and contribution in the new mobile payment ecosystem.

Table 4: Overview of stakeholders in the NFC m-payment landscape

M-Payment Service Provider	Financial Institutions	Technology/Service Provider	Demand Side	Regulatory Authorities
MNO	**Issuer**	**TSM**	**Merchant**	**Government**
Handset manufacturer (**OEM**)	**Acquirer**	**OS/App developer**	**Consumer**	
NFC chip manufacturer (**OEM**)	**Payment/Card network**	Independent players		
		Payment processors		

Source: author's creation

4.3.1 Mobile operators

Mobile network operators provide the mobile device to consumers and are responsible for the maintenance and service of the handset. Any mobile payment service requires the use of the over-the-air (OTA) infrastructure run by the MNOs. They are strongly motivated to join the mobile payment industry for a number of reasons. First, offering new value-added service may result in attracting new customers and reduce customer turnover (Frost&Sullivan, 2011a; SmartCardAlliance, 2007). MNOs are currently facing high churn rate of their subscriber base (Juntunen, Luukkainen, & Tuunainen, 2010). As a result, they are looking for opportunities that permit them to provide long-term services for customers and thereby increasing customer loyalty (MobeyForum, 2012). Turning the mobile handset into a practical payment device at the physical POS would allow MNOs to provide complex commercial and/or financial services (SmartCardAlliance, 2007). Second, the transition into the payment world would open new revenue channels through increased network use, data services related to payment, and gaining parts of the interchange fees from payment transactions. Lastly, offering new value added (payment) services encourages customers to upgrade to more feature-rich NFC-enabled mobile devices (SmartCardAlliance, 2007).

Carriers play a substantial role in the deployment of mobile wallets. They control the network and SIM card, hold an existing customer base of mobile communication services, and have the capability to push out the required application and functionality onto the end-user's mobile phone through the SIM card. In addition, they have large distribution networks with widespread retail outlets (MobeyForum, 2012), which would ease the NFC-enabled device provisioning on a large scale. However, MNO's, as new entrants, are lacking experience in the payment industry compared to the traditional players. This may be a main motivator for new partnership relationships with financial institutions.

4.3.2 OEM: mobile handset and NFC chip manufacturer

Mobile device manufacturer are responsible for the design and production of NFC mobile handset in compliance to industry standards. They provide capabilities for service providers to built applications

that permit an intuitive user experience (NFC-Forum, 2008). Offering mobile phones that support payment and other mobile applications, may lead to strengthening the OEM's competitive advantage. Just as the early camera phones captured consumer market share, mobile phones that support additional applications can capture new customers. As such, for the majority of OEMs, the opportunity in mobile payments lies in collecting increased revenues by attracting new customers and by commanding a higher price point for NFC mobile devices. Some OEM's, such as Google, RIM or Apple, may also eye on the opportunity to play an even bigger role in this new ecosystem by positioning themselves as the wallet owner/provider (Galaski, Daley, Castonguay, & Magder, 2011).

Integrating cutting-edge technologies and services into mobile devices will contribute to a flow of acceptance and innovation that promotes users to adopt NFC services. It would also encourage consumers to upgrade their current mobile phone to NFC enabled phones further fostering the deployment of new payment services. They can also tap into their strong branding as well as their sales and distribution networks to provide credibility in consumer's minds and promote NFC services (MobeyForum, 2012).

4.3.3 Financial institutions

4.3.3.1 Issuer and acquirers

As a traditional player in the payment sphere, mobile payments are first and foremost a defensive move for financial institutions (Boer & de Boer, 2010). However, rather than just being a means to protect their current business, (proximity) mobile payments also provide numerous new opportunities for these incumbents. It would enable them to reach new customers, and offer value-added and differentiated payment services to existing clients (SmartCardAlliance, 2007). In addition, proximity m-payment may also spur revenues by increasing debit or credit card transactions volume from replacing cash sales. It would also lead to further penetration of cash- and check-heavy merchant segments as well as opening new acceptance channels. Thus, the new payment functionality may increase speed and convenience for payments, thus enhancing customer loyalty for banks.

With their existing financial expertise and payment infrastructure, financial institutions bring a lot of value to the mobile payment ecosystem (Contini et al., 2011). Banks enjoy high levels of trust by consumers to deal with personal financial management and adopted the security systems and processes to do so safely. In addition, they are already in possession of customer's financial accounts and an establish issuer of payment cards and other instruments(Galaski, Daley, Castonguay, & Lalka, 2011). However, they posses limited technical exposure in mobile communication and may be inhibited by

their "old" legacy payment system to adapt to new challenges in the mobile payment ecosystem. Consequently, financial institutions are interested in forming business partnerships with MNOs and technology providers.

4.3.3.2 Card/payment network

Payment networks, such as Visa or MasterCard, are providing the operational and technological structures to facilitate transactions. These financial service organizations process payments between the card issuing bank of customers and the bank of merchants. They have been strong proponents of contactless payment- and mobile NFC technologies. Their commitment is exemplified through their active involvement in various mobile payment initiatives (MasterCard, 2012a). Card networks expect these new technologies to replace low-value cash transaction, resulting in an increase in the number and the total value of transaction on their payment networks (Galaski, Daley, Castonguay, & Magder, 2011). This surge in transaction volume is expected to drive their revenue from interchange fees even higher.

Payment card networks play a pivotal role in the mobile payments ecosystem, especially when it comes to the acceptance and adoption of NFC-enabled mobile payment services. They are heavily involved in growing acceptance by providing incentives to merchants to upgrade their POS-terminals to accept NFC (Keane, Sabadra, & Diamond, 2012). In addition, they leverage their relationship with issuers to promote adoption among existing customers. Payment networks have also played a major role in certification of mobile payments by testing for security and compliance.

4.3.4 Technology/service providers

4.3.4.1 Trusted Service Manager

The complex mobile payment ecosystem with its multiple stakeholders has caused the emergence of a TSM. One of the key roles foreseen for the TSM is to support service providers to securely distribute and manage contactless services for their customers using the mobile network of MNOs. Essentially, they provision the payment credentials on the mobile phone's SE over-the-air, easing the process of provision and de-provision of new accounts (Galaski, Daley, Castonguay, & Magder, 2011). They play an important role in customer data protection and ensuring secure transaction processes. Depending on the size and scope of the TSM, other functions may be provided. These include fraud and risk management, customer service and support, or ensuring compliance with carious security requirements among others (Contini et al., 2011). A comprehensive list of roles of the TSM can be found in Appendix 1. In essence, they connect multi-account services to different mobile devices, which are accessed trough a different rang of propriety networks (PwC, 2011). Other players in the mobile

payment ecosystem, such as OEMs, payment networks, acquirers and other independent players, may challenge traditional TSMs from the card world because they recognized an opportunity to generate additional revenue by acting as a TSM.

4.3.4.2 OS/App developer

Mobile operating system and app developer provide or support financial application loaded on mobile device that enables mobile payment transaction (Contini et al., 2011). OS providers are mainly motivated by the prospect of widening their range of service offerings and opening new revenue steams. They can embed and control crucial security provision and native applications for mobile wallet into their operating systems. In addition, they are able to dynamically update them to safeguard that mobile phones remain secure as the market evolves. On top, they are also critical in ensuring a well-rounded end-user experience of mobile wallet.

4.3.5 Regulators

The emergence of new mobile payment ecosystem surged the need to update the current regulatory framework. Therefore, it is upmost crucial that regulators participate in the evolution of the payment ecosystem. As of now, the regulatory framework for mobile payments is fragmented, especially in regards MNO and other third party participation in the provision of payment services. Arising question about legal liabilities and responsibilities of new players to payment transactions need to be addressed (Contini et al., 2011). Participants require clarity of new regulatory structures and are keen on how to proactively tackle issues on consumer protection, e.g. cyber security and identity management. A dialogue between the various regulatory institutions and participants of the mobile payment ecosystem need to be fostered to allow for the safety and integrity of the target country's payment system.

4.3.6 Demand Side

4.3.6.1 Merchant

Merchants are principally interested in payment solution that will reduce their costs. As such, they are more likely to adopt these new mobile payment systems if two requirements are fulfilled (Boer & de Boer, 2010; MobeyForum, 2012; SmartCardAlliance, 2007). First, there must be a widespread acceptance and popularity among consumers. Second, these new technologies are proven to be more cost effective, as well as easier, faster, and saver compared to alternative payment methods. However, mobile payment solutions may provide additional benefits beyond operational efficiencies and cost reduction. It may help merchants to establish stronger customer relationships and customer royalty. Market differentiation, branding opportunities and an opportunity to enlarge their customer base, may

also be incentives for merchant to adopt mobile payment solutions.

Without widespread merchant acceptance, it will be challenging to reach mass adoption for NFC mobile payments at POS. This makes merchants a critical stakeholder in the mobile payment ecosystem. They have to cover substantial costs in upgrading their retail POS to accept NFC payments (Keane et al., 2012). Consequently, without a strong value proposition and standardization of mobile payments, merchants are reluctant to switch their systems to systems that support NFC mobile payments.

4.3.6.2 Consumer

NFC enabled mobile payments are able to offer consumers a number of benefits, such as increased convenience, savings, and personalized assistant related to their payment and shopping needs (SmartCardAlliance, 2007). Various players will compete for their business, which may result in cost savings, better features and richer shopping experience.

As the user of mobile payments, they are placed at the center of the ecosystem. It is the consumer that generates the value for other stakeholders in the ecosystem. They do so by choosing handsets, making transaction, choosing the mobile payment service provider, and creating data among other activities.

4.4 Chapter sub-conclusion

So far this chapter has highlighted a number of important findings. First, it revealed that different stakeholders hold different interests and motivations to participate in the mobile payment sphere. For example, carriers and other new entrants of the payment sphere are driven to tap into new sources of revenues and gain a foothold in an emerging and very lucrative new market. Threatened by these new entrants, traditional players such as banks are rather motivated to defend their current market position and not to loose ground in the changing payment landscape. Second, the analysis provided an insight of the relative importance of the different stakeholders in the mobile payment ecosystem. Key roles can be assigned to financial institutions, MNOs, and other technology providers, e.g. Google. This is mostly tied to their current market power and influence to scale mobile payment solutions towards a mass-market adoption. For instance, MNOs have already a large customer base and the existing distribution channels are an effective means to kick-start and reach existing as well as new customers. Further, they hold the key to the required OTA infrastructure for mobile payments. On the other hand, banks can leverage their existing financial infrastructure and expertise, as well as establish trust among customers and would-be customers for NFC-enabled mobile payments. All stakeholders' role and interests are summarized in the table below.

Table 5: Overview of stakeholders' role and motivation

Actor	Role	Interest and Motivation
MNO	• Handset distribution • Technology enabler: OTA infrastructure • SE access • Mobile wallet selection • Leveraging existing technological expertise in mobile	• Reduce churn by offering m-payment as a value-added service and brand experience enhancement • Increase Average Revenue per User due to more data traffic and extra services like OTA application management • Access new revenue streams via margins on payment transaction • Create a parallel solution or participate in existing payments network
OEM	• Design and production of NFC mobile devices	• Increase revenues from more (expensive) hardware sales
Banks	• Building trust to existing account holders • Provision of the payment infrastructure • Leveraging existing financial expertise	• Protect margins from interchange revenue • Retain control of payments space • Generate revenue from new-value added services • Generate revenues from additional interchange fees (e.g. NFC instead of cash)
Payment/Card Network	• NFC payment app specification • Testing, auditing, and certification • POS acceptance rules • Evangelizing NFC to their existing merchant relationships	• Increase interchange revenues based on increased transactions
Trusted Service Manager	• Installing the payment credentials in the SE • Providing a secure link between multiple parties by facilitating and managing the secure access to the SE in the handset for all service providers	• Increase revenues from managed services
OS/App Developer	• Develop core enabling technology	• New business opportunity by gaining part of the interchange (e.g. by providing mWallet) • Revenue gains from loyalty, couponing and ads
Merchant	• Upgrading or installing NFC capable POS device • Accepting NFC payments • Adopting and using the added-value services NFC offers • Promoting the benefits to the consumer	• Reduce interchange cost • New direct communication channel to drive foot-traffic
Consumer	• Adopting and using the added-value services NFC offers	• Convenience, ease-of-use, savings and security
Regulatory Authority	• Create and govern an appropriate regulatory framework • Pass clear laws and rules for mobile payments	• Defining the boundaries of mobile payments

Source: adapted from(Broex, Consultant, & Vulder, 2008; Galaski, Daley, Castonguay, & Lalka, 2011; PaymentTaskForce, 2012; Rutter, 2012)

4.5 Industry challenges regarding widespread mobile payments adoption

NFC enabled mobile payments still face significant challenges regarding mass-market deployment and adoption. While most of the stakeholders are enthusiastic about its undeniable potential, adoption for this new payment solution is lagging behind its expectations. This may be due to following demand and supply-side barriers.

4.5.1 Demand-side barriers

The inherent demand-side barrier may be that NFC m-payments are not solving an acute problem (Williams, Hillard, & Green, 2012). The existing payment methods with debit or credit card are widely accepted and engrained in the life of consumers and merchants. In order, to break these payment habits

and their comfort with the status quo, incentives and education on both sides are required (Crowe & Tavilla, 2012). For consumers, it is natural to swipe-and-sign or chip-and-pin their cards at POS, and a tap with their mobile phones is not necessarily easier. In fact, it is less easy since it needs new learning and behavior for consumers (Aw, Garbowski, Krishna, Pande, & Rios, 2011). It calls out for a stronger incentive for consumers to switch to m-payments than mere convenience arguments. Consequently, a winning solution will require addressing the end-to-end consumer experience, as well as the value across that experience. For merchants, accepting NFC m-payments is tied to new required investments to upgrade POS terminals (Frost&Sullivan, 2011b), and costs related to retrain employees for the new payment systems. However, costs for NFC POS devices have declined (PwC, 2011) and are in some cases subsidized by companies or even governments[1] (Keane et al., 2012). However, similar to consumers, merchants may also require a multi-dimensional value proposition rather than just a cost saving argument to justify the switching cost.

4.5.2 **Supply-side barriers**

One of the main supply-side barriers is the difficulty to coordinate all stakeholders that are necessary to include so as to develop industry-wide m-payment standards (M. Crowe et al., 2010; Liezenberg & Lycklama, 2012). The adequacy of such standards are crucial as they directly affect the safety, efficiency, and robustness of the payments systems (Crowe et al., 2010). The process to develop a stipulated set of technology standards for mobile devices, chips, and SE as well as standards related to provisioning and maintaining m-payment credentials still requires significant work (Crowe & Tavilla, 2012). In order to address these problems furthering the development of m-payment standards, various industry associations have been formed.

Another supply-side barrier has been the absence of productive cooperation between key stakeholders in the ecosystem (Boer & de Boer, 2010). This may stem from the complex nature of the ecosystem, and the varying interest and motivation of the numerous stakeholders. As such, the process to develop a coherent model with multiple stakeholders involved will be tedious, especially since they have not worked together in the past (Richardson, 2012). Conflicting views on both commercial positioning and technical solution must be aligned. A general agreement on these subjects forms the foundation from which stakeholders are able to divert their efforts and resources in one direction. Clarifying and agreeing on standards will permit various approaches from different players to co-exist and the lack of interoperability won't he an issue any more.

[1] The French government, for example, is closely working with French Telecom provider Orange to distribute 500.000 NFC enabled

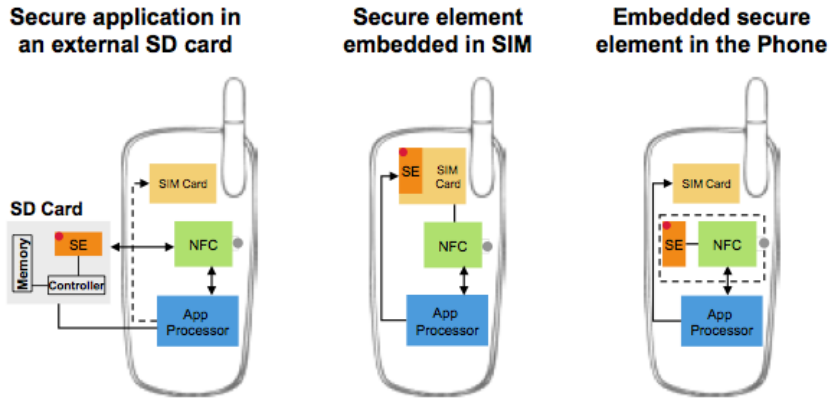
4.6 Key debate on NFC: The issue of SE location

At the center of the development of a secure proximity mobile payment ecosystem lays the Secure Element. It is a smart chip located in the mobile phone, which serves the specific purpose of securely facilitating mobile financial services. It is a vital component as it prevents any unauthorized data access. The risk or perceived risk of electronic pick pocketing, or gaining access into someone's NFC-enabled account from close distance, becomes prominent with the greater market traction of NFC-powered mobile payments.

Any application, such as the mobile wallet, can only be embedded in the SE with the consensus of the entity that controls it. As such, any stakeholders with the ambition to claim a major stake in the m-payment industry will likely aim to gain control of the SE. Mobile network operators, OS providers, and handset manufacturers are assumed to compete for this position, and results will probably be decisive on the relative power of the vendor in the value chain (Keane et al., 2012).

Essentially there are three ways on how to deploy the SE in the mobile phone (cf. Figure 4) with each approach being attractive for different stakeholders.

Figure 4: Different SE/NFC models



Source: (Acker, Knott, & Marcelis, 2012)

First, the SE can be embedded in a micrsoSD card, which will be inserted into the phone with a SD card slot. This approach enables non-NFC phones with NFC capabilities; thus, overcomes the limited availability of NFC phones. It is assumed to be a bridge technology until NFC phones are widely deployed. It is model preferred by bank or other independent players, since it can be easily distributed.

Second, the SE can be placed in the SIM card. MNOs already own the access control of SIMS, thus is their favored model. It allows end-users to switch mobile devices without having their data being locked to a specific device. This provides an important user benefit, as consumers can change their

phone and application providers without losing their personal data or endangering transaction acceptance(Acker et al., 2012).

