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Abstract

Designing business models for mobile services is a complex undertaking because it requires multiple actors to balance different design requirements. A business model can be seen as a blueprint of four interrelated components or domains: service, technology, organization and finance domain. Little attention has been paid to how these different domains are related to each other. This knowledge is needed to enhance our understanding of what constitutes a viable business model. In this paper the connections between two of these domains, namely service and technology domain, are explored by analysing critical design issues in business models for mobile services, i.e. targeting, creating value, branding and customer retention in the service domain, and security, quality of service, management of service profiles, system integration and accessibility in the technology domain. A causal framework is developed, which link these critical design issues to expected customer value and business model viability.

1　Introduction

The mobile telecom industry is currently facing several opportunities that may radically change the field of mobile telecommunication. The development of new networks like GPRS (2,5 G), UMTS (3G), WLAN (WiFi), and Personal Area Networks (beyond 3G) will spark the development of mobile Internet services. With 'mobile services' we mean all kinds of innovative services that combine technologies and concepts from the domains of (mobile and wireless) telecommunication (e.g. mobile services), information technology (e.g. the Internet), consumer electronics (e.g. PDA's, digital cameras). These

new technologies and concepts, and the 'convergence' of the domains offer opportunities for the mobile telecom industry.

Most industry players currently lack the resources and capabilities to exploit these opportunities. Mobile services are increasingly being developed and provided by networks of cooperating organizations. It is assumed that flexible 'value webs' will arise and replace traditional, static and linear 'value chains' (Moschella, 2003). In such a 'value web' each player has different capabilities and resources, and innovation thrives on the combination of these capabilities and resources of different players. For instance Compaq HP, Microsoft and KPN Mobile recently started to jointly develop and market a mobile office application called Lucio.

Cooperation in value webs is by no means a straightforward task. Various studies (Levine & Byrne, 1986; Harrigan, 1988; Bleeke & Ernst, 1993) indicate that companies encounter serious difficulties in achieving the anticipated benefits from co-operation. First, partner organisations may pursue different strategic goals with the cooperation, which may induce partners to act against what is agreed upon, hide the truth or try to extract confidential information from their partners. Second, partner organisations often originate from different industries (e.g. network operators, financial institutions, and retailers), each with their own peculiar business logic. Such diversity may be necessary for the development of new innovative services, yet at the same time this diversity may disrupt cooperation. Finally, cooperation gives rise to complex interdependencies between organisations because no single partner has formal authority over another partner. Hence, every adjustment has to be discussed and jointly agreed upon (Klein-Woolthuis, 1999).

Given the disappointing success rates of inter-firm co-operations and the risks and cost involved in the introduction of new mobile services, it is not surprising that practitioners and academics pay a great deal of attention to the concept of business models. In our view a business model is a blueprint for how a network of organizations co-operates in creating and capturing value from new services or products. Designing business models is a complex issue. Technical, financial, organizational and professional user or consumer's needs and requirements need to be balanced. For instance, what makes sense from a technical point of view (better specs of positioning technology) may not make sense from a financial (higher costs) and user perspective (privacy concerns). Moreover, organizations have to balance their different interests and business logics to create a 'win-win' situation, in which each player has incentives to co-operate, and in which the combined benefits are higher and the combined efforts are smaller compared to each player working separately.

Although literature on strategic alliances in the telecommunication domain (Carlson, 1996) and network formation (Gulati, Nohria, & Zaheer, 2000; Kothandaraman & Wilson, 2001; Li & Whalley, 2002) is available it fails to provide insight into the subtleties involved in the design of viable business models for the provisioning of mobile services in value webs. The predominant focus of literature on business models has thus far been on defining and classifying business models. Little attention has been paid to how the viability of business models is related to critical design issues. We define a critical design issue as a decision regarding the characteristics of a (mobile) service that has significant impact on the viability and feasibility of the services.

In this paper we will present research into the critical, organizational, technical and financial, design issues that are related to business models of new mobile services that are delivered by complex value networks in order to understand what constitutes a viable business model. Before we present our research we will first discuss the theoretical framework of this research project

2   Business Models

There is little consensus on how to define business models (Timmer, 1998; Afuah &Tucci, 2001; Hedman & Kalling, 2003; Madehevan, 2000; Osterwalder& Pigneur, 2002; Weill & Vitale, 2001, see for an overview Pateli & Giaglis, 2003). Some researchers equal business models with revenue models. While others reserve the term to denote the value creation logic of new business initiatives. Each of these approaches provides a rather limited perspective on *cross-company* collaboration in complex value networks because they focus on business models of a single company. We focus on service offerings that require cross-company collaboration.

