

VALUE ANALYSIS OF RETAIL ELECTRONIC PAYMENTS MARKET

A generic value framework for electronic payment services providers

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Abstract: Rapid developments in retail electronic payments industry increase complexity and result in fragmented view of the market. Key players in the domain need compact tools for analysis and decision support. This paper proposes a generic value framework for retail electronic payments industry, which is based on the concept of value network and consists part of an ongoing work towards an integrated decision support environment for actors in the payments industry. We use value network approach for the analysis of retail electronic payments aiming to provide a useful tool for better understanding of payments domain.

Key words: value creation; value chain; value store; value network; electronic payments.

1. INTRODUCTION

Payments data (Markose and Loke, 2000) demonstrate a clear trend towards replacement of cash instruments by non-cash ones and digitization of payment processes. Traditional forms of money are being transformed into their digital analogues. New payment methods and instruments are competing with traditional cash. Initially, electronic retail payments were born from electronic commerce evolution, as a demand for retail payments over Internet. Nowadays, evolution of mobile devices is expanding needs to mobile retail payments, and future technologies may also impose new needs in payments (Schapp and Cornelius, 2000). Researchers are studying issues deriving from emerging payment methods and instruments. So far, analysis of payment systems is based on financial (econometric models, cost), legislative (policy), or technical perspective (security, internet and mobile

technologies, software design), mostly affected by the orientation of researchers. Several complementary views of the payment scene exist, increasing complexity that is already present.

Our research focuses on the subsection of electronic retail payments, which according to Rice and Stanton (2003) contribute at a large percentage at banks' revenues although it is not always obvious. In this paper we present a framework for value analysis of the payments industry, based on the concepts of value chain (Porter, 1985), value shop and value network (Stabell and Fjeldstad, 1998). We identify the basic value entities and argue that value network model is appropriate for a value analysis of the domain. We provide a preliminary approach towards a value framework for payment industry, which is part of an ongoing work towards an integrated decision support tool for the actors in the domain. Though an extensive value analysis of the payments domain is necessary, we limit the scope of this paper and present only an overview of our approach.

In the remainder of this paper we provide some background theory and relevant literature (Section 2), present the value network configuration (Section 3), and conclude with future directions of this project (Section 4).

2. BACKGROUND AND RELEVANT WORK

In this section we provide some background on payments terminology (Section 2.1), on firm's value theory (Section 2.2) and selective relevant literature references on payments with emphasis on network economics (Section 2.3).

2.1 Payments

Money is the central concept behind all payments, traditional or digital. Though money is a term that is trivial in our everyday life, it is not easy to define it. Stenkula (2003) proposes that we may define it by what it is and by what it does. A commonly accepted definition is that "money is anything that is generally accepted as payment for goods and services and in settlement of debts". Money also fulfills three functions: a medium of exchange, a unit of account and a store of value. Shamos (2002) combines both views and defines money as "something generally accepted as a medium of exchange, a measure of value, or a means of payment".

The above definitions reflect traditional view of money as an economic phenomenon related to the market alone. According to this, money is a commodity universal and homogenous, which is distinguished by quantity. However, during last decade, sociology of money (Zelizer, 1994) has shown

that money is not an economic phenomenon but a social one that belongs to both market and non-market aspects of social life (Singh, 2004). Dodd (1994) contributes to social approach of money, defining that what distinguishes money from non-money is a person's use and perception of money, arguing that money has to be part of a social network of trust.

The term *payment* is defined as "the payer's transfer of a monetary claim on a party acceptable to the payee. Typically, claims take the form of banknotes or deposit balances held at a financial institution or at a central bank" (ECB, 2001). *Payment system* is defined as "a set of instruments, banking procedures and, typically, interbank funds transfer systems which facilitate the circulation of money" (ECB, 2001; Soramäki and Hanssens, 2003). A *payment instrument* is defined as "any instrument enabling the holder/user to transfer funds" (ECB, 2001). *Electronic payments* are defined as "payments that are initiated, processed and received electronically. For electronic payments, the monetary claims (electronic means of payment) are held, processed and received in the form of digital information, and their transfer is initiated via electronic payment instruments" (ECB, 2004). *Mobile payments* are defined as "payments initiated through mobile phones. They are a sub-group of electronic payments" (ECB, 2004). *Clearing* is the process of transmitting, reconciling and, in some cases, confirming payment orders prior to settlement. *Settlement* is an act of discharging obligations related to payment transactions between two or more parties.

Payments have evolved during the previous hundreds of years, from barter to electronic money, through hard money, paper money and checks, in parallel with the available technology. We may analyze this process in two vertical axes, depicting degree of technology abstraction and degree of adoption respectively (Fig. 1).