Lastly, the SE can be directly embedded in the mobile handset by the handset manufacturer. Naturally, it is the preferred model of over-the-top (OTT) players such as Google or Apple. This would mean that users of NFC-enabled phones have to access NFC applications that are provisioned by just mentioned players.

4.7 Chapter conclusion

This chapter has highlighted the complexity of the mobile payment with its stakeholders. Each of them has their own roles and motivations, which has provided important insight on their potential and ambition in the new payment sphere. As such, three actors, i.e. banks, MNOs, and other technology providers such as Google, may challenge each other for the prime position in the new ecosystem.

Further, main challenges for the broad adoption of the NFC m-payments have been discussed. Demand-side barriers are the low benefits because of the existing payment systems as well as the high cost to merchants and consumers of upgrading to the new technology. Thus, implying the need for strong value positions of NFC-payments, together with providing incentives and further education on the benefits and capabilities of NFC. Supply-side barriers evolve around the difficult process to agree upon standards and the lack of constructive cooperation among stakeholders. In order to address the former issues industry associations have been founded. In addition, more cooperation-centric approaches have been rolled out, as the cases of Google Wallet and ISIS will depict later.

The last section of this chapter presented the importance and relevance of the location of the SE in regards of the power distribution of stakeholders within the ecosystem. It has been argued that different stakeholder prefer different locations of the SE. Mobile network operators prefer the approach in which the SE is embedded in the SIM card, since they already control and own the SIM card in the mobile device. Banks are more eager for the approach in which the SE is deployed externally, e.g. in a SD card, in order to be more independent and not to rely on MNOs. The approach in which the SE is embedded in the phone is most interesting for OTA service providers such as Google.

5 Theory review on Business models

5.1 Introduction

The objective of this chapter is to critically analyze the literature on business models. Thus, this chapter proceeds with discussing the relevance and importance of business models. Next, the author attempts to clarify the confusion around the business model concept by inquiring into the discussions on business model definitions in academia. Lastly, existing knowledge on business model frameworks will be critically reviewed. It shall be noted that the author takes a particular focus on business model frameworks that originated from a mobile service context. This chapter provides the foundation for the next chapter in which a novel business model framework for mobile payments will be proposed.

5.2 The relevance and importance of the Business Model

The Business Model plays a fundamental role to any organization (Magretta, 2002). Most of it is due to the facilitating power that the business model provides. It allows the business and technology stakeholders to understand, communicate, analyze and manage strategic-orientated decisions among each other (Osterwalder & Pigneur, 2002; Pateli & Giaglis, 2004) along with changing the business logic of the firm (Osterwalder, Pigneur, & Tucci, 2005). In addition, Chesborough and Rosenbloom (2002) argue that the BM provides a holistic perspective of the business which helps it to understand internal functions and structures, as well as its interconnectivity and interaction dynamics with the external world. Al-Debei (2010) is more concrete and identifies three main practical functions of the Business Model. First, he suggests that it can serve as a conceptual tool for alignment. In specific, the BM bridges the gap between the corporate strategy and business processes, as well as provides harmonization between these organizational layers. Second, the BM acts as an interceding framework, which indicates its significance as a mediating construct between technological artifacts and the realization of strategic objectives and goals. In other words, the BM reflects a 'sound translating method essential to obtain and capture values from propose digital innovation' (Al-Debei, 2010:91). Finally, the BM can function as a strategic-orientated knowledge capital; making the business logic of the firm with its dynamics explicit, creates a vital organization asset, which allows for both improved strategic decision making and leveraged practices of the BM in action.

5.3 Towards a definition of the Business Model

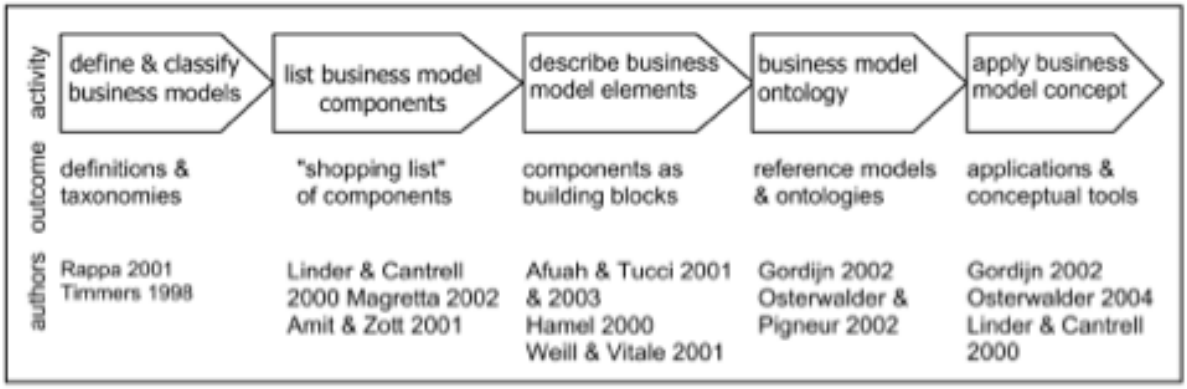
The previous section highlighted the significance of the Business Model, which may explain the rise in interest and need to further delineate and understand the BM concept. In fact, this new field of study has experienced a wave of publications both from practitioners and researchers, especially with the rise

of the internet for businesses in the 1990s (Osterwalder et al., 2005). However, given the intuitive appeal and popularity, the BM concept lacks a clear consensus on its underpinnings (Al-Debei, 2010). To date, the Business Model is still regarded as relatively poorly understood (Linder & Cantrell, 2000) and as an ill-defined 'buzzword' (Seppänen & Mäkinen, 2005). Moreover, the BM has been confused or substituted with other concepts such as business processes, corporate strategy. The 'fuzziness' (Linder & Cantrell, 2000) could stem from a number of sources. One reason for the lack of agreement could be the youthfulness of the subject and it related research. Another one could originate from the fact that the concept has been investigated from a wide range of disciplines (Shafer, Smith, & Linder, 2005), e.g. business, management, strategy, economics, technology, eCommerce and information systems (Pateli & Giaglis, 2004). Consequently, researchers have looked at the Business Model from a variety of perspectives, thus not necessarily meaning the same thing when writing about it (Linder & Cantrell, 2000). Many of them have proposed their own definitions in which they consider one or few elements of the whole. A comprehensive review of scholarly description of the business model along with their thematic indicators have been done in past studies (Al-Debei, 2010; Al-Debei, El-Haddadeh, & Avison, 2008; Osterwalder, 2004). The analysis exemplifies the rich diversity of definitions highlighting different features of the concept. For example, (Magretta, 2002) emphasizes on the logical story telling aspect of the BM which explains who the businesses' customer are, what they value, and how the company can make money in providing them the value. Especially the 'money-making' aspect is also the focus of Linder and Cantrell's (2000:2) definition. Afuah (2004) takes a similar position where else (Haaker, Bouwman, & Faber, 2004) focuses on elements such as cross-company collaboration and coordination systems. As such they depict the Business Model as "a blueprint collaborative effort of multiple companies to offer joint proposition to their customer to their consumers". With these various definitions at hand, Al-Debei and Avison's (2010) study aimed to provide more clarity and a common understanding of the business model. Grounded in an extensive review of the literature, they proposed a synthesized definition of the Business Model. As such, they define a business model as "an abstract representation of an organization, be it conceptual, textual, and/or graphical, of all core interrelated architectural, co-operational, and financial arrangements designs and developed by an organization presently and in the future, as well as all core products and/or services the organization offers, or will offer, based on these arrangements that are needed to achieve its strategic goals and objectives" (Al-Debei & Avison, 2009). The author regards it as a comprehensive definition, which is why it will be taken as the working definition of this thesis.

5.4 Towards a Business Model Ontology for mobile payments

Gordijn, Osterwalder, and Pigneur (2005) provided an overview of the evolution of the business model in which they have identified five distinct phases. As Figure 5 illustrates, research on business models started with defining and classifying them, moved on towards exploring their atomic elements, and transitioned towards categories with greater complexity in which research have attempted to conceptualize and make sense of relationships between these components. Research focusing on the latter category aimed to develop ontologies, which describes a thoroughly defined framework that offers a common and shared understanding of a domain that can also be communicated between actors (Osterwalder & Pigneur, 2002). The fragmentation that can be found in the domain of business model definitions is also reflected in the business model ontology domain. Many academics with different research paradigms have developed their own frameworks. However, these frameworks differ in their rigor and depth, as well as complexity in which definitions, elements and their relations are included and analyzed.

Figure 5: Evolution of the business model concept towards ontologies and application



Source: (Gordijn et al., 2005)

More recent approaches at developing a common understanding of Business Models have incorporated a methodology of synthesizing large quantities of past research. Al-Debei (2010) provides an extensive review of business models frameworks, listing them with their constituent dimensions and sub-dimensions. Their findings suggest two things. First, although the number and names of dimensions and elements included vary between frameworks, most of these business model elements correspond to distinct themes, i.e. offer, customer, network, and finance. Second, the majority of frameworks stem from a strategy or eBusiness context, and only a limited number of frameworks originate from the mobile area. Inspired by Al-Debei's (2010) work, the author conducted a review of existing business model frameworks originating from the mobile area (cf. Table 6) with their respective objectives.

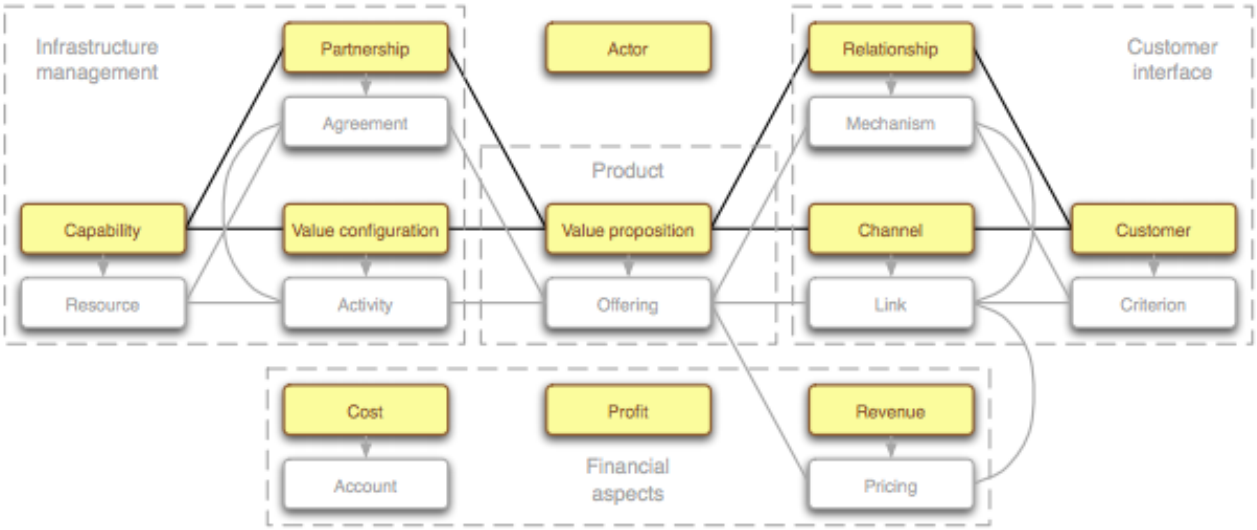
Table 6: Literature review on business model frameworks from a mobile context

#	Source	BM Component	Count	Context	Research Approach	Granularity	Objective
1	Pigneur (2002),	**Product innovation:** target customer, value proposition, and capabilities; **customer relationship:** information strategy, feel and serve, and trust and loyalty; **infrastructure management:** resources, activity configuration, and partner network; **financials:** revenue model, profit/loss, and cost structure	4 (12)	Mobile Business and Technology	Theoretical framework (dimensions and building blocks)	Organization-centric	To provide an ontology to analyse and assess BM for mobile businesses
2	Van De Kar et al. (2003)	Service formula including customer value; network formation and coordination; enabling technology; revenue model	4	Mobile (cellular) technology	Theoretical framework (dimensions);case study	Service-centric	to provide a design approach for a special category of mobile services (Mobile Information and Entertainment Services)
3	Camponovo and Pigneur (2003); Camponovo (2002)	Value propositions; target customers; business partners; and revenue flows	4	Mobile Business	Theoretical framework (dimensions)	Organization-centric	to study the strategic uncertainties in the mobile business arena by applying business model analysis methodology (partial application of **Pigneur (2002)**
4	**Osterwalder et al. (2005), Osterwalder (2004)**	**Product:** value proposition; **Infrastructure management**: value configuration, core competency, and partner network; **Customer interface**: target customer, distribution channel, and relationship; and **Financial aspects**: cost structure, and revenue model	4(9)	Information systems, eBusiness	Theoretical framework (dimensions and building blocks)	Organization-centric	to propose a BM ontology to describe and represent business models
5	Maitland et al. (2005)	**revenue model** and **benefits;** and **Inter- firm service network**: actors and roles, and governance	2(2)	Mobile (cellular) technology	Theoretical framework (dimensions and building blocks): case studies	Network- centric (service- specific)	to study the influence of BM in shaping the mobile service network
6	Tadayoni and Henten (2006)	Value proposition; technology solution; cooperation platform; and financial design	4	Mobile (cellular) technology	Theoretical framework (dimensions)	Service-centric	to identify the potentials and the characteristics of possible business models for mobile broadcast
7	Kallio et al. (2006)	Product development strategy; sales and marketing strategy; servicing and implementation strategy; value creation strategy; customer base; government policy and regulations; technological advances and constraints; and value chain dynamics	8	Mobile (cellular) technology	Theoretical framework (dimensions and building blocks): case study	Organization-centric	to understand the success factors of mobile operators by adopting the business model framework of Rajala et al. (2001) and partially Ostwalder et al. (2002)
8	Derballa et al. (2006)	Value proposition; targeted customer segment; and revenue source	3	Mobile Commerce	Theoretical framework (dimensions)	Service-centric	to provide an approach to classify mobile business models
9	**Pousttchi et al. (2008)**	**Product:** value proposition; **customer interface:** target customer, relationship, distribution channel; **infrastructure management**: capability, partnership, value configuration; **financial perspective:** cost, revenue, financing; **threat model**	5(11)	Mobile payment service	Theoretical framework (dimensions): 27 case studies	Service-centric	to develop a theoretical and conceptual understanding of the different elements of an m-payment business model and the interrelationships between these
10	**Bouwman et al. (2008); Kijl et al. (2005)**	**Service domain; technology domain; organization domain; finance domain**	4	Mobile service	Theoretical framework (dimensions)	Network- centric (service- specific)	to provide theoretically grounded yet practical approach to designing viable business models for electronic services (incl. mobile)
11	**Al-Debei (2010)**	**Value proposition:** product/service, market segments; **value network:** actors, flow communications, channels, governance; **value architecture:** resources, value configuration, core competencies; **value finance:** cost structure, pricing methods, revenue structure	4(12)	Mobile Business and Technology	Theoretical framework (dimensions): 3 case studies	Organization-centric	To develop a novel and valuable knowledge framework (Ontology) based on business model thinking for designing and engineering innovative mobile data services that will help telecoms to achieve their strategic goals and objectives.

Source: adapted from Al-Debei's (2012)

The work of (Osterwalder, 2004; Osterwalder et al., 2005) depict a more developed framework, when applying the most widely applied criteria for evaluating models: (1) simplicity, (2) accuracy, (3) and generalizability (Miller & Dess, 1993). The framework has it roots in the Balance Score Card and in business management literature, and describes the underlying logic of a business system for value creation in the digital era (Osterwalder, 2004). The BMO consists of four main pillars, i.e. product, customer interface, infrastructure management, and financial aspects, which are further decomposed into nine sub-components (cf. Figure 7). For each of these subcomponents a generic description is provided, which again allows for greater generalizability. The popularity of this framework, called the Business Model Ontology (BMO), is also characterized by the fact that it has been adopted and applied by subsequent studies to study and analyze business models in across different industries. However, the BMO has a number of limitations. For example, the framework provides a high level of abstraction, in which elements are defined through rich narratives (Lambert, 2012). The underlying problem with descriptions, which take the form of unstructured narratives, is that it makes it difficult to compare among business models. Another limitation, is that the framework takes an inside-out approach that focuses on the business logic of individual enterprises rather than on the dynamic interaction within value networks (Solaimani & Bouwman, 2012). So, though the BMO provides a robust and generalizable framework, it may not be suited for a specific context such as the mobile payment sphere.

