

Lost Opportunity – Why Has Dominant Design Failed to Emerge for the Mobile Payment Services Market in Finland?

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Abstract

The approximately 10 year history of mobile payment services is characterized by numerous failures and promising but yet uncertain future. Against this background we take a look at why a dominant design has not emerged for this payment services market in Finland, despite dozens of efforts and continuous user interest even when necessary technologies, competencies, attitudes, regulation and opportunities have existed. We developed a multidisciplinary framework to answer this question. The framework integrates the constructs and findings of earlier research on the emergence of dominant designs with the findings of the case, for which data was collected over five years. We also extended earlier research by analyzing the issue from the era of ferment to present.

1. Introduction

Mobile payment services have an approximately 10 year long history. Dahlberg et al [7] define mobile payments as “payments for goods, services, and bills with a mobile device (such as a mobile phone, smart-phone, or Personal Digital Assistant) by taking advantage of wireless and other communication technologies. Mobile devices can be used in a variety of payment scenarios such as payment for digital content (e.g. ring tones, logos, news, music, or games), tickets, parking fees, transport fares, and to access electronic payment services to pay bills and invoices. Payments for physical goods are also possible, both at vending and ticketing machines and at manned point-of-sale (POS) terminals.”

A typical chain of reasoning for the need of mobile payment services goes roughly as follows. Purchases have to be paid for and mobile payments are a natural choice for mobile services. Since physical and/or electronic payments are often unavailable or infeasible, the lack of suitable (mobile) payment services would hamper the development of mobile commerce.

Moreover, there are more mobile phones than any other devices that can be used to sell, produce, and deliver products and services to customers. Hence, accepting mobile payments is seen to offer lucrative opportunities to merchants and solid business cases to mobile payment service providers.

The slow development of mobile payments service markets has been a disappointment to many observers. These markets have remained small in size and limited in scope in most parts of the globe. Markets still comprise mainly of selling and paying for mobile telephony, ring tones and music, logos, data and messaging services including ticketing and vending [7]. Dahlberg et al concluded, that mobile payment services are “under transition with a history of numerous tried and failed solutions and a future of promising but yet uncertain possibilities [7].”

Within this context, the history of the Finnish mobile payment services market contains an additional feature, which we call a lost opportunity. Towards the end of 1990s, mobile commerce and mobile payment services started to appear as feasible businesses in Finland. A group of leading Finnish enterprises noticed that they held – in a global perspective - crucial resources for establishing the mobile payment services market. We call these enterprises the key industry actors. They consisted of mobile telecom operators who benefited from high mobile phone penetration, growing ARPU (average revenue per user) and at that time healthy margins, financial institutions with strong electronic and Internet banking services, mobile handset and network manufacturers (including the global market leader in mobile phones), software vendors who served the above mentioned enterprises, mobile payment service start-ups and merchants. The resource and competence based “agreement” among these actors was that it is possible to develop a generic, effective and reliable mobile payment service infrastructure in one country to be then exported elsewhere. Authorities supported this development with regulative activities.

Further, several international projects and standardization efforts were conducted with the aim to facilitate the establishment of standards and infrastructure for mobile payment services. Finnish key industry actors participated eagerly to these efforts motivated by the perceived business opportunities.

Despite of the common understanding, the key industry actors started to offer mobile payment services inconsistent to one another. Various service designs were built around competing technologies and standards. No service proved commercially powerful enough to emerge as a de-facto industry standard, around which other technologies and actors could have effectively clustered. Since no dominant design emerged, merchant adoption remained low, mobile phone users had few opportunities to use these services and economies of scale remained limited. Most key industry actors scaled down their investments and later even the services due to lack of commercial success, changed business priorities, etc. The leading handset manufacturer increased cooperation with other actors. The window of opportunity closed down, probably for good.

Why has a dominant design failed to emerge despite of dozens of efforts and continuous user interest in mobile payments both in paying daily purchases and in accessing electronic payment services (e.g. [6], [8]), even when necessary technologies, attitudes, regulation and opportunities have existed? Since several other mobile payment services markets have failed to establish a dominant design (e.g. [20], [30]), is it possible to learn from the Finnish case? Does the case increase understanding on how dominant designs emerge for complex information and communications technology enabled services markets?