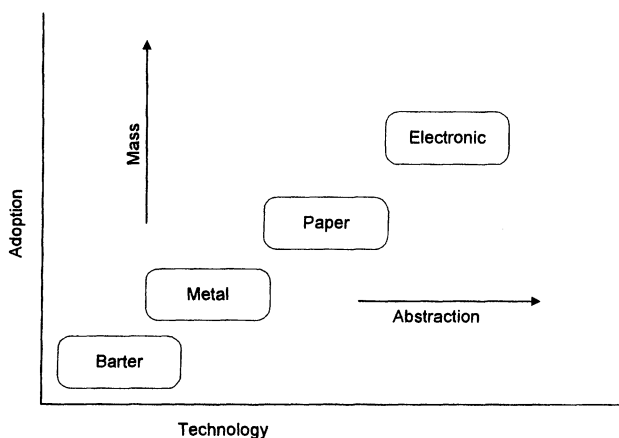


Figure 1. Evolution of payments

This process is continuing today and is due to both social and technological drivers. Social drivers include the various needs of involved parties in the payment process. Some major drivers of change include universal acceptance, reliable value, portability, ease of use, safe storage and transport. Technological drivers include all the innovations that transform the money format and the payment process towards abstraction.

2.2 Value creation theory

In this section we provide some background on value theory as a tool for understanding value creation at firm level. The value concept is important in the analysis of how a firm creates and transfers value to its customers.

Porter (1985) introduced the value chain framework as a framework for value creation analysis at firm level. Stabell and Fjeldstad (1998) proposed value shop and value network models in addition to Porter's value chain. All value models are based on Thompson's (1967) typology of long-linked, intensive, and mediating technologies. An overview of the three models is following.

The value chain model is based on the logic of value creation through transformation of inputs to products mainly through sequential process. It is consisted of primary and support activities. Primary activities are directly involved in creating and bringing value to customers. Porter's (1985) five generic primary activities of a value chain are, *inbound logistics, operations, outbound logistics, marketing and sales, and service*. Support activities that enable and improve the performance of the primary activities are, procurement, technology development, human resource management and firm infrastructure (Porter, 1985).

Value shop model is based on the logic of value creation through problem solving. Value is created by mobilizing resources and activities to resolve a particular customer problem (Stabell and Fjeldstad, 1998). Customer value is not related to the solution itself, but to the value of solving the problem. The primary activities of a value shop are, *problem-finding and acquisition, problem-solving, choice, execution and control and evaluation* (Stabell and Fjeldstad, 1998).

Value network model is based in the logic of value creation through linking customers. Value networks rely on a mediating technology to link independent customers. The primary activities of a value network are *network promotion and contract management, service provisioning, and network infrastructure operations* (Stabell and Fjeldstad, 1998). The primary activity network promotion and contract management consists of activities related to attracting and selecting customers and to managing the customer relationship, in particular contracts related to governing service provisioning

and pricing. Service provisioning is linking customers to one another and charging for the services provided. Network infrastructure operation consists of activities related to maintaining a physical and informational infrastructure (Stabell and Fjeldstad, 1998). Value creation, can be direct between two customers, or indirect where one customer is not linked directly to another customer but linked through a pool.

2.3 Relevant literature

During previous years we may notice increasing research interest in retail electronic payments from players in the domain. We may find a lot of discussion in electronic payment systems concerning analysis and taxonomies (Yu et al 2002), classification schemes (Zmijewska et al, 2004), critical success factors (Hort et al, 2002) and adoption studies (Plouffe et al 2000, 2001a, 2001b), to name a few.

However, there is no clear value framework proposed for the analysis of payments domain. The main reason for this is that researchers, policy makers, business owners, and other actors in the domain, approach the subject according to their own perspective. Additionally, domination of banks in retail payments services provision until recently was also a limiting factor for interest from other firms. Nowadays, that payment services are being deregulated and competition from new firms is increasing (Bossone, 2001), such an approach is necessary (Chakravorti and Kobor 2003). Literature contributing to our work may be classified in two major categories.

The first category is consisted from network economics studies related to payments. Network economics (Economides, 1996) is a research field that contributes towards our value network approach. Researchers in the field approach payments domain from a network economics perspective (Chakravorti, 2003; Chakravorti and Roson, 2004) emphasizing in network effects that are present in such industries (Guibourg, 2001), or studying adoption (Saloner and Shephard, 1995) under the presence of network effects. These studies though focus on economic issues, provide evidence for the network characteristics of payment firms and instruments.

The second category is consisted from studies with similar approaches. A framework towards payment services provision is presented by Kannen et al (2003), which analyses the payment process in phases based on Lelieveldt's (2001) generic B2C purchase process analysis. A value network approach is presented in Sannes (2001), who proposes such a model for self-service banking based on firm's value theory (Stabell and Fjeldstad, 1998). Camponovo and Pigneur (2003) also utilize value network theory in their analysis of mobile business.

