

Business Models for NFC Based Mobile Payments

Chae, Johannes Sang-Un; Hedman, Jonas

Document Version

Final published version

Published in:

Journal of Business Models

DOI:

[10.5278/ojs.jbm.v3i1.1046](https://doi.org/10.5278/ojs.jbm.v3i1.1046)

Publication date:

2015

License

CC BY-NC-ND

Citation for published version (APA):

Chae, J. S-U., & Hedman, J. (2015). Business Models for NFC Based Mobile Payments. *Journal of Business Models*, 3(1), 29-48. <https://doi.org/10.5278/ojs.jbm.v3i1.1046>

[Link to publication in CBS Research Portal](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

If you believe that this document breaches copyright please contact us (research.lib@cbs.dk) providing details, and we will remove access to the work immediately and investigate your claim.

Download date: 24. Aug. 2022



Business Models for NFC based mobile payments

Johannes Sang Un Chae¹ & Jonas Hedman (Corresponding author)²

Abstract

Purpose: The purpose of the paper is to develop a business model framework for NFC based mobile payment solutions consisting of four mutually interdependent components: the value service, value network, value architecture, and value finance.

Design: Using a comparative case study method, the paper investigates Google Wallet and ISIS Mobile Wallet and their underlying business models.

Findings: Google Wallet and ISIS Mobile Wallet are focusing on providing an enhanced customer experience with their mobile wallet through a multifaceted value proposition. The delivery of its offering requires cooperation from multiple stakeholders and the creation of an ecosystem. Furthermore, they focus on the scalability of their value propositions.

Originality / value: The paper offers an applicable business model framework that allows practitioners and academics to study current and future mobile payment approaches.

Keywords: NFC, mobile payment, mobile wallet, business model

Article Classification: Research paper

¹ Department of IT Management, Copenhagen Business School, Denmark

² Department of IT Management, Copenhagen Business School, Denmark, jh.itm@cbs.dk

Please cite this paper as: Sang Un Chae, J., Hedman, J. 2015. 'Business Models for NFC based mobile payments', *Journal of Business Models*, Vol. 3, No. 1, pp. 29-48

1. INTRODUCTION

Mobile payments are an emerging and innovative market (Carton *et al.* 2012; Ondrus and Lyytinen 2011; Ozcan and Santos 2014; Pope *et al.* 2011; Vanetti 2010). This is reflected in research. The focus so far in mobile payment research is mainly on adoption of mobile payments (Crowe *et al.* 2010; Dan and Jing 2011; de Meijer and Bye 2011; Mallat 2007; Mallat and Tuunainen 2005; Mallat and Tuunainen 2008; Plouffe *et al.* 2001; Saji 2008; van der Horst 2011; Zhang 2009) from the perspective of technological innovations.

One characteristic of mobile payments is the fusion of new technologies, such as mobile banking, mobile wallets, biometric payments, SMS payments, QR codes, and Near Field Communication (NFC). In particular, NFC is bespoken of as the payment solution of the future (Birch 2007; Ozcan and Santos 2014; Pope *et al.* 2011). One recent launched NFC based payment solutions is Apple Pay by Apple. In short NFC is a communication protocol that enables contactless payments by establishing wireless communication between two technical devices, for instance between a mobile phone and a point of sales (POS) terminal.

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% from 2011 to 2016 (MarketsandMarkets 2012). Juniper Research projections are even more optimistic, suggesting a market size of \$50 billion by 2014 (Purcell, 2011). However, despite these prospects, claiming a stake in this industry is not an easy task; NFC mobile payment solutions have been lagging behind their expectations. So, why has this pro-claimed technology not been widely adopted? One recurring explanation for the slow market adoption is issues surrounding the business model and the complex ecosystem (see for instance Delottie, 2011; Crowe *et al.*, 2010). In order to understand the slow adoption research suggests a need for an analysis of the underlying business models of mobile payment services (Pousttchi *et al.*, 2008).

The purpose of the paper is to increase the understanding of NFC based mobile payment and their underlying business models. We do this by

developing a business model framework for NFC based mobile payment solutions from existing literature (Al-Debei and Avison 2010; Al-Debei and Avison 2011; Amit and Zott 2001; Amit *et al.* 2012; Ballon 2007; Hedman and Kalling 2003; Osterwalder and Pigneur 2013; Van Bossuyt and Van Hove 2007; Zott and Amit 2007). We enhance the business model framework by empirically challenging it in a comparative case study of two NFC based mobile payment solutions, namely Google Wallet and ISIS Mobile Wallet (ISIS). We show the complexity in the mobile payment ecosystem and there is no silver bullet to success. Furthermore, we show that the business model framework is applicable as a tool to understand the underlying complexity in the NFC based mobile payment landscape. Thereby we contribute to research on mobile payments in general and NFC based mobile payments in specific.