To answer these questions we developed a theoretical framework by integrating the results of earlier research on intra- and inter-firm emergence of dominant designs and the findings of the Finnish case. We extend the scope of dominant design research by including the fuzzy front end during the era of ferment into analysis. Our framework describes the dominant design emergence process by integrating economic, technological, organizational and socio-political factors. The framework also builds on standardization research which suggests that key industry actors are the most important developers and users of standards [3]. To develop and probe the framework we carried out three series of in-depth open-ended interviews during the years 2001 and 2005, cumulatively 28 interviews and used other evidence.

Thus, in addition to being a theoretical model, the

framework contains the perceived key conditions for market growth [17], [21] for the investigated market as seen by persons working for the key industry actors. In line with Tushman and Nelson [27], we believe that a multi-disciplinary, multilevel analysis provides more insight as compared to single theory, single level analysis. The main level of analysis is a combination of organizational and market levels.

Next section presents the theoretical background. We then describe methodology used in data collection and analysis. Research findings are presented by first describing the constructed theoretical framework. The framework illustrates how complex information and communication technology enabled service markets emerge and how such markets develop impacted by economic, technological, organizational and socio-political factors. The framework is used as a holistic model to present empirical findings, which sheds light on why and how a dominant design failed to emerge for the investigated market. We also present analyses on three competing service designs. We finally discuss the findings and suggest how developments could have gone better for the mobile payment services innovators. Although our study addresses one specific market in one country, we believe that the presented theoretical framework is applicable for studies, which analyze the early developments of complex services markets and the emergence of dominant designs for such services.

2. Theoretical background

With an emerging complex information and communication technology enabled service market we mean a network technologies enabled market where technology is embedded in different communication infrastructures, which shape and constrain market's services and commercial activities, and the economic relationships between parties. The construction of the market's technological architecture is also influenced by the perceived business opportunities and resources available to relevant actors, see, e.g. [1].

During the early stage(s) of such a market, that is, the fuzzy first steps of new service innovation exploitation, participating enterprises face considerable risks in terms of what technologies to use, how to design services, and what business models to apply. When right choices are made, enterprises select technologies, service designs, and business models that prove to be commercially feasible and competitive. If an enterprise is able to decrease the costs or number of experiments and limit the consequences of wrong choices, that enterprise makes better and more focused

use of its (scarce) resources and probably arrives at a dominant design more efficiently than its competitors.

The emergence of complex technology enabled service markets has been studied within many disciplines. The intra- and inter-firm emergence of dominant designs has been investigated from economic [22], institutional ([14], [1]), and organizational–sociological ([27], [26], [23], [17], [28], [24]) perspectives. Standards competition research provides relevant background as industrial enterprises are seen as the most important developers and users of standards with related designs. They then enable other actors to achieve benefits, improve technologies and broaden applications [3]. Despite these research implications, studies on dominant designs have largely ignored the role of inter-organizational support arising from the interests of industrial players ([28], [7]).

Earlier research has also been criticized for concentrating too much on dominant designs, that is, on the structures of established mature markets. The “fuzzy front end” of the market emergence process is less understood and has, e.g. been called a “black box” by Rosenberg [22]. Also Tushman and Nelson [27] call for research on the early phases of market emergence: “While there is ample evidence that technological change is shaped by social, political, and organizational forces...these dynamics are left unexplored...(and) there is no systematic work on how organizations actually shape technological change.” Wade [28] notes, that there is “little insight into the underlying processes by which competing designs garner support.” By starting from the fuzzy front end during the era of ferment, we aim to extend the scope of prior research. In line with Djelic and Ainamo [11], we expect increased understanding to result from studies, which trace market history back to processes and logics applied during the era of ferment, and which thus investigate the emergence of a dominant design from the early beginnings, via evolutions of alternative designs, to competition for market dominance and finally to a dominant design – or the lack of it.

What is the right level of analysis? Tushman and Nelson [27] suggest that: “Progress needs to be made on the community and organization politics of technological change.” We follow their advice and combine organizational and market levels, which jointly describe how organizations impact technological market structures and vice versa. The underlying assumption is that a market design – at the latest during the era of a dominant design - will ultimately define how market participants with diverse interests will operate under common rules and practices within that market.