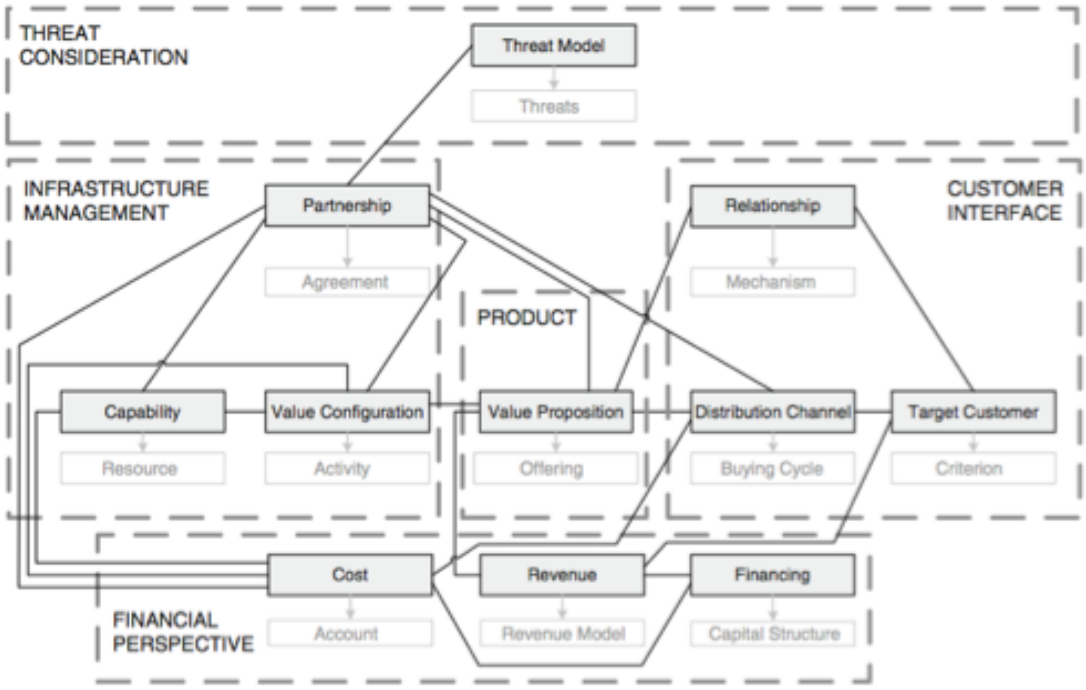
Figure 6: The Business Model Ontology



Source: (Osterwalder, 2004; Osterwalder et al., 2005)

One of the subsequent studies, that incorporates some of the limitations, is the business model framework developed by Pousttchi et al. (2008). It is an extension of the BMO and adds two new aspects: the external environment (threat-model) and the financing perspective (cf. Figure 8). Derived from a multi case study analysis of twenty seven mobile payment procedures, this business model framework has been built specifically for the analysis and engineering of mobile payment business models. As such, it represents only one of very few studies with aforementioned focus and context. Another difference to the BMO is that it introduces morphological boxes, thus providing a lower level of analysis that allows specifying characteristics of a particular industry. The first layer of abstraction is depicted by the five pillars: product, customer interface, infrastructure management, financial perspective and threat model. The second layer also follows (Osterwalder, 2004; Osterwalder et al., 2005) and are represented by the so-called building blocks (grey boxes in figure below). However, beyond this the morphological boxes provide a third layer, which are the compartmentalization of each of the building blocks in a set of characteristics. Finally, the fourth layer is a break down of these characteristics into specific instances. Pousttchi et al. (2008) suggest that in the future more instances need to added or adopted. The introduction of these abstraction levels allows comparing one business model to another more effectively.

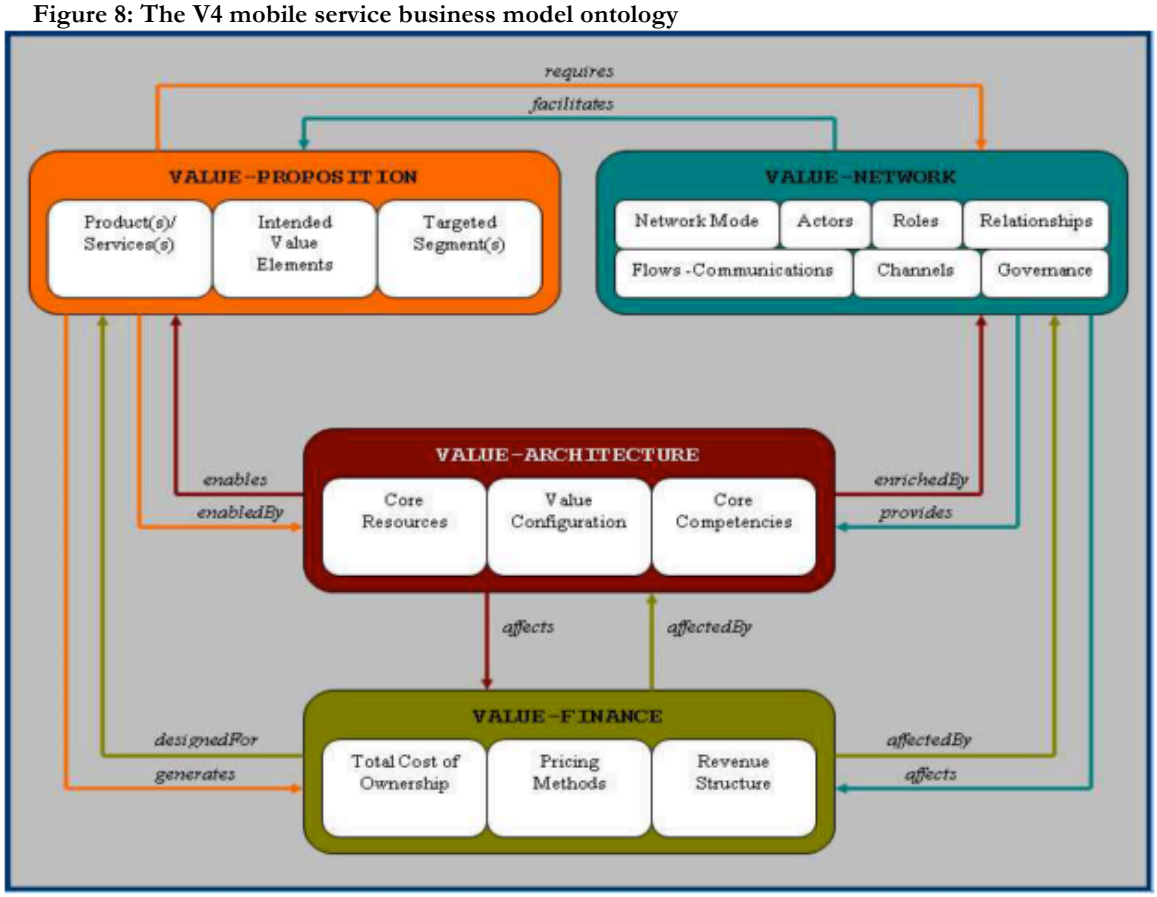
Figure 7: Mobile payment business model framework



Source: (Pousttchi et al., 2008)

Another well developed business model framework that fits into the objective of this thesis, is the V4 business model by (Al-Debei, 2010). He employed a content analysis approach of existing literature on business models to derive his business model framework. The V4-model contains four main pillars, i.e. value proposition, value network, value architecture, and value finance. They are further decomposed into sixteen elements (cf. Figure 9). At the center of this framework is the aspect of value, which is highlighted in the terminology used describe the four main pillars. Consequently, each of them are targeted to provide the market with desired values through delivering products and services in order to capture economic and other values in return (Al-Debei, 2010).

Figure 8: The V4 mobile service business model ontology



Source: (Al-Debei, 2010)

A slightly different approach is taken in the STOF business model framework by (Bouwman, Vos, & Haaker, 2008; Kijl, Bouwman, Haaker, & Faber, 2005), which comprises of four components, i.e. service domain, technology domain, organizational domain, and financial domain. In specific, they have taken an evolutionary and dynamic approach of business models, which they have been identified as missing in the current literature. As such, they have introduced the phasing concept as well included a high-level analysis of the external market place dynamics. Similar to (Pousttchi et al., 2008), (Bouwman

et al., 2008) argue that businesses do not operate in a vacuum, but rather are influenced and depend on the environment. Another important key aspect in the STOF business model is their network-centric view of the organization. In their perspective, firms are part of a value network or value web (Bouwman, De Reuver, & MacInnes, 2006), in which businesses exchange resources and capabilities in a parallel and simultaneous manner. As elaborated in chapter 4, this represents crucial aspects in the context of mobile payments with its complex ecosystem structure.

5.5 Chapter conclusion

This chapter has highlighted the relevance and importance of business models by inquiring into the different functions that a business model can serve as. In summary, it provides an effective tool for the organization to gain a holistic overview of the different dynamics within and outside of the organization. In concrete, the business model can be used as a conceptual tool for alignment, interceding framework, and finally as a strategic-orientated knowledge capital.

Further, the author joined the discussion on the confusion surrounded around the business model concept. The business model has been studied from a variety of different academic field of studies with researchers focusing on different parts of the business model. This may have added to the confusion of the business model concept, since different authors meant different things when referring to the business model. However, several researchers have attempted to provide clarity, by synthesizing existing definitions into holistic and generalizable definition. As such, the author decided to follow the definition proposed by Al-Debei (2010).

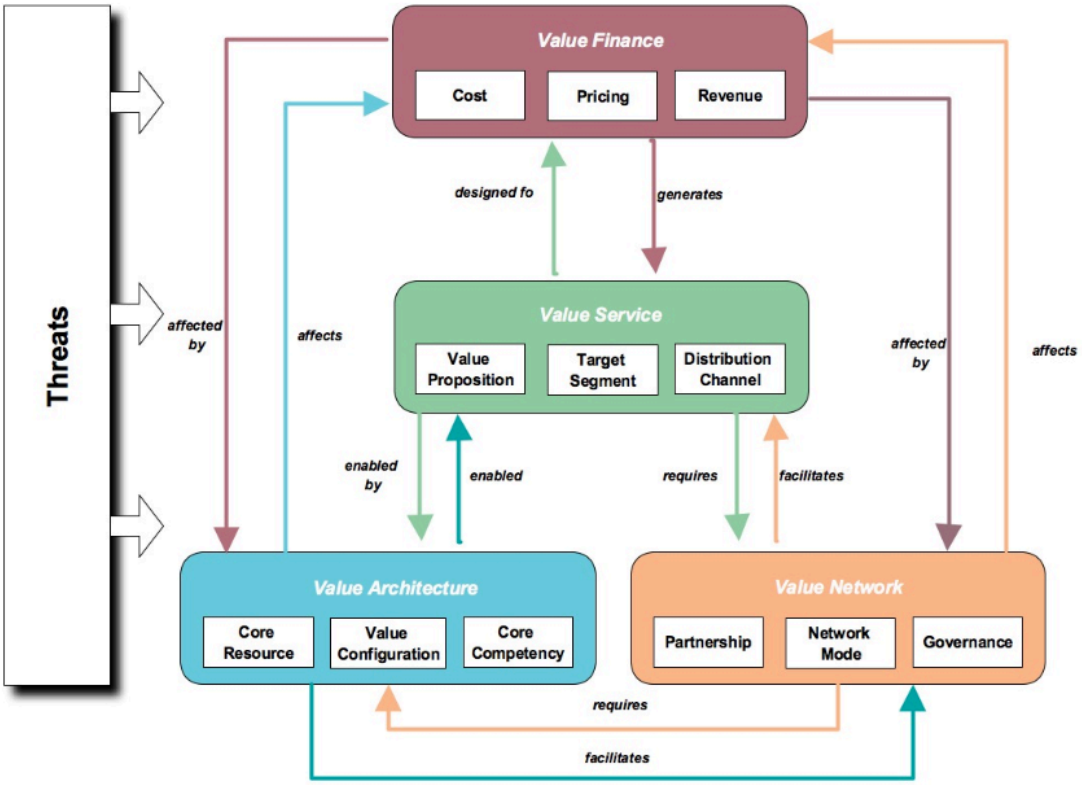
Finally, this chapter presented a critical review of existing business model frameworks. It was striking that the various frameworks differed in their extensiveness and complexity in which definitions, elements and their interrelations are being identified and analyzed. For example, the number of elements included in a framework deviated significantly across different frameworks. However, most of the dimensions corresponded to four distinct themes: (1) offer, (2) customer, (3) network and (4) finance. Further, the author has narrowed its scope by specifically inquiring into business model that are more developed and had a focus on mobile services. As such, four distinctive frameworks have been analyzed, which will serve as the foundation of the synthesized framework presented in the next chapter.

6 The conceptual model

6.1 Chapter introduction

The objective of this chapter is to introduce a novel conceptual framework for the study and analysis of business models in the mobile payment sphere. The developed ontology is built upon the specifics and dynamics of the mobile payment context (cf. Chapter 4) and on a literature review on existing business model frameworks (cf. Chapter 5). It consists of five main dimensions, which are value product/service, value network, value architecture, value finance, and threats (cf. Figure 10). Each of the dimensions is further decomposed into fifteen sub-dimensions, which provides the second layer of analysis. In the following these five main elements and their respective sub-elements are discussed in more details.

Figure 9: The Business Model for Mobile Payment framework



Source: author's creation

6.2 The Business Model for Mobile Payments (BMMP)

6.2.1 Value Product

The value product dimension covers all aspect of the targets firm offering to the customer. It comprises of the sub dimensions: (1) value proposition, (2) target segment, and (3) distribution channel.

6.2.1.1 Value proposition

One of the main challenges (cf. section 4.5) related to the mass-deployment of NFC enabled mobile wallets is to overcome the lack of adoption and support from both the consumer and merchant side. It has been suggested that simply providing a new way to pay, i.e. tapping instead of swiping may not be convincing enough to get the consumer on board for this new payment solution. Thus, it may be necessary to provide an added value to excite and incentivize consumers to break and change old, deeply engrained payment behaviors and move them towards the use of NFC-powered mobile wallets. However, feeding only one side of the market is not sufficient enough given the nature of a two-sided market for contactless payments. Merchants are also demanding compelling reasons to undertake the necessary investment to upgrade NFC-capable POS devices. As such, having a clear and strong value proposition, which articulates the offer and value created for customers, is a pre-requisite and plays an important role.

6.2.1.2 Target segment

The segmentation of customers involves grouping them into different clusters based on shared common characteristics and properties. These customer segments can take the form of individuals, groups or organization. So, customer type may vary, as well as the relationship between them and the company, i.e. B2C or B2B. Identifying and defining them is an important and crucial task for developing mobile payment business models. The reason is that effective segmentation will allow the firm to redirect investment resources to customers, which are most likely appealed by the offered solution. It will also determine the appropriate channel to reach the designated audience.

6.2.1.3 Distribution Channel

The distribution channel describes the path in which the value proposition is delivered to the target customer. It may as short as a direct transaction from the mobile payment service provider to the consumer, or may include several interconnected intermediaries along the way such as MNO, issuing bank, or payment networks. According to Osterwalder (2004), a channel is investigated over the customer's complete buying cycle, which are all possible contact points between the service provider

and the customer. These contact points may include creating customer awareness, evaluating the needs, service provision, and after sales (Pousttchi et al., 2008).

6.2.2 **Value Network**

As highlighted in chapter four, the mobile payment industry is complex in nature and consists of many different stakeholders. Consequently, the effective deployment of NFC-powered mobile wallets requires not only participation but also collaboration amongst various players possessing different expertise. This is especially true given the number of new entrants in this new emerging market, transforming the traditional payment sphere into the mobile era. Non-traditional players such as Google or mobile network operators are jumping into the very lucrative mobile payment opportunity, disrupting the established payment world of financial institutions. Bouwman et al. (2008) suggest changing the analytical lens from value chain perspective to a value network perspective when looking at this new mobile service industry. The underlying reason is that relationships between companies are not simple and linear anymore, which is the premise of value chains (Al-Debei, 2010). The emerging concept of value networks seems to be more appropriate and a valid mechanism when dealing with complex collaborations including non-linear relationships between traditional and non-traditional players, such as banks and MNOs.

The concept of value network can be best understood as a multi-party stakeholder network (Gordijn & Akkermanns, 2001) since it emphasizes the inter-organization or cross-company view towards value creation and capture from innovation. This concept depicts the way in which transactions are facilitated through coordination and collaboration among parties, multiple companies and stakeholders (Camponovo & Pigneur, 2003). So, when analyzing value networks it is helpful to look at it from three perspectives: partnership, network mode, and governance.

6.2.2.1 **Partnership**

Zmijewska and Lawrence (2006) suggest that the lack of cooperation between key actors may be the main inhibitor for the success of mobile payments. Different players have different strengths and weaknesses, implying that the key to success may be a business model based on strong partnership (Pousttchi, 2004). A partnership depicts a corporate agreement that is voluntarily initiated and established between two or more parties so as to realize a particular activity or project jointly (Osterwalder, 2004). This is usually achieved by coordinating the required activities, resources, and capabilities. For the purpose of this thesis, the author distinguished between actors, their role and their expertise, when looking at the nature of the partnership between stakeholders in the mobile payment

industry. The different types of actors in the ecosystem have been identified in Chapter 4. Regarding the roles, they may take the form of functional or strategic roles. They are distinguished based on the NFC mobile payment service provider's need to identify the contributions of partners related to value creation and the overall success for the target firm (Al-Debei, 2010). Functional roles may highlight the partner's specialty, knowledge domain, and experience. On the other hand, strategic roles may refer to what key objectives and benefits the target firm is achieving by including a specific player in its value network. An overview of the eight main strategic roles can be found in Al-Debei (2010), which are resource allocation, efficiency, risk mitigation, effectiveness, time-to-market, agility, intelligence, and finally enlarging customer base.

6.2.2.2 Network mode

The different network modes can be placed in a continuum from totally open to fully close. The design of a closed network implies that only selected actors may participate with ideas and other contributions, where else an open network design encourages anyone to participate. However, network modes can also be neither fully open nor totally closed. One such case is called 'walled garden'. In such network modes certain rules and criteria for participation are being established by the initial value network and only if these are accepted, actors can participate.

Selecting the right network mode can be a daunting task, since different requirements and settings may demand different kinds of configurations. Unfortunately, there is no single approach that is successful at all times. Both approaches have their advantages and disadvantages. For example, providing an open network can be challenging since it requires the alignment of interest and goals among all the participants, which may make it more difficult to coordinate and manage. In contrast, it is also a challenging task to form a closed network where a large number of actors are needed and when these are coming various knowledge domains.

6.2.2.3 Governance

The concept of governance in the mobile payment sphere can be looked at from two levels: (1) the mobile payment industry; and (2) the value network itself. At the first level, regulatory commissions and other legal bodies manage and handle governance. They are responsible for setting the rules and regulation for the complete industry. However, due to the infancy of the mobile payment industry as an emerging market, regulation has not kept pace with the mobile payment innovation. For example, Crowe (Crowe, 2012) from the Federal Reserve Bank of Boston points out the lack of specific guidance or legal framework for this new market which results in gaps where liability and coverage are unclear.

At the level of the value network, governance refers to which actors within the network has what form of power and control over which kind of objects (Maitland, van de Kar, Montalvo, & Bouwman, 2005). These objects may relate to relationships, data, functions, channels, and transactions (Al-Debei, 2010). In most cases, network actors aim to gain more power and control so as to enlarge the value captured. In the context of NFC, the control of the SE will determine the relative importance of the actor in the ecosystem (cf. 4.6).

