EXPLORING THE RELATIONSHIP BETWEEN STRUCTURAL MARKET CONDITIONS AND BUSINESS CONDUCT IN MOBILE DATA SERVICE MARKETS

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ABSTRACT

A business model represents the decision space for strategic options of a firm. These options are determined by the market situation in which the firm operates. Among these options the firm makes its strategic decisions which are evaluated by the firm's performance in the market measured by business values. Thus, there is a link between market conditions, business model choices, and performance. This link was first formulated in the structure-conduct-performance (SCP) framework in the field of industrial organization, which links together the supply-side with the demand-side. MAPIT is a framework for understanding the structural conditions under which intermediaries and platform providers in online markets choose their strategies, roles and functions.

In this paper, five case studies of mobile data service providers are analyzed and described using the MAPIT conceptual framework. The fundamental concept in this framework is *integration* – vertical integration of activities along the value chain, and horizontal integration across value chains. For each case, we describe the relationships between specific structural conditions and the business model choices made by the service providers. Finally, the findings on business model options are generalized across cases and some industry implications of the observations are made.

Keywords: Mobile business model, Integration decisions, Structural market conditions, Value network, Industry implications.

1 Introduction

The success of the Internet for commercial services has attracted the interest from operators of wireless networks as a new source of revenues in a mature voice market. The question is whether the business models of e-commerce can be transferred to the mobile data service markets. So far we have seen various business models adopted in these markets with variable success. The Nordic experience with the so-called CPA-models (Content Provider Access) for SMS and MMS services has been fairly successful. These models are open and collaborative. Open models, however, have not been equally successful for WAP based services. On the other hand, the more closed and vertically integrated business models (semi walled garden) adopted by DoCoMo for its I-mode services in Japan, and the model applied by Vodafone's "Live!" services are found very successful [Pedersen & Methlie 2004].

It is expected that the battle for control of the customer interface will increase as the services offered over mobile networks increase in both variety and quantity. Mobile operators have so far been very active in the market in capturing added values from these services, and to positioning themselves as service providers at the customer interface. Their main advantages rest with the ownership of the network infrastructure, their technical know-how and understanding of mobile features, and their control of the billing interface with customers. As we move into more complex m-commerce services the operators' dominant positions may be challenged and we expect to see greater variety in the choice of business models. The question than is which business model warrants success in a specific mobile data service market? Mobile data services, including m-commerce services, refer to transactions over a mobile telecommunications network using a handheld device. Journal of Electronic Commerce Research recently devoted a special issue on m-commerce research (see Vol. 6, No. 3, 2005). Okazaki [2005] summarizes in this issue the progress and future directions of this research.

The term *business model* has been used mostly in traditional electronic commerce to describe the key components of a business [Timmers 1998, Weill & Vitale 2001]. Methlie and Pedersen [2002] included three operational dimensions in their business model concept: integration model, collaboration model, and revenue model. Recently, several authors have applied the business model concept to mobile commerce and mobile data services contexts [Campanovo & Pigneur 2003, Faber et al. 2003, Bouwman 2003]. With some variations in the concepts applied, these authors suggest four dimensions of business models: the product innovation, the customer relationship, the infrastructure, and the financial dimension, covering the product related value proposition, the customer related value proposition, the structural dimension and the revenue dimension, respectively [e.g. Campanovo & Pigneur 2003]. However, the choice between specific options along these dimensions and the performance effects of choosing specific options under different structural conditions have been given less attention in this literature. Therefore, to understand the effects of business model choices on the performance of a firm in a specific market we have to establish the relationships between market conditions and business options; and between choices (business conduct) and performance. These relationships are known under the label of "structure-conduct-performance paradigm" [Bain 1951]. There is a rich tradition of empirical research in industrial organization beginning in the 1950s that examines the impact of market conditions on performance [see for instance Kadiyali et al. 2001].

In this research we shall concentrate on the relationship between market conditions and business conduct, i.e. how structural conditions of the market affect business model choices. An exploratory study using a framework developed by Methlie and Pedersen [2002] for the e-commerce markets known as MAPIT is applied to five cases of mobile data services. This conceptual framework is used to identify the structural conditions of the specific service markets of the cases, and relate these conditions to the business models chosen by the providing firms. From these case descriptions some general findings and industry implications are developed.

2 Theoretical Foundation

The theoretical foundation of our research model is based on the "structure – conduct – performance" (SCP) paradigm originally defined by Bain [1951]. The industry competitive structure is measured by factors related to the demand market, economics and powers of industry actors, product attributes, and exchange attributes. Business conduct is defined by factors related to competitive behavior such as choices of market strategy, integration model and revenue model. Business performance is measured by profitability, rate of innovation, etc. The SCP paradigm states that industry structure drives industry conduct, which in turn drives industry performance [Kadiyali et al. 2001].

In the late 1970s, new research convinced empirical researchers that market performance was not merely a function of broad structural characteristics employed in the SCP studies. Several methodological issues were raised against this paradigm, among which are the issue of heterogeneity of an industry, and the non-exogeneity of the structural variables. The heterogeneous issue is a problem when applying the paradigm across a broad population of firms. When applied to a narrow set of firms serving similar product markets this is not regarded a severe problem. The non-exogeneity issue, however, remains in that structural conditions may be influenced by the conduct of dominant actors. This can be the case in mobile data service markets where telecom operators in several product markets have dominant positions and thereby may influence the structural market conditions. As a consequence of these insights, the SCP paradigm was extended with more industry and firm-specific details, and the strict linearity between structure and conduct was released. This gave birth to the so-called "New Empirical Industrial Organization" literature [see Kadiyali et al. 2001]. By using MAPIT in our study we do increase the amount of industry and firm specific details, but we shall retain the linearity in the structure-conduct relationship since we are not trying to establish empirically verified explanations of the relationships based on cross-industry analysis, but merely explore these relationships in each case studied.