3. Data collection and analysis methods

When this research started, mobile payment services were at an early stage in Finland. Concepts, market characteristics, and the interests of the key industry actors were poorly understood with limited empirical data available. A small number of industry experts were responsible for the development of this market. Case study method was chosen, since it is also appropriate “in the early stages of research on a topic or when a fresh perspective is needed” [13]. Case studies suit well to situations where how and why questions are asked about contemporary events over which the investigator has little or no control [29], and enables researchers to deal with multiple sources of evidence. Research may include several analysis levels, for example, in the context of an emerging multilevel technology enabled market [27] and develop converging lines of inquiry to triangulate data [29].

Since one of our aims was to develop a theoretical framework to describe the case, we decided to apply also the analysis techniques of grounded theory building. We used the case study and grounded theory building methods described by [29], [13], [25] in conjunction with the systematic combining approach presented by [12]. This approach suited well to the early phases of our research with continuous iterative interaction between empirical data and theory building. Since the number of industry experts was small and the investigated market evolved continuously, we continued to use the case study method even for probing the theoretical framework.

Data was collected in three phases over a period of five years. Data collection included 28 interviews each lasting 1-2.5 hours. Interviewees were Finnish top and middle managers, who drove and/or closely observed the mobile payment services market development.

The first phase was an exploration on the Finnish mobile payment services industry with 19 interviews carried out during late 2001 and early 2002. Findings were augmented until mid 2003 with evidence from other data sources. The focus was on understanding the history and the status of this new services market and its key industry actors with their interests.

The second phase was an update of market developments and an exploration on the impacts of standardization process and standards competition. Literature and Internet review results were refined with three interviews conducted during the first half of 2004. Interviewed industry actors held key positions in international mobile payment standardization initiatives. The focus was on understanding cooperative

and competitive industry dynamics and the impacts of regulation/standards on both the mobile payment services market and on technological infrastructure. An initial theoretical framework was also developed.

The third phase contained six follow-up interviews conducted during the autumn of 2005 and an analysis of cumulative evidence which continued until late 2006. The key persons working for the six key industry actors, as identified during earlier phases, were interviewed. Five of them were the same persons that were interviewed for the first time during the first phase of the research. The evolution of market was revisited by asking the interviewees to describe the history of each mobile payment project the interviewee had been involved with. Interviewees were also asked to explain why those projects, service designs and business models had not led to commercial success. The theoretical framework was refined based on the cumulative evidence of all data gathered.

4. Results

4.1 Theoretical framework – case summary

The proposed theoretical framework is shown in Figure 1. As discussed above, the framework integrates theoretical results and constructs of earlier research, especially Lee et al [17], with the findings of our case. It describes how the framework factors as such and through their interrelations impact the emergence/non-emergence of a dominant design – at least in this case.

The theoretical framework suggests that the ability of an *interested organization* to influence the emergence of a (mobile payments) *services market*, *institutional* and *technology factors* can be understood through the resource based (or “complementary assets”) [17] and the resource dependence [23] perspectives. Lee et al [17] define these as “assets which are complementary to the commercial viability of a design”. Christensen and Bower [5] state: “...we hope that future researchers can develop clearer models for managerial action and strategic change in the face of disruptive technology change that are consistent with the principles of resource dependence and the processes of resource allocation.”

Earlier research suggests that these perspectives are especially useful if the emergence of the market is based on a systemic innovation (e.g. information and communication technology) applying new and/or revolutionary technology, as is the case with mobile payment services. Earlier research also suggests that the success of a technology in industries with increasing returns depends on the *organizational*

support received [28], and that in systemic industries mutualism between complementary organizations limits rivalry on the organizational level [2]. Furthermore, earlier research suggests that the resource based and resource dependence perspectives have close linkages to institutional theory [19] and to the nature and coordination of innovations ([4], [15]). In summary, the emergence of a dominant design for a (mobile payment services) market depends thus on institutional support garnered on several levels, such as regulatory, normative, and social-cognitive, the composition of which may vary by geographic area. Payment services are typically subject to active institutional and technical regulations and to strong industry actor interests. The ability of an individual organization to impact the emergence of a dominant design depends on its (complementary) resource strengths and weaknesses.

