

# EXPLORING BUSINESS MODELS FOR NFC ENABLED MOBILE PAYMENT SERVICES: THE CASE OF GOOGLE WALLET AND ISIS

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## Abstract

*Over the past few years, mobile payments have been present like a storm on the horizon. They have generated a lot of attention; yet have not reached wide adoption. Issues such as the complexity of the mobile payment ecosystem and the lack of sustainable business models have been accounted for the slow market penetration. With the rise of new technologies such as NFC, the mobile payment sphere experiences a new height of talk, which materialized in a second wave of companies entering the market. Using the case study method, we will enquire into two recent mobile payment initiatives in the U.S, namely Google Wallet and ISIS. As such, the paper sets out to study NFC-enabled mobile payment innovations and provide an analysis of business models of m-payment services. The outcome of the paper contributes to the research of business models and mobile payment in two ways. First, it offers an applicable business model framework that allows practitioners and academics to study current and future mobile payment approaches. Second, it offers new insight in the field of NFC mobile payments; specifically about concrete business model configurations to effectively reach mass-market.*

Keywords: NFC mobile payment, mobile wallet, business model

## **INTRODUCTION**

The mobile payment industry is an emerging market. New technologies, such as mobile banking and mobile wallets, SMS payments, and Near Field Communication (NFC), have emerged; creating excitement and increasing the number of new market entrants. In particular, NFC is bespoken as the payment solution of the future. 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 a projected compound annual growth rate (CAGR) of 35% during 2011 to 2016 (Markets and Markets, 2012). Juniper projections are more optimistic, suggesting a market size of \$50 billion by 2014 (Purcell, 2011). However, despite these prospects, claiming a stake in this lucrative industry is not an easy task; NFC mobile payment solutions have been lagging behind their expectation. Issues surrounding the business model and complex ecosystem have been accounted for the slow market progressions (see for instance Asmundson et al., 2011; Crowe et al., 2010). Academics identified the need for stringed and rigorous analysis of the underlying business models of mobile payment services based on the relevancy and lack of such studies (Pousttchi, Schiessler and Wiedemann 2008).

Consequently, this paper sets out to analyse NFC-enabled mobile payment solutions grounded in business model literature. In specific, contribution is made by increasing the understanding of business models for NFC mobile payment services, as well as shedding light on the dynamics of this emerging industry. In specific, the research produces two contributions. First, we develop a business model framework that is applied and enhanced through a comparative case study of two NFC based mobile payment solutions. 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, we apply 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 Mobile Wallet (ISIS).

The remainder of the paper is structured according to the following logic: The next section presents a brief overview of the business model literature followed by a proposal of a business model framework for mobile payment services in section three. Section four provides a description of the research method. Subsequently, section five presents a brief case summary. Next, the analysis and results of the application of the framework are presented. Finally, the paper concludes with a discussion and summary of the findings.

## **BUSINESS MODEL LITERATURE**

The Business Model (BM) plays a fundamental role to any organization (Amit and Zott 2001; Magretta 2002; Hedman and Kalling, 2003; Shafer et al., 2005; Zott, Amit, and Massa, 2011). Most of it is due to the facilitating power that the business model provides. It allows the business and technology stakeholders to understand, communicate, analyse and manage strategic-orientated decisions among each other (Osterwalder and Pigneur, 2002; Pateli and Giaglis, 2004) along with changing the business logic of the firm (Osterwalder et al., 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.

There are many business model frameworks (Hedman and Kalling, 2003; Shafer et al., 2005) they differ in their rigor and depth, as well as complexity in which definitions, elements and their relations are included and analysed. More recent approaches aimed to develop 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. The 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. One popular framework has been proposed by (Osterwalder, 2004), the Business Model Ontology (BMO). The model describes the logic of a business system for value creation in the digital era, and constitutes of four main pillars, which are further decomposed into nine sub-components. While his framework provides a robust and generalizable framework, it has certain limitations in the context of mobile payment services. The BMO takes an inside out approach that focuses on the business logic of individual enterprises rather than on the dynamic interaction within value networks (Solaimani and Bouwman 2012). Based on the BMO, Pousttchi et al. (2008) propose an extended version in which they have incorporated external threats and increased the layer of abstraction, providing a lower level of analysis that allows specifying the characteristics of the particular industry. The external market place dynamics are also included in Bouwman et al's (2008) work. As such, they argue that businesses do not operate in a vacuum, but rather are influenced and dependent on the environment. Unlike the BMO, their so-called STOF business model takes a network-centric view of the organization; firms are part of a value network or value web (Bouwman et al., 2006), in which organizations exchange resources and capabilities in a parallel and simultaneous manner. The value centric perspective is

also represented in (Al-Debei 2010) V4 business model. It is derived from a content analysis of existing literature on business models, and contains four main pillars.