Methlie and Pedersen [2002] developed the structure – conduct mapping taxonomy, MAPIT, when studying how intermediaries in online e-commerce markets choose their strategies, roles and functions. The focus of this taxonomy is on how transactions along the value chain are organized, that is, the vertical and horizontal positioning of an actor at any stage of the value chain. Transaction cost economics [see Williamson 1985] has been the dominant theoretical framework to decide on vertical boundaries of a firm. Horizontal boundaries, on the other hand, identify the variety of products and services transacted by a market player and are primarily determined by scope economics [Besanko et al. 2000].

The structural determinants of MAPIT are defined along five dimensions: Market, Actor, Product, Influence, and Transaction. The Market measures include two main factors, fragmentation and knowledge. Fragmentation refers to the number of competing players on each side of the transaction, that is, on the number of suppliers and the number of buyers. Knowledge refers to the competencies required to serve in a specific market. Three sub-

competencies are defined: technical knowledge to develop an application on the specific infrastructure used, e-business knowledge that includes the understanding on how e-technology drives business values [Amit & Zott 2001], and domain knowledge to offer a specific product or service (the content) in the demand market, for instance financial advice which requires competencies in finance. In this study we do not distinguish strictly between technical and e-business knowledge but denote an aggregate of these two as m-commerce knowledge. The Actor dimension includes measures on scale and scope economics, and cost variables. The Product dimension defines the *content* of a transaction and is measured by the degree of differentiation potential and the complexity of the service, both production complexity and buying complexity, when it is transferred to an Internet or a wireless infrastructure. We also assess the utilization of mobile specificity when the transaction is moved into the mobile market space. The Influence and Transaction dimensions define the *exchange*, where influence measures the social mechanisms, and transaction refers to the economical conditions that impact on the relationships.

These structural dimensions are mapped on to integration variables of the business model that include *initiator, market strategy, integration form, and governance.* By initiator we mean the actor in the value chain or network that takes the initiative to make an integration move. This move can be downstream from a seller, upstream from a buyer, or from a new entrant. It is fair to assume that from either a buyer or a seller position the move is taken from a dominant position in the value chain while for a new entrant to enter the value chain, the market should be rather fragmented on both sides. Following roughly the competitive strategies defined by Porter [1985], two market strategies are defined: focused and undifferentiated. In a focused strategy a firm chooses to concentrate on offering a narrow scope of products to a selected target segment. In an undifferentiated strategy, on the other hand, a firm pursues a broad coverage strategy where a scope of products is offered to a broad market. Integration form has two dimensions; horizontal integration defines the scope of offerings on the supply side, and vertical integration refers to how value-creating activities, both in the upstream supply system and in the downstream customer relationships, are organized. Governance is concerned with the coordination and control of the transactions being exchanged. Four governance mechanisms are defined in the MAPIT framework: hierarchy, agent, distributor, and mediator. Hierarchy means that a player takes full control (closed, vertical integration) of the transactions. Mediator, on the other hand, denotes an organizer of market transactions. Agent and distributor are two intermediate forms that differ in the amount of ownership the service provider takes in the transaction.

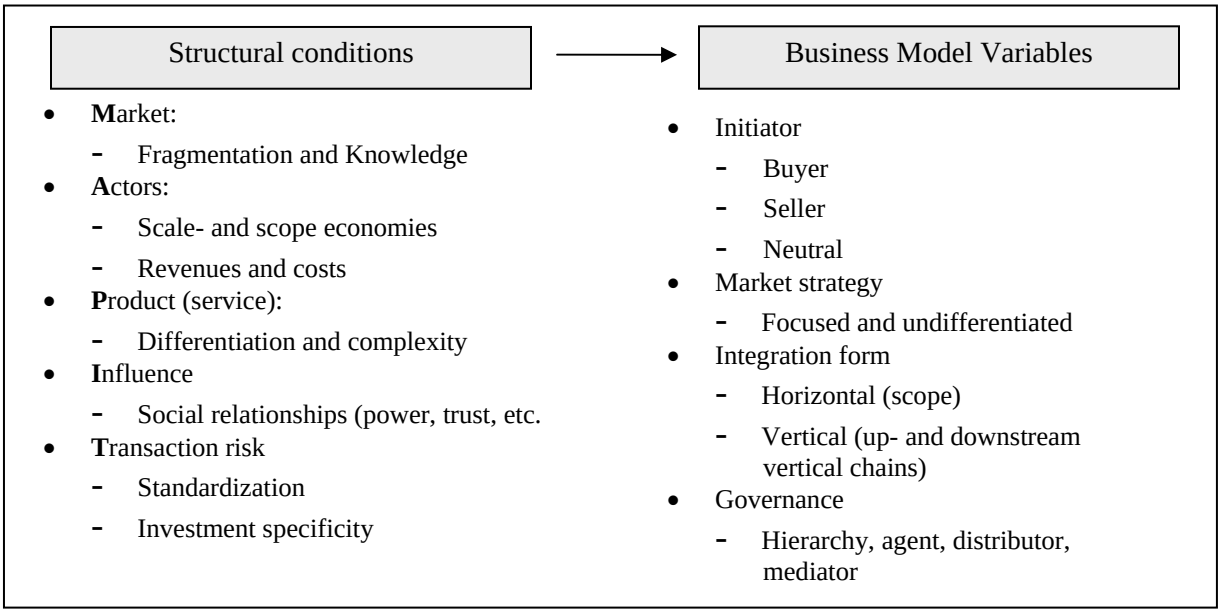

Figure 1: The MAPIT Framework

Horizontal integration increases the breadth of offerings provided by a firm. The firm may gain economies of scope in doing so. A special case of horizontal integration is found in two-sided markets [Rochet & Tirole 2001], where two different groups of customers have to get on board for the business to succeed. A sometimes seemingly single service intermediary needs two different value propositions for its product, one for each side of the market. A firm providing mobile parking payment, for instance, needs to get car drivers paying for parking time to accept the mobile phone as a payment device, and at the same time get the companies providing the parking lots and who need