6.2.3 **Value Architecture**

The value architecture consists of three elements: core resource, value configuration and core competencies. It reflects a rough outlay that identifies all the required technological architecture arrangements which allows for an efficient and effective operation of mobile payments (Al-Debei, 2010) Further, it specifies the organizational infrastructure arrangements, such as key functions and processes, company culture or management mindset (ibid.).

6.2.3.1 **Core Resource**

It is important to examine and create relevant information on the assets and resources needed to develop the mobile payment solution. (Pousttchi et al., 2008) distinguished between three types of resources: (1) tangible resource, (2) intangible resource, and (3) human resource. In the context of mobile payments, tangible resources may refer to existing payment infrastructures, such as in the case of banks other traditional payments actors, or other assets that are typically included in the balance sheet of a company. Second, intangible resources may consist of intellectual properties (patents), brand power, reputation, or full banking licenses. Finally, as the term suggest human resources refer to the people need for the firm so as to create value with both the tangible and intangible resources.

6.2.3.2 **Value Configuration**

In order to successfully rollout mobile payment solutions or any other services for that matter, the company needs to efficiently and effectively integrate aforementioned organizational and technological core-resources. By rearranging resources in novel ways, new sources of value can be generated (Moran & Ghosal, 1996). However, in some cases reorganizing and restructuring existing resources may not be sufficient enough, and call for the combination and integration of new kinds of resources. To give an example, banks may already posses the necessary payment infrastructures and relationship with other actors in the traditional payment industry to move into the mobile sphere, but clearly lack the

technological resources a mobile network operator has. As such, banks may be dependent on these new resources, in order to successfully rollout their mobile payment wallet.

The concept of value configuration plays an important role in the design and engineering of mobile payment solutions given the complex and dynamic nature of the mobile payment ecosystem. It also fits with the concept of dynamic capabilities which depicts the firm's ability to adopt its resource base to fit the evolving nature of the market, including customers and the industry the company belongs to (Al-Debei, 2010). The ability to transform is based on learning processes on when and how companies should develop, assimilate, (re-) combine, (re-) configure, and dispense resources (Teece, Pisano, & Shuen, 1997).

6.2.3.3 Core Competencies

The concept of core competencies has been first brought up by Prahald and Hamel (1990), which they refer to as the collective learning in the organization. They are developed through the process of continuous improvements over a period of time and reflect the unique factors that differentiate the company from its competitors. In order to be a core competency, it must fulfill two requirements, i.e. (1) it can not be easily imitated by competitors, and (2) it can be leveraged to a variety of products and markets (Prahald & Hamel, 1990). (Osterwalder & Pigneur, 2002) look at it from a different perspective. For them, core competencies can also be seen as repeatable patterns of actions in the deployment of assets and use of the resources acquired to create and offer services to the target customers.

6.2.4 Value Finance

The value finance describes the required core arrangements to ensure the economic viability of the offering (Al-Debei & Avison, 2010). It consist of the three elements: (1) cost, (2) Pricing, and (3) revenue structure.

6.2.4.1 Cost

The cost element measures all incurring costs for the mobile service provider so as to create, market and deliver its offering to the customer (Osterwalder, 2004). These cost may include set-up costs, e.g. costs of foundation or rental fee of banks to MNO for the location of the SE; costs of development, maintenance, and support of the (technological) infrastructure; costs of operation such as salaries, authentication fees, or losses e.g. fraud losses or bad debt; and finally promotion and advertising expenses (Pousttchi et al., 2008). The cost element plays an significant role since efficiency approaches

may lead to lower cost structures in comparison to competitors, which in turn may give the mobile payment service provider greater competitiveness and flexibility in setting up profit margins that are more attractive to customers and thus more revenue generating for the target company.

6.2.4.2 Pricing

Setting the price for a service or product is a dynamic process in which internal and external factors needs to be accounted, such as cost considerations or the alternative products/services from competition. In its simplest form, the price depicts the amount of money a customer has to pay to use for the use of the offer. However, in an extended definition, the price correlates to all 'sacrifices' the customer has to make to use the product or service, e.g. switching costs. In the context of NFC-enabled mobile payments, these costs are very considerable given the ingrained habits, convenience, and the competitive pricing of traditional payment methods, i.e. paying with (consumer) and accepting (merchant) cash or debit and credit card.

There are different approaches to setting the price. For example, cost-plus pricing involves setting a price at a level that covers the costs at acceptable price margin. Another way is competitive pricing, which depicts that prices are based alternative offers in the market. Other pricing strategies are for example value-based pricing or dynamic pricing. However, it would be out of the scope to discuss each pricing method in details.

6.2.4.3 Revenue Structure

The revenue structure depicts all incoming revenue streams from the value offer by the mobile payment service provider. It is characterized by the revenue source and the revenue type. The different revenue sources can be categorized as consumers, merchants, and third parties (Pousttchi et al., 2008). For example, merchants can be charged for membership or the usage of the new payment system. For the purpose of this thesis the author refers to third parties when they are not related to the demand side (consumer and merchants), but rather responsible for the supply side, such as banks, TSM, card networks and resellers or marketers.

In addition, different revenue types can be distinguished as transaction-depended or transaction-independent (Turowski & Pousttchi, 2004). The former is related to revenues that are generated based on each transaction. The latter depicts revenues that are not tied to the transaction volumes, but rather to nonrecurring costs and/or set costs for a certain period, such as royalty fees, integration, support and similar. In most cases, costumers with large transaction volumes prefer this latter type of fee

structure in their contract. The opposite is the case for customers with low transaction volumes. They prefer the reverse.

6.2.5 Threats

Businesses do not operate in a vacuum, meaning that a firm's success depends as much as on its business model as on it environment (Kijl et al., 2005). The inclusion of the environment is represented in this threat dimension. It depicts the potential and profound threats that may endanger the economic viability of a mobile payment business model. Especially in the young and emerging mobile payments market with its uncertainties and peculiarities, unpredicted threats are more likely to occur (Pousttchi et al., 2008). In the following, the author distinguishes between three types of threats.

6.2.5.1 Market

At the bottom line, the market environment and its dynamics built the foundation for the existence of a service or product (Kijl et al., 2005). Consequently, threats stemming from changes in the customer demand need to be carefully treated and migrated in the business model. Customer priorities, which should always be reflected in business model, may change over time, thus calling out for business models that are dynamic and flexible enough to accommodate these changes.

Another source of market threats are competitors, both from the same market or other markets. As such, mobile payment service providers are required to closely follow market trends and developments as well as anticipate other player's actions.

6.2.5.2 Technology

When looking at the technological advances for m- payments, one can observe the development towards more complex solutions, such as payment methods via text message, or QR codes to NFC technology. Each of these technologies opened up new opportunities and different means to leverage on it in favor of the end-user. However, it shall be noted that different m- payment solutions would be appropriate for different markets. The context dependency can be found in the success of M-Pesa, a SMS based mobile payment solutions in the developing world.

Other technological issues are related to the evolutions of standards or mobile devices, unreliable technology, and inadequate scalability and may challenge any NFC-enabled m-payment business model. These issues are very relevant due to the infancy of NFC technology and its mobile payment market.

6.2.5.3 Regulation

Emerging markets experience greater exposure of and impacts from changes in laws (Pousttchi et al., 2008). Falling in this market category, NFC mobile payment service providers are subject to unsteady and changing regulations, legislations and consumer protections. This is partly because of the current immature regulatory framework for mobile payments. In the United States for example, no one law or governing authority oversees these new financial transactions (Crowe, Kepler, & Merritt, 2012); responsibility is rather dispersed among five different financial regulatory agencies. Further, there are also uncertainties attached to issues such as coverage and liability responsibilities. These dynamics and uncertainties must be factored in when designing and engineering mobile payment business models.

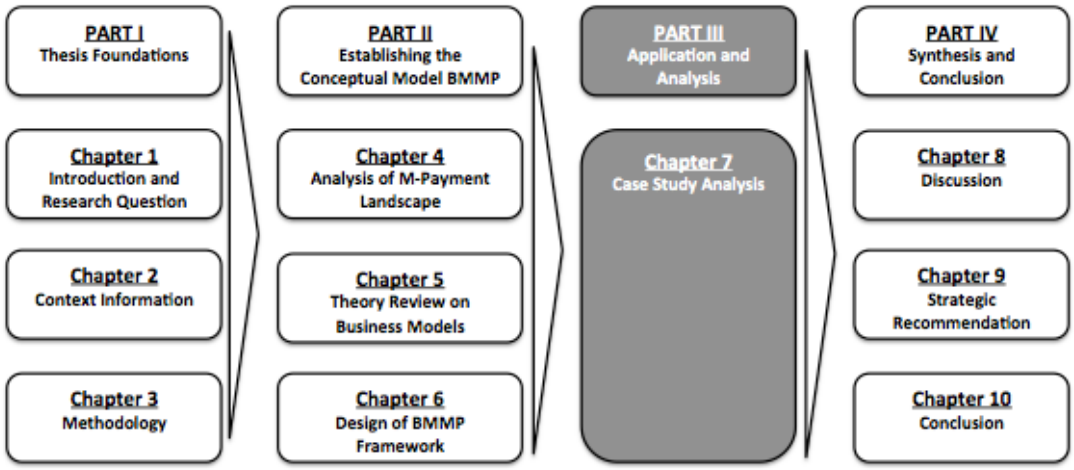
6.3 Chapter conclusion

Based on the critical review provided in the previous two chapters, this chapter presented the Business Model for Mobile Payments framework. Developed for the context of NFC-enabled mobile payments, this framework consists of five main dimensions: Value Service, Value Network, Value Architecture, Value Finance, and Threats. Each of these dimensions are further categorized into sub-dimensions, and discussed in more detail from a NFC context. The framework will serve as the analytical tool to inquire into two specific business models of NFC-powered mobile payment solutions in the US market.

Introduction to part III – Application of the framework and analysis

Part III – Application of the framework and analysis – provides the case study analysis in which the proposed BMMP framework will be applied and tested. Further, this process will provide a profound understanding of NFC m-payment initiatives as well as specific business model design configurations to deploy a ubiquitous m-payment system.

Figure 10: Thesis outline for Part III



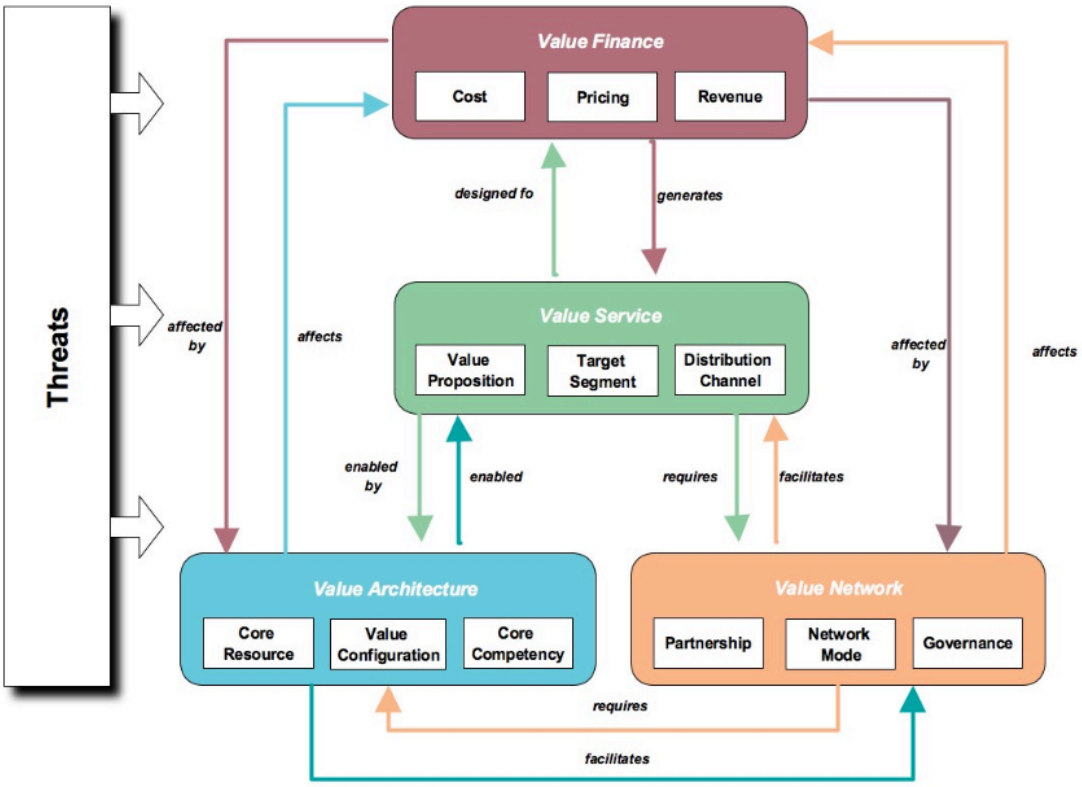
Source: author's creation

7 Application of BMMP framework: case study analysis

7.1 Chapter Introduction

The proposed BMMP framework (cf. Figure 12) will guide the analysis and allow for a structured approach. The chapter proceeds as follows. First, a brief case company introduction of Google Wallet and ISIS will be provided. Then, the BMMP framework will be applied. In specific, both mobile wallet initiatives will be analyzed based on the five main building blocks, and their respective sub-elements. The chapter will finish with a summary and conclusions of the analysis.

Figure 11: The Business Model for Mobile Payment framework



Source: author's creation

7.2 Case Company Introduction

7.2.1 Google

After a three-month pilot phase in San Francisco and New York, Google launched Google Wallet nationwide in the U.S. in September 2011. The company collaborated with respective industry leaders, in order to build the necessary ecosystem to deliver a seamless new payment solution to customers.

Google Wallet offers a number of benefits for consumers and merchants (Google, 2012a; GoogleWallet, 2012a). On the consumer-side, it allows them to tap, pay and save money at the point-of-sales, aiming to improve their shopping experience. On the merchant-side, Google Wallet aims to enable businesses to strengthen their customer relationship by offering faster, easier shopping with relevant discounts and loyalty rewards (Ionescu & Ying, 2012). Google has partnered with more than twenty-five national retailers, and due to MasterCard PayPass systems it is now accepted at more than 200.000 retail locations across the U.S.

The mobile wallet is based on NFC and cloud technology, thus requires NFC phones with embedded SE running on the Android OS. The cloud aspect allows Google to provide consumers the freedom to add any payment cards through a linked proxy card issued by Google (cf. section 7.3.5.2). However, the wallet runs only on NFC phones from selected carrier network (Google, 2012b). In addition to in-store wallet features, Google Wallet also provides wallet features for online commerce through Google

Checkout. For the purpose of this paper, the author focuses mainly on the in-store capabilities, but acknowledges the added values provided through ecommerce capabilities of the phone.

7.2.2 ISIS

ISIS is a joint venture between AT&T, T-Mobile, and Verizon Wireless - the three largest mobile network operators in the U.S, founded in November 2010, and launched in Austin and Salt Lake City in October 2012. Its mission is to create the most consumer-friendly and widely accepted mobile wallet possible (PayWithISIS, 2012a). Although, lagging one year behind Google Wallet, ISIS managed to secure a larger number of partnerships upon launch. The joint venture is collaborating with major card issuers, all major payment networks and merchants across a variety of categories (PayWithISIS, 2012b). Similar to Google, it provides consumers a simplified way of paying, storing and redeeming coupons, and collecting loyalty points all in one device (ISIS, 2012a). Merchant benefit from the possibility to connect with their customers in new ways and deliver targeted offers directly into the phone (ISIS, 2012b).They can also deploy in-store posters which consumers can 'tap' through their NFC-phones to access information and offers (ibid).

In contrast to Google, ISIS adopts the mobile wallet approach with SE integrated in the SIM card. Banking partners can directly integrate their payment cards into the m-wallet and offer these services to their customers (Olivarez-Giles, 2012). Consumers have a greater choice on available NFC phones, which can be purchases at the three largest carriers in the U.S ISIS (AT&T, 2012a; T-Mobile, 2012; VerizonWireless, 2012).

7.3 Applying the BMMP framework

7.3.1 Value Service

7.3.1.1 Value Proposition

Google Wallet and ISIS's services offer a multifaceted value proposition for their three main customers, which are consumers, merchant, and banks. It is delivered through the four distinctive wallet properties (1) payment, (2) offers, (3) loyalty, and (4) gift cards.

Value Proposition for consumers

Google's value proposition of its mobile wallet for consumers is threefold (GoogleWallet, 2012a). First, it provides a faster means to pay through Google's *'Tap and Pay'* feature at the point-of-sale. The consumer can add any debit or credit card into the mobile wallet, providing them the full choice. Second, it offers a simple way to safe money through offers and loyalty points that are automatically redeemed and collected at participating merchant locations, the so-called *SingleTap* merchants (Google, 2012c). Finally, the mobile wallet provides a safer wallet and way of shopping through the rigorous

security features (cf. 7.3.5.2) deployed than the traditional mobile wallet (GoogleWallet, 2012b). As such, Google Wallet was developed with the greater purpose to not only just replace the traditional leather wallet, but also enrich it with several added values and convenient advantages for all their customers. Osama Bedier, Google's vice president of payments, describes it as enabling the purse with things that it could never do, i.e. connecting the experience from discovery, to transaction, to post transaction (Knowledge@Wharton, 2012).

ISIS has a similar value proposition, as it also offer consumers an easier and smarter way to pay, save and shop (PayWithISIS, 2012b). For example, coupons or offers can be collected through various means online and offline, i.e. by tapping any NFC-enabled poster, scanning weekly circulars, clicking websites or emails, or following merchant directly through the wallet application. These offers can be then redeemed at participating ISIS ready 'Pay&Safe' – merchants. In addition, it has implemented multiple security features like Google, too. However, consumers are limited to add only payment cards from ISIS banking partners (ISIS, 2012c).. Alternatively they can still use the mobile wallet through a reloadable ISIS cash card in which they can transfer their funds from any debit or credit card (ISIS, 2012d).