In order to be able to establish a new (payment) services market an enabling innovation has to offer something superior as compared to existing services [17]. The *economic/business factors* of the framework mean that the emergence of the (mobile payment services) market is influenced by its ability to provide benefits to market participants (payment service users, merchants, payment service providers and institutional actors) so that they are willing to pay for the benefits. Benefits may materialize through lower transaction costs, freedom of time and place, value-added services, or other benefits identified in mobile payment adoption research (see e.g. [7]). Benefits are actor group specific. For example, financial institutions have invested into new payment systems in order to earn additional fees, to lower their operating costs, to strengthen their customer relationships, and/or to benefit from float.

The size of the market in relation to a minimum efficient scale of service production is another relevant economic issue. Market size impacts how many competing designs a market is able to support and what roles key industry actors are likely to adopt. The expectations of users regarding the scale and scope of the services needs also be understood [17]. We suggest that any analysis on the emergence of a complex information and communication technology enabled services market should consider factors shown in the proposed framework, as well as the history of such a market from the fuzzy early steps all the way to the emergence of a dominant design ([17], [10], [11], [9]). Institutional environments described by the framework factors not only affect efforts of the emerging and the competing industries, but also the evolution of the technology as well as intra- and inter-organizational dynamics ([23], [19], [17]).

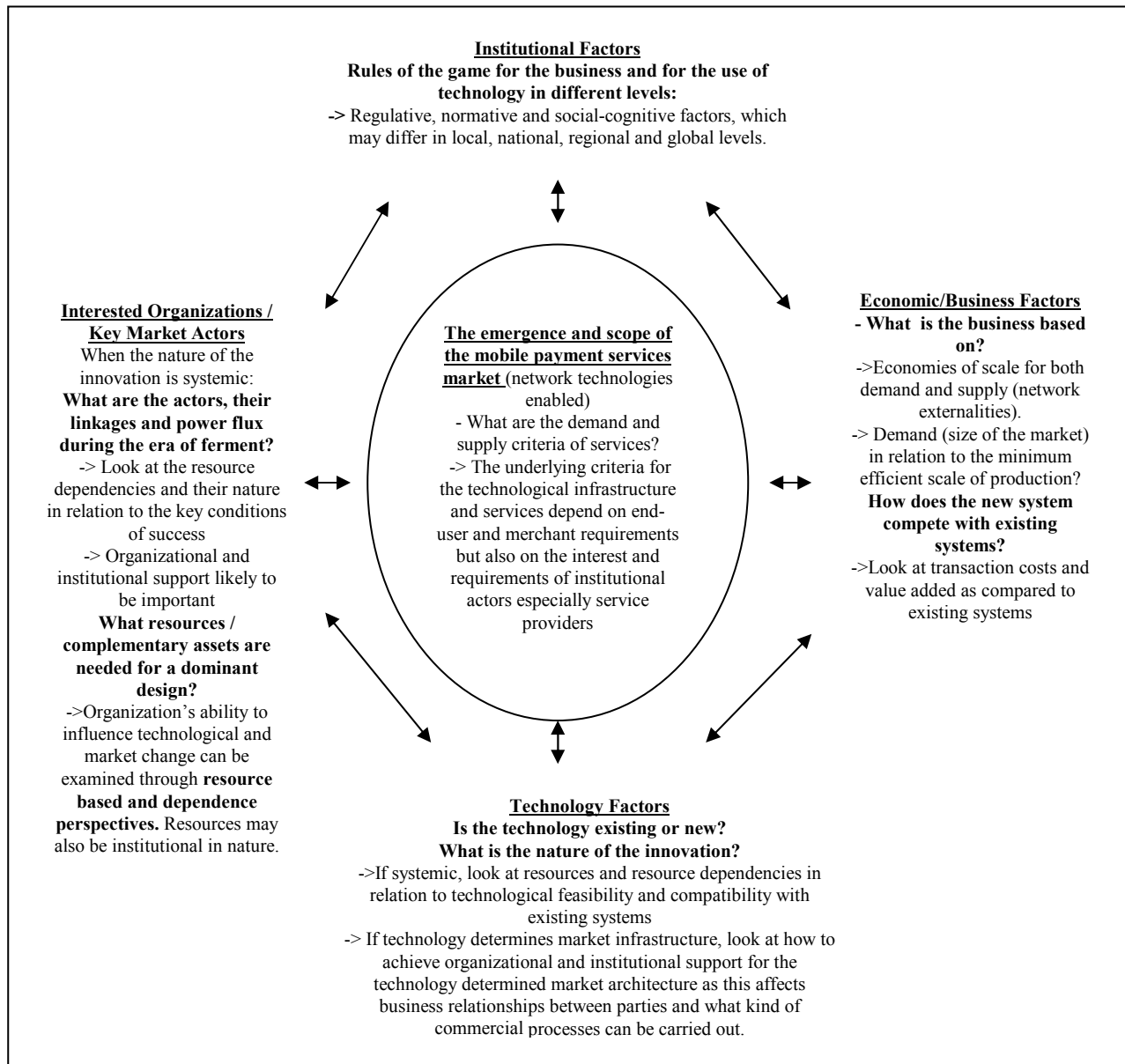


Figure 1. Theoretical Framework.

4.2 Supporting and inhibiting factors for the emergence of a dominant design

Sometime in late 1990s / early 2000s, when mobile phones, Internet and electronic banking had diffused to the majority of Finnish population, leading international Finnish enterprises - in such industries as mobile telecom handset & network manufacturing, banking, mobile telecom network & service operating and software - suddenly understood that they had necessary knowledge as well as resources to establish

mobile commerce including a mobile payment services market. Such combination of resourceful complementary industries within one country was unique at that time.

As a technology, mobile networks and phones had/have features which make them suitable for payment services. A mobile phone is embedded with a SIM (secure identity module) smartcard chip, which is technically similar to a credit or debit card chip. SIM cards identify and authenticate the user, but may also store value, provide digital signatures and credentials.

With strong PKI (public key infrastructure) identification or proprietary solutions, mobile handsets become applicable to large value payments and/or for accessing electronic payment services, particularly when persons are on the move - the main idea of mobile technology. Mobile phones may also act as contactless card readers and provide the interface for transmitting information between mobile phones and POS (point of sale) terminals, vending/ticketing machines, computers, software applications and communication networks. The advancement of near field communication technologies has dramatically expanded this enabling role of mobile technology. Already in late 1990s, SMS messaging facilitated the development of premium SMS services, typically mobile commerce services used and charged via mobile phones. Other message types and protocols, such as MMS (multimedia message), IM (instant messaging) WAP (wireless application protocol) and mobile Internet with increased data transfer capacity enable sophisticated mobile services, e.g. payment services.