From a selective review of literature on the field, we notice relative lack in theoretical work towards an integrated value analysis framework for electronic retail payments. Extensive studies related to technology and security issues, user requirements (Abrazhevich, 2001a, 2001b, 2001c, 2002), adoption and diffusion, provide extensive knowledge to researchers, but they are not practical for the decision makers in the domain, that need integrated analysis tools. Our work aims to contribute in the above, providing a value analysis framework for retail electronic payments domain.

3. THE PROPOSED VALUE FRAMEWORK

Electronic payments transform the entire internet business sector. Not only traditional financial institutions, like banks, face new challenges from new competitors (Bradford et al 2002), but also consumers face increasing complexity in their interaction at the point of sale. Absence of an integrated value analysis framework is a serious drawback for payment industry, since multiple views increase complexity and result in limited understanding and failure of payment innovations.

The proposed framework is part of our ongoing work towards an integrated decision support tool for decision makers in the domain and is focusing on retail electronic payments, which are designed with the main purpose to facilitate payments for consumer e-commerce.

Within the limited scope of this paper we present an overview of the analysis of retail payment services provision (Section 3.1), a brief analysis of actors in the domain (Section 3.2) and the proposed value framework (Section 3.3).

3.1 Payment layers

Retail electronic payment is a part of customers' online buying activities as described by the Consumer Mercantile Activities Model, (Kalakota and Whinston, 1997). The model comprises pre-purchase interaction, purchase consummation and post-purchase interaction phases. The payment activity takes place within the purchase consummation phase. Such an activity is based on a number of payment services offered by various actors in the domain. Bradford et al (2002) group payment services provided by banks and non-banks in three major activities: payment instrument provision, payment processing and authorization. Camponovo and Pigneur (2003) propose tree axes: device, network and services and content, for an m-business analysis framework. Ondrus (2003) utilizes this framework for mobile payments domain analysis.

Based on concepts from previous similar approaches and value network theory (Section 2.2), we approach retail electronic payments as a network product, which is offered to consumers as a bundle of services from a number of involved actors. Despite the complexity of different technologies and services, we model payments as a three-layer structure: core services, network infrastructure and payment services (Fig. 2).

Each layer comprises services provided from corresponding actors that are either essential for the payment activity or facilitate the payment process. Each service incorporates a value offer to consumers or users of payment service. Below we present some key services indicative for each layer.

Core services layer comprises all the necessary prerequisite services for payment transactions. Such services include: social contract about what is accepted as money (e.g. metal, paper), customer trust building (e.g. by payment risk reduction), payment instruments issuing (e.g. debit cards, credit cards) and account provision. .

Network infrastructure layer is based on top of the previous layer and comprises services that connect users of *core services* in a network. Such services include: internet services, and mobile network services.

Payment services layer comprises all services that are built upon the network infrastructure layer such as withdrawals, deposits, account transfers and bill payments.

Payment Layers	Provided Services
Payment Services	Payment services built on the network infrastructure (e.g. withdrawal, deposit, payment)
Network Infrastructure	Existing or new network services that connect users of core services (e.g. telephone, internet)
Core Services	Social contract about "what is accepted as money" (e.g. metal, paper, check, plastic), instrument issuing, trust building, account provision

Figure 2. Layers of payments

Actors in the domain should identify and improve the value offer for each service in order to obtaining competitive advantage (Porter, 1985).

3.2 Actors

Deregulation of payments, though not complete, is challenging new players to enter the promising market of retail payments. Payments industry has evolved through the years as a collection of specialized products built around single purpose networks. Various players operate in retail electronic

payments industry today, ranging from traditional banks to non-bank payment service providers (Bradford et al, 2002). Below we present an overview of key actors in the domain focusing on payment services provision and not in the related industry of software and hardware solutions vendors, despite their contribution in payments evolution. In our analysis we focus on the supply side of payment services referring to corresponding actors, and not on demand side where consumers and merchants are the major users of payment services as payers and payees. Major actors that provide payment services based on the previous payment layers approach (Section 3.1) are banks, telecommunication companies, payment service providers, network providers and regulators. Each actor operates within one or more payment layers providing corresponding services as depicted below (Fig. 3).