The next section of the paper presents a brief overview of the business model literature, including a proposal of a business model framework for mobile payment services. Section three provides a description of the research method followed by a brief case summary in section four. Next, the analysis and results are presented. Finally, the paper concludes with a discussion and summary of the findings.

2. BUSINESS MODEL LITERATURE

A business model plays a fundamental role to any organization (Amit and Zott, 2001; Magretta, 2002; Hedman and Kalling, 2003; Shafer *et al.*, 2005; Zott *et al.*, 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, analyze, and manage strategic-orientated decisions among each other (Osterwalder and Pigneur, 2002; Osterwalder and Pigneur, 2013; 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 a business model 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; Al-Debei and

Avison, 2010), and they differ in their rigor and depth, as well as their complexity in which definitions, elements, and their relations are included and analyzed. More recent approaches aimed to develop a common understanding of business models and have synthesized large quantities of past research. Al-Debei (2010) provides an analysis of business model frameworks. 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, including offering or value proposition, customer, network, and finance. Second, the majority of frameworks stem from a strategy or eBusiness context (Hedman and Kalling 2002), and only a limited number of frameworks originate from the mobile or payments area (Carton *et al.*, 2012). Third, most frameworks take 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), thereby missing external *threats*

and the characteristics of the particular industry. External marketplace dynamics are in Bouwman *et al.* (2008). As such, they argue that businesses do not operate in a vacuum, but rather are influenced and dependent on the environment. Their business model takes a network-centric view (Stabell and Fjeldstad 1998; Zott *et al.* 2011) 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.

Building upon the specifics and dynamics of the mobile payment context and the literature review on existing business model frameworks, we propose a Business Model for Mobile Payments. It includes five main dimensions: *value service*, *value network*, *value architecture*, *value finance*, and *threats*. Figure 1 depicts a summary of the framework. Each of the dimensions is further decomposed into 15 sub-dimensions, which provide the second layer of analysis.