In addition to technology, institutional factors and to some extent the expectations of consumers and merchants favored the development of mobile payment services [18]. Telecom and financial services industry regulators support the development of safe electronic and mobile payment services as such services are regarded efficient. In addition to Finnish authorities European Union strongly supports this development of “e-Europe”. During the era of ferment, several mobile payment standardization initiatives were established both under established and new standardization organizations to achieve interoperable and standardized mobile payment infrastructures [16]. It is symptomatic to the failure of the dominant design emergence that, instead of cooperation, standardization efforts were overlapping, even competing. This reflected technological uncertainty and lack of organizational support from the key industry actors.

The penetration of mobile phones and electronic payment services were already high in Finland by early 2000s. Thus the basic social-cognitive understanding for mobile payment services has existed for many years ([6], [8]). Due to extensive experimentation, market trials and service launches, the Finnish key industry actors understand well the demand and economic criteria for mobile payment services. They also understand that end-user and merchant preferences focus on the benefits of ubiquity, mobility, compatibility, ease of use, security and trust as well as on offering complementary assets to merchants to limit their investments. Complementary asset strategy has been used previously in the connection of credit cards

[17] to solve the “chicken and egg” problem. In summary, most of the factors of the theoretical framework supported the emergence of a dominant design for the mobile payment services market.

The inhibiting factors for the development of a dominant within the investigated market are the adverse market dynamics between the key industrial actors. The key industry actors had/have divergent rivaling interests, alternative asset strengths and priorities and short history of cooperation. For example, banking industry approaches mobile payments as another access technology. An interviewee described: “Our aim is to build a structure that is more or less an additional user interface via a different channel, the mobile channel. The actual functionality behind this user interface is exactly the same as in other user interfaces such as in Internet banking or in our branch offices. What is important is that we have one service agreement that covers all channels, so that customers can really choose what they like and what they don’t like.” This approach differs from the interests of operators, who wish to increase traffic in their networks and to earn additional fees for services transmitted and/or charged via their networks. Financial industry has a long cooperation history with merchants in payment services whereas cooperation with telecom industry and technology vendors in payment services development is a new phenomenon.