We see a business model as a blueprint for how a network of organizations co-operates in creating and capturing value from technological innovation (cf. Chesbrough & Rosenbloom, 2002). So we look beyond the individual firm and consider the business model for a *networked enterprise*: a collaborative effort of multiple companies to offer a joint proposition to their consumers. When comparing the different definitions of business models it is possible to distinguish some common components, which are described in our descriptive conceptual framework or ontology (Faber et al., 2003):

- **Service domain***: a description of the <u>service offering</u>, its added value, and the market segment at which the offering is targeted

- **Technology domain***: a description of the <u>technical functionality</u> required to realise the service offering

- **Organization domain**: a description of the structure of the multi-actor value network required to create and distribute the service offering (<u>organizational arrangements</u>)

- **Finance domain**: a description of how risks, investments and revenues are divided over the different actors of a value network (<u>financial arrangements</u>).

The field of business modelling has developed over the past few years from defining business models, via exploring business model components and classifying business models into categories, to developing descriptive models (see for an overview Pateli & Giaglis, 2003). The emphasis in more recent literature is shifting away from classifications to representations or descriptive models of business models. The majority of researchers (see e.g. Tapscott et al., 2000; Gordijn & Akkermans, 2001; Weill & Vitale, 2001) focus on the actors, relationships, and value objects exchanged. Little attention has been paid to conceptualising the linkages between variables of the different business model domains (see Figure 1).
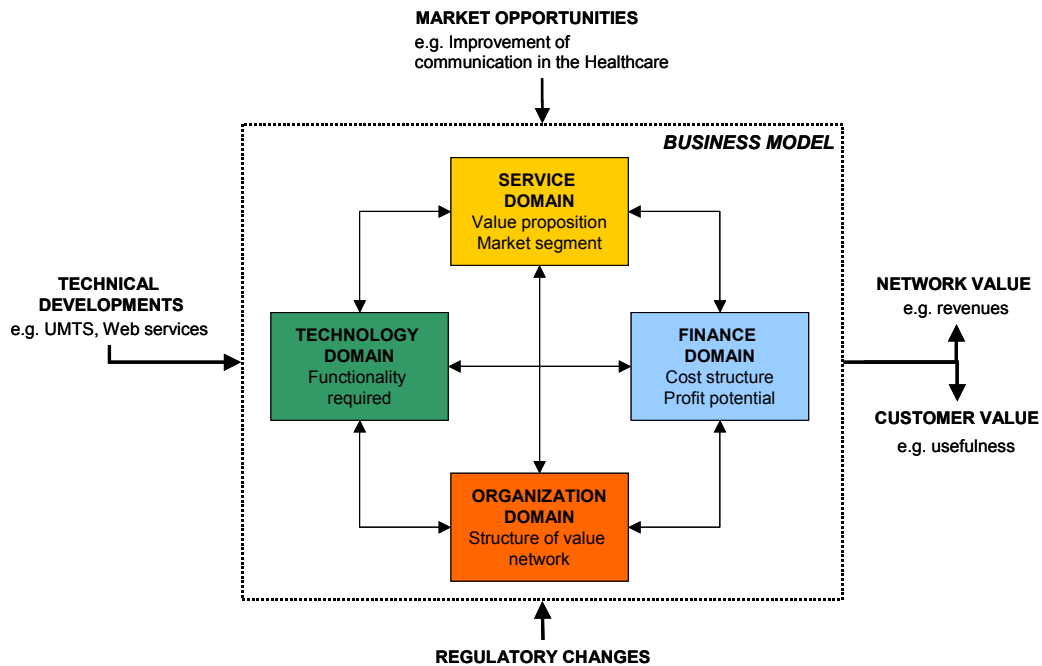
Figure 1: *Descriptive Business Model Framework*

The challenging aspect of analysing and designing business models is that it requires managers to connect and balance design choices in different business model domains (service, technology, organization, and finance domain) in the face of technical, market, and legal developments, the ultimate aim being to create sufficient economic and customer value.

To improve the readability of this paper and to reduce the complexity of the research we limit our analysis to the service and technology domain. This demarcation has been chosen since design choices in the service and technology domain are closely related and significantly impact the customer value of a service offering (see Figure 2). The results with respect to design choices that impact network value and impact both customer and network value are discussed in forthcoming papers of Bouwman et al. (2004) and Haaker et al. (2004). The service and technology domain are elaborated below.

The central issue in the ***service domain*** is 'value'. Value is seen as the perceived benefits and total costs (or sacrifice) of (obtaining) a product or service for customers in target markets (Chen & Dubinsky, 2003; Petrovic & Kittl, 2002). The service offering must be considered better, and deliver the desired satisfaction more effectively and efficiently than competitors. Customer or use experience is key (Aron & Sampler, 2003; Bouwman, Staal & Steinfield, 2001). To a large extent, the added value of 3G mobile services is stated in terms of anyplace, anytime, anywhere. However, this is very general description of customer value. Future mobile and wireless technologies enable applications and services that are situation and context aware, augmented and virtual, and use speech recognition, multi-modal interaction and human supervised computing. Customer value as perceived by the end-user has in many cases little to do with the customer value that is envisaged in initial business models and greatly depends on the user's personal or consumption context (Chen & Dubinsky, 2003). Therefore we introduce related concepts: intended value and delivered value on side of the provider, and perceived value on the side of consumers. These concepts model the match or gaps between the different perspectives on 'value'.