settlement for the payments collected over the phones, to accept this payment system. Likewise, a credit card company needs to have not only consumers adopting their cards, but also merchants accepting the cards. It is essential for these companies to get both sides aboard simultaneously. For others, producing products for both sides may not be critical, but still important because the sales of complementary products produce indirect network effects. Indirect network effects originate when the networked good is a platform for complementary services and products [Gupta et al. 1999]. Indirect network effects generate more value for the users of the service on the one side of the market, and therefore the demand is greater, the more users there are on the other side of the market, and vice versa. Merchants value a payment system more if more customers adopt the system. Application developers value an operating system the more prospective application buyers are using it. A newspaper can afford higher quality editorial content or lower prices the more advertisers it attracts. The effect on the business model of two-sided markets is that two value propositions must be designed, one for each side of the market, that create benefits for both customer groups.

Two-sided markets are numerous in the network economy because of the integration possibilities. By serving both sides of the market, a firm can take pricing interdependency into account. A key aspect of the business model for firms operating in two-sided markets involves the optimal pricing structure: the division of revenues between the two sides. Many economists have studied pricing strategies in two sided markets [see e.g. Rochet & Tirole 2001, Evans 2002]. Also, pricing strategies due to the indirect network effects of complementary, network services have been studied more specifically [Gandal et al. 2000, Basu et al. 2003, Brynjolfsson & Kemerer 1996]. The revenue model dimension is not included in the integration aspects analyzed by the MAPIT framework but will be discussed in section 5.

3 Methodology

3.1 Research design

Research on business models is dominated by developing conceptual frameworks. We wanted to extend this research by investigating models of the relationships between market conditions and business model choices. We used case studies and applied a holistic multiple case design [Yin 1984], meaning that we investigated several cases, and examined each case as a whole (in contrast to an embedded multiple design, which denotes several units of analysis within each case). A multiple case design allows for a "replication logic", which means that each case serves to confirm or disconfirm the inferences drawn from previous ones [Yin 1984]. Further, the comparative dimension also add value in terms of external validity, and can contribute in generating new and interesting insights that often remain undiscovered in single case studies. Five cases of mobile services were selectively chosen among providers with different positions in the value chain of mobile services. The selection criteria included: (a) services that involve a mobile device; (b) different types of mobile services such as entertainment services, transaction services, and information services; (c) focal actors with different positions in the value creating network, i.e. some cases where the focal actor is close to the customer and other cases where the focal actor is further away from the customer (e.g. a content provider).

The cases studied are: *1) Easypark* - parking payment over the mobile phone provided by a small company (application provider). Easypark was established in August 1998, and has developed a wireless solution for payment of parking time. In addition to offering payment options, users of the service can also prolong or curtail their parking time depending on their needs. *2) Smartpay* - a mobile payment system launched by a bank and a mobile operator in 2001 as a joint venture. Smartpay can be used to transfer money from several terminal devices such as mobile phones, PCs, and digital television. Through this system, customers can use electronic commerce services without providing sensitive information about their credit card or bank accounts. The most popular services today are SMS-based and include parking (Easypark), purchasing of soft drinks, recharging of mobile phone cards, and various tickets and games. Smartpay comes in two versions, one micropayment version with a cash account called Smartcash, and one full functional bank and credit card account charging version. Only the latter is included in the analysis here. *3) Djuice* - a portal provided by a mobile operator. Djuice is an open mobile Internet portal for the consumer market. The business idea is to provide an Internet portal accessed by the mobile phone. The Djuice portal is a collection of entertainment-, information-, and communication-services with search functionality and a set of links to specific themes. In addition to the portal function, Djuice distributes an application platform (a shell), that enables local telecom operators, content providers, and media companies to easily establish mobile Internet portal services for end users in various local markets. *4) SMS Jackpot* - a mobile lottery launched in the fall of 2001. SMS Jackpot is an electronic lottery offered as an entertainment service trough a mobile channel (SMS or WAP). In order to play the lottery, customers need to be at least 18 years old. To be able to verify a player's age he or she must be registered as a SmartPay customer. In placing the bets, the participants' charge their SmartPay cash accounts. Part of the profit of the lottery goes to a humanitarian organization who is the concession owner of this service. *5) The Tax*

Magazine - electronic content (personal tax listings with associated editorial comments) provided by a newspaper and accessed over the mobile device. The Tax Magazine is one of several services offered by an online newspaper. The magazine presents online tax information services about taxpayers taxable income and taxation for a fiscal year on the web or on the mobile phone (by using WAP). It consists of searchable lists about individual taxpayers as well as editorial material bounded to the personal taxation data issued by the tax authorities.