As a whole, the adverse market dynamics resulted in competition between technologies, in non-interoperable services, and in too cautious investments and marketing efforts. One interviewee commented that “the payment business is fully a volume business...Internet and mobile payments would require mobile telecom operators and banks to cooperate but no commercial grounds have been found for this. It also culminates to the identification of users.” As a consequence, Finnish, European and many other mobile payment services markets still suffer from this lack of cooperation.

4.3 Adverse market dynamics

To deepen the above stated conclusion with more detailed supportive evidence, we describe the adverse market dynamics in the context of three competing designs. In addition to WAP/mobile Internet access to Internet banking and mobile operator billing based service, we identified cumulatively six competing technology enabled service designs with related business models developed for the Finnish mobile payment services market. Of these European operators’ backed Simpaya, Nokia Mobile Wallet piloted by Nokia and a credit card company and a new entrant’s mobile

payment service never received significant market support or proceeded beyond the pilot phase.

We first discuss the initiative to develop a dual chip mobile payment and banking solution, supported by the Mobey Forum. The Mobey Forum, established in May 2000, represented “the technical and functional business requirements of financial institutions in the field of mobile payments and banking at the global level.” Yet, the initiator of the forum was the leading mobile handset manufacturer, who considered that handset manufacturers have similar interests as financial institutions. Certain mobile technologies, the dual chip solution especially, were seen to offer financial institutions possibilities to bypass mobile operator owned user interfaces and to provide a direct customer relationship in the mobile channel. Handset manufacturers, in their part, saw that the dual chip could increase the value of mobile handsets.

The Mobey Forum advocates considered that the dual chip solution was the only available technical solution which fulfilled the technical, functional, and business requirements set by the financial institutions participating in the Forum. The dual chip solution was then developed and piloted together with the leading mobile handset manufacturers. By late 2002 or early 2003, it became evident to the participating financial institutions that apart from the dual chip mobile phones delivered to the pilots, other dual chip mobile phones were not available and would not enter the market in the near future. Financial institutions finally came to the conclusion that the dual chip solution had to be forgotten. During the pilots several new mobile technologies had entered the market, which also contributed to this decision.

One interviewee explained, why the dual chip solution was never taken to the market: “In the dual chip case ...the solution was tried with approximately ten different European banks ... We were certain that if this kind of concept had a mass market and possibilities to live, some million pieces of phones would be sold....What became the problem was not so much that the technology would not have worked. We got it working very well but...in Finland, the situation was such that the banks were not willing or they did not have the possibility to invest enough to take this kind of dual chip system to the market ... Banks apparently expected that this dual chip functionality would come to the phones like free of charge...and did not generally take into account the fact that the selling of mobile phones in various European countries is based on established channels, practices, and business models. Namely, in most European countries, operators subsidize the price of the devices, and connect the

devices and the mobile operator subscriptions together...This makes a kind of favourable package to the consumer. In order for mobile operators to subsidize the price, operators naturally expect that these devices, which do not bring money to them, will bring additional revenues ... in the form of service payments. Due to this factor operators did not have any interest to start to subsidize this kind of dual chip characteristic which would have been advantageous only to the banks. ... When there was not money for marketing, when there was not a realistic ‘go to market’ or a channel idea and when the banks did not want to distribute these mobile phones, there was simply no...market realism... How the service is taken to the market ... often requires consumers to change their habits, but such changes are not fast and...one needs long term persistent marketing.”

The next story started in 2000 when a leading Finnish mobile operator developed and launched an operator centric service design and business model for mobile payment services. An account-based mobile payment service was developed, which enabled mobile phone subscribers to pay for purchases in both proximity (POS and vending machines) and remote commerce environments by using phones for payments via the mobile operator’s network. The mobile operator acted as the “money and payment broker” between payment service users and merchants. The business model was thus similar to that of credit card companies. One interviewee explained: “The original idea was to be able to get commissions from every transaction (carried through the network) so that we would get our share from every transaction. Hence, in a way, we would be something similar to an acquirer of the international Visa and Mastercard, or some other kind of credit card type commissioner who has the transactions of the users as the revenue source.”