Value propositions for merchants

Google's main value proposition for merchants is to provide them a pay-per-performance advertising model in which they can increase their sales through personalized marketing offers and ads (Frost&Sullivan, 2011c; GoogleWallet, 2012c). These are delivered through the so-called *Google Offers* service. Merchants can choose between a range of various types of offers such as *'Featured Offers'* or *'Nearby Offers'*. The former are exclusive discounts only to Google Wallet, and the latter are discounts made available to its users who are nearby local businesses (Google, 2012c). The aim is to provide businesses targeted customer-specific and location-based offers based on consumer's purchasing data so as to drive their revenue (Keane et al., 2012). Google also accompanies these features with a set of tools for merchants to track, analyze, and understand the context of who, where and how consumers shop in their stores (ibid.). Google has been providing these services in the virtual world already, and is aspiring to do the same for off-line businesses in the physical world.

ISIS overall value proposition for merchants is to provide them a platform that enables them to directly communicate and connect with their consumers through a medium that is frequently used by the consumers – the mobile phone (SmartCardAlliance, 2012). Businesses would be able to push messages to consumers, which would appear in 'Feed'. These messages can take the form of offers or loyalty programs. According to ISIS, the main point is to allow merchants to built relationships and improve their customer engagement by easing the process for consumer to present and redeem loyalty points and offer (ISIS, 2012e). This will enhance and transform the customer's shop and buy experience, and

may also result into getting more consumer into the store, increasing their basket size, and motivating them to return (PayWithISIS, 2012c).

Value Proposition for banks

Google's value proposition for banks is to provide them a simplified and less cost – intensive way to offer their payment cards in a mobile wallet solution for their customers (Dua, 2012). Google's specific mobile wallet architecture allows banks to quickly integrate their payment cards into the wallet without their customers' payment credentials directly being stored in the phone. In addition, Google does not charge any fees to banks. The details of its wallet approach are discussed in the sub-sequent sections (cf. 7.3.5.2).

In contrast, ISIS's value proposition focuses on the aspects that (partnering) banks are directly able to place their cards into the wallet that directly connects to their servers (R. Kim, 2012). This way ISIS has no visibility to the bank's customer data, which allows banks in turn to provide more banking services such as checking balances or paying bills right through the app. Again, details of the different approaches are subject of the value architecture section.

7.3.1.2 Target Segment

In regards to the target segments, both Google Wallet and ISIS distinguish between three target customers: (1) consumers, (2) merchants, and (3) issuing banks. Since NFC represents an emerging technology, it is natural to target early adopters that are keen on experimenting, providing feedback and giving advise, as an initial target segment (G. Kim, 2011).. As the NFC mobile wallet solution evolves, this will expand to other groups in the innovation cycle.

The second target customers are merchants, which includes retailers, grocery stores, gas stations, restaurants and coffee shops among others (Google, 2012d; ISIS, 2012f). In order to kick start the availability of merchants that accept NFC mobile payments, both companies have targeted large national merchants. Upon launch, Google Wallet announced fourteen large merchants, where else ISIS could only announce seven national merchants (Isisnews, 2012). This move could also be motivated to create credibility and display the potential of NFC to local businesses, given that large merchants have put their faith in it.

Finally, banks are also representing an important target group. As mentioned, consumers can only integrate payment cards from ISIS's banking partners; thus it is in the interest of ISIS to target as many banks as possible. Google Wallet does not rely on that, since consumers can already add any of their payment cards through Google's novel wallet approach (Dua, 2012). However, Google still targets

banks to invite them to provide their card art[2], and thus a more personalized customer experience (ibid).

7.3.1.3 Distribution Channel

Google has formed partnerships with Sprint and Virgin Mobile, which will be distributing NFC-enabled mobile devices in which the application is already pre-installed (Google, 2012e). For their subscribers, Google Wallet will be automatically installed with a software update, if the phone is NFC-capable (Zefferer, 2012). The customer can also manually download the wallet application from the Google Play store. However, this may not be possible for customers from other carriers. For example, Verizon, one of the joint venture partners of ISIS, has blocked the Google Wallet application from being pre-loaded on its newest smartphone or being downloaded by consumers themselves (Efrati, 2011). According to Verizon, this move is based on security concerns, but industry experts regard it more as a strategic move to block a competitor's product from entering the market (Moritz, 2011).

Another route to market for Google Wallet are through their partnerships with issuing banks. Citibank provides its existing and new customers with the option directly integrate their credit card with Google Wallet. The ease of integrating and enabling Google Wallet to customers via issuing banks is enabled through Google's '*Save To Wallet API for Payment Cards*' (Young, 2012). Essentially, this API allows issuing banks to add a button to their website so that customers can easily add their cards to Google Wallet in just a few clicks. Discover and Barclay Card USA have recently integrated the API.

In terms of distribution, ISIS may have a more advantageous position than Google Wallet. As a joint venture from three major carriers (Abraham, 2011), ISIS already owns a vast distribution network, which they can leverage, to sell and activate services as well educate end-users on how it works. This is crucial since for the service to reach mass-market deployment, considerable 'consumer hand holding' will be required. All three partners, AT&T, Verizon, and T-Mobile have more than 20.000 wireless carrier retail outlets (Matthews, 2011), in which the customer can enter the store, try out and select among a variety of NFC enabled phones, and get personal assistance on all issues related to the ISIS mobile wallet. Given their clear market dominance and advantageous position in distribution, ISIS may have significantly more clout to roll out the mobile wallet initiative.

7.3.2 Sub - conclusion Value Service

The value proposition of Google Wallet and ISIS are both multifaceted and targeted to consumers, merchants and banks. They are focused on providing an enhanced customer experience and added

[2] Card art are the imagery representation of the bank's brand and helps Wallet users to recognize their cards.

services beyond what a conventional payment card or wallet is able to deliver. It aims to fully leverage the capabilities of NFC technology and the smartphone. However, there are also slight differences in their value propositions, especially for merchants and banks. For example, Google offers merchants a wider range of offers (e.g. Today's Offer, Nearby Offers, or My Offers), and targeted offers are based on Google's collected consumer data on previous transaction records. On the other hand, ISIS's does not collect consumer data, due to its privacy commitment, so targeted offers may have to rely on less complex data. For banks, Google's wallet approach offers them fast integration and a simplified and less-cost intensive m-wallet solution. This is in contrast to ISIS's value proposition. Only partnering banks can be integrated into the wallet. However, these banks benefit from absolute control of their customer data, creating the trust to add further banking services into the application. Overall, Google and ISIS's value proposition reflect that the payment feature is just a part of the value propositions and is expanded with other features such as coupons, loyalty cards and gift cards.

Google Wallet and ISIS both target three main customer segments, i.e. customers, merchants, and banks. Both mobile wallets are also focusing to sign up big merchants in order to prepare for scale and broad acceptance of locations for their mobile wallet.

The analysis of the distribution channel sub-element revealed that both companies are in an excellent position to distribute the channel on a larger scale. The main route to market will be through their partnerships with carriers' existing distribution networks; ISIS is in a stronger position because of the strong market position of their carrier' partners. Other channels include direct download from the app stores or other partners.

7.3.3 **Value Network**

7.3.3.1 **Partnerships**

The complexity of the NFC mobile payment ecosystem requires service providers to form partnership to effectively reach mass-market penetration. This is also reflected in the numerous partnerships formed by Google Wallet and ISIS. A brief overview of all relevant partners, including category and role description in terms of function and strategy is presented in the Table 7.

Table 7: Overview of partnerships

Partner Category	Google			ISIS		
	Actor	Functional Role	Strategic Role	Actor	Functional Role	Strategic Role
MNO	• Sprint • Virgin Mobile	• Distribution of NFC Android mobile devices • OTA Google Wallet app distribution • Consumer marketing funding	• Enlarging customer base through leveraging distribution network and existing customer base • Resource allocation by sharing marketing costs	• AT&T • Verizon • T-Mobile	• Distribution of all NFC mobile devices • Distribution of SIM card with SE • OTA ISIS mobile app distribution • Consumer marketing funding • Customer service	• Enlarging customer base through leveraging distribution network and existing customer base • Resource allocation by sharing marketing costs
Payment Networks	• MasterCard (preferred) • Visa • Discovery • American Express	• Initial network brand (MasterCard) • Providing payment infrastructure, e.g. MasterCard's PayPass, or Visa's payWave • Funding support • Value-added services	• Efficiency increase and faster time-to-market by leveraging existing payment infrastructure and expertise • Risk mitigation • Resource allocation by sharing marketing costs	• Visa • MasterCard • Discover • American Express	• Providing payment infrastructure, e.g. MasterCard's PayPass, or Visa's payWave • Issuing credit card into the wallet (American Express only)	• Efficiency increase and faster time-to-market by leveraging existing payment infrastructure and expertise • Risk mitigation
Bank	• Citi • Bancorp Bank • Barclaycard US • Green Dot • Silicon Valley Bank	• Initial consumer credit accounts • Issuing the card into the wallet and service the customer • Providing a linked virtual prepaid MasterCard card that links credit or debit cards from other banks (by Bankcorp) • Providing basic customer service • Consumer marketing funding	• Efficiency increase and faster time-to-market by leveraging existing infrastructures and expertise • Enlarging customer base through banks' existing customer base • Resource allocation by sharing marketing costs • Risk mitigation	• Chase • Capital One • Barclay Card	• Initial consumer credit accounts • Issuing the card into the wallet and service the customer • Providing ISIS Visa Cash Card (by Chase) • Enlarging customer base through banks' existing customer base • Providing added value services, e.g. mobile banking functionality (in the future) • Consumer marketing funding	• Efficiency increase and faster time-to-market by leveraging existing infrastructures and expertise • Enlarging customer base through banks' existing customer base • Resource allocation by sharing marketing costs • Risk mitigation
TSM	• First Data	• Full TSM services • Lead merchant acquirer • Merchant marketing funding • Welcome kit fulfillment	• Efficiency increase and faster time-to-market by leveraging on TSM core competencies, infrastructure and relationships • Resource allocation, i.e. access to needed resources and technological know-how; sharing marketing costs • Risk mitigation	• Gemalto	• Full TSM services	• Efficiency increase and faster time-to-market by leveraging on TSM core competencies and infrastructure • Resource allocation, i.e. access to needed resources and technological know-how; sharing marketing costs • Risk mitigation
Mobile Wallet Software Provider	n.a. (in-house)			• C-Sam	• Providing the wallet management platform (license) and software development kit	• Efficiency increase and faster time-to-market by leveraging on C-Sam's core competencies • Resource allocation, i.e. access to needed resources and technological know-how; sharing marketing costs
Handset Manufacturers	• Samsung • LG • HTC • Motorola	• Providing the mobile device • Enabling compatibility	• Resource allocation, i.e. access to the mobile device	• Samsung • LG • HTC • RIM • Sony Ericsson • Motorola	• Providing the mobile device • Enabling compatibility	• Resource allocation, i.e. access to the mobile device
POS Terminal	• Verifone • Vivotech • Ingenico • Hypercom	• Distribution of NFC POS devices to merchants • Enabling the interoperability of the mobile wallet with the POS device	• Resource allocation, i.e. guaranteeing interoperability • Enlarging customer base with more enabled NFC POS devices (merchants)	• Verifone • Vivotech • Ingenico • Equinox	• Distribution of NFC POS devices to merchants • Enabling the interoperability of the mobile wallet with the POS device	• Resource allocation, i.e. guaranteeing interoperability • Enlarging customer base with more enabled NFC POS devices (merchants)
Merchant (major)	• Champs • Footlocker • Jamba Juice • Macy's*	• Enabling Google's *SingleTap* experience by accepting NFC payments, providing offers, loyalty rewards and gift cards	• Enlarging customer base on a national scale (consumers)	• Champs • Footlocker • Jamba Juice • Macy's**	• Enabling ISIS's *Pay&Save* experience by accepting NFC payments, providing offers, loyalty rewards and gift cards	• Enlarging customer base on national scale (consumers)

* Also: American Eagle, Bloomingdale, Container Store, Duane Reade, GAP, Guess, Office Max, Toys R Us, Walgreens | **Also: Aeropostale, Coca Cola, Dillard's

Source: author's creation

7.3.3.1.1 Partnerships with Carriers

Google as a technology company requires distribution partners to effectively reach customers. Mobile network operators already own distribution networks and have an existing customer base, which is why they are strategically important.

On the other hand, founded by the three main carriers, ISIS is already equipped with a vast distribution network and an existing customer base to deploy its mobile wallet solution. The market power and advantages of this formation were highlighted in the previous section (cf. section 7.3.1.3.). In contrast to Google, ISIS will be the main contact point for customers, thus take the main responsibility for the customer service. Sprint's customers on the other hand are redirected to Google Wallet for most of their issues and questions with the wallet (Sprint, 2012).

7.3.3.1.2 Partnerships with Payment Networks

Both Google and ISIS managed to secure partnerships with all four major payment networks. Upon launch, Google selected MasterCard as the preferred partner. As such, MasterCard provided the initial network brand for Google Wallet (Google, 2011), and more importantly access to MasterCard's PayPass infrastructure. This empowered Google Wallet to be accepted in 144.000 PayPass-enabled merchants nationally, and more than 311.000 merchants globally (Frost&Sullivan, 2011c; McLaughlin, 2012). In addition, MasterCard also provided terminal and merchant funding support and other value-added services (Rutter, 2012). Gradually, further partnerships were formed with the remaining three major payment networks.

ISIS took a slightly different route, and managed to form partnerships with all major card networks right from its launch. However, the results of these partnerships are similar to Google. For Google Wallet and ISIS, the formation of these partnerships was motivated by increasing efficiency and time-to-market by leveraging on their partners' existing payment infrastructure, relationships and expertise. This way, both mobile wallet providers could tap into complementary resources and mitigate risks exposure. In addition, by supporting all four major networks, it will allow card issuers to issue Google Wallet or ISIS enabled cards regardless of the underlying payment network. Again, the emphasis lies on scalability and quickly reaching the critical mass.

7.3.3.1.3 Partnership with Banks

As new entrants in the payment sphere, partnerships with banks are important for Google Wallet and ISIS. Google Wallet formed a partnership with Citi as the lead bank. Citibank has provided its own core industrial strength in banking capabilities, and helped transforming these technical capabilities into

Google Wallet, a product that provides greater convenience and control in regards to their day to day payments (Google, 2011). In addition, Citi will also issue its own Citibank MasterCard cards into Google Wallet for their existing and new customer base. As such Citi provides the channel to get the monetary value into the Google Wallet (MobeyForum, 2012). The bank has further committed to allocate funds for consumer marketing (Rutter, 2012) and provide basic customer service in regards to how to load a Citi card into the wallet (Citi, 2012).

ISIS decided to rely on existing accounts from several bank partners, and letting bank's customers integrate their existing debit or credit cards to their phones (Carew & Aspan, 2011). It is in alignment with ISIS's value proposition of being a technology enabler for banks and not to interfere with their customer relationships. However, to ensure scalability and consumer wide adoption, ISIS has specifically targeted and selected banks based on their market size (Hibberd, 2012a).

As highlighted, banking partnerships were not only formed on the basis to fill functional roles, but also to take on strategic roles, too. These partnerships allow them to tap into bank's resources such as their financial capabilities, expertise, and infrastructure, which in turn facilitate a faster time-to-market or mitigating risk. Another bonus is that banks as established financial institutions exude trust and security, which should also positively, reflect on the mobile wallet solution.

7.3.3.1.4 Partnerships with Trusted Service Manager

As previously mentioned, TSMs play important roles in deploying secure m-wallets. Based on Google and ISIS's different approach to their mobile wallet (cf. 7.3.5.2.), their TSMs fulfill different roles. First Data, Google's preferred TSM, provides Google both SE management (referred as MNO TSM[3] services) and service provider TSM[4] services. For Google's case, First Data provides both services for them (Frost&Sullivan, 2011c). ISIS's Trusted Service Manager on the other provides only the SE management side. The TSM will securely place and provision consumers' information for all NFC activities such as payments, transit, loyalty, smart posters or similar onto their mobile phone (Cano, 2011). Gemalto essentially holds the key for ISIS, controlling and overviewing which service providers can access ISIS via the SE (R. Kim, 2011).

[3] MNO TSM services relate activities such as managing the SE using the key shared by the owner of the SE (here Google), and doing the typical OTA SE management functions (Cox, 2009).

[4] SP TSM services depict services, that a TSM provides on behalf an issuer (bank) to use and access the SE (ibid).

7.3.3.1.5 Partnership with Mobile Wallet Software Provider

One of the main differences between Google and ISIS is that Google develops the software for the mobile wallet application in-house in collaboration with their launch partners. As a technology company Google has the technical capabilities (cf. 7.3.5.) to engineer their own wallet solution. While ISIS may also have the necessary technical capabilities to do so, the company decided to take a licensing agreement. It has selected C-Sam to provide the wallet management platform and the software development kit (Morgan, 2011). The rationale behind this decision was to leverage on C-Sam's existing mobile wallet competencies rather than developing the resource intensive route to develop these from scratch. According to Michael Abbot, the CEO of ISIS, C-Sam superior technology ensures scalability and interoperability across carrier networks, operating systems and NFC devices (ibid.)

7.3.3.1.6 Partnerships with handset manufacturers

Partnerships with device manufacturers are driven to ensure technological interoperability with the wallet applications (Cook, 2011) as well as promoting the productions of NFC phones. Google Wallet is currently tied to Android OS, thus works with those companies running on it. In contrast, ISIS is not tied to a specific OS, which allows them to partner with more handset manufacturers.

7.3.3.1.7 Partnerships with POS device manufacturer

POS device manufacturers distribute NFC capable POS terminals to merchants and have already built long-lasting relationships with merchants to effectively do so. They are the ones that could effectively encourage merchants to upgrade their existing terminals. Consequently, establishing partnerships with them are crucial, since POS terminals do not only need to be NFC ready but also be enabled for specifically accepting Google Wallet and ISIS. The underlying issue here is the lack of established interface specifications for mobile offers, coupons, and loyalty in merchants' systems (Verifone, 2012). So a partnership with POS device manufacturers enables the interoperability of the mobile wallet with the POS terminal, making sure that the value-added services are understood by the merchant systems and flow seamlessly. Both Google Wallet and ISIS manage to secure the major players of the industry (cf. Table 7), so that each respective interface and user experience is placed at the POS device manufacturers existing merchant network.