Given the link between market conditions, business model choices, and performance, the optimal cases to be included in our research sample would have been the ones that score highest on the performance dimension. However, making this selection is difficult given the immaturity of the mobile data services industry. Hence, it is too early to determine the degree of success (how well the companies perform) as they have been in the market for a relatively short period of time. The lack of performance information does not mean that studying the relationship between structural conditions and business model choices is of limited value. There are two reasons for this. First, by drawing some conclusions of end-user values from the nature of the mobile services offered, preliminary assumptions regarding the actual business model choices and expected performance can be made. In doing this, we have drawn on empirical research focusing on consumer behavior and adoption of mobile services [e.g. Pedersen & Nysveen 2003, Nysveen et al. 2005, Bauer et al. 2005]. Second, the results obtained by investigating the relationship between structural conditions and business model choices found in this study can be subsequently linked to performance measures, and accordingly, the relationships between all elements can be analyzed.

3.2 Data collection

Because of the strategic nature of the information needed to answer our research question, a key informant approach was chosen. Relying on key informant accounts is appropriate when the content of inquiry is such that complete or in-depth information cannot be expected from representative survey respondents [Kumar et al. 1993]. We therefore selected one key informant from each organization[1] based on their knowledge of the issues being researched. Hence, the main sources of data consisted of qualitative data from in-depth interviews with key organizational members, supplemented with second-hand information (mainly from the organizations' web sites). The interviews lasted between two and three hours, and were based on a questionnaire consisting of open-ended questions serving as an interview guide. All interviews were conducted in tandem (two researchers), with one researcher responsible for the interviews and the other responsible for taking notes and filling in gaps in the questioning. The interviews were also tape-recorded and subsequently transcribed verbatim. The transcriptions were completed on an immediate basis, thus complying with a central rule for within-case analysis [Yin 1984].

The questionnaire was structured based on the MAPIT framework, meaning that the key informants were asked to describe the mobile services they offered; to explain how they have organized supply of the services; and to identify with whom they cooperate. In addition we probed how they viewed their customers, which values they aimed to create for customers (value propositions), and future strategic choices in terms of organization and cooperation.

4 Analysis

Few guidelines exist for conducting the inductive process central to interpretive research [Bourgeois & Eisenhardt 1988]. In this study, all researchers involved in the project individually made assessments regarding market conditions and business model choices based on the transcriptions. Then, the researchers participated in a workshop where the data and the individual interpretations were discussed and unified. In this workshop, patterns in the data were also investigated. In the following, we will present our analysis of the relationships between structural variables and business model choices (horizontal case-wise analysis) by applying the MAPIT framework. We will also draw some industry implications by analyzing vertically across cases, as illustrated in figure 2 below.

[1] For SmartPay, we included one key informant from each partner in the joint venture.

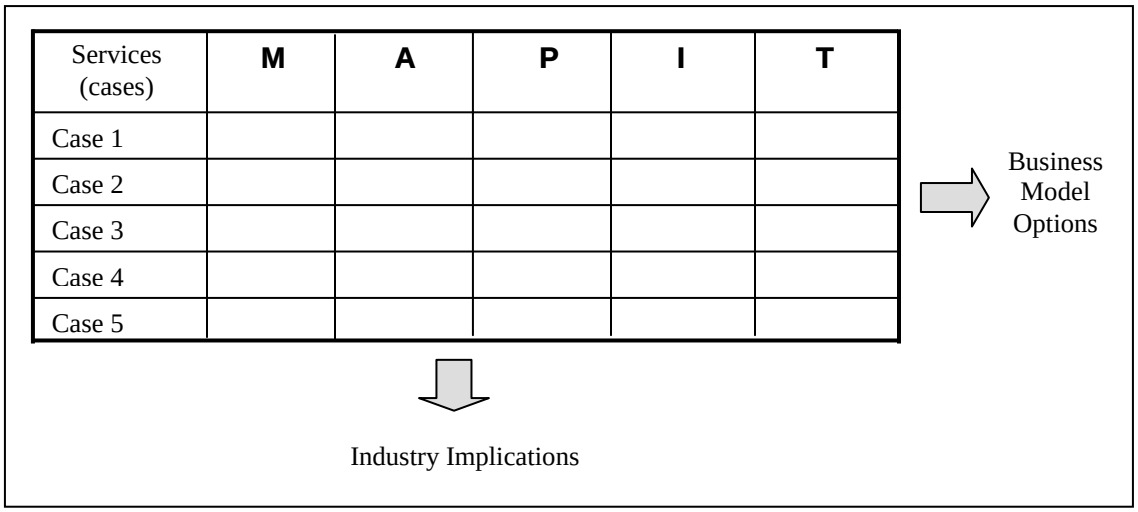

Figure 2: Using MAPIT horizontally and vertically

4.1 Structural Conditions and Business Model Choices

In this section we present the actors' business models in terms of integration decisions (table 1), and relate these decisions to the structural conditions for each case and discuss on which theoretical grounds the choices are made.

Table 1: Business Models

Platform	**Initiator**	**Strategy**	**Governance**	**Integration Form**
Easypark	New entrant Application provider	Undifferentiated	Agent	Supplier aggregate Vert. Integration Up and down
Smartpay	Existing trans. provider in collaboration with telecom operator	Undifferentiated	Agent (Walled garden)	Supplier aggregate End-user aggregate
Djuice	Telecom operator	Undifferentiated	Distributor (Walled garden)	Supplier aggregate Horizontal integate Up and down
SMS Jackpot	New entrant. Application provider, telecom operator	Undifferentiated	Distributor	One-sided market
Tax Magazine	Existing provider. Newspaper	Focused	Hierarchy	Vertical integrate Information integr. (bundling)

4.1.1 Integration initiator

Factors important for integration initiation are market conditions like knowledge requirements and market fragmentation. For the market conditions of EasyPark, we find that high supplier market fragmentation, high m-commerce competence requirements, and low domain competence needed to serve the parking customers with an m-based payment facility, allow a new, independent firm to establish an intermediary role in this value chain. Easypark is a new independent entrant exclusively serving parking customers with a wireless payment facility.