To have the legal right to operate the account system, the mobile operator acquired a financial institution license. The operator approached credit card companies and financial institutions and encouraged them to join the service in order to allow consumers to choose their preferred payment instrument(s) from:

1. A mobile operator branded prepaid mobile payment account, that is, a mobile wallet.
2. Credit card, provided that the credit card details were registered on the server operated by the mobile operator. The credit card was the only payment instrument, which allowed the service user to make payments without having to deposit money in advance to the operator’s payment account.
3. Bank-linked mobile e-money account. This payment instrument was designed so that the payment service

user, as a customer of a bank, was to money transfer in advance to the mobile e-money account via Internet banking from a “traditional” bank account.

Technologically, the service was advanced, many-sided and functioned well. Users were able to access the service via SMS, WAP, or Internet. The authentication of the users was conducted on various security levels, ranging from mobile phone number recognition to strong PKI authentication, depending on the requirements of specific payment transactions. The service design and the business model did not capture support from financial institutions. Rather, banks regarded the service as a hostile competitor and also the credit card company withdrew its support. One interviewee explains: “...What happened in the end was that the credit card company...started to see that it is somehow against the international credit card rules, if they do not have direct contracts with merchants. So they ... wanted that every merchant would still make a separate contract with them so that the money would not go...directly to the merchant... It would not have been enough...to see that the mobile operator is their merchant in this case.” Another interviewee continued: “Mobile operators cannot operate...in between the merchant/service provider and the credit card company...in such a way that the operator would make contracts. Of course, it is possible for them to sign contracts with merchants, but credit card companies also need direct contracts with those merchants. This arrangement guarantees that there exists normal billing and risk routines. ... This has always been the case both in conventional and in Internet marketplaces.”

Difficulties with merchants were foreseen as one interviewee explained: “There were already contracts with merchants. That new requirement from credit card companies would have meant that it would have been necessary to say to all these merchants that they still have to make a contract with the credit card company... It would have been... too laborious, and they, the merchants, would have started...to ask ‘hey, the commission to the credit card issuer is something like 1-1.5% per transaction. Why is there another commission when we wanted to have this at a cheaper rate?’ So that was it, the end of the story”. Another interviewee commented: “There were eventually many reasons why it did not succeed. ... For example lack of resources in marketing, then there was no killer application... the kind of application that would have triggered end-user to start to use this service, the credit card contract issue ...and there was a lack of...content services.” As the service did not manage to become

profitable, the service was terminated at the end of the year 2004.

The third story started in September 2001, when another major mobile operator and two of the three major banks in Finland decided to cooperatively develop a mobile e-money micro-payment service. The service was launched in late 2003. At launch it could be used to pay for the SMS and WAP based mobile services of approximately ten merchants, and there were plans to rapidly acquire more merchants.

The technological architecture, the service design, and the business model were built to utilize existing infrastructures of both the operator and the banks. From technology perspective the project integrated two infrastructures by defining what information needs to be transmitted between them to process payment transactions. Banks developed a server based “Mobile e-money Clearing and Settlement System” which was implemented on top of the e-money card system operated by Automatia Ltd., a company owned jointly by banks operating in Finland. Automatia operates the Finnish ATMs and the ATM network as a service, and operates also the bank-end infrastructure of the “mobile e-money payment system” and manages the “mobile e-money wallets” of the mobile handset users and merchants registered into this service. Yet, banks are the actors towards the users and merchants. The mobile operator acts as a payment broker with development and operating responsibility for the “Payment Transaction Switching System” built by the operator.

The service is operator independent, that is, a user can be the client of any operator. The service works so that a customer of a bank opens a “mobile e-money account” against the customer’s mobile phone number via the bank’s Internet banking. When the “mobile e-money account” has been opened, the customer can download money up to 400 Euros from the customer’s traditional bank account. Security is provided by using the same strong authentication mechanism with unique keys that banks use in their Internet banking. The service is thus an additional Internet banking service and corresponds to a cash withdrawal.