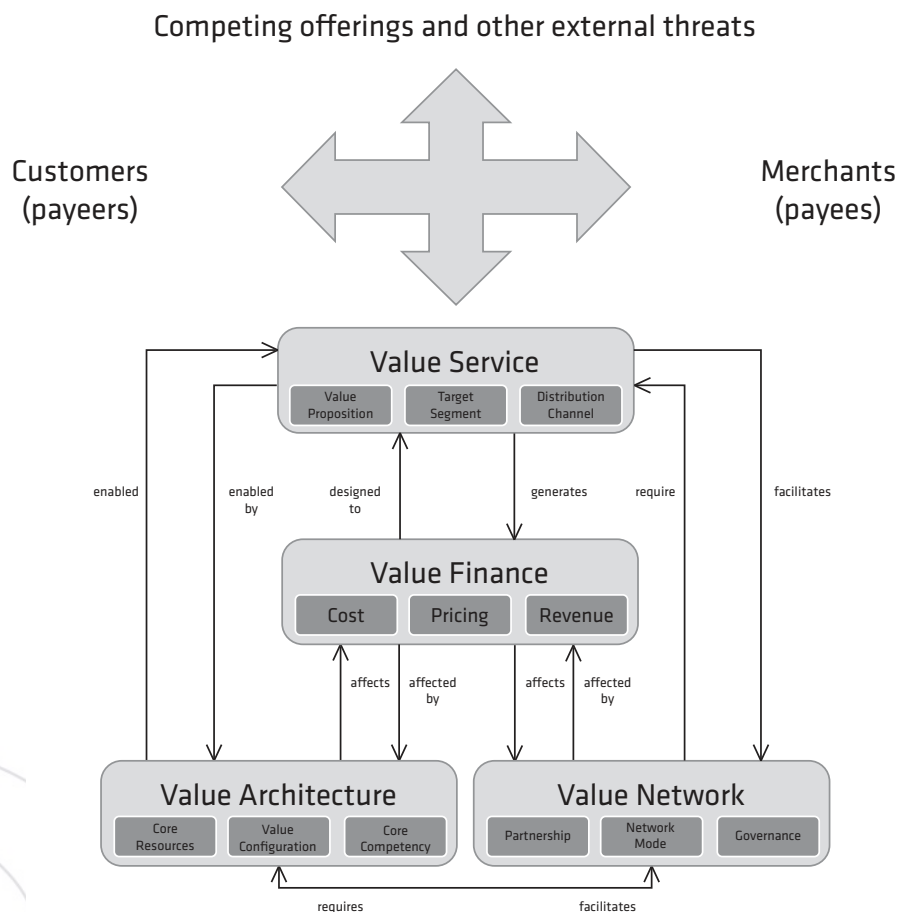


Figure 1. The Business Model Mobile Payment Framework

- The *value service* dimension covers all aspects of the target firm's offering to the customers. It comprises the value proposition, target segment, and distribution channel (Hedman and Kalling, 2003; Shafer *et al.*, 2005; Al-Debei and Avison, 2010).
- 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 toward 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 analyzing *value networks* it is helpful to look at them from three perspectives: partnership, network mode, and governance (Al-Debei and Avison, 2010).
- The *value architecture* dimension reflects a rough outlay that identifies all the required technological architecture arrangements, which allows for an efficient and effective operation (Al-Debei and Avison, 2010). Further, it specifies the organizational infrastructure arrangements, such as key functions and processes, company culture, or management mindset. This dimension comprises three elements: core resource, value configuration, and core competencies.
- The *value finance* dimension describes the required core arrangements to ensure the economic viability of the offering (Al-Debei and Avison, 2010). It consists of three elements: cost, pricing, and revenue structure. The revenue structure depicts all incoming revenue streams from the value offer by the mobile payment service provider. The revenue source and the revenue type characterize it. The different revenue sources can be categorized as consumers, merchants, and third parties (Pousttchi, 2008). 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 inclusion of the environment is represented in the *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 (Carton *et al.*, 2012). Three types of *threats* can be distinguished: market, technology, and regulation.

3. METHODOLOGY

Given the multifaceted and context-dependent nature of mobile payments, 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, they argue that the case study approach helps to generate answers to the "Why?" as well as the "What?" and "How?" questions. Because of its ability to obtain complex details and novel understandings about the specific phenomenon under investigation, we adopt the case study approach.

Data was collected using publically available interviews, Q&A sessions, panel discussions, and live presentations from previously identified key personnel of the case companies; see Table 1 below 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 ensure validity, the authors 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.

Table 1: Overview of data sources

COMPANY	PERSON	ROLE	TYPE OF DATA	TOPIC
ISIS	Michael Abbott	CEO	Transcribed Interview	<i>Value Service, Value Architecture, Value Network, Value Finance</i>
ISIS	Ed Busby	CCO	Video Panel Discussion	<i>Value Service, Value Architecture</i>
ISIS	Ryan Hughes	CMO	Video Interview	<i>Value Service</i>
ISIS	Jaymee Johnson	Head of Marketing	Transcribed Interview	Overview of ISIS's Activity, <i>Value Finance</i>
ISIS	Jaymee Johnson	See above	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	<i>Value Service, Value Network</i>
ISIS	John Theiss	VP, Merchant Sales	Transcribed Interview	<i>Value Service, Value Architecture</i>
ISIS	Tony Sebeti	Director, POS and Payment Alliance	Video Interview	Latest Development of ISIS, <i>Value Service</i>
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

Table 1: Overview of data sources

ISIS	Nan Edwards	City Development Manager	Video Interview	<i>Value Service, Value Network, Value Architecture</i>
Google	Osama Bedier	VP Google Wallet and Payments	Transcribed Interview	<i>Value Service, Value Finance</i>
Google	Osama Bedier	See above	Video Interview	<i>Google's Wallet Opportunity, Value Network, Value Architecture</i>
Google	Osama Bedier	See above	Video Launch Presentation	<i>Value Service, Value Architecture, Value Network, Value Finance</i>
Google	Robin Dua	Head of Product Management, Consumer Payments Wallet	Video Q&A	<i>Value Service, Value Architecture, Value Finance</i>

We have selected two initiatives in the field of mobile payment: Google Wallet and ISIS. Backed by large information technology (IT) giants with a proven track record to bring innovative products and services successfully to the mass-market, both NFC mobile wallet solutions exhibit the potency to also advance the payment sphere into the next era and commercialize 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 kind. Google Wallet and ISIS were also chosen because they operate in the same context, e.g. geographical area, demographics, and regulatory environment.

4. ANALYSIS

We start the section with a short introduction of the two cases. Following 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. Aiming to revolutionize the offline

shopping experience, Google Wallet offers a number of benefits for consumers 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 relationships by offering faster, easier shopping with relevant discounts and loyalty rewards. The mobile wallet is based on NFC and cloud technology, thus requiring 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 on only NFC phones from selected carrier networks.

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, storing, and redeeming coupons, and

collecting loyalty points all in one device. Merchants' benefit from the possibility to connect with their customers in new ways and deliver targeted offers directly into phones. 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 purchased from the three largest carriers in the U.S.

Based on the business model 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 serves 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 below.

Table 2: Main differences between the Google Wallet and ISIS business models

		GOOGLE WALLET	ISIS
<i>Value Service</i>			
VALUE PROPOSITION	Merchants	<ul style="list-style-type: none"> Offers based on more complex customer data Performance-based advertising 	<ul style="list-style-type: none"> Offers are based on simpler data, but customer data stays with merchants
	Banks	<ul style="list-style-type: none"> Fast integration and no added fees 	<ul style="list-style-type: none"> Full control of customer data and possible integration of other banking services
	Payers	<ul style="list-style-type: none"> No fees attached 	<ul style="list-style-type: none"> No fees attached
<i>Value Network</i>			
NETWORK MODE		<ul style="list-style-type: none"> Open platform: no charge to lease platform and support of multiple SE locations 	<ul style="list-style-type: none"> Walled garden: tight control of the SIM SE and rental fee
<i>Value Architecture</i>			
PAYMENT CREDENTIAL LOCATION		<ul style="list-style-type: none"> Embedded SE and on secure servers (cloud) 	<ul style="list-style-type: none"> SE in SIM card