In the case of SmartPay, high fragmentation on both sides of the market offers the opportunity for an independent intermediary to enter. The new entrant must, however, possess high m-commerce and high domain competences. The high domain knowledge is associated with the special knowledge required to execute banking transactions, a competence which is possessed by the banks due to licenses and interbanking systems. Thus, the new entrant must be a bank alone or in partnership with a firm possessing high m-commerce competence. An alliance between a bank and a telecom operator is therefore an adequate partnership, as is the situation for SmartPay.

Similar to SmartPay, the level of fragmentation is high on both sides of the market for Djuice as well, giving a new intermediary the opportunity to enter the market with aggregated mobile data services. However, high m-commerce knowledge is required for launching a portal, and this may contribute in explaining why an established telecom operator initiated this service. High m-commerce knowledge is required for the initiator of SMS Jackpot as

well. Further, due to statutory regulations of firms offering lottery services, a license is required to market this service. The domain knowledge is assessed to high and the fragmentation on the supply side is very low. According to theory, this should render probable the occurrence of an already established actor as integrator initiator. However, the requirements for high m-commerce knowledge may open the market to a new intermediary as integrator in close partnership with a licensee. Together, these factors explain why a new intermediary initiated this service. The new intermediary is a telecom operator who operates this service in agreement with a licensee.

The business idea behind the Tax Magazine is to offer online access to tax-related information bounded to personal taxation data issued annually by the Tax Authorities. The Tax Magazine was initiated by an established actor, a newspaper, which can be explained by the high domain knowledge needed in terms of journalistic resources, and the non-commercial focus of the monopolistic content provider, the Tax Authorities.

4.1.2 Market strategy

Several factors are important for the selection of market strategy. First, increased opportunities for differentiation will most likely result in smaller actors with focused strategies [Dewan et al. 1999]. Also, one may find that high complexity requires more focused market strategies. On the contrary, substantial (potential for) network externalities and low production costs may indicate undifferentiated strategies. Low unit costs imply high scale economies potential provided a corresponding adoption rate in the market is achieved.

In the case of EasyPark, we find that disintegrating the payment activity from the parking value chain and transfer it to a network accessed by a mobile device opens a set of new functions to be added such as remote extension of parking time. EasyPark, therefore, has functionally medium differential potential relative to other payment facilities for parking. Its market scope, however, is consumer wide. Together with economy of scale potential this leads to an undifferentiated market strategy. However, if the m-market space was further developed, by for example location based information; complementarities focusing on customers searching for parking space in a specific area, etc. than the increase in differentiation potential would allow for market segmentation and more focused market strategies.

For the more general payment facility SmartPay, utilization of the full functionality of this service, including bank account charging, requires sophisticated authorization procedures implemented on the hand set. Therefore, this service has high complexity (which is also reflected in the adoption rate of this service). Isolated, this should promote a focused market strategy. However, the differential potential is regarded as moderate (remote payment), and the scale economy of this mobile payment facility is high supporting volume based market coverage, which may have encouraged the selection of an undifferentiated market strategy.

In the case of Djuice, high potential for scale and scope economies due to the simplicity of the services offered at the mobile portal, and low production costs, are factors that may have contributed to an undifferentiated market strategy. For SMS Jackpot, we also find high potential for volume-based economies of scale, low unit production costs, and low product complexity. This may have resulted in an undifferentiated market strategy in order to obtain broad market coverage.

The Tax Magazine creates an additional access channel for an existing service of publishing personal taxation lists, and it adds new value to this service by providing complementary and related tax information. The Tax Magazine has applied a focused strategy, which may be explained by the low potential for scale and scope economies and high differentiation potential inherent in the service.

4.1.3 Integration form

Factors important for integration form are knowledge requirements, production complexity, potential for network externalities, and influence in the value network. According to theory, integration takes place along the vertical chain when domain specific knowledge is required. Low complexity, on the other hand, has the opposite effect on integration. Further, in situations with substantial potential for scope economies, horizontal integration is expected. When it comes to influence, social exchange theory suggests that two specific aspects of organizational context may influence integration decisions: trust and dependence [Young-Ybarra & Wiersema 1999]. If trust is high, then disintegration and reintegration of actors in the value network is more likely; and if dependence is high, then transactions should be secured by vertical integration.

For EasyPark, high production complexity leads to disintegration of the new payment transaction from the existing value chain. However, dominating supplier influence leads to vertical integration upstream. EasyPark integrates settlement with the parking companies by interfacing directly with the parking companies' legacy (accounting) systems. An increase in differentiation potential, for example by use of location based information, would also allow EasyPark to bundle complementarities, i.e. horizontal integration. We also find vertical integration in the SMS Jackpot case, which can be explained by the high influence of the concession owner of the service.

The factors that contribute in explaining the undifferentiated market strategy of Djuice presented earlier may also have been influential in the selection of integration form. That is, simplicity of the services offered, potential for

scale and scope economies, and low production costs, creates potential for attaining coverage and direct and indirect network effects, and by this supports supplier aggregation and horizontal integration. For the Tax Magazine, the high differential potential can explain the information integration of the service (bundling of editorial content with personal taxation data).

4.1.4 Governance

Important factors for governance decisions are economic conditions related to individual transactions, and influence in the value network. Transaction cost economics [Williamson 1985] deals with transaction risks and various governance mechanisms. If the transaction risk is high, participants will apply governance mechanisms that increase transaction control, for instance vertical integration.