The central issue in the ***technology domain*** is 'functionality'. Functionality can be defined as 'the things a system or application can do' for its end-users. Examples of functionality enabled by 2,5 and 3G mobile services are: always on capabilities, and higher data rates, which are assumed to carry video and sound clips. Future outlooks are directed towards the personal area and wearable networks, with the so-called I-centric services, which automatically adapt to individual requirements (Popescu-Zeletin, et al., 2003). Another core concept of the technology domain is 'technical architecture'. A technical architecture describes the fundamental organization of a technical system, which is needed by the firms in the value network to deliver the service offering exhibited in the service domain. Important components of a technical architecture are: applications, devices, access networks, service platforms, and backbone infrastructure. Important characteristics of the technical architecture are: centralized vs. distributed, open vs. closed, interoperable vs. non-interoperable.

3　　Designing Business Models

As illustrated in Figure 1 when designing a business model one needs to take into account both customer value and network value.

Creating customer value is not an easy task due to the difficulty of extracting user requirements and conflicting design requirements. Design choices in the service domain may affect those of the technology domain and vice versa. For instance, what might make sense from the perspective of technology (e.g. deployment of high precision positioning technique) may make no sense at all from the perspective of users (e.g. privacy concerns). Hence, service providers need to balance technical and user requirements.

Creating value for business actors (network value) is a rather complex task due to the conflicting strategic interests of partner organizations. Actors often originate from different industries (e.g. network operators, financial institutions, and retailers), each with their own strategic interests (e.g. generate traffic, extend services to customers, generate transactions). Design choices in the organization and finance domain may to a more or lesser extent serve the strategic interests of the involved actors. For instance, operator and content providers may disagree how to brand an information service and who needs to pay whom.

Knowledge on how to effectively balance requirements and strategic interests is largely missing in the business model literature (Seddon & Lewis, 2003; Hedman & Kalling, 2003). To develop insight into how organizations can design 'balanced' business models researchers need to go beyond identifying simple success prescriptions and try to understand the critical design issues in business models and their interdependencies.
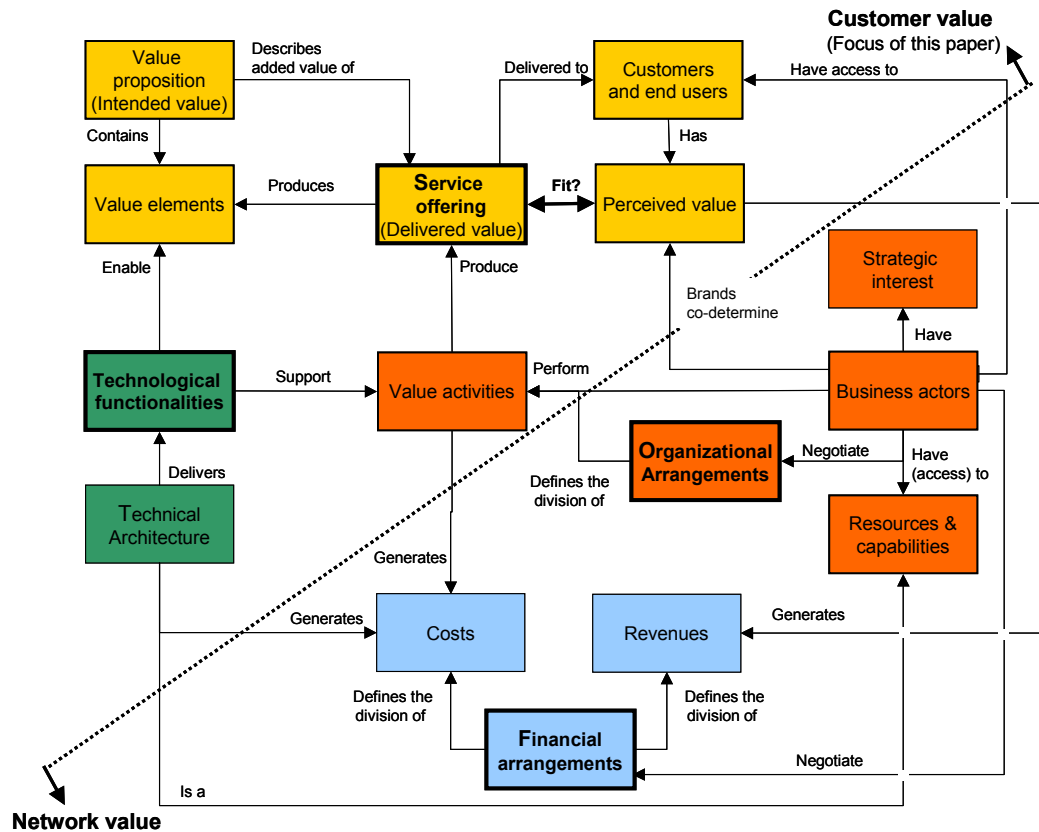
Figure 2: *Elaborated Descriptive Business Model Framework*

4   Research Methodology

Our research approach contains three steps. First we started from our descriptive conceptual framework (ontology) describing the most important design variables within the service, organization, finance and technology domain and the relationships between these variables (see Faber et al., 2003a). We use the term "design variable" to denote that our framework focuses on variables that can be influenced by design teams, business developers, and managers. Second, a considerable amount of cases (see table 1), i.e. business models of mobile services have been analyzed. Case selection criteria were innovativeness of mobile service (2.5 G, payment services), relevance of specific aspects for instance domain (health care, mobile entertainment) or context (community services). For the case study, case and interview protocols (Bouwman & Faber, 2003) were used. Interviews were recorded and transcribed. Data from interviews were supplemented with information from company websites, industry reports and academic literature. Data were systematically coded and analyzed. Interviewees validated results.