7.3.3.1.8 Partnerships with (national) merchants

Google Wallet and ISIS targeted large merchants to form partnerships for scalability reasons. These partnerships will allow them to quickly reach a broad acceptance of locations for their mobile wallet services on a national scale. The author could observe cross partnerships of merchants with both Google and ISIS, which signifies merchants' openness to accept multiple wallets

7.3.3.2 Network Mode

Given the nature and complexity of the mobile payment ecosystem (cf. Chapter 4), one might assume an open network mode as the preferred mode to tackle the inherent challenges linked to reach mass-market deployment. And at first glance, it may appear that both companies adopt an open model based on their significant efforts to built the ecosystem and form partnerships. However, a closer look reveals differences in Google and ISIS's network mode, with the former being more open and the latter revealing characteristics of a walled garden approach.

Openness runs in Google's corporate DNA and reflects a deep part of its culture, according to Osama Bedier, VP of Payments for Google (Knowledge@Wharton, 2012). This perspective is tied to the belief that open systems drive innovation, competition, provides consumers choice and most importantly exponential growth (ibid). The past product releases provides evidence for this. Google always has been consumer-centric, taking the mantra that when you focus on the user, everything else will follow. For example, when starting out, the objective of the founders were to provide the best search experience for users regardless of having no revenue driver put in place. Overtime, Google evolved to an advertising company, providing targeted ads based on the extensive customer data they collected. This open approach is also reflected in Google Wallet. The company collaborated with numerous partners and invited its initial partners to be part of the big launch (Google, 2011). Together with its partners, Google developed a mobile wallet that allows for broad participation by payment networks, banks, retailers, mobile operators, transit operators, and others (Frost&Sullivan, 2011c). Google Wallet has further introduced technical solutions, such as an API, that simplifies the interaction with Google (Keane et al., 2012). In specific, the API permits banks to easily integrate their credit or debit card into the mobile wallet and allow other third-party providers, e.g. individual merchants or daily deal websites, to interact with Google to provide offers, coupons or gift cards.

Since the first announcement of its mobile wallet, ISIS has changed its strategy a number of times, which may suggest an open approach. In specific, ISIS dismissed their initial plan of developing its own mobile payment service in competition with existing payments networks (Sidel, 2011), and to recruit its own merchants for the new service. The new plan suggests a B2B2C approach, in which the company

no longer aims to develop their own branded payments products. This has several implications for all participating mobile payment actors. First, Banks are now able to insert their own cards into a widget-like sandbox within the wallet app, that connects directly into their servers, so customer data won't be visible to ISIS. This move creates trust among banks as well as further options to include more banking services right into the ISIS app. For example, users could check their balances, pay bills and get rewards from the wallet. Second, banks and payment networks are now expected to have their own TSM, which communicate with ISIS's TSM. This gives banks the option to choose their own TSM supplier, who handles complex task of encrypting and transmitting sensitive customer data. The strategic move to open up the architecture will probably reduce both ISIS's role and the percentage of NFC revenues, however made it more attractive for other important stakeholders to join forces for the widespread adoption of NFC mobile payments. Consequently, it may imply ISIS's intention not to disintermediate or interfere with existing payment actors, but rather invite them to be part of the ISIS mobile wallet.

Although, these changes reflect a move towards openness, ISIS displays characteristics of a walled garden approach. For example, ISIS takes a premium for issuing banks to be integrated in the mobile wallet. However, these rental fees are set higher compared for issuing conventional (plastic) cards (Balaban, 2012a) and positive earnings from interchange fees are only possible at large scale. Thus, it imposes barriers for smaller banks to join, and in turn limits the consumers' choice of adding their preferred cards. Further, ISIS does not allow multiple SE to coexist, as Verizon's move to block Google Wallet indicates (Goldman, 2011). These two examples demonstrate ISIS's clear control over the platform by restricting the convenient access to non-approved apps.

7.3.3.3 Governance

In the case of Google Wallet and ISIS, both mobile wallet providers are operating in the US, and as such must comply with the same national regulatory framework. However, payments methods via the mobile phone and related transactions reflect an emerging channel, and as such existing frameworks may have gaps in regulation and laws to govern these new financial transaction (Crowe et al., 2012). The need to address these new developments has also been recognize by authorities from the regulatory environment. The underlying issue is that mobile transacting overlaps domains that are covered by a multitude of regulatory agencies (Contini et al., 2011). As a result, industry-working groups, which Google and ISIS also joined, were formed to discuss and shape an appropriate regulatory framework (FEDBoston, 2012). It suggest their proactive approach to shape the industry.

However, in the case of Google Wallet and ISIS, the existing regulatory may still be applicable overall, though it may change in the future. The underlying reason is the fact that both companies are

leveraging existing payment channels (Crowe et al., 2012) provided by traditional players. So, although the payment transaction has been initiated through a mobile wallet, the transaction itself undergoes the traditional route, in which financial institutions retained their responsibility for clearing and settlement (ibid.).

7.3.4 **Sub-conclusion Value Network**

Google Wallet and ISIS heavily focus on building the ecosystem with multiple partners across the payment sphere. The findings of the partnership analysis reveal a common pattern of their partnership choices. Most of Google and ISIS's partners are big players and industry leaders in their respective field with large customer bases, existing industry relationships and other valuable resources and capabilities. It suggests that they were carefully selected based on the criteria to quickly gain in scale and reach. As such, partnerships were formed to leverage their respective market power and access complementary competencies, in order to accelerate the process broad market adoption. Aspects such as enabling technological interoperability between the mobile wallets' and partners' system played also a major role. In general, the partnership served both functional and strategic roles. Further, one could observe cross partnerships of various payment actors with both Google Wallet and ISIS. This highlights the fact that having formed a partnership with one of the mobile wallet partners does not exclude another partnership with the other. For instance, all major payment networks partnered up with Google Wallet and ISIS, as well as some of the big merchant such as Footlocker or Macy's. The reasons may lay behind the pre-mature stage of both mobile wallet launches as well as the inhibitions to commit to solely one solution early on, among others. However, variations in the degree of partner commitments could be observed between the wallet approaches. For example, MasterCard agreed not only to provide technological, but also funding support. As such, the concrete partnership terms are still subject to the negotiations and relationships between the mobile wallet providers and their partners.

In terms of network mode, the analysis highlighted the different approaches between Google Wallet and ISIS, i.e. open vs. walled garden network approach. Interestingly, these network approaches can be traced back in past product launches. For example, Google's is most renowned to adopt an open model, which is reflected in all their products and services such as in their search engine, Gmail, and YouTube. In contrast, ISIS with roots from carriers, have tightly controlled platforms, including providing locked phones only opt for the usage of their own networks.

Since Google and ISIS operate both in the U.S. and uses existing payment channels, they are obliged to same regulatory framework. However, this is still in the process of evolving and may be subject to changes.

7.3.5 Value Architecture

7.3.5.1 Core Resources

To provide a comprehensive list of all resources for Google and ISIS would be beyond the scope of this thesis. As such, the author will focuses on core resources that are relevant for the deployment of their mobile wallet solution. The table below depicts an overview of the core resources, distinguished as tangible and intangible resources, which will be briefly discussed starting with Google and followed by ISIS.

Table 8: Overview of core resources for Google and ISIS

Google	ISIS
Tangible	
▪ Deep pockets ▪ Infrastructure base ▪ Android platform	▪ Deep pockets ▪ Distribution network ▪ Control of SIM and network
Intangible	
▪ Organizational culture ▪ Intellectual property ▪ Brand power	▪ Customer relationships ▪ Existing relationships with handset manufacturers ▪ Brand power

Source: author's creation (2012)

7.3.5.1.1 Google core resources

Among others, Google's liquidity, strong (IT) infrastructure base, and its Android OS platform will support Google's new entrance in the mobile wallet sphere. A quick look on the Fortune 100 list illustrates the size and power of Google as a major corporation. It is currently ranked on 73rd position, with an annual revenue of $38 billion and a net profit of around $10 billion (CNNMoney, 2012). Google has constantly reported robust financials, both in terms of growth in revenue and cash flow. This strong financial performance is primarily due to Google's increase in advertising revenues generated by its websites and Google Network members' websites (Datamonitor, 2011). Consequently, it strengthens not only investors' confidence, but also allows Google to aggressively pursue new and resource intensive business opportunities, such as Google Wallet.

Another core resource is Google's strong infrastructure base, which includes online, software and hardware resources. This homegrown infrastructure is the backbone of each of Google's products and services, and supply substantial computing power at low cost. The enormous computing power is especially relevant, when in comes to processing large amount of data to deliver contextualize information and ads for consumers and merchants in Google Wallet. Google's IT assets accumulated to a staggering size of approximately $4 billion (Datamonitor, 2010a), and allows to introduce innovative services and products at large scale.

An additional tangible core resource is Google's Android platform, which would potentially provide Google a large customer base, if included as a native app in all Android phones, as it is the case of Google Map or YouTube (MarketLine, 2011). In addition, as the driver of Android, Google can create a seamless user experience with its wallet application, as it knows the OS the best.

One of Google's most important intangible resources is its unique organizational culture, which fuels the engine for innovation. Google employees are encouraged to pursuit independent projects during their work hours, which results in innovative products such as Google News or AdSense (Edelman & Eisenmann, 2010). This does not only empower employees and facilitates creativity, but also allows to quickly react to new opportunities. Further, Google remains committed to invest in promising long shots. This is manifested in the 'Owner's manual' written by the two founders, in which they state that Google will not shy away from high-risk, high reward projects just based on short-term earnings pressure (Page & Brin, 2004), which may be best exemplified with Google Wallet yet again.
Google as an innovative powerhouse is also represented through its growing portfolio of patens. It has secured 283 U.S. utility patents in 2012, compared to only 28 in 2006, placing them second in a patent ranking for the category of communication/internet services (IEEE, 2011).
Finally, brand power is also a significant intangible resource that will help to deploy Google Wallet at mass-market level. According to analyst firm, Google is one of the premier internet brands in the world (Datamonitor, 2011) and is ranked among the top global brands. In a current brand ranking, For example, Google is placed fourth with a brad value of around $70 billion, an increase of 26% compared to 2011 (Interbrand, 2012).

7.3.5.1.2 ISIS Core Resources

ISIS can draw back on several existing core resources that will help to deploy the mobile wallet. Specifically, the financial backing, existing distribution network, and the mobile network infrastructure represent valuable tangible resources.
ISIS consist of three joint venture partner, two of which are ranked among the Top 15 in the Fortune 100 (CNNMoney, 2012); AT&T (ranked 11st) and Verizon (ranked 15th) have a combined revenue of around $240 billion and a net profit of approximately $6.5 billion. As such, ISIS is financially backed up by financially very potent companies, which are believed to have invested $100 million in setting up the joint venture (Kharif & Moritz, 2012) and another $150 million in the second half of 2012 (Wester, 2012). This will provide the required run-way for the ISIS mobile wallet to stay in the game for the long-run, as the development of a solid ecosystem and consumer adoption may take time.

Next to having deep pockets, the large distribution network of all joint venture partners' is a huge core resource. The nation-wide presence of physical stores with an army of sales and support staff represents an edge over Google.
Another important resource represents the control of the mobile network and the SIM card. ISIS can draw on a sophisticated and robust network as well as a large client based from its JV-partners. To provide a perspective, the accumulated relationship with subscribers of all founding carriers accounts for more than 200 million (Wester, 2012).

Important intangible resources for ISIS include existing relationships both with consumers and with handset manufacturers, as well as the brand recognition behind ISIS.
Customer relationships, especially in an industry with high customer churn rates, depict an important aspect to maintain market leadership. This is why ISIS JV-partners are very focused to deliver extensive customer care and developed core resources. For example, AT&T has dedicated teams and provides different channels to which customers can submit questions or initiate service requests such as maintenance requests or ordering new services (Datamonitor, 2005). On a broader scope, the customer-centric approach would more likely generate customer goodwill, which should result to customer retention and repeat business, consequently keeping new customer acquisition costs at a low level (Datamonitor, 2005). The customer satisfaction of each of the joint venture partners would positively reflect on ISIS as a whole, and provide the trust and confidence to adopt the mobile wallet.
However, ISIS can also build on the good relationship established between its founding carriers and handset manufacturers. The relationship is based on the co-dependence between the parties, i.e. handset manufacturers producing innovative products and carriers distributing and subsidizing them. The good relationship is also reflected on ISIS's ability to secure the backing of six hardware partners early on in the planning phase. Each of these device manufacturers were very positive about the formed partnership in their press release statement (Cook, 2011). The partnerships make sure that the ISIS's technology and standards will be implemented in the NFC devices produced.
In combination with the good relationships, brand power also enables ISIS to enlarge its costumer base. However, brand power comes indirectly from its JV partners, and would likely create a halo effect. For example, AT&T was ranked among the Top 50 Most Admired Companies by Fortune magazine in 2010 (Datamonitor, 2010b). Further, according to WPP, a marketing communications consultancy, both companies AT&T and Verizon were top ranked with 7th and 13rd. and a brand value of around $70 and $50 billion respectively (Hughes, 2012). In order to leverage the brand power, some of ISIS's marketing efforts stresses on its corporate roots among other characteristics. The brand

power of the joined venture partners helps also to form new partnerships and to sign new customers such as merchants.

7.3.5.2 Value Configuration

Both Google and ISIS have different value configuration approaches towards providing NFC mobile wallet services based on the location of the SE. These will be analyzed including the security features they put in place (cf. Table 9).

Table 9: Overview of Google and ISIS's Value Configuration

	Google Wallet	ISIS
Payment Credential Location	Embedded SE and on secure servers (cloud)	SE in SIM card
Security features	• Four-digit pin for wallet access • Remote account/wallet suspension online • Full account numbers of debit or credit card are not visible in wallet	• Four-digit pin for wallet access • Remote wallet suspensions via online and calling ISIS • Full account numbers of debit or credit card are not visible in wallet • Personal privacy: transaction data only visible between consumer and merchant

Source: (GoogleWallet, 2012b; ISIS, 2012g)

Google adopted the NFC model in which the SE is directly embedded in the phone. However, payment credentials are stored in the SE and in the cloud (Dua, 2012). The payment credentials in the SE are not the consumer's account details from its debit or credit card, but from a linked proxy card. This proxy card is a virtual prepaid MasterCard issued by Google. The consumer's original payment cards are safely stored online in secure servers.

The dual SE and cloud approach represents Google's change in strategy and directly benefits consumers and banks. Consumers can now add any of their preferred payment cards into the wallet independent from their issuing banks (Dua, 2012). For banks the integration process into Google Wallet has been significantly simplified, as card-issuing banks do not longer have to connect their systems directly to Google Wallet (Young, 2012); it has reduced not only the complexity but also the costs for banks to offer customers' their payment cards in a mobile wallet (ibid.). In addition, Google introduced the *'Save to Wallet API for Payment Cards'* which allows banks to provide a means for customer to add their card directly to Google Wallet from their website via a button (cf. Appendix 2 for visual representation). The change in approach has already materialized into winning over new banking partners, i.e. Barclays Card USA, Silicon Valley Bank, and Green Dot (Dua, 2012). It has also enabled Google to ease the process to directly collect and access them based on customers' pertinent purchase information and purchase amount. This is because of the new way Google Wallet handles the

multiple credit card types: Google actually pays the merchant, and then processes the transaction with the consumer's selected debit or credit card (GoogleWallet, 2012b; Velazco, 2012).

On the other hand, ISIS adopted the NFC model in which the SE is being deployed in the SIM card. It allows ISIS to leverage on the existing control of the SIM card by its joint venture partners. There are a number of differences in the value configuration between Google and ISIS's approach. First, banks can directly place their card into the wallet through access on the SIM's SE. So, essentially ISIS is renting out the space in the SE for service providers (i.e. banks) for the use its mobile wallet application. In addition, ISIS takes a different TSM architecture model than Google, namely a split TSM model. In this model banks will have their own TSMs for the downloading and provisioning of their payment application to the ISIS's SE, in communication with ISIS's TSM (Gemalto). It suggests a Service Provider TSM to Secure Element TSM approach. The implications for banks are that they will not only end up paying fees to ISIS, but also to their own TSMs for their application provisioning (Balaban, 2012a). This is in contrast to Google's TSM approach, in which banks do not necessarily need an own TSM because of Google's cloud approach of the linked virtual card. Instead, Google's TSM First Data will provide both the SP TSM and the SE TSM services, simplifying the process as well as potentially saving costs for banks.

In terms of security, Google and ISIS implement very similar features (cf. Table 9). One major difference is that Google does not store consumers' payment cards directly in the mobile phone but on secure servers (GoogleWallet, 2012b). Another point is that ISIS does not collect any payment transaction data, since banks are directly integrated into the wallet. Further, ISIS allows customers to remotely suspend their wallets by calling ISIS directly in addition to accessing their accounts online (ISIS, 2012g).

7.3.5.3 Core Competency

Both Google and ISIS possess a number of core competencies, which will help them to deploy the mobile wallet solution on wider scale. For the purpose of this thesis, the author will focus on selected core competencies (cf. Table 10), which may be relevant for the success of Google Wallet and ISIS.

Table 10: Selected core competencies relevant for Google Wallet and ISIS

Core Competencies	
Google	**ISIS**
▪ Advertising ▪ Disrupting markets through innovation ▪ Building user-centric products	▪ Customer service management ▪ Network management ▪ Delivery of scalable innovations

Source: author's creation

One of Google's core competency lies in advertising (Fitzgerald, 2012). It developed effective ways to monetize its search and complementary products, e.g. YouTube and Google Maps, through relevant and contextualized advertising via AdWords. In effect, Google managed to transform the massive amount of data into valuable consumer data that allows them to utilize and leverage it to drive its advertising business. Thus, Google has great interest to control and use the data generated from consumers' behavior with the mobile wallet to combine it with existing resources so as to provide the most relevant ads and offers for its business customers (MobeyForum, 2012). With the increasing relevance of the smartphone in the consumers' life, it is the natural step for Google to expand its advertising business and follow the customers into the mobile sphere.