Table 2: Main differences between the Google Wallet and ISIS business models

INTEGRATION OF CARDS	<ul style="list-style-type: none"> • Direct partnerships (CITI) • Through proxy card 	<ul style="list-style-type: none"> • Only through direct partnerships (Chase, Capital One, Barclays, Amex)
SECURITY FEATURES	<ul style="list-style-type: none"> • Four-digit pin for wallet access • Remote account/wallet suspension online • Full account numbers of debit or credit card not visible in wallet 	<ul style="list-style-type: none"> • Four-digit pin for wallet access • Remote wallet suspensions online and via calling ISIS • Full account numbers of debit or credit card not visible in wallet • Personal privacy: ISIS sees no transaction data
<i>Value Finance</i>		
REVENUE SOURCES	<ul style="list-style-type: none"> • Single source: value added services 	<ul style="list-style-type: none"> • Dual source: SE SIM rental fee and value added services

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 initiatives arising on the horizon. Next to Google and ISIS, PayPal and Apple are other IT giants entering the mobile payment sphere. The dynamics of the industry players are certainly affecting each other's business models. For example, Verizon has blocked the Google Wallet application from being loaded on 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 (Federal Reserve Bank of Boston, 2012) to jointly shape the appropriate regulatory framework for the U.S.

Value Service

The *value propositions* of Google Wallet and ISIS are

both multifaceted and target to consumers, 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 appears more or less attractive depending on the customers' preferences and needs. A closer look at the case companies' distribution channels reveals their excellent positions for large-scale distribution.

Value Network

Google Wallet and ISIS heavily focus on building the ecosystem with multiple partners across the payment sphere. In appendix 1, we provided more data and discussion related to the NFC ecosystem. 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 fields with large customer bases, existing industry relationships, and other valuable resources and capabilities. It suggests that they have been carefully selected based on these selection criteria to quickly

progress in scale and reach. As such, partnerships have been formed to leverage their respective market powers and access complementary competencies in order to accelerate the process of broad market adoption. Aspects such as enabling technological interoperability between the mobile wallets' and partners' systems also have played a major role. In general, the partnerships have served both functional and strategic roles. Further, one can observe cross partnerships of various payment actors with both Google Wallet and ISIS.

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. In terms of network mode, the analysis highlights the different approaches between Google Wallet and ISIS, i.e. an open vs. a 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 the ISIS carrier's tightly controlled platform through locking phones, opting for the usage of only their own networks.

Value Architecture

The *value architecture* between Google Wallet and ISIS is 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 build the ecosystem and shape the market in the long run. In addition, both companies have significant brand power, which is, however, covert in 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 strengths 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 these 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, see appendix 2 for additional data on the pricing methods. Though Google offers its basic services for free 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 affect the different revenue drivers for each of the mobile wallets: 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. Appendix 2 provides more data on the pricing and revenues model.

5. RESULTS

In terms of the specifics of the two business models, the analysis has revealed interesting details on Google and ISIS's strategies to deploy their mobile wallets to the masses. 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 multiple stakeholders. As such, significant efforts have been made in building the ecosystem, see appendix 1, that enables the deployment of a ubiquitous mobile wallet solution.

However, differences in their mobile wallet approaches are also apparent and have been summarized in the table 2. First, different network modes have been implemented to maneuver through the complex m-payment ecosystem; network modes have been chosen based on their control points and *value architecture* basis. Both network modes enabled the Google Wallet and ISIS to form partnerships and build 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-wallets to deliver services were found, though with both having the potency to reach the broad mass-market. Further, adopted m-wallet models affected the value proposition for their 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's revenue structure, which charges 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 (Carton *et al.*, 2012; Al-Debei and Avison, 2010) and propose an integrated payment business model framework, depicted in Figure 1. The logic of the framework is that the *value service*, *value network*, *value architecture*, and *value finance* dimensions are mutually interdependent and are challenged by external *threats*.

6. DISCUSSION AND CONCLUSION

First, we developed the novel Mobile Payments Business Model 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. The framework 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 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 delivering value to customers, and originating from the aforementioned constellations of the four value elements. Lastly, the framework regards 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 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 mobile payment business models. Past studies suggest the lack of stringent and rigorous analysis of business models of m-payment services (Pousttchi *et al.* 2009), which is even more the case for NFC-enabled payments, given their infancy. This paper addresses this research gap and explores and compares two high profile mobile wallet approaches in the U.S. market according to five dimensions and 15 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 with regards to the main differences in their configuration of the business model elements.