Table 1: *Overview Of Cases*

Theme	Cases	Case analysis
Mobile entertainment services	My Babes, Radio 538 ring tunes	Maitland et al., 2003
Mobile tracking & tracing service	TMC4U (Traffic Management Channel for You), Traphic SMS alerts, Finder i-mode service	Faber et al., 2003b Kar et al., 2003
(Mobile) Community services	I-Karos, Vaccination Database, Botfighter	Rietkerk & Timmerman, 2003
Presence and Instant messaging services	Splendo, Jaytown, MSN	Kijl & Timmerman, 2003
Access to the back office services	P-info, Lucio, Zorgpas, and Caremore	Bouwman & Van Ham, 2003
Mobile payment services	Moxmo, Mobile2Pay, and Mobipay	Faber & Bouwman, 2003

The objective of the case studies was to detect critical design issues. A critical design issue is defined as a design variable that is not nominal in nature, i.e. availability of a network or of investments, but is perceived to contribute to the feasibility and viability of the studied business model. When practitioners explicitly mentioned an issue as nominal or critical, the researchers coded this accordingly. Based on the case study descriptions (see table 1 for more extensive publications on the cases) for every domain - service, organizational, technical and financial, as described in the conceptual framework - specific critical design issues were extracted and systematically clustered. Based on the recurrence of issues and/or the perceived relevance for the feasibility and viability of business model, as indicated by the interviewees and coded as such, these issues were qualified as critical. Third, this knowledge on critical design issues has subsequently been used to build causal frameworks describing the interrelatedness of design variables and their relationship with business model viability.

5 Critical Design Issues In Service Domain

Critical design issues that originate from the service domain are targeting, creating value, branding, trust and customer retention (see Table 2 for an overview of the extracted critical design issues).

Targeting. An important issue in almost every case was choosing a profitable target group. Should the service offering be targeted towards consumers or business? Should the service offering be targeted towards a niche market or a mass market? Should the service focus on youngsters or elderly people? Etcetera. Sometimes service providers formulated a growth strategy in which target group evolved from one market segment to another. For instance, Moxmo's strategy is to extend its activities and related target group from micro payments (e.g. ticketing and ring tones) to medium sized payments (e.g. payment of compact discs).

Creating value Closely connected to choosing a target group is formulating a compelling value proposition for end-users. The added value of a service can be based on value elements such as: fun, efficiency, accuracy, speed, personalization, trust, etc. The cases show a clear tension between the possibilities offered by technology and the wishes and needs of end-users. Quite a view of the studied services did not have a clear and compelling value proposition and seemed to be blinded by the technical possibilities. For instance, Lucio's, which is a provider of B2B access to the back office services, value proposition mainly boils down to providing access to Microsoft Outlook and the Internet at any time when away from the office. This value proposition is heavily based on the technical capabilities of the service offering. Hardly any mention is made of the (latent) problems of end-users and customers. In several cases an important value element was trust. Main issue was how to enhance trust (or reduce the need for trust). The objects of trust differed in the studied cases. In some cases trust was related to the reliability of business actors (e.g. mobile payment cases) whereas in other cases trust was associated with the security and privacy of the deployed technology (e.g. PIM cases). Also different mechanisms were used to enhance trust. For instance, in the mobile payment cases we found that Mobipay used a trusted third party (institution-based trust) whereas Moxmo, on the other hand, mainly relied on recurrent positive experiences (process-based trust).

Branding. Another important design issue in the studied cases was how to reach customers. An important mechanism to reach customers was branding. Brands seem to directly influence the perceived value of service offerings, which makes it an important means to create customer value. Brands were used for different purposes in the studied cases. First and foremost brands were used to increase visibility of the service in the market (all cases). Apart from visibility brands were also used to communicate trustworthiness (e.g. mobile payment and community cases). An important balancing issue in the mobile information cases was whether to brand a service as an operator or content provider service. An important decision parameter was the recognition of the brand by the target group.

Customer retention Besides choosing a target group and defining the added value, customer retention was found to be a critical design issue. Customer retention refers to marketing strategies aimed to keep customers satisfied and loyal with the service offering. The cases show that service providers adopt different strategies and stress different value elements to stimulate recurrent usage of their services. In the entertainment case service bundling and personalization were used to promote customer retention. In the tracking and tracing cases the accuracy and actuality of information was used to attract and retain users. In the PIM cases the strategy was to introduce new versions with new functionality. In the access to the back office cases customisation of the service for end-user organization was used to create a lock-in effect. An important balancing issue is how to retain customers without annoying or bothering them too much with for instance new versions and registration forms.