## **THE BUSINESS MODEL FOR MOBILE PAYMENT FRAMEWORK**

Built upon the specifics and dynamics of the mobile payment context and the literature review on existing business model framework, we propose a Business Model for Mobile Payments. It includes five main dimensions: *value service*, *value network*, *value architecture*, *value finance*, and *threats*. Each of the dimensions is further decomposed into fifteen sub-dimensions, which provides the second layer of analysis

- The *value service* dimensions covers all aspects of the target firm's offering to the customers. It comprises of the value proposition, target segment, and distribution channel.
- The *value network* dimension incorporates the complex nature of the mobile payment industry with its numerous stakeholders. 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 and Pigneur, 2003). So, when analysing value networks it is helpful to look at it from three perspectives: partnership, network mode, and governance.
- The *value architecture* reflects a rough outlay that identifies all the required technological architecture arrangements which allows for an efficient and effective operation (Al-Debei 2010). Further, it specifies the organizational infrastructure arrangements, such as key functions and processes, company culture or management mindset. This dimension comprises of three elements: core resource, value configuration and core competencies.
- The *value finance* describes the required core arrangements to ensure the economic viability of the offering (Al-Debei and Avison, 2010). It consist of the three elements: (1) cost, (2) Pricing, and (3) revenue structure. 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); three types of threats can be distinguished: market, technology, and regulation.

## METHODOLOGY

Given the multifaceted nature of mobile payments and its context-dependency, we apply an exploratory comparative case study approach to challenge and enable re-interpretation of our proposed business model framework. 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, we adopt the case study approach.

Data was collected using publically available interviews, Q&A sessions, panel discussions, and live presentation from previously identified key personal of the case companies, see table one for a summary. In order to ensure originality and authenticity of the data only rich-media data sources from audio and video recordings or fully published transcribed interviews, i.e. not edited or summarized, were considered. To insure construct validity, the author adopted the triangulations method as suggested by (Yin, 1994). Thus, two or more independent sources of data were used to corroborate research findings within this paper. 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.

<b>Table 1: Overview of data sources</b>				
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 Sebeti	Director, POS and Payment Alliance	Video Interview	latest Development of ISIS, Value Service
ISIS	Michael Gran-nan	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

<b>ISIS</b>	Nan Edwards	City Development Manager	Video Interview	Value Service, Value Network, Value Architecture
<b>Google</b>	Osama Bedier	VP Google Wallet and payments	Transcribed Interview	Value Service, Value Finance
<b>Google</b>	Osama Bedier	see above	Video Interview	Google's Wallet Opportunity, Value Network, Value Architecture
<b>Google</b>	Osama Bedier, Google Wallet engineers, and executives from Google's partners	see above	Video Launch Presentation	Value Service, Value Architecture, Value Network, Value Finance
<b>Google</b>	Robin Dua	Head of product management, consumer payments wallet	Video Q&A	Value Service, Value Architecture, Value Finance

We have selected two recent initiatives in the field of mobile payment: Google Wallet and ISIS. Backed by large ICT-giants with proven track record to bring innovative products and services successfully to mass-market, both NFC mobile wallet solutions exhibit the potency to also advance the payment sphere into the next era, and commercialise the technology. Based on the relative infancy of NFC m-payment solutions, as well as the new market presence of their commercial attempts, this study is one of its kinds. Google Wallet and ISIS were also chosen because they operate in the same context, e.g. geographical area, demographical and regulatory environment.

### **Google Wallet**

Followed by a three-month pilot phase, Google Wallet launched in the U.S. in September 2011. From the beginning, Google collaborated with respective industry leaders, in order to build the necessary ecosystem to deliver a seamless new payment solution to customers. Aimed to revolutionize the offline shopping experience, Google wallet offers a number of benefits for consumer and merchants. 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. 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. However, the wallet runs only on NFC phones from selected carrier network.

### **ISIS**

ISIS is a joint venture between AT&T, T-Mobile, and Verizon Wireless - the three largest mobile network operators in the U.S.; it was 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. Similar to Google, it provides consumers a simplified way of paying, stor-

ing and redeeming coupons, and collecting loyalty points all in one device. Merchant benefit from the possibility to connect with their customers in new ways and deliver targeted offers directly into the phone. They can also deploy in-store posters which consumers can ‘tap’ through their NFC-phones to access information and offers. 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. Consumers have a greater choice on available NFC phones, which can be purchases at the three largest carriers in the U.S.