- First, contrary to expectation, not both of the mobile wallet providers have adopted an open network mode. However, ISIS's closed network mode has not hindered them from building the required ecosystem around their mobile wallet solution. In addition, Google's open network mode has not enabled 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 have 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 have focused on different m-wallet approaches to deliver their *value service*. Google's engineering and creative power has enabled it to construct a new technical approach to the wallet that overcomes its past obstacles. ISIS, on the other hand, has adopted an approach that leverages on existing control points, i.e. the SIM card and its distribution network. However, given their relatively short market presence, no definite answer can be given in terms of which wallet approach will 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 services*, and have been affected by the different constellations of the *value architecture* and *value network*. They also suggest that the ISIS revenue model may be appropriate

but its price setting may be flawed, given the associated risks for customers to become part of the early stage of m-payment evolution.

The results of the analysis of Google and ISIS's business models confirm the potency of their NFC mobile payment approaches. The value dimensions of their business models are aligned and aimed to deliver a solution that can effectively reach the mass-market. However, it is too early to make a prediction toward 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.

Acknowledgement

This work was carried with the support of Copenhagen Finance IT Region (www.cfir.dk) and was funded by the Danish Enterprise and Construction Authority grant number ERDFH-09-0026.

References

- Al-Debei, M. M., and Avison, D. 2010. Developing a Unified Framework of the Business Model Concept, *European Journal of Information Systems*, 19 (3): 359-376.
- Al-Debei, M. M., and Avison, D. 2011. Business Model Requirements and Challenges in the Mobile Telecommunication Sector, *Journal of Organisational Transformation & Social Change* 8 (2): 215-235.
- Amit, R., and Zott, C. 2001. Value Creation in E-Business, *Strategic Management Journal*, 22 (6/7): 493-520.
- Amit, R., Zott, C., and Pearson, A. 2012. Creating Value through Business Model Innovation, *MIT Sloan Management Review* 53 (3): 41-49.
- Ballon, P. 2007. Changing Business Models for Europe's Mobile Telecommunications Industry: The Impact of Alternative Wireless Technologies, *Telematics and Informatics*, 24 (3): 192-205.
- Birch, D. G. W. 2007. The Digital Money Decade, *Journal of Internet Banking & Commerce*, 12 (1): 1-4.
- Bouwman, H., De Reuver, M., & MacInnes, I. (2006), Dynamic business model framework: A comparative case study analysis, in ITS 2006 - 16th Biennial Conference in Beijing, International Telecommunication Society, June 12-16.
- Bouwman, H., de Vos, H., & Haaker, T. (2008), *Mobile Service Innovation and Business Models*, Springer.

- Camponovo, G. & Pigneur, Y. (2003), Business model analysis applied to mobile business, in Proceedings of the 5th International Conference on Enterprise Information Systems (ICEIS), 4, pp.173-183, Angers, France, April 23-26.
- Carton, F., Hedman, J., Damsgaard, J., Tan, K.-T., and McCarthy, J. 2012. Framework for Mobile Payments Integration, *Electronic Journal of Information Systems Evaluation* 15 (1): 14-25.
- Cherry, S. (2012), Verizon versus Google Wallet, IEEE Spectrum, available at: <http://spectrum.ieee.org/podcast/at-work/innovation/verizon-versus-google-wallet> (accessed November 6, 2012).
- Chesborough, H. & Rosenbloom, R. (2002), The role of the business model in capturing value from innovation: Evidence from Xerox Corporation's technology spin-off companies, *Industrial and Corporate Change*, 11 (3): 529-555.
- Crowe, M., Rysman, M., & Stavins, J. (2010), Mobile payments in the United States at retail point of sale: Current market and future prospects, Federal Reserve Bank of Boston, Public Policy Discussion Paper No. 10-2: 1-39.
- Crowe, M., Rysman, M., and Stavins, J. 2010. Mobile Payments at the Retail Point of Sale in the United States: Prospects for Adoption, *Review of network economics* 9 (4): 1-31.
- Dan, L., and Jing, Z. 2011. Tam-Based Study on Factors Influencing the Adoption of Mobile Payment, *China Communications* 8 (3): 198-204.
- de Meijer, C. R. W., and Bye, J. 2011. The Increasing Adoption of Mobile Payments in Europe - and Remaining Challenges to Growth, *Journal of Payments Strategy & Systems* 5 (3): 273-288.
- Federal Reserve Bank of Boston (2012), Mobile payments industry workgroup, Federal Reserve Bank of Boston, available at: <http://www.bos.frb.org/bankinfo/payment-strategies/mpiw/index.htm> (accessed November 6, 2012).
- Hedman, J., and Kalling, T. 2002. Behind the Scenes of the E-Business Construct, in: *4th International Conference on Electronic Commerce*, Chan et. al. (ed.). Hong-Kong: Faculty of Business, City University of Hong Kong.
- Hedman, J., and Kalling, T. 2003. The Business Model Concept: Theoretical Underpinnings and Empirical Illustrations, *European Journal of Information Systems*, 12 (1): 49-59.
- Magretta, J. (2002), Why business models matter, *Harvard Business Review*, 80: 86-92.
- Mallat, N. 2007. Exploring Consumer Adoption of Mobile Payments: A Qualitative Study, *The Journal of Strategic Information Systems*, 16 (4): 413-432.
- Mallat, N., and Tuunainen, V. K. 2005. Merchant Adoption of Mobile Payment Systems, in: *International Conference on Mobile Business: ICMB 2005*, W. Brookes, E. Lawrence, R. Steele and E. Chang (eds.): 347-353.
- Mallat, N., and Tuunainen, V. K. 2008. Exploring Merchant Adoption of Mobile Payment Systems: An Empirical Study, *e-Service Journal*, 6 (2): 24-57.
- MarketsandMarkets. 2012. Bring-Your-Own-Device (Byod), Consumerization of It (Co-It) and Enterprise Mobility Market - Global Advancements, Business Models, Market Forecasts & Analysis (2012-2017), <http://www.marketsandmarkets.com/AnalystBriefing/byod-enterprise-mobility-market.asp>.
- Morris, T. & Wood, S. (1991), Testing the survey method: Continuity and change in British industrial relations, *Work Employment and Society*, 5 (2): 259-82.
- Ondrus, J., and Lyytinen, K. 2011. Mobile Payments Market: Towards Another Clash of the Titans?, in: *The 10th International Conference on Mobile Business (ICMB)*. Como, Italy.