The extracted critical design issues and related design requirements are summarized in Table 2 below.

Table 2: Critical Design Issues And Related Design Requirements (Service Domain)

Critical design issue	Description	Balancing requirements
Targeting	How to define the target group?	Generic vs. niche service B2C vs. B2B service
Creating value	How to create value for the targeted users of the service?	Technological possibilities vs. user needs and wishes
Branding	How to promote/ brand the service?	Operator vs. content brand
Trust	How to enhance end-users' trust in service?	Security vs. ease of use Privacy vs. added value
Customer retention	How to stimulate recurrent usage of service?	Customer lock-in vs. customer annoyance

6 Critical Design Issues In Technology Domain

Critical design issues that originate from the technology domain are security, Quality of Service, system integration, accessibility and management of user profiles (see Table 5 for an overview of the extracted critical design issues).

Security Trust of end-users and customers in a service offering is partly determined by the way security is implemented in the technical architecture. That is, the way in which access to a service is granted and how security of communication and (stored) information is realized. Often security requires a trade off between ease of use or privacy considerations and preventing abuse. For example in community and instant messaging cases access ranges from anonymous access (SABN), use of a username (nickname) and password (MSN Messenger), to full user identification (enterprise PIM service). With anonymous access privacy is guaranteed but a user cannot be traced in case of abuse of the service. In the case of mobile entertainment services, authentication of users is simply based on the SIM card in their mobile phone. Security may be realized more easily in a closed environment. For example for enterprise PIM services, the company may deploy its own IM server shielded from the outside world by a firewall. Obviously the service cannot include contacts from outside the company, thereby limiting its use and value.

Quality of service In all studied cases the performance of the technical architecture in delivering the technical functionalities has a profound impact on the service offering and perceived value. A balance between the quality of the service and the incurred costs has to be maintained. A typical performance measure influencing the quality of service is the accuracy of the deployed positioning technology in tracking and tracing services. The choice for a more accurate positioning technology may lead to unacceptable costs or even be an intrusion on one's privacy.

For mobile entertainment services the data transmission rate determines download times and therefore also acceptable page sizes (3-5kb per page for I-mode services).

Management of user profiles For personalization of a service, a user profile that contains user interests, preferences and behavior must me created and maintained. The management of this profile, i.e. creation, use, maintenance and access to the profile, requires technical functionality that may be realized in different ways by the technical

architecture. Balancing is needed between user involvement and automatic profile generation, and between privacy and access to the users profile. For MSN Messenger the IM server keeps a profile for each user. A privacy statement is issued to users about the protection of the provided data. In the case of the Traphic SMS-alert service, the user controls his profile, containing times and routes of travel, via Internet. In the I-mode finder case, the necessary location information is automatically determined by the operator and anonymously transferred to the location based service provider.

System integration To what extent the new service can be integrated with the existing technical infrastructure partly determines the adoption of the service. The trade off with system integration is between flexibility and costs. The costs for building on legacy systems may be lower but provides for less flexibility than an open system based on standards and open interfaces. For instance for mobile payment services the degree of integration with existing payment solutions is an important barrier for merchant adoption. In the Botfighter case the Geographic Information System was not integrated in the general platform but included in the specific Botfighter application, as no generally accepted standard for the GIS was available.

Accessibility The accessibility of the service for the target group is influenced by the choice for an open or a closed architecture. A closed architecture restricts service usage to a restricted target group. This may be intentional, for instance in enterprise IM services, access-to-the-back-office services or mobile entertainment services offered to the operator's customer base. But also unintentionally, when a service requires specific resources (handset) or capabilities (cumbersome user interface) from the end-user. For instance, adoption of the P-Info service (a service for police officers) was hindered, as users required mobile devices that both could be used on the street as in patrol cars, officers had a strong preference for voice interfaces and access to critical databases were not realized.

The extracted critical design issues and related design requirements are summarized in Table 3 below.

Table 3: *Critical Design Issues And Balancing Requirements (Technology Domain)*

Critical design issue	Description	Balancing requirements
Security	How to arrange secure access and communication?	Ease of use vs. abuse and privacy.
Quality of Service	How to provide for the desired level of quality?	Quality vs. costs
System Integration	How to integrate new services with existing systems?	Flexibility vs. costs
Accessibility	How to realize technical accessibility to the service for the target group?	Open vs. closed system
Management of user profiles	How to manage and maintain user profiles?	User involvement vs. automatic generation

7 Explaining Customer Value

Based on the descriptive framework and case findings we have built a tentative causal framework (see Figure 3) explaining the expected customer value and business model viability. The causal framework is based on the extracted critical design issues and the structure of the causal framework is as follows.