## Analysis

Based on the BMMP framework, the two specific NFC mobile wallet initiatives Google Wallet and ISIS have been analysed. 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. A summary of the main differences is shown in table 2.

<b>Table 2: Main differences between Google Wallet and ISIS business model</b>			
		<b>Google Wallet</b>	<b>ISIS</b>
<b>Value Service</b>			
<b>Value Proposition</b>	Merchants	<ul style="list-style-type: none"> <li>• Offers based on more complex customer data</li> <li>• Performance based advertising</li> </ul>	<ul style="list-style-type: none"> <li>• Offers are based on simpler data, but customer data stays with merchants</li> </ul>
	Banks	<ul style="list-style-type: none"> <li>• Fast integration and no added fees</li> </ul>	<ul style="list-style-type: none"> <li>• Full control of customer data and possible integration of other banking services</li> </ul>
<b>Value Network</b>			
<b>Network mode</b>		Open platform: no charge to lease platform and support of multiple SE locations	Walled Garden: tight control of the SIM SE and rental fee
<b>Value Architecture</b>			
<b>Payment Credential Location</b>		Embedded SE and on secure servers (cloud)	SE in SIM card
<b>Integration of cards</b>		<ul style="list-style-type: none"> <li>• Direct partnerships (CITI)</li> <li>• Through proxy card</li> </ul>	<ul style="list-style-type: none"> <li>• Only through direct partnerships (Chase, Capital One, Barclays, Amex)</li> </ul>
<b>Security features</b>		<ul style="list-style-type: none"> <li>• Four-digit pin for wallet access</li> <li>• Remote account/wallet suspension online</li> <li>• Full account numbers of debit or credit card are not visible in wallet</li> </ul>	<ul style="list-style-type: none"> <li>• Four-digit pin for wallet access</li> <li>• Remote wallet suspensions via online and calling ISIS</li> <li>• Full account numbers of debit or credit card are not visible in wallet</li> <li>• Personal privacy: ISIS has no visibility to any transaction data</li> </ul>
<b>Value Finance</b>			
<b>Revenue Sources</b>		<ul style="list-style-type: none"> <li>• Single source: value added services</li> </ul>	<ul style="list-style-type: none"> <li>• Dual source: SE SIM rental fee and value added services</li> </ul>

### Value Service

The value proposition of Google Wallet and ISIS are both multifaceted and target to consumer, merchants and banks. Clear focus is put on enhancing customer experience and service add-ons beyond the capabilities of a conventional payment card or wallet. Differences in value propositions can be found for merchants and banks, based on the collection and usage of consumer data; making each wallet offer more or less attractive depending on the customers' priority and needs. A closer look on the case companies distribution channel reveals their excellent position for large-scale distribution.

### **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.

In terms of network mode, the analysis highlighted the different approaches between Google Wallet and ISIS, i.e. open vs. walled garden network approach. The adopted network mode reflects the characteristics of past product launches: e.g. Google's open model in products such as Gmail or YouTube or ISIS carrier's tightly controlled platform through locking phones only opt for the usage of their own networks