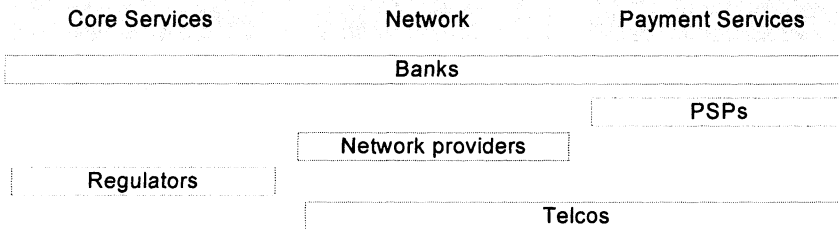


Figure 3. Major actors in the payments domain

Banks provide a full range of payment services covering all three layers, and keep an outstanding role in the domain. Though new entrants threaten their revenues, their exclusive access to core services layer provides them unique competitive advantages. Banks also operate in the network and payment services layers providing total payment solutions to their customers.

Telecommunication companies started to offer payment services in the domain based on their own networks infrastructure. Till now they are the major competitors of banks, but not able to provide total solutions due to restricted access to core services.

Payment service providers (PSPs) have evolved as intermediaries or aggregators providing only payment services in collaboration with actors that operate in network and core services layer. For example, a PSP may provide payers a single gateway to multiple payment networks (e.g. electronic, mobile) and payment instruments (e.g. credit card, debit card).

Network providers act as intermediaries connecting actors operating in the other two layers. They provide network infrastructure for wired and wireless communication and electronic payments.

Regulators operate mostly in the core services layer in close relationship mostly with banks. They set rules for the entire payments domain operation, and supervise their application. Governments and international institutions comprise the most important ones.

3.3 Value network configuration

Based on value theory (Section 2.2) we consider a payment services provider as a firm that relies on a mediating technology and links its customers in a network pool, and thus is best modeled by the model of value network. Payment service provision is offered to a pool of users connected through a facilitating network structure. Traditionally, payment services provision from a bank was rather an indirect offer to its customers and not a separate service. Today, as we may notice from previous analysis (Sections 3.1, 3.2) payment services have been transformed to a value offer from different competing actors to consumers. Our focus is on retail electronic payments only, since B2B payments require extensive analysis for the limited scope of this paper.

In order to identify competitive advantages leading to market leadership we propose a value framework that integrates value network concepts (Section 2.2) and payment layers (Section 3.1) into a value matrix (Fig. 4), where we identify major value creation entities for every part of the transaction process.

First, we map each payment layer (Section 3.1) to a primary activity as is defined in value network configuration (Section 2.2). *Payment services, network* and *core services* layers are mapped to *service provisioning, infrastructure operation* and *network promotion and contract management* activities respectively.

Next, following a similar approach to Kannen et al (2003) who propose a phase model for electronic payments, we divide a retail electronic payment in three phases: pre-payment, payment and post-payment phase.

Pre-payment phase includes all the initial actions prerequisite for the execution of a payment. For example involved parties must keep accounts to banks or third parties should guarantee for the involved parties.

Payment phase includes the initiation of transaction and actions necessary for the payment process such as payment instrument, payment mode, and payment channel selection. It also includes actions of the payment process such as authorization and payment.

Post-payment phase includes the end of transaction and actions after the completion of payment process such as clearing and settlement.

Finally, following the value network theory (Stabell and Fjeldstad, 1998) and deriving concepts from similar approaches (Sannes, 2001), we identify a

value entity for each primary activity and payment phase box of the matrix, resulting in a generic value matrix.

Pre-payment services, transaction services and post payment services are the value creation entities for the service provisioning primary activity. These entities cover all the high-level payment services such as withdrawals, deposits, account transfers and bill payments. Availability, accessibility and customer training are the value creation entities for the infrastructure operation primary activity. Services bundling, channel integration and customer service are the value creation entities for the network promotion and contract management primary activity.

Actors in the domain (Section 3.2) that offer their services within a payment layer should enhance them by increasing the corresponding value entity.

Payment layers	Primary activity	Payment phase		
		Pre-payment	Payment	Post-payment
Payment Services	Service provisioning	pre-payment services	transaction services	post-payment services
Network	Infrastructure operation	availability	accessibility	customer training
Core Services	Network promotion & contract management	services bundling	channel integration	customer service and self-service

Figure 4. Value network configuration for payments

From the above analysis appears that a payment system or innovation is not a competitive advantage by itself. Competitive advantage comes from built around services and customer service. Present complexity in the domain requires an integrated view, helpful for the decision makers.

4. CONCLUSION

In this paper we presented our approach towards a value analysis framework for the retail electronic payments domain. It is part of an ongoing work towards building integrated decision support tool for actors in the domain. The aim of the paper was to demonstrate our approach, so it was not provided extensive value analysis of the domain. We also focused on theoretical presentation and did not examine current practices in the domain.

However, from our analysis, value network approach provides a valuable analysis tool for the domain.

Future directions of our work include extensive value analysis of the electronic payments industry and enhancement of our framework with contributions from real cases. Due to increasing impact of technology to retail payments and their contribution to banks' revenues we aim to provide a helpful tool for decision makers in the retail electronic payments domain.

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