Elaborating and balancing the critical design issues are expected to result in clear target group definitions with sufficient critical mass, persuasive value propositions, acceptable service delivery combined with non-obtrusive customer retention mechanism. High scores on these variables will result in a service that will meet the expectations of users. As such these variables can be regarded critical success factors for creating customer value. Finally, it is expected that a business model is viable on the long run if it succeeds in creating both customer value and network value sufficiently. The issue of creating network value is topic of further research (see Bouman et al., 2004; and Haaker et al., 2004).
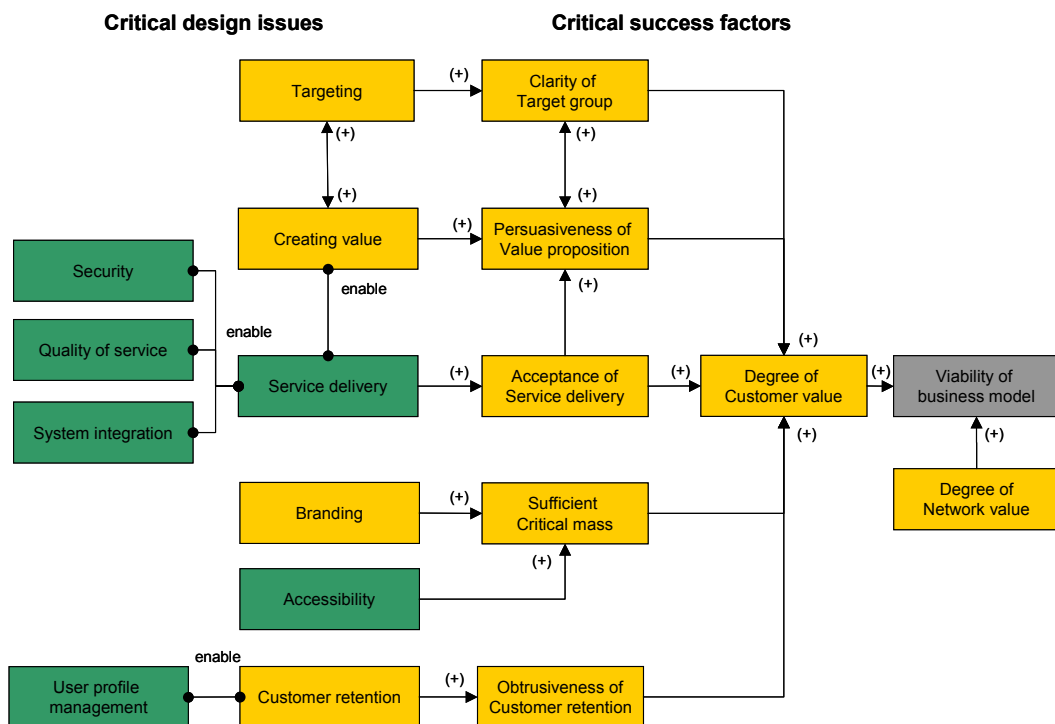

Figure 3: *Tentative Causal Framework*

An important finding is that critical design issues originating from the technology domain can be considered as enablers for those originating from the service domain. For instance, access to customers is enabled by open architectures (accessibility). Trust (creating value) in mobile payment is enabled be enhanced by secure transaction platforms (security). User profile management enables personalisation of mobile services (creating value). This is inline with the elaborated descriptive framework in which technological architecture delivers technological functionalities, which in turn enable value elements and support value activities (see Figure 2).

8   Discussion

In contrast with existing research with respect to business models our approach is directed towards the design of viable business models, more specifically business models for mobile services that are developed by organizations that collaborate in complex value systems. Our research shows that there are critical interdependencies between service definition, technical architectures, organizational, and financial arrangements in the development of mobile (wireless) services.

In this paper we focused on the interrelatedness of critical design issues in and between the service domain and the technical domain. Based on extensive case-studies we found five critical design issues in the service domain, i.e. targeting, creating value, branding, trust and customer retention, and five critical design issues in the technical domain, i.e. security, Quality of Service, system integration, accessibility and management of user profiles. Critical design issues from both domains are directly related to each other. Technical design issues enable and solve critical design issues in the service domain. Based on extensive case studies, analyses of the case data and focus on design issues we developed a causal model that explaining the viability of mobile services.

This paper and the results however have some limitations. In the first place we have to make clear that the material presented in this paper can impossibly reflect all the data, analysis and steps in the analysis made. Similar analyses have been done with the focus on creating network value (Bouwman et al., 2004) and on the interactions between the service and technology domain (Haaker et al., 2004). Second, the critical nature of the identified design issues for (mobile) business models have to be validated in other contexts. For this purpose we intend to initiate a large-scale survey and to organize design sessions with practitioners. Both research steps should result in a more parsimonious causal model. Finally, we did not analyze and discuss the business models and business cases of the individual organizations that participate in the complex value system developing a service offering. We intend to take this up in a follow up research project.