In the case of EasyPark, a newcomer to engage in developing and running a new payment facility is a risky process, and the investment in relation to specific assets is relatively high. Transactions are not standardized and we assess the transaction costs to be high. Further, the dominating influence and low cost savings by the parking companies (suppliers) allow the parking companies to maintain control of the value chain and dictate a closed business model (hierarchy or tight relationship). The contractual relationship can be characterized as an *agent* governance mechanism since EasyPark collects the money on behalf of the parking companies.

In the SmartPay case, the suppliers have alternative payment facilities and they will have to invest in new infrastructure to use this new mobile payment mechanism. Therefore, their influence is high and the uncertainty regarding market coverage and asset specificity is high. The governance form likely to be applied is a contractual agreement between the merchant and the platform provider in order to settle bank accounts payments. We will characterize this intermediary role as an *agent*. This governance form requires vertical integration towards the merchants. Also broad coverage is sought due to scale economy of both supplier and consumer markets. However, in this early stage of market penetration, this payment facility is only available for suppliers of products and services accepted on the operator's own content aggregation server. At this stage, therefore, we may further characterize the governance as "walled garden"[2]. However, the business mode of SmartPay is about to be opened up allowing merchants and customers of any bank and network operator to use the SmartPay facility.

In the case of Djuice, uncertainty and influence are low on the supplier side. This pushes the governance form towards market. With scope and differentiation potential high on the platform provider side, a distribution market mechanism can be applied. For the Tax Magazine, high domain knowledge is possessed by the editorial staff of a newspaper. The newspaper establishes the platform to exploit the differentiation potential. Thus, this service is organized as a fully owned integration initiative, and the governance mechanism, therefore, is a hierarchy. In our last case, SMS Jackpot, the tight partnership explained by high influence of the content provider and high uncertainty, imposes a distributor governance mechanism.

5 General Findings and Industry Implications

The business models employed in all cases are GSM/SMS-based. On basis of the structural market conditions and integration decisions observed, and information collected from the interviewees in each case study, we can develop some general characteristics of the business models. As it is too early to make firm conclusions regarding the performance of the services, we will in the following section discuss improvements in the business model components with reference to customer values and adoption given the nature of the mobile services offered.

5.1 Value propositions

5.1.1 More attention on two-sided markets

All services are based upon the providers being strong on m-commerce knowledge, more specifically, on the technical part of it. The markets are characterized by dominant players controlling much of the infrastructure knowledge, so the providers need to adapt to this infrastructure and rely on the dominant players for their infrastructure knowledge. The case studies reveal a lack of concern with customer values and the value propositions offered. By combining technology knowledge with domain knowledge such as knowledge of consumer behavior, trends in mobile service use and service preferences, new customer values could be offered and better market positions could be achieved. Attention should be paid to offer each side of the two-sided market beneficial value propositions. Our interviewees were not overly concerned with which customer needs or preferences their services were trying to meet or create.

5.1.2 More value-added complementarities needed

The combination of domain knowledge and technology knowledge may be used to offer value propositions that are based on service complementarities rather than disintegration of existing value chains typical of the cases

[2] "The term *walled garden* also commonly refers to the content that wireless devices such as mobile phones have access to if the content provided by the wireless carrier is limited" (webopedia.com)

included here. All the services studied aimed at providing value (cost efficiency) primarily through scale effects while increasing customer values by complementarities were almost non-existent. After all, low production costs do not in and of themselves create scale effects without substantial volume output. This requires wide adoption of the services. We believe that a more customer centric view could contribute to more innovative and profitable business models, based on features which distinguish and differentiate the mobile services from other electronic and non-electronic similar services.

5.1.3 Low utilization of mobile specificity of the market space

Mobile services are often characterized by four unique properties: location specificity, ubiquity, time independency and personalization [Rask & Dholakia 2001, Balasubramanian et al. 2002, Watson et al. 2002]. However, few of the services investigated here transform these inherent properties into new product or service characteristics for the end user. Even though the services discussed here are somewhat unrelated to location, location information may be used to offer complementary services or to differentiate services. Because of digitalization of services, differentiation and location information come at almost no cost to the service provider and may represent added values to the end users. Personalization has not been utilized in the services. However, personalization provides new opportunities for service differentiation. Common to almost all the cases is that markets are approached by breadth rather than focused segments or differentiation. In some cases it is argued that differentiation and consequently price discrimination is unacceptable. Very little has been done, however, to explore this proposition. New services are often provided as undifferentiated, at least as a first initiative. Parking services, gaming services, general payment services and content services easily lend themselves to service differentiation if they are provided in complementary bundles as suggested above. Lower cost is a value creating feature, but low transaction costs and a high potential for economies of scale are not enough to ensure profits.

5.1.4 Lack of utilizing differentiation potential in the mobile market space

All services except Tax Magazine are transaction based services. Transaction based services have less differentiation potential than content based services. Redesigning the basic logic from transaction to content may release differentiation potential and stimulate to provide more value-added components in the value propositions. The transaction based services lead to a choice of undifferentiated market strategies which is the common choice in most cases here. Content based services with more differentiation potential make it easier to employ focused market strategies. Also, since none of the cases achieve any significant effect of the potential scale economy in the services due to low volumes, it seems more profitable to pursue differentiation and added customer values.

While many of the services are based on creating large scale cost reductions through digitalization, few other value propositions typical for digital markets have been identified. Examples of such propositions are closer integration with existing service use, horizontal and vertical complementary service offerings, service novelty and network effects [Amit & Zott 2001]. A main implication of this is that the platform providers' integration models should be based on integrating complementary services, utilizing the unique characteristics of mobile services rather than focusing solely on cost efficiency as the key value proposition.