- Osterwalder, A. & Pigneur, Y. (2002), An e-business model ontology for modeling e-business, in 15th Bled Electronic Commerce e-Reality: Constructing the e-Economy in Bled, Slovenia, June 17-19.
- Osterwalder, A., and Pigneur, Y. 2013. Designing Business Models and Similar Strategic Objects: The Contribution of Is, *Journal of the Association for Information Systems*, 14 (5): 237-244.
- Osterwalder, A., Pigneur, Y., & Tucci, C. (2005), Clarifying business models: Origins, present, and future of the concept, *Communications of the Association for Information Systems*, 16 (1): 1-40.
- Ozcan, P., and Santos, F. M. 2014. The Market That Never Was: Turf Wars and Failed Alliances in Mobile Payments, *Strategic Management Journal*, online.
- Pateli, A. G. & Giaglis, G. M. (2004), A research framework for analysing eBusiness models, *European Journal of Information Systems*, 13 (4): 302-314.
- Plouffe, C. R., Vandenbosch, M., and Hulland, J. 2001. Intermediating Technologies and Multi-Group Adoption: A Comparison of Consumer and Merchant Adoption Intentions toward a New Electronic Payment System, *Journal of Product Innovation Management*, 18 (2): 65-81.
- Pope, M., Pantages, R., Enachescu, N., Dinshaw, R., Joshlin, C., Stone, R., Austria, P. A., and Seal, K. 2011. Mobile Payments: The Reality on the Ground in Selected Asian Countries and the United States, *International Journal of Mobile Marketing*, 6 (2): 88-104.
- Pousttchi, K., Schiessler, M., and Wiedemann, D. G. 2009. Proposing a Comprehensive Framework for Analysis and Engineering of Mobile Payment Business Models, *Information Systems and e-Business Management* (7:3): 363-393.
- Purcell, K. (2011), The future of mobile payments and NFC is bright (infographic), Available at <http://www.gottabemobile.com/2011/07/10/the-future-of-mobile-payments-and-nfc-is-bright-infographic/>, Accessed July 10.
- Saji, K. B. 2008. Market Adoption of Mobile Payment Solutions: An Exploratory Study, in: *Proceedings of the 2nd Wseas International Conference on Management, Marketing and Finances: Recent Advances on Development and Financial Engineering*, L. Perlovsky, I.W. Sandberg and D. Halkias (eds.). 109-114.
- Shafer, S. M., Smith, H. J., & Linder, J. C. (2005), The power of the business models, *Business Horizons*, 48 (3): 199-207.
- Solaimani, S. & Bouwman, H. (2012), A framework for the alignment of business model and business processes: A generic model for trans-sector innovation, *Business Process Management Journal*, 18 (4): 655-679.
- Stabell, C. B., and Fjeldstad, Ø. D. 1998. Configuring Value for Competitive Advantage: On Chains, Shops, and Networks, *Strategic Management Journal* 19 (5): 413-437.
- Van Bossuyt, M., and Van Hove, L. 2007. Mobile Payment Models and Their Implications for Nextgen Msps, *Info*, 9 (5): 31-43.
- Van der Horst, D. 2011. Adoption of Payments for Ecosystem Services: An Application of the Hagerstrand Model, *Applied Geography*, 31 (2): 668-676.
- Vanetti, R. 2010. Strategic Innovation in Payments Systems: What Are the Next Big Things?, *Journal of Payments Strategy & Systems*, 4 (1): 17-25.
- Yin, R. K. (1994), Case Study Research: Design and Method (second ed.), Thousand Oaks, CA: Sage Publications Inc.