The validity of our results strongly depends on the sampling of our cases, which we used as a starting point. Seen the fact that selected cases are quite heterogeneous in nature, targeted customers, technology focus and innovativeness, we may expect that case selection did not bias our results. Although we focused our case studies on mobile services we observed that many of the extracted critical design issues seem to be more generic in nature. Follow up research has to prove to what extent this is the case.

The value of our research for managers and business developers in the mobile domain lies in its practical nature. The descriptive and causal framework helps practitioners to select critical design issues and to balance the design choices to be made. The trade offs between different design choices can be identified and analysed. Based on the case studies and the causal framework we have developed a methodology for designing viable business models, called the Freeband Business Blueprint Method (see for more information: http://www.freeband.nl/projecten/b4u/businessmodellenEN; Haaker et al., 2004). The design methodology and its application in workshops will be discussed in a forthcoming paper.

References

Afuah, A. & C. Tucci (2001) Internet Business Models and Strategies. Boston: McGraw-Hill, Irwin.

Aron, D. & J.L. Sampler (2003) Understanding IT. Harlow: Prentice Hall, Financial Times.

Bleeke, J. and D. Ernst (Eds) (1993) Collaborating to Compete: Using Strategic Alliances and Acquisitions in the Global Market Place, New York: John Wiley.

Bouwman, H. (2003) Designing metrics for business models describing Mobile services delivered by networked organisations. Paper presented to Workshop on concepts, metrics & visualisation, at the 16th Bled Electronic Commerce Conference eTransformation, Bled, Slovenia, June 9 -11, 2003

Bouwman, H., E. Faber, & T. Haaker (2004) Balancing Strategic Interests for Network Value, paper accepted for publication in the proceedings in the Tenth Americas Conference on Information Systems (AMCIS), New York, August 2004.

Bouwman, H. & E. Faber (2003) B4U Case Study Protocol. Enschede Telematica Instituut: http://www.freeband.nl/projecten/B4U

Bouwman, H., M. Staal & C. Steinfield (2001) Klantenervaring en Internet concepten. (Consumer experience and Internet concepts). Management & Informatie, Vol 9 (6) pp.52-60.

Bouwman, H. & E. van den Ham (2003) Business models and eMetrics, a state of the art. In: B. Preissl, H. Bouwman & C. Steinfield (eds). Elife after the Dot.com bust. Berlin; Springer Verlag.

Carlson, R. (1996) The Information Super Highway. Strategic Alliances in Telecommunications and Multimedia. New York: St Martin Press.

Chen, Z. & A. Dubinsky (2003). A conceptual model of Perceived Customer Value in E-commerce: A Preliminary Investigation. Psychology & Marketing, Vol. 20 (4): 323-347.

Chesbrough, H. & R.S. Rosenbloom (2002). The role of the business model in capturing value from innovation: evidence from Xerox corporation's technology spinoff companies, extracted on March 2004 from http://www.hbs.edu/research/facpubs/workingpapers/papers2/0001/01-002.pdf

Faber, E. & H. Bouwman (2003) Designing business models for mobile sevices. Exploring the connections between customer value and value networks. 3rd International Conference on Electronic Business, Business Paradigms: Strategic Transformation and Partnerships. ICEB 2003, Singapore December 10-12.

Faber, E., P. Ballon, H. Bouwman, T. Haaker, O. Rietkerk & M. Steen (2003a) Designing business models for mobile ICT services. Paper presented to Workshop on concepts, metrics & visualization, at the 16th Bled Electronic Commerce Conference eTransformation, Bled, Slovenia, June 9 -11, 2003.

Faber, E., T. Haaker, H. Bouwman & O. Rietkerk (2003b) Business models fore personalised real-time traffic information in cars: which route to take. Paper submitted to ICEC, 2003 Pittsburg.

Gulati, R., Nohria, N., & Zaheer, A. (2000). Strategic networks. Strategic Management Journal, 21, 203-216.

Haaker, T., E.Faber & H.Bouwman (2004). Balancing Strategic Interests and Technological Requirements for Mobile Services. Paper submitted to the sixth International Conference on Electronic Commerce (ICEC), Delft, The Netherlands, 25-27 October, 2004.

Haaker, T., K. Oerlemans, M.Steen & H. de Vos (2004) Freeband Business Blauwdruk Methode, Handleiding voor succesvol samenwerken bij het ontwikkelen en exploiteren van innovatieve (mobiele) ICT diensten [in Dutch]. Telematica Instituut: TI/RS/2003/105.

Hedman, J. & T. Kalling (2003) The business model concept: theoretical underpinnings and empirical illustrations. European Journal of Information Systems 12, 49-59

Kar, E. van de, C. Maitland, U. Wehn de Montalvo, & H. Bouwman (2003) Design guidelines for Mobile Information and Entertainment Services; Based on the Finder I-mode service. Internal case study report, Telematica Instituut.

Kijl, B. & W. Timmerman (2003). Presence and Instant messaging: cross case analysis, Internal deliverable B4U project, Telematica Instituut: TI/RS/2003/108

Klein-Woolthuis, R. (1999) Sleeping with the enemy, Trust and Dependence in Inter Organisational relationships. Doctoral thesis, University of Twente, Enschede, the Netherlands.