### **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. 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.

### **Value Finance**

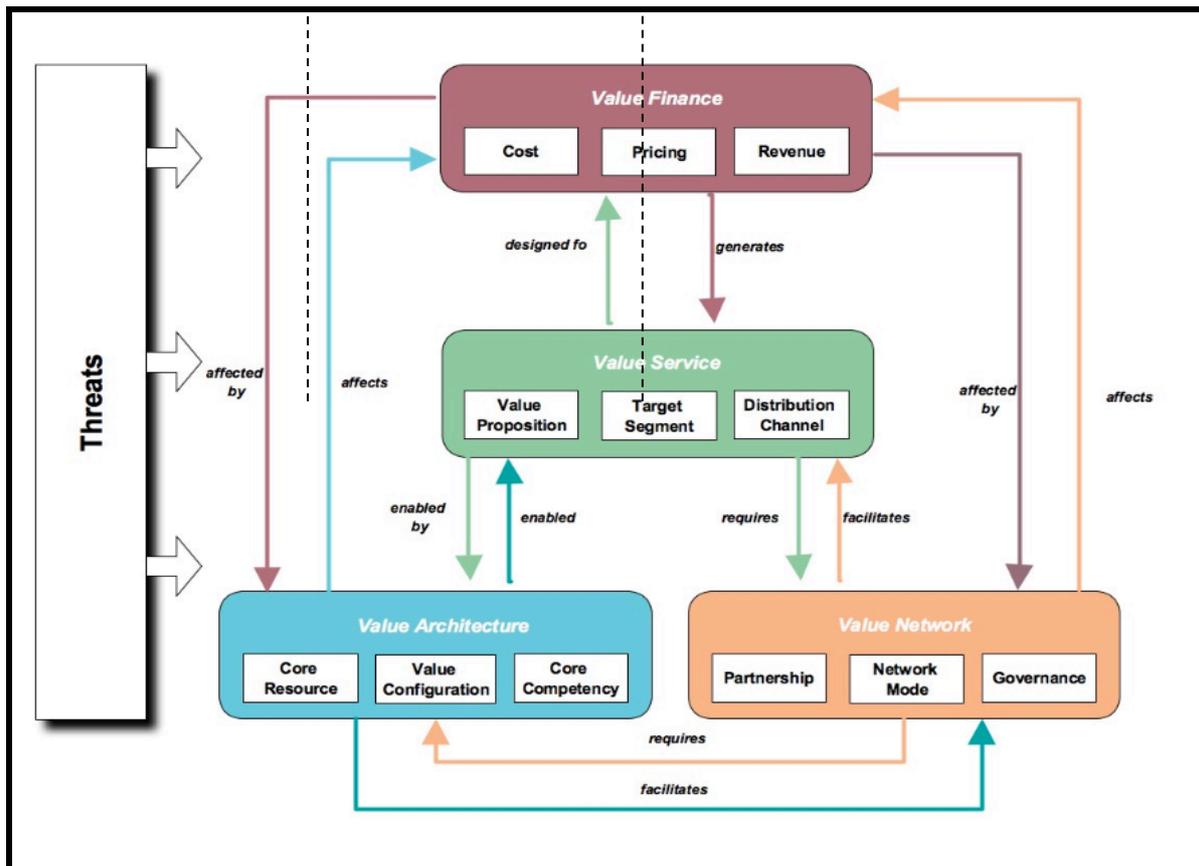
The Value Finance section analysed the monetary aspects associated with delivering the mobile wallet services of Google Wallet and ISIS. Differences between each of this dimensions' sub-elements originate from the different configurations of the other dimensions, i.e. Value Service and Value Architecture. For example, Google's main cost driver is the double acquiring process related to its new cloud and proxy card approach; ISIS's main cost driver is associated with the procurement and deployment of the higher priced NFC-enabled SIM cards. Significant differentiations are also reflected in pricing methods. Though, Google offers its basic services for free both for consumers and banks, ISIS charges banks with a rental fee to be integrated in the mobile wallet application. These fees are rather steep, as some industry players have complained; especially in this early stage of the product cycle. The dissimilarities in pricing structures also affects the different revenue drivers for each of the mobile wallet: 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.

### **Threats**

Market threats can stem from changes in the competitive landscape. As an emerging and lucrative market, the market for mobile payments gets more crowded with more promising initiatives arising on the horizon. Next to Google and ISIS, PayPal is yet another technology giant entering mobile payment sphere. The dynamics of the industry players are certainly affecting each one's business model. For example, Verizon has blocked the Google Wallet application to be loaded for its distributed NFC mobile phones (Cherry, 2012). Changes in technological standards or interoperability impose technology threats. In order to mitigate these, cooperation and partnerships with stakeholders are crucial as seen by Google and ISIS. Further, they are also exposed to threats originating from the evolving regulatory framework. Again, both companies 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.

## RESULTS

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.



**Figure 1. The Business Model for Mobile Payment framework**

However, differences in their mobile wallet approach are also apparent and have been summarized in the table below. First, different network modes were adopted to manoeuvre 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.

Based on the above we expand upon existing literature and propose an integrated payment business model framework, depicted in figure 1. The logic of the framework is that *value service*, *value network*, *value architecture*, and *value finance* dimensions are mutually interdependent and are challenged by external threats.

## **DISCUSSION AND CONCLUSION**

This paper 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, we 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. Building a strong and sustainable Value Network significantly enhances the efficacy of the m-payment service. 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. 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. Lastly, 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, we provide 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 et al., 2009), which is even more the case for NFC-enabled payments given its infan-

cy. This paper 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, our 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.

The results of the analysis of Google and ISIS's business model confirms the potency of their NFC mobile payment approach. The value dimensions of their business model are aligned and aimed to deliver a solution that can effectively reach mass-market. However, it is too early to make prediction towards the long-term sustainability of the companies' business models due to the relative infant stage of the industry with the accompanying uncertainties and threats. Nonetheless, Google and ISIS both acknowledge the long road to commercial success. In addition, it helps that they possess the necessary capabilities and resources to stay in the game for the long run.

## **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 artefact. 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, we 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 analyse m-payment business models.

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