5.2 Value network

5.2.1 Low influence by the new, independent service providers

Most of the cases discussed include independent firms playing a role as integrators, or platform providers, offering a mature service on a new infrastructure operated by dominant players. Thus, they do not challenge or bypass the position of existing dominant players typical of many of the successful players in traditional electronic commerce. The integrators prefer specialization and link up with existing actors to provide the platform, which means that power and influence in the network remains largely unaffected. Although mobile solutions can create lower costs and new values, it becomes difficult for the integrators to claim some of these values as long as the influence in the network remains low. A second aspect that creates difficulties for the new services is that the new infrastructures do not substitute old infrastructures, but become alternatives for the customers. EasyPark's revenues, for instance, are limited by the agreements with parking companies who offer alternative payment channels. In order to capture more of the value creation, the integrators would have to offer additional services that are not provided by existing actors. As an example, EasyPark could offer additional information on the mobile device about available parking spaces and remote reservations.

5.2.2 Service providers can increase their influence

More concern of customer values and value propositions can increase service providers' influence in the value creating system. New forms of lock-in are suggested by Amit and Zott [2001] as something that may be perceived in two different ways. For example, the transformation of services from physical to electronic infrastructures may create new opportunities for service providers to lock in customers. From the customers' point of view, however, this lock-in may be perceived as a superior service and not something that restricts their choice. In our cases, little has been done to exercise lock-in by providing superior services that create loyal customers. In fact, many of the

service providers emphasized that their services are offered as disintegrated services unbundled from other offerings. For example, EasyPark focuses on how their service may be used with a wide variety of payment alternatives. This illustrates the lack of influence in the value chain making it difficult for a provider to add complementary services and transform services into solutions that can create customer loyalty. In most of the cases, the influence of the platform providers seems to be perceived as a static property. Few of the providers had any plans for increasing their own power, influencing the resource dependency among players, or bypassing influential players in the value chain. Instead future plans focused on keeping alternatives open.

5.2.3 Disintegration but no reintegration

Many of the cases discussed here are based upon taking a role as disintegrator rather than disintegrating activities from the value chain and then reintegrate these activities into novel services. The basis for disintegration as a position is that unbundling creates new values for end customers or that unbundled services may be re-bundled in new and better ways in the value chain. Behavioral studies conducted on the same services indicate, however, that both parking and mobile payment services are perceived by customers as specialized payment services lacking the required generality offered by traditional payment facilities (e.g. ubiquity) [Pedersen et al. 2002]. This indicates that disintegration of a service without new reintegration creates services that are conflicting with the unique characteristics of mobile services rather than utilizing them.

5.2.4 Integration forms in m-commerce differ from e-commerce

The MAPIT framework was originally designed for analyzing intermediaries taking positions as integrators in traditional electronic markets. We have generally seen very few initiatives of this kind in mobile service markets. Instead, service providers have taken rather narrow positions adapting to existing infrastructures. They provide simple forms of integration, mostly simple vertical integration. Thus, one may imply that some of the successful initiatives found in traditional electronic commerce have so far not yet appeared in mobile commerce. There are several reasons for this such as lack of influence by new entrants in the value chains, proprietary technological and service infrastructures, and lack of transaction standardization. This may also be the reason why existing infrastructure players, such as the telecom operators, are the dominating players on the platforms in our study. The general structural conditions of mobile service markets seem much less suited for new initiatives of disintegration and reintegration of services into new bundles.

5.3 Governance

5.3.1 Telecom operators remain in control

Five cases may be characterized as applying rather closed governance mechanisms. The hierarchically owned Tax Magazine is the closest governed; next to this we have the two payment systems which are governed as agents; and finally as the most open of these cases we find the portal as a distributor. It is likely that existing infrastructure players, such as telecom operators, will have a dominant position in the value chain, that services will be offered with high transaction control, and that vertical integration initiatives are more likely than horizontal. Although service providers may reach their customers by open services, they have to rely on operator infrastructures to get paid for services, on handset vendors to get their service integrated into the standard functionality of the terminal, and on adaptation of the physical constraints of terminal handsets in their service design. For example, customers are used to pay for mobile services, they have a long history of perceiving these services as separate services (voice, text, etc.), and they require that new services fit into this historical pattern. Because mobile terminals are much more widespread than PC's with Internet access, the heterogeneity of user skills and functionality requirements are greater. Also, mobile user contexts require tightly integrated, stable and well functioning services. Thus, customers seem to accept less experimentation and end-user initiated integration than on traditional PC's. Also, attitudes towards new mobile services are influenced by the current usage patterns of mobile terminals. These terminals are first of all perceived as communication tools for social coordination in everyday life. Adapting services to include, relate to, or bundle with elements well known in communication contexts may be necessary. The problem is that these services are controlled by operators and handset providers primarily. Thus, there are a large set of obvious restrictions in the mobile services industry on what kind of integration models we are likely to find also in the future.

5.4 Revenue models

5.4.1 Revenue models require more dynamic elements

Many of the services are based on the idea of significantly reduced costs by large scale digitalization of services. However, this often requires a complete substitution of the existing service infrastructure. As long as the service is based on maintaining two or more service infrastructures, both physical and digital, the cost advantages and scale effects are scarce, and the providers have not been able to offer customers a reduced cost value proposition. Most mobile services are in fact more expensive than their non-mobile substitutes. Naturally, this makes it difficult to achieve the level of adoption required to take advantage of the potential scale economies inherent in most mobile services. This is a severe problem (and a paradox of the business models) as it is hard to

find any other customer values that might boost adoption. Almost all cases involve mobile services in which the proposed revenue model is very simple. Typically, the model is based upon transaction fees that make revenues of the provider dependent on high volumes to exploit the scale effects. Dynamic elements in the revenue models are hardly utilized over the adoption cycle or across services to generate traffic. Changes in revenue models probably require power shifts among the network players.