Zhang, H. M. 2009. The Study on the Influential Factors of Electronic Payment System Adoption, in: *International Conference on Management Science & Engineering*, H. Lan (ed.): 106-111.

Zott, C., Amit, R., and Massa, L. 2011. The Business Model: Recent Developments and Future Research, *Journal of management*, 37 (4): 1019-1042.

Zott, C., and Amit, R. 2007. Business Model Design and the Performance of Entrepreneurial Firms, *Organization Science*, 18 (2): 181-199.

Appendix 1. The NFC Ecosystem

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 relevant partners, including category and role description in terms of function is presented in the table below.

Table 1. Partner in the NFC ecosystem

	GOOGLE		ISIS	
Partner Category	Actor	Functional Role	Actor	Functional Role
MNO	<ul style="list-style-type: none"> Sprint Virgin Mobile 	<ul style="list-style-type: none"> Distribution of NFC Android mobile devices OTA Google Wallet app distribution Consumer marketing funding 	<ul style="list-style-type: none"> AT&T Verizon T-Mobile 	<ul style="list-style-type: none"> Distribution of all NFC mobile devices Distribution of SIM card with SE OTA ISIS mobile app distribution Consumer marketing funding Customer service
PAYMENT NETWORKS	<ul style="list-style-type: none"> MasterCard (preferred) Visa Discovery American Express 	<ul style="list-style-type: none"> Initial network brand (MasterCard) Providing payment infrastructure, e.g. MasterCard's PayPass, or Visa's payWave Funding support Value-added services 	<ul style="list-style-type: none"> Visa MasterCard Discover American Express 	<ul style="list-style-type: none"> Providing payment infrastructure, e.g. MasterCard's PayPass, or Visa's payWave Issuing credit card into the wallet (American Express only)

Table 1. Partner in the NFC ecosystem

BANK	<ul style="list-style-type: none"> • Citi • Bancorp Bank • Barclaycard US • Green Dot • Silicon Valley Bank 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Chase • CapitalOne • Barclay Card 	<ul style="list-style-type: none"> • 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
TSM	<ul style="list-style-type: none"> • FirstData 	<ul style="list-style-type: none"> • Full TSM services • Lead merchant acquirer • Merchant marketing funding • Welcome kit fulfillment 	<ul style="list-style-type: none"> • Gemalto 	<ul style="list-style-type: none"> • Full TSM services
MOBILE WALLET SOFTWARE PROVIDER	n.a. (in-house)		<ul style="list-style-type: none"> • C-Sam 	<ul style="list-style-type: none"> • Providing the wallet management platform (license) and software development kit
HANDSET MANUFACTURERS	<ul style="list-style-type: none"> • Samsung • LG • HTC • Motorola 	<ul style="list-style-type: none"> • Providing the mobile device • Enabling compatibility 	<ul style="list-style-type: none"> • Samsung • LG • HTC • RIM • Sony Ericsson • Motorola 	<ul style="list-style-type: none"> • Providing the mobile device • Enabling compatibility

Table 1. Partner in the NFC ecosystem

POS TERMINAL	<ul style="list-style-type: none"> • Verifone • Vivotech • Ingenico • Hypercom 	<ul style="list-style-type: none"> • Distribution of NFC POS devices to merchants • Enabling the interoperability of the mobile wallet with the POS device 	<ul style="list-style-type: none"> • Verifone • Vivotech • Ingenico • Equinox 	<ul style="list-style-type: none"> • Distribution of NFC POS devices to merchants • Enabling the interoperability of the mobile wallet with the POS device
MERCHANT (MAJOR)	<ul style="list-style-type: none"> • Champs • Footlocker • Jamba Juice • Macy's • American Eagle • Bloomingdale • Container Store • Duane Reade • GAP • Guess • Office Max • Toys R Us • Walgreens 	<ul style="list-style-type: none"> • Enabling Google's SingleTap experience by accepting NFC payments, providing offers, loyalty rewards and gift cards 	<ul style="list-style-type: none"> • Champs • Footlocker • Jamba Juice • Macy's • Aero-postale • Coca Cola • Dillard's 	<ul style="list-style-type: none"> • Enabling ISIS's Pay&Save experience by accepting NFC payments, providing offers, loyalty rewards and gift cards

Mobile Network Operator (MNO)

Google as a technology company required distribution partners to effectively reach customers and formed partnerships with Sprint and later on with Virgin Mobile. Both partners will distribute NFC mobile devices in which Google Wallet is already pre-installed. For existing customers who already own NFC eligible mobile phones, the wallet app will be automatically installed through an over-the-air software update. On the other hand, ISIS is a joint venture between the largest MNOs in the U.S., so ISIS is already equipped with a vast distribution network and an existing customer base to deploy its mobile wallet solution. One of the differences to Google's partnerships with its MNOs is that, 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.