Google has already proven its capabilities to disrupt existing markets through innovation. One example is Google's initial market entry in the search area, where it completely took over the market from Internet giants like Yahoo or (back then) Lycos. Google has done it again with Gmail, challenging Hotmail and Yahoo with improved email services and user interfaces, as well as with Google maps, destroying the market leadership of Garmin and TomTom (Abraham, 2012). With this proven track record, Google has displayed its competencies to commercialize innovative solutions to broad mass-market, which will certainly be helpful for the deployment of its mobile wallet solution.

Another core competency is Google's meticulous approach to develop and design user-centric products. In a presentation, former Google Product Manager Marissa Mayer gave insight about Google's product development and management processes (Rodriguez, 2003). She explained the importance of *experimentation*, *iteration*, and providing *expedient solutions* in the user-centric design approach. This core competence of quickly developing products and improving along the way through feedback loops came also into play with launch of Google Wallet. It was released one year prior to ISIS mobile wallet, and also changed its (technological) approach towards a cloud solution to provide users more choice of adding any of their cards into the wallet.

As the market leaders in the telecommunication sector, ISIS's joint venture partners developed superior customer service competencies to serve their large customer base. For example, the results in Verizon's

commitment to provide superior customer service satisfaction and to set new standards for the telecommunication industry has been awarded by industry organizations and publications (Verizon, 2012a). The customer service capabilities are also reflected in the sheer amount of processed customers' inquiries by Verizon, which add up to 4.2 million daily interactions from various customer service channels, e.g. service hotlines, in-store, and online (Verizon, 2012b). Since, ISIS mobile wallet will be distributed through its joint venture partners, ISIS will be able to leverage on these customer service capabilities.

Next to customer service management, network management in a complex environment is another core competency of the joint venture partners that will serve ISIS. The history of building and running complex networks has given the carriers an incomparable knowledge of networks and the constituents that comprise them (AT&T, 2012b). For the case of the mobile wallet, it provides the safe and secure OTA mobile wallet-provisioning infrastructure.

ISIS can also build on its joint venture partners' long history of delivering scalable innovations for a broad mass market. Their market leadership has proven their ability to build complex systems and to serve millions of customers simultaneously. This would support ISIS to maneuver in the complex mobile payment ecosystem and to built a scalable model to reach large customer bases.

7.3.6 **Sub – conclusion Value Architecture**

The Value Architecture of Google Wallet and ISIS are significantly different as the analysis based on the sub-elements core resource, value configuration and core competency highlights. Both companies are financially well situated. This extended 'cash runway' provides the basis to built the ecosystem and shape the market in the long run. In addition, both companies have significant brand power which is however covert for the case of ISIS. Apart from those similarities in core resources, Google and ISIS exhibit rather different resource bases given their industry background in IT and telecommunications respectively. These resources are important pieces in the construction of the value configuration for Google and ISIS. For example, ISIS's choice to adopt the SIM-centric NFC model for the mobile wallet reflects the logical consequence of its core resource, i.e. control of the mobile network and SIM card. On the other hand, Google's decision to build the mobile wallet application in-house and from scratch also makes sense given its IT engineering capabilities and organizational culture. These capabilities also enabled Google to completely change its technological approach towards an improved customer-centric solution. The company has moved its wallet to the cloud and currently provides a virtual prepaid MasterCard, which is essentially a proxy card that allows any payment cards to be added into the wallet. The benefits of this change include giving customers' more choice as well as relevant

ads in form of offers. These relevant offers are generated through the collection of customer data from payment transaction, which are a sensible issue especially for issuing banks and payment networks. This has been recognized by ISIS, which is why it restricts access to those data sources in its value configuration of the mobile wallet. This avenue may also partly be taken because the lack of these competencies to make use of all the data to provide targeted and relevant ads to the level of Google. So, the desired Value Service is driven by the structure of the Value Architecture, since the efficacy to deliver the value elements is grounded on the respective strength in competencies and given resources.

7.3.7 **Value Finance**

7.3.7.1 **Cost**

This section focused mainly on the costs, related to providing the mobile wallet services. Thus, it will not consider all costs elements required to build the overall NFC mobile ecosystem, as it would be beyond the scope of this thesis. The differences in cost structures are mostly based on the different value configurations.

Google moved its wallet to the cloud and enabled other cards to be added in the mobile wallet through the linked virtual prepaid MasterCard. As the issuing entity, Google assumes interchange fees in the first transaction step from the merchant. However, these will be passed on to the original linked payment card of the consumer. This added layer does not only increase complexity but also the attached costs (Noyes, 2012; Peschkoff, 2012a, 2012b). Another derived cost from this approach could be costs associated with credit risks and customer service, since the liability shifts to Google as it acts now as the merchant of record (Rocky Agrawal, 2012). So, if a customer faces an issue with a transaction, and contacts the credit card company, the issue would be redirected to Google, which has to settle the issue with the merchant. This adds another cost layer for Google. Lastly, an additional cost factor is associated with the service fees to its TSM First Data for its OTA SE management functions, as well other typical service provider TSM services, such as OTA application personalization and lifecycle management (Cox, 2009).

Next to subsidizing NFC mobile phones, ISIS incurs large costs for the procurement of NFC SIM cards. These SIM cards are approximately at least three to four times higher than for conventional SIMs, depending on the size of the memory (Balaban, 2012a). ISIS does not pass these extra costs to customers when they want to make their phones NFC mobile wallet ready, thus absorb the full costs. Another cost aspect is the TSM service fee to its TSM Gemalto. For example, Gemalto fees for provisioning mobile bank cards OTA are estimated to be between €2 to €3 per card (Balaban, 2012b).

7.3.7.2 Pricing

As discussed in the Value Service section, the mobile wallet offers value propositions for merchants, consumers, and issuing banks. Further, this value proposition is not only limited to payment transaction through NFC enabled mobile phones but also extends to value added services such as offers, coupons, ads, or transit ticketing among others. Consequently, prices are set accordingly based on customer as well as the offered service. An overview of the different pricing set ups can be found in the table below. However, it shall be noted that some of the information are not publicly available due to confidentially agreements and may vary for customer segments, i.e. merchants and banks, based on their bargaining power.

Table 11: Pricing structures for Google Wallet and ISIS

Price Element		Google Wallet	ISIS
		Consumers	
Download/Installment and use of mobile wallet application		**Free**	**Free** $2 per month maintenance fee if account has not been used for more than 9 month
		Merchants	
Accepting NFC payments		**Free**, merchants pay card-present rates for all transactions made using Google Wallet, regardless of the user's selected cards	**Free**, merchant standard transaction fees will not be affected by accepting payments with ISIS
Value added services	Coupons	**40%-50%** of revenue share (Google Offers)	**Undisclosed**
	Loyalty Cards	**Undisclosed**, but assumed to be free	**Undisclosed**, but assumed to charge rental fees
	Gift Cards	**Undisclosed**, but assumed to be free	**Undisclosed**, but assumed to charge rental fees
		Banks	
Card provisioning and use of mobile wallet app		**Free**	**$5** per account and additional charges for other events

Source: author's creation

For consumers, the use of Google Wallet and ISIS is free, as they will not charge them anything for the download or installment and the use of the mobile wallet application. This includes payments and other added services such as the redemption for coupons and offers (Google, 2012c; ISIS, 2012h). Google Wallet will be available for download at Google's app store platform Google Play or come pre-installed for Sprints' NFC mobile phones. ISIS will also not charge customers for changing their SIM cards to NFC SIM cards. Store employees will freely install the chip when customers bring their phone or buy a new one, as well as download the application in-store if wished (Wester, 2012). However, ISIS charges $2 per month account maintenance fees if the pre-paid card has not been charged every nine month (Higginbotham, 2012; PayWithISIS, 2012d).

For merchants, both mobile wallet providers do not charge fees for accepting the new payment methods with NFC-powered mobile phones (Google, 2012c; PayWithISIS, 2012a). Instead, the regular standard transaction fees from merchant acquirers and card networks apply. However, it shall be noted that for merchants, Google may be a more attractive solution when consumers use the linked virtual prepaid MasterCard since transaction fees are lower for prepaid cards compared to debit and credit cards (MasterCard, 2012b; Visa, 2012). However, Google and ISIS impose fees for added value services such as coupons and loyalty cards. The exact pricing structures are undisclosed and confidential, and may vary for each merchant depending on their bargaining power. Nonetheless, a leaked merchant agreement of Google Offers suggests that Google takes a revenue share of 40-50% of the merchants couponing offer (Rakesh Agrawal, 2012). This represent a significant cut of the merchants' revenue, but may be justified with the benefits Google provides for them. For example, the merchant will get direct support to craft a customized and compelling offer from the Google team (Google, 2012d), as well as placing the offer where it gets exposed to their relevant customers to drive new customers to the business (Google, 2012f). As such, Google will leverage its advertising competencies to provide targeted ads in forms of coupons, and performance metrics to track and measure merchant's ROI. The pricing for couponing service for ISIS is not publically available. In regards of loyalty cards and gift cards, one could assume that Google would not charge those cards to be added in the wallet, as Google does not charges payment cards (credit or debit) either. However, Google does not disclose that information publicly. For ISIS, some fees may apply for adding loyalty or gifts cards since ISIS generally charges rental fees for accessing the SE in the SIM (Balaban, 2012a). But again, this information is not disclosed and confidential.

In regards to banks, Google and ISIS implement different pricing structures for banks. Google does not charge issuing banks to place their cards into the mobile wallet. So, NFC payment services are completely free for banks (Abraham, 2011; Frost&Sullivan, 2011c). This reasoning for adopting this 'free-model' will be subject in the next section. ISIS on the other hand charges rental fees to banks for storing their payment credentials in the SE of the SIM. ISIS does not publish these fees, but insight sources have revealed to NFC TIMES, a major industry publication, that issuing banks would be charged $5 per account per year, which is more than issuing plastic card (Balaban, 2012a). Additional charges may apply for events, such as canceling the mobile application on stolen or lost phones or upgrading an app OTA, which would add several cents per event (ibid.). Essentially, these parties are paying a premium to be placed on the card, especially since SIM cards are not known to store a lot of data (Planck, 2012). Nonetheless, an industry supplier suggested that these set prices may be to high, as he recommends that lifecycle cost for mobile card maintenance for two years should only account for

60% - 70% of their current card cost (Balaban, 2012a). These fees are around $4 - $5 for EMV plastic cards. The implications are that may be discouraged to be part of ISIS or similar NFC wallet projects.

7.3.7.3 Revenue structure

The pricing structure revealed the revenue models for Google and ISIS. Google's main revenue source stems from added value service provided to its merchants (Keane et al., 2012), since payment related services are free of charge for all of Google's customers. As such, merchants and advertisers will be charged when they place customized ads and coupons to consumers through the mobile wallet (Galaski, Daley, Castonguay, & Lalka, 2011). Thus, Google is mainly interested in the control of consumer data through the purchasing chain. This includes consideration, promotion, transaction details, receipts and coupons (ibid.). In other words, Google aims to make money by focusing on its core business, which is connecting the right consumers with the right merchants (Knowledge@Wharton, 2012).

In comparison, ISIS's revenue model stem from two sources**.** First, ISIS charges charging rental fees from its control point, the SE SIM (Abraham, 2011). As previously mentioned, ISIS charges a relatively steep price for issuing banks to place their cards, and also intends to charge other service providers for placing their credentials into the SE of the SIM (Hibberd, 2012b). Second, revenues will be generated by offering the mobile wallet as a marketing channel for merchants (ibid.)

7.3.8 Sub – conclusion Value Finance

The Value Finance section analyzed the monetary aspects associated with delivering the mobile wallet services of Google Wallet and ISIS. These have been studied according to the sub-elements of cost, pricing and revenue structure. The findings of the analysis suggest that one of Google's main cost driver is the double acquiring process related to its new cloud and proxy card approach. This value configuration exposed Google to assume interchange differences, and potential credit risks. Another cost driver are fees charged by Google's TSM First Data. These costs are also incurred for ISIS, as TSM services play an important role for the secure OTA provisioning of payment and other identity credentials. However, one of ISIS's main cost driver is associated with the procurement and deployment of the higher priced NFC-enabled SIM cards.

These costs need to be recouped by the services Google and ISIS provide to their customers. In terms of pricing methods both mobile wallets do not charge their consumers for the installment and use of the application. In addition, Google does also not charge banks to be integrated in the mobile wallet application as opposed to ISIS. Banks are required to pay a rental fee to access the SE of the SIM card,

in order to be included in ISIS's mobile wallet. These fees are rather steep, as some industry players have complained. Further, both companies adopt charges to value added services, such as couponing or loyalty features. However, no charges apply regarding payment transactions.

The different pricing structures also reveal the different revenue drivers for each of the mobile wallet. As, such Google implements only one revenue source stemming from added values from non-payment services offered to its business customers. In contrast, ISIS has two revenue sources put in place, which stem from rental fees and added services provided to its merchants.

7.3.9 **Threats**

The mobile payment sphere especially for NFC is a relatively new and an emerging market, which is still in the process of evolving. This state of flux can bear threats towards the broad acceptance of Google Wallet and ISIS. Sources of threats can be market-related, technology-related, and regulatory related.

In terms of threats originating from changes in the market, one can observe that the mobile payment industry is getting more crowded with more promising initiatives such as PayPal's cloud digital wallet. As an established and dominant player in the online payments space and increasing traction and acceptance of its (digital) wallet solution, PayPal poses a threat for other market players such as Google Wallet and ISIS (Galaski, Daley, Castonguay, & Lalka, 2011). Further, as competitors they are also in the position to threaten each other. For example, Verizon has blocked the Google Wallet application to be loaded for its distributed NFC mobile phones (Cherry, 2012).

Technology threats include threats steaming from changes in technological standards or interoperability. In order to mitigate these cooperation and partnerships with stakeholders are crucial, as it has been discussed in chapter four. Google Wallet and ISIS both followed the approach and formed partnerships that enable the interoperability of their mobile wallet with its partners' systems.

Google and ISIS are both exposed to threats stemming from the evolving regulatory framework (cf. section 7.3.3.3). However, they are mitigating those risks by actively participating in workgroups with regulatory institutions (FED-Boston, 2012), to jointly shape the appropriate regulatory framework for the U.S.

7.3.10 **Chapter Conclusion**

Based on the BMMP framework, the two specific NFC mobile wallet initiatives Google Wallet and ISIS have been analyzed. In specific, their business models have been investigated and compared according to the five sub-elements of the developed framework. The applied analysis suggests the

efficacy and value of the developed framework. It served as a structured approach to comprehensively reveal the core elements of NFC mobile wallet initiatives as well as a means to compare them.
In addition, case application has also revealed and validated the connection between the BM elements; all elements are influencing each other and are jointly allowing Google and ISIS to form a solid business model. For example, Google Wallet and ISIS leverage existing core resources and competencies to align their value configuration (*Value Architecture* elements) that enables them to deliver their *Value Service* and set their *Value Finance* accordingly. However, both companies rely on a vast *Value Network* as they are depended on competencies and support of other players in the ecosystem. Nonetheless, Google and ISIS's strong *Value Architecture* facilitated the process of establishing a strong *Value Network*.

In terms of the specifics of the two business models, the analysis has revealed interesting details on Google and ISIS's strategy to deploy their mobile wallet to the mass. They are both strongly focusing on providing an enhanced customer experience with their mobile wallet through a sound and multifaceted value proposition. The success of the delivery of its offering requires support and cooperation from other stakeholders. As such, significant efforts have been put in building the ecosystem that enables the deployment of a ubiquitous mobile wallet solution. However, differences in their mobile wallet approach are also apparent and have been summarized in the table below.

Table 12: Main differences between Google Wallet and ISIS

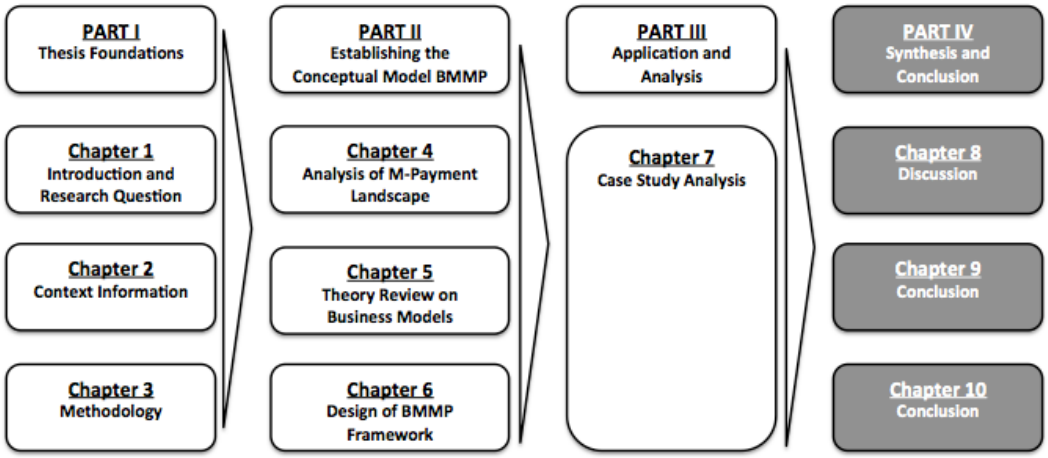
		Google Wallet	ISIS
		Value Service	
Value Proposition	Merchants	• Offers based on more complex customer data • Performance based advertising	• Offers are based on simpler data, but customer data stays with merchants
	Banks	• Fast integration and no added fees	• Full control of customer data and possible integration of other banking services
		Value Network	
Network mode		Open platform: no charge to lease platform and support of multiple SE locations	Walled Garden: tight control of the SIM SE and rental fee
		Value Architecture	
Payment Credential Location		Embedded SE and on secure servers (cloud)	SE in SIM card
Integration of cards		• Direct partnerships (CITI) • Through proxy card	• Only through direct partnerships (Chase, Capital One, Barclays, Amex)
Security features		• Four-digit pin for wallet access • Remote account/wallet suspension online • Full account numbers of debit or credit card are not visible in wallet	• Four-digit pin for wallet access • Remote wallet suspensions via online and calling ISIS • Full account numbers of debit or credit card are not visible in wallet • Personal privacy: ISIS has no visibility to any transaction data
		Value Finance	
Revenue Sources		• Single source: value added services	• Dual source: SE SIM rental fee and value added services

Source: author's creation

Introduction to part IV – Synthesis and conclusion

Part IV – Synthesis and conclusion – has two chapters. Chapter 8 provides a discussion based on the main differences of Google and ISIS's business model design. Chapter 9 depicts the overall conclusion and avenues for future research.