To join the service a merchant needs to sign contracts with at least one bank (merchant’s house bank) and with one “transaction data broker” (the operator preferred by the merchant). Banks charge service fees from merchants similarly to traditional payment card service business. Operators, in their part, earn from the generated SMS traffic. Furthermore, the mobile operator who acts as the payment data transfer broker charges data transfer fees from the merchants.

The service design and the business model is based on the idea, that all key industry actors continue to run

their traditional businesses. One interviewee explained: “While in 2001 some other mobile operators aimed at producing everything by themselves, that is, to take care of all kinds of value added services in the mobile channel, we were more like “networking”. A good example is the business model of the project.” Another interviewee commented: “the service is not technologically interesting but the business model is, because it is genuinely based on competition. ... We believe in these kinds of open solutions, where the competition is open and the pricing happens independently by each actor and where consumers and merchants can also change their preferred vendors. ... We believe that these kinds of business models are those that in the longer run will establish the biggest market.” To understand consumer and merchant adoption, large surveys were conducted, e.g. [5].

In terms of charged fees the service is more beneficial to merchants than the dominant mobile operator billing based revenue sharing. The data transfer brokerage fee and the commission paid to a bank is cumulatively smaller than the operator retained revenue share. Funds are also transferred faster to merchants. The average fund transfer cycle, counted from service delivery to the date when the merchant receives the payment, is in the revenue sharing model linked to the cycle of post-paid billing service plus a few weeks’ delay, whereas in this system, the mobile e-money accounts are cleared and settled daily.

Although this service still exists it has not proven profitable, so far and is no longer actively promoted. The number of merchants remained low as efforts to market the service were insufficient, the priorities of the parties changed and merchants were unwilling to update their POS and other payment systems. In many cases, uncertain lower commissions were not deemed to justify certain technology update costs. Interviewees also pointed out that the launch of several similar non-interoperable mobile payment services has inhibited the service from gaining a mass market status. One interviewee explained: “In Europe we have one common currency, the Euro. Now, compare this to the situation where we in our small country (Finland)...have in a way three different non-exchangeable currencies for electronic money.”

The common characteristic of all these service designs is that necessary multilevel organizational and institutional support has clearly been insufficient. Negative industry dynamics between at least some key industry actors is also symptomatic, seemingly resulting from misjudged resource strengths, complementary assets, and market size evaluations.

5. Discussion and concluding remarks

We presented a theoretical framework that describes factors, which impact the emergence of dominant designs for complex information and communication technology enabled service markets. That multi-disciplinary framework was used to analyze the mobile payment services market in Finland. The framework helped us to organize case research data and to provide solid explanations to the question, why a dominant design had not emerged for that market. Within the case we were able to capture the development of the investigated market from the era of ferment to mid 2000s. Our study indicates that this kind approach helps to understand how dominant designs emerge or fail to emerge for new innovative systemic markets.

The analysis showed that technology and institutional factors, and to some extent demand and economic factors supported the development of the mobile payment service market in Finland. On the other hand, the lack of multilevel organizational and institutional support from the key market actors fuelled by misjudged resource and complementary asset strengths resulted in market uncertainty as well as in technological, service design and business model competition, which has so far prevented a dominant design from emerging for this services market.

The reviewed service designs are at the same time good examples of how things could have evolved more successfully in Finland and perhaps elsewhere in Europe. Although all services were technically feasible, were based on clear business models and had institutional and organizational support from some key industry actors, they were not commercially feasible since they did not manage to receive support from all relevant key industry actors. Thus they did not capture marketplace level support, and a dominant design has failed to emerge. These lessons are valid for future efforts, as one interviewee pointed out: “There was simply not at all market realism ... (and) ... that kind of realistic holistic view, how the technology will be harnessed to bring some kind of service to the market.”

Our study is based on a single case study in one country. As we did not identify studies with a comparable approach, we have not compared our results to other countries. Caution is therefore necessary with our results including the framework. We further remind that qualitative research is according to prevailing wisdom considered to be more useful for theory building than for theory testing. By focusing on the analysis of empirical findings in this article, we had to leave out discussion on the nature of dominant design and background theory selection. We still

believe that studies covering early developments of new services markets will significantly increase understanding on how dominant designs emerge.

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