5.4.2 Cost structure of mobile services not favorable unless adoption reaches a critical mass

Mobile services are often based on cost structures with relatively high development costs and low production costs. This creates the potential for scale economies. Most of the services were not able to take advantage of the potentially lower unit cost of production due to established and persisting cost structures on alternative infrastructures. EasyPark and SmartPay were not able to offer their new alternative services at lower costs than existing alternatives. Hence they would have to create additional values for the content providers and the customers. In the case of EasyPark, customer values are added in the purchasing processes (vertical complementarities), differentiating this m-service from other, more traditional payment means. For SmartPay's services, there are added customer values in location independence and security. For the content providers there are business values in the newness of the channel and in differentiation potential.

5.4.3 The main transaction of the services should be reinterpreted

Most of the investigated cases involve transactions of relatively high frequency, low transaction risk and low transaction standardization. In fact, many of the providers' ideas are to adapt to highly proprietary transaction standards rather than transforming these into standardized transactions that may change the pattern of influence. This is a line of development typically found in knowledge intensive service markets where technology knowledge and proprietary infrastructures are found. However, it seems very difficult to design a profitable business model around this kind of transactions. In many of the cases discussed here, it may be necessary to reinterpret what constitutes the main transaction of the service. For instance, EasyPark currently adapts to proprietary transaction standards but they do not open their application interfaces so that other services or parts of their own offerings can be bundled with services of other providers. As such, they offer very few opportunities for other service providers to utilize indirect network effects by connecting to their service infrastructure.

6 Conclusions

In summing up the results of our research, we will highlight the relationship between the uniqueness potential of m-commerce services, customer values, services adoption, and value network influence which we have found underutilized in the cases of this study. It should be emphasized that the study is explorative and therefore of limited explanatory value. However, the five cases do represent a fair cross-sectional view of available mobile services in the market.

Our research indicates that providers of mobile services have to emphasize service elements that exploit unique m-commerce properties in order to capture more of the total value creation. In this way, new integrators with high m-commerce knowledge can offer services (or service complementarities) to the market that incumbents cannot offer themselves. This is likely to lead to an increase in adoption as there are no substitutes to these services in the market. In situations where there are substitutes (as in most of our cases), the service providers must create customer values (e.g. best price) that make the customers prefer their services. For the same reason, new players in the market must also focus on customer values and market information that can be acted upon in order to create non-substitutable m-commerce services and thereby creating benefits for the customers that they are willing to pay for. By doing this, new players in the market may gain increased influential positions in the value networks.

Another element related to customer values that must be highlighted is the important role of service complementarities. Because of the nature of electronic business conduct, there will be potential for indirect and/or direct network externalities. Furthermore, a focus on two-sided markets is crucial in situations where indirect network externalities are important, and where the potential for customer value augmentation by use of service complementarities is present. Integrators must in other words emphasize both customer values (end-user market), and at the same time strive for achieving mutual benefits for the actors involved at the supply side (value for the suppliers). This two-sided focus may be necessary in order to start a positive circle where the customers perceive the complementary services on the technological platform to be attractive and valuable, and where the firms offering the services attract more and more customers.

In sum, the main conclusion from our study is the invariable need for a focus on market knowledge and customer orientation. Firms must develop customer centric perspectives alongside their technological competence and thereby gain knowledge of what the customers want or may need. Firms that are able to recognize customer needs and preferences (or even create needs and demands), and also act upon this information by introducing unique and non-substitutable products and services, will experience rapid adoption and achieve value network influence.

The paper is an attempt to move the research on e-business models a step further from the dominating conceptual model research and use an industrial organization view to establish relationships between market structures and strategic conduct of players in a network environment of e-business technology.

7 Future Research

The MAPIT framework has been developed for e-commerce contexts and used here on case studies of mobile services. MAPIT has never been empirically verified but is based on and extends a well known paradigm in industrial organizations, the SCP paradigm. To improve the MAPIT framework from being a descriptive tool to become an evaluative instrument, empirical verification of the relationships between structural conditions and business model variables are required.

Furthermore, the SCP paradigm consists of three components linearly related from structural conditions, through conduct to market performance. In the traditional SCP framework, performance is measured by a firm's business values such as profitability. The m-commerce market, however, is an emerging market of network goods which makes this market different from more established markets usually studied in industrial organization. Among other things, network externalities increase the functionality of network goods. The ultimate effects of these externalities, since they are extrinsic to the service, must be measured by the values perceived by the end-users. Furthermore, services will differ with respect to these effects. Point-of-sales services involving two-sided markets, for instance, are assumed to promote indirect network effects through complementarities, while communication services like chat and MMS are strongly affected by direct network effects. Thus, different business models may be needed to promote these effects. To be able to evaluate the performance of a new network service, the market situation must be assessed and the appropriate business model options chosen. Thus, all three components of the SCP framework must be analyzed simultaneously. However, business models and customer behavior have traditionally been studied using different perspectives and models. An integrated model of the supply side with the demand side should therefore be developed. Pedersen and Methlie [2004] have proposed a model for integrating the business model variables with end-user behavioral variables. This model has been empirically tested [Methlie & Pedersen 2005], but we still lack empirical testing of the link between structural market conditions and business model variables.

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