Figure 12: Thesis outline for Part IV



Source: author's creation

8 Discussion

8.1 Chapter introduction

This chapter presents the discussion on the findings of the case study analysis. As such, the author uses three main differences of Google and ISIS's business model as the point of departure. First, their different network modes will be reviewed as well as the implications for the broad acceptance of mobile payment. Second, the author discusses which of the adopted mobile wallet model may lead to a sustainable and scalable solution. Lastly, a discussion on the adopted revenue models and its implications will be provided.

8.2 Network mode: open vs. walled garden

As previously elaborated, the mobile payment ecosystem is complex in nature, and requires rigorous collaboration between participants (Xia, Rost, & Holmquist, 2010). Thus, past studies suggest the convergence of collaborative models (e.g. An, Yang, & Wu, 2010; Galaski, Daley, Castonguay, & Magder, 2011; PwC, 2011) for sustainable mobile payment solutions to arise. These findings are somewhat in accordance with the current findings in this research. The extensive analysis of the Value Network has highlighted the significant efforts of Google and ISIS to built the ecosystem and form partnerships with market leaders in their respective fields. Those partners fulfilled both functional and

strategic roles that are required to deliver the Value Service. However, despite the emphasis on collaboration, only Google adopts an open network mode. ISIS on the other hand takes a walled garden approach, though it claims to be open and welcoming any partners. Consequently, one may expect Google to gain more traction, which is not the case however. For example, banks were not lining up to be part of Google Wallet, even though it was free and Google was not touching interchange fees. Also, the support of CITI bank, that has publicly advocated the benefits for other banks of joining Google Wallet and criticized ISIS gatekeeper approach, did not lead to more bank acceptance. In fact, ISIS was able to secure more and bigger banking partners with its launch than Google, despite charging them rental fees. One of the reasons may have been the compelling value proposition to banks, not to interfere with relationships that banks have with their customers by collecting transaction related data. Further, the choice of the network mode was driven by Google and ISIS's different control points, i.e. data flow and SIM card, as well as their different Value Architecture (resources, value configuration, core competencies) basis. Both approaches have already shown some traction, suggesting their efficacy. It also join the argumentation that no one single approach is successful at all times to thrive in new innovation landscape (Pisano & Verganti, 2008).

However, ISIS's walled garden approach may hurt the broad adoption of NFC mobile payment and slow down the adoption process of the whole industry. ISIS tightly controls the SE integrated in the SIM, and inhibits multiple locations of the SE to be used for their carrier-distributed phones. ISIS has blocked the Google Wallet app for its network subscribers to be loaded and used for its carriers' phones. Without the support of the MNO's that owns 75% of the U.S. mobile subscription market, Google's slow consumer acceptance comes at no surprise. ISIS was in the position to accelerate the process of m-wallets to reach consumers, but decided against it because of its interest to deploy its own mobile wallet solution. In other words, instead of increasing the overall pie by popularizing and accepting multiple mobile wallets, and giving consumers' the power to choose their own wallet, ISIS exercised its gatekeeping power to maintain full-control. Further, without consumers NFC mobile payment would not be able to reach the volume that is necessary to make it a profitable business for banks since interchange fees are marginal. The bottom line is, that the adoption of NFC m-payments could be further than as it is currently, if both agree to collaborate in a mutually beneficial way to leverage on each other strength.

8.3 NFC & Cloud vs. SIM SE model

The findings of the analysis suggest that Google and ISIS are focusing on building a scalable model for their mobile payment solution. Both firms assessed their strength and weaknesses to built a strong

business model. Based on that, they have identified their missing pieces and utilized levers that would enable them to provide a ubiquitous m-payment solution. As a result, they have chosen different mobile wallet models. Google adopted a hybrid model using NFC and cloud technology, where else ISIS took the traditional model with a SE integrated in the SIM. The question arises which of these models would be more scalable and sustainable in the long run. Both models have their benefits and drawbacks.

Google's new adopted model has been a response of its slow process to win over consumers and sign up banks. It has given consumers the freedom to add any payment cards, and simplified the process for banks to be part of the wallet. However, this does not come at a cost for them. Consumer may potentially lose on rewards commonly offered by credit cards for spending in certain shopping categories, since Google will now be presented to banks as the merchant of record. Banks in turn lose another differentiation factor or even worse the customer ownership since their customer relationship is being distorted. These drawbacks may hinder the adoption process for consumers and banks. Google's decision was driven by scalability issues, but also comes at a cost for them. As mentioned before, it created another layer of cost for itself and increased its liability.

With ISIS's mobile wallet model, banks' relationships with their customers are not affected, since banks directly integrate their solution into the m-wallet via the SE. However, this comes at a premium since space on the SIM SE is costly and scarce. This may raise issues on the scalability of ISIS's model. On the one hand, the market structure for issuing banks is concentrated, in which ten issuers account for 75% of the market share. ISIS has already formed partnership with three major issuing banks, thus is on the right track. On the other hands, it may exclude consumers that have payment cards from the other 25% of 8500 issuing banks in the U.S. As such, it does not support all banks and provide consumers the free choice to pick their cards, which are requirements to provide a genuine ubiquitous mobile wallet. However, one definite ace towards a ubiquitous m-wallet is ISIS large large distribution network to push out their smart SIM cards with NFC phones.

So all in all, the posed question on the judgment of Google and ISIS's wallet models in terms of scalability and sustainability may not have a definite answer at the current stage, but may become clearer at a more mature stage.

8.4 Revenue models for mobile wallet providers

Past studies emphasized the centrality of revenue sharing arrangements to mobile payments (Asmundson et al., 2011; SmartCardAlliance, 2008). According to them, it represents a source of great latent competitive friction and the key to rapid deployment of NFC-enabled m-payments.

Google and ISIS adopt different revenue models based on the different fundamentals and arrangements of their business model. Google built its revenue model based on its value proposition, which in turn has been designed based on its advertising competencies. Thus, Google relies merely on consumer data, and not on interchange fees, which it leaves for its banking partners. On top, Google does not charge banks any additional fees. Google's main revenue source stems from value-added services unrelated to payments offered to merchants. ISIS's revenue model is structured around its control of the SIM SE. It does not take a cut from interchange fees, however charges banks to be integrated in the mobile wallet. Even though findings of a past study (SmartCardAlliance, 2008) suggest that revenues should be split according to the assumed risks of each entity, industry participants have voiced their discontent with ISIS's model (Balaban, 2012a). They were complaining about the high rental fees, which were set higher than traditional payment cards. Although ISIS set this fee to quickly recoup its own costs, it may not be the optimal approach. ISIS has just launched its mobile wallet, and NFC payments are generally in an early stage; thus, success is not guaranteed and the required payment volume far from being reached. This volatile situation poses great risks and a significant barrier for banks to join ISIS. In fact, Google appears to be the less risky option in terms of required investment and costs. Consequently, ISIS revenue model, and linked pricing structure, may be appropriate in a more mature stage, but does not appear so in their current stage.

8.5 Chapter Conclusions

The business model analysis based on the framework has highlighted the different BM design approaches of Google and ISIS. Three main different design approaches were found and discussed further in this chapter. First, different network modes were adopted to maneuver through the complex m-payment ecosystem; network modes were chosen based on their control points and Value Architecture basis. Both network modes enabled them to form partnerships and built the ecosystem, suggesting their efficacy. However, findings suggest that collaboration between both m-wallet providers would more likely accelerate the process for broad m-payment acceptance. Second, differences in Google and ISIS's m-wallet to deliver the services were found, though, both with the potency to reach broad mass-market. Further, adopted m-wallet models affected the value proposition for its customers, providing different benefits for them. Lastly, variations in Google and ISIS's revenue models were observed, posing different risk levels for their customers. ISIS revenue structure to charge premium prices to banks suggests its plan to quickly recoup its investment, which appears to be a sub-optimal strategy given the uncertainties and infancy of the industry.

9 Final Conclusion

This thesis departed on an exploratory journey with the aim to study NFC mobile payment approaches on the basis of business model thinking. As such, it has produced two significant outcomes that contribute to the research of business models and NFC mobile payment.

First, the author developed the novel Business Model for Mobile Payments framework, which has been derived from extant research on business models and tested on two case studies. The findings suggest the applicability of the framework to deal with the complexity and particular characteristics of NFC m-payments and related business issues. It considers a broad range of facets that are seen as highly relevant in the m-payment domain. The Value Service element depicts the nature and aspects of the new service and ensures that these are delivered to the right target segment and through the relevant distribution channels. In order to successfully deliver the desired Value Service, mobile wallet providers need to check that their given resource base is strong and configured it in a way that adds to their core competencies. However, the efficacy of the m-payment service is significantly enhanced by building a well-rounded and lasting Value Network. As highlighted through the cases, Value Networks provide valuable expertise as well as other complementary resources and benefits that strengthen the potency of the wallet services. Lastly, the Value Finance element includes the financial attributes incurred and generated through the delivering the value to customers, and originating from the aforementioned constellations of the four value elements. In addition, the framework regards the potential threats that are apparent in the emerging and volatile market of m-payments. So, given the broad coverage, the framework appears to provide a comprehensive tool for researchers and practitioners to study and analyze current and future mobile payment solutions. Further, it also enables them to communicate and share understandings of the different or overall aspects of the business model.

Second, the author provides a grounded understanding of NFC m-payment business models. Past studies suggest the lack of stringent and rigorous analysis of business models of m-payment services (Wiedemann, Palka, & Pousttchi, 2009), which is even more the case for NFC-enabled payments given its infancy. This thesis addresses this research gap and explored and compared two high profile mobile wallet approaches in the U.S. market, according to five dimensions, and twelve sub-dimensions. The analysis of Google Wallet and ISIS has highlighted the similarities and differences of their design approaches to deploy a mobile wallet service for a broad mass market. The analysis suggests three main findings in regards to the main differences in their configuration of the business model elements.

First, contrary to expectation not both of the mobile wallet providers adopted an open network mode. However, ISIS's closed network mode did not hinder them to build the required ecosystem around their mobile wallet solution. In addition, Google's open network mode did not enable them to form more partnerships. Nonetheless, the adoption of NFC m-payment could be more widespread if both would agree to collaborate given their different strengths and market power.
Second, the author's findings suggest the importance of focusing on the aspect of scalability. Google and ISIS both aligned their value elements to create a mobile wallet solution that could quickly reach the scale to become a ubiquitous payment method. As such, they focused on different m-wallet approaches to deliver their Value Service. Google's engineering and creative power enabled it to construct a new technical approach to the wallet that overcomes its past obstacles. ISIS's on the hand adopts an approach that leverages on existing control points, i.e. the SIM card, and its distribution network. However, given the relative short market presence of them, no definite answer can be given in terms of which wallet approach would be more scalable and sustainable.
Third, the analysis has exposed the different revenue models of the m-wallet providers. The findings suggest that these have been designed accordingly to their Value Service, and were affected by the different constellations of the Value Architecture and Value Network. It also suggests that ISIS revenue model may be appropriate but its price setting may be flawed, given the associated risks for customers to become part in the early stage of the m-payment evolution.

To sum up, the thesis has constructed a business model framework that allows practitioners and academics to study current and future m-payment approaches. This artifact has been used and tested on two recent NFC mobile payment services. The application of the framework has been proven to be useful and lead to a grounded understanding of such business models and its related issues.

9.1 Future research

It was necessary to draw some demarcations in the writing process, which left some avenues for future research. The framework was tested on two case studies, consisting on previously collected primary data and desk research. Thus, more work is necessary to test the artifact. Access to more primary data, a larger sample of companies, or a broader geographical scope would enhance the validity of proposed framework. Especially the latter two would increase the validity and reliability, also in different contexts. However, the author demonstrated the soundness of the business model framework. Further, inclusions of measures and evaluation metrics would also more likely improve strength of the framework as tool to study and analyze m-payment business models.

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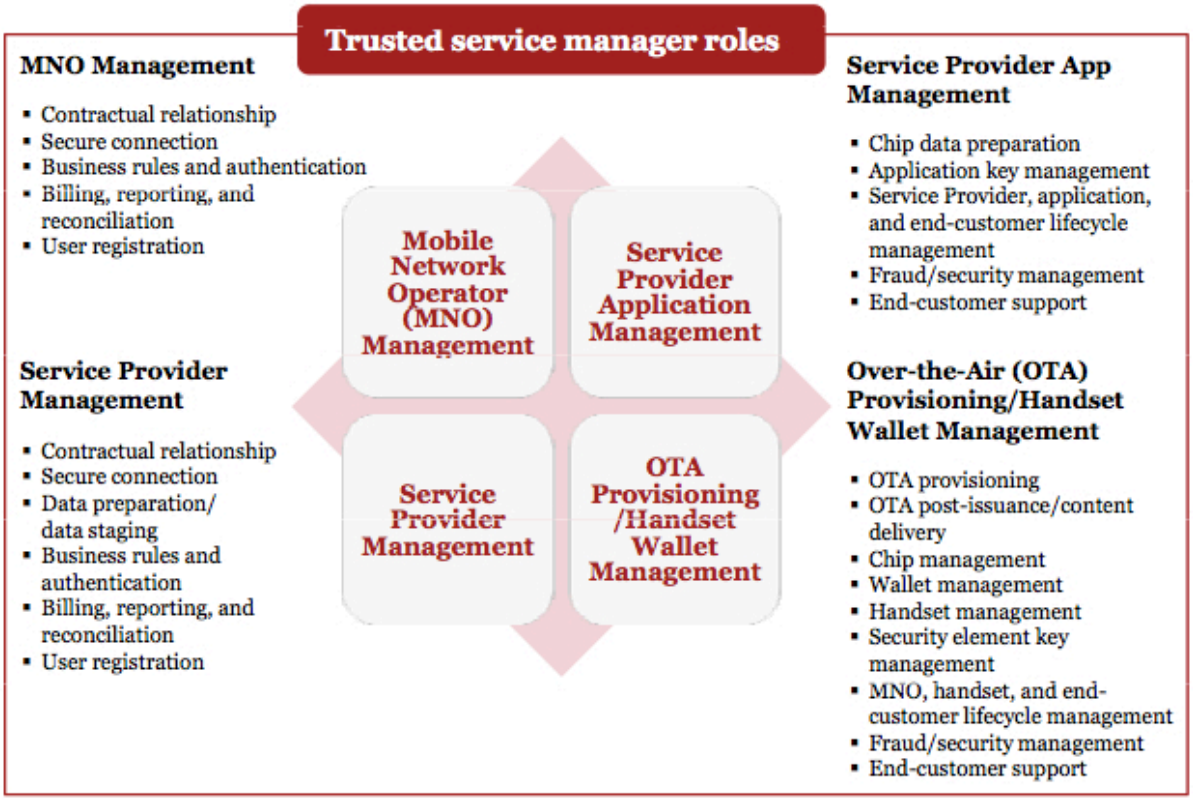
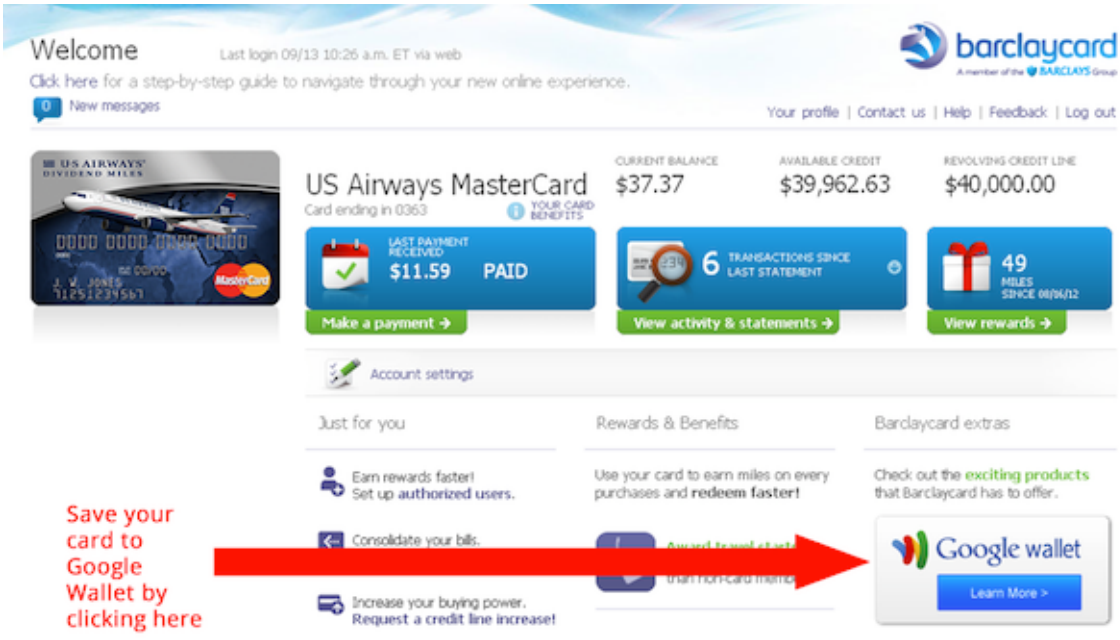
11 APPENDICES

Appendix 1: Different roles of the TSM



source: (PwC, 2011)

Appendix 2: Graphical Example of '*Save to Wallet*' API at issuing bank's website



Source: (Young, 2012)