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, and more importantly access to MasterCard's PayPass infrastructure. This enabled Google Wallet to be accepted in 144.000 PayPass-enabled merchants nationally, and more than 311.000 merchants globally. ISIS

formed partnerships with all MasterCard, Visa, Amex, and Discovery right from its launch. However, the decision to integrate the existing payment networks reflected a change in strategy, as ISIS initially planned to introduce its own payment network to handle transactions itself. ISIS came to the conclusion that building an alternative payment would be too complex and time-consuming, and thus dismissed the idea.

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. In addition, Citi will also issue its own Citibank MasterCard cards into Google Wallet for their existing and new customer base. ISIS initially planned to build its own payment network, in which Discover would have played the key role as the payment processor, but decided to take a similar approach to Google Wallet by relying on existing accounts at several bank partners, and letting bank's customers link their existing debit or credit cards to their phones.

Trusted Service Manager

Google Wallet and ISIS differ in their choice of Trusted Service Manager. However, both selected partners are established and big players in the payment sphere. Google Wallet picked First Data as the preferred partner. Its main role is to supply the infrastructure, functionality, and services that enable the end-to-end management of payment accounts on the SE of mobile phones. As such First Data is involved in the secure distribution, provisioning, and management of contactless payment information for consumers on behalf of Google Wallet and card issuers. In addition, the partner is also taking charge in signing up small merchant to use Google Wallet. ISIS selected Gemalto as its partner to provide the full service TSM provisioning. Gemalto's main role is to provide a secure link between ISIS and the payments or service providers that access the wallet. 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. One of the key arguments for selecting Gemalto was its commitment towards security experience in issuing sensitive financial information to the consumer and provisioning services OTA.

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 to engineer their own wallet solution. While ISIS may also have the necessary technical capabilities to build its mobile solution from scratch, the company decided to take a licensing agreement with one of its partners. It has selected C-Sam to provide the wallet management platform and the software development kit. 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.

Handset manufacturers

Google Wallet runs only on the Android Operating System, as such works only on mobile devices that support Android. These are currently Samsung, LG, HTC, and Motorola. ISIS on the other side supports different Operating Systems, which is why they also run on Sony Ericson and RIM devices. ISIS emphasizes the importance of working with device manufacturers because it will enable consumer choice and scale that is required for widespread adoption of mobile commerce.

POS device manufacturer

Establishing partnerships with POS device manufacturers are crucial. They are the ones that could effectively encourage merchants to upgrade their existing terminals. The underlying issue here is the lack of established interface specifications for mobile offers, coupons, and loyalty in merchants' systems. 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

Appendix 2. Pricing and revenue model

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 publicly not available due to confidentially agreements and may vary within customer segments, i.e. merchants and banks, based on the bargaining power of the customer.

Table 1. Pricing differences between Google Wallet and ISIS			
		GOOGLE WALLET	ISIS
<i>Consumers</i>			
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
<i>Merchants</i>			
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
<i>Banks</i>			
CARD PROVISIONING AND USE OF MOBILE WALLET APP		Free	\$5 per account and additional charges for other events

For consumers, the use of Google Wallet and ISIS is free, as they will not charge them anything for the download or instalment and the use of the mobile wallet application. This includes payments and other added services such as the redemption for coupons and offers. 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. However, ISIS charges \$2 per month account maintenance fees if the pre-paid card has not been charged every nine month. For merchants, both mobile wallet providers do not charge fees for accepting the new payment methods with NFC-powered mobile phones. 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. 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 market size. 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. 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 may be charged \$5 per account per year, which is more than issuing plastic card.

The analysis of the pricing structures revealed the potential revenue drivers for Google Wallet and ISIS. As such Google provide most of its services free of charge for consumers, merchants, and banks. It clearly shows that Google is only interested in ad revenues, i.e. incremental revenues generated from targeted offers, loyalty programs and digital downloads, rather than taking a share of current card payments revenues. The main revenue driver will be Google Offers, in which merchants and advertisers will be charged when they place customized ads and coupons to consumers through the mobile wallet. In comparison, ISIS structures its revenue model differently by implementing several revenue drivers. First, ISIS charges charging rental fees from its control point, the SE SIM. 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. Second, another revenue stream will be offering the mobile wallet as a marketing channel for retailers.

About the authors

Johannes Sang Un Chae, Department of IT Management, Copenhagen Business School, Denmark.

Johannes Sang Un Chae works as a Project Manager for the Seller Program & Strategy Team at eBay Marketplaces in the Berlin area. Previously, he took a role in the Strategy Team at PayPal. He received his master from Copenhagen Business School.



Jonas Hedman (Corresponding author), Department of IT Management, Copenhagen Business School, Denmark.
jh.itm@cbs.dk

Jonas Hedman is an Associate Professor at the Department of IT Management, Copenhagen Business School, Denmark. He investigates the role of IT in business and is involved in projects researching firms sourcing strategies, business models, and payments.