Kothandaraman, P. & D. Wilson (2001) The Future of Competition: Value Creating Networks. Industrial Marketing Management, 30: 379-389.

Levine, J.B. & J.A. Byrne (1986) Odd couples, Business Week, 21 July, 100-106

Li, F. & J. Whalley (2002) Deconstruction of the Telecommunication Industry: from Value Chains to Value Networks. Telecommunications Policy (26). 451-472.

Maitland, C., E. van de Kar, U. De When Montalvo, H. Bouwman (2003) Mobile Information and Entertainment Services: Business Models and Service Networks (pp. 69-86). In: G.M. Giaglis, H, Werthner, V. Tschammer & K.A. Froeschl (eds) 2nd International Conference on Mobile Business. June 23/24 Vienna: Osterreichische Computer Gesellschaft.

Mahadevan, B. (2000) Business models for internet- Based E-commerce. California Management Review. Vol. 42, No.4, pp. 55-69

Moschella, D. (2003) Customer Driven IT. How Users are Shaping Technology Industry Growth. Boston: HBS Press.

Osterwalder, A. & Y. Pigneur (2002) An e-business Model Ontology for Modelling e-business. In: Loebbecke, C., R. Wigand, J. Gricar, A. Puchicar & G. Lenart (Eds.). Ereality: constructing the eEconomy. Proceedings 15th Beld Electronic Commerce Conference. Bled Slovenai June 17-19, 2002.

Pateli, A.G. & G.M. Giaglis (2003) A Framework for Understanding and Analysing eBusiness Models, In the *proceedings of 16th Bled eCommerce Conference on eTransformation*, Bled Slovenia, pp 329-348.

Petrovic, O & C. Kittl (2003) Capturing the value proposition of a product or service. Position paper for the international workshop on business models. Lausanne Switzerland, October, 2003.

Popescu-Zeletin, R., S. Abranowski, I. Fikouras, G. Gasbaronne, M. Gebler, S. Henning, H. Van Kranenenburg, H. Postschy, E. Postmann & K. Raatikainen (2003) Service architecture for the Wireles World. Computer Communications. (26) 19-25.

Rietkerk, O, & W. Timmerman (editors) (2003) Communities of Interest: Cross-case Analysis, Internal deliverable B4U project, Telematica Instituut.

Seddon, P&G. Lewis (2003) Stategy and Business Models: What's the difference. 7th Pacific-Asia Conference on Information Systems Adelaide, 10-13 July 2003.

Selz, D. (1999) Value Webs: Emerging forms of fluid and flexible organisations.

Tapscott, D., Lowi, A., Ticoll, D. (2000)

Digital Capital – Harnessing the Power of Business Webs, Havard Business School Press, Boston.

Timmers, P. (1998) Business models for E-commerce. Electronic Markets, 8 (2): 3-7. (wwww.electronicmarkets.org).

Weill, P. & M.R. Vitale (2001). Place to Space. Migrating to e-business Models. Boston: Harvard Business School Press.

Apendix 1

Table 4: *Extracted Critical Design Issues Service Domain*

Case themes	Targeting	Creating value	Branding	Customer retention
Entertainment services	Niche service, targeting specific cultural context versus generic market	Dilemma of whether or not to Include erotic content	Operator or content provider service	Service bundling & personalization (My babes)
Tracking & tracing services	Generic vs. niche service	Added value vis-à-vis maps/ existing traffic information channels	Operator or content provider service	Accuracy of information
Community services	Different target group needs vs. cost of implementation	Not seen as an issue	Brands of patient associations is used to create trust	Users can influence functionality (personalization)
Presence & Instant messaging services	Generic vs. niche service, B2C vs. B2B service	Added value vis-à-vis e-mail and telephone	Stand alone vs. brand content partners	Add functionality (versioning)
Access to the back office services	Generic vs. customized solution	Lack of attention to customer needs and wishes (Lucio)	Strength of brands	Customized solutions
Payment services	Generic vs. niche service Middleware vs. end-user service	Added value vis-à-vis existing payment products	Brands of financial institutions are used to create trust	Free service, Low entry barriers, price reductions on purchased goods

Table 5: *Extracted Critical Design Issues Technology Domain*

Case themes	Security	Quality of service	Management of user profiles	System Integration	Accessibility
Entertainment services	Authentication and authorisation	Functionality of hand-set Network performance and download times	User control over user profile and how this is used or accessed	Open or closed environment with respect to content provisioning	Access limited to operators customer base
Tracking & tracing services	Privacy concerns for tracking/push services	Positioning accuracy Accuracy and speed of information delivery	User control over user profile and how this is used or accessed	Open or closed environment with respect to content provisioning Integration of positioning technology	Service requires specific hand-set or uses specific protocols
Community services	Authentication and authorisation of users	Always on connection Synchronous communication	User profile allows for personalisation of service	Build on legacy systems or new system	Availability of PC or mobile device for access
Presence & Instant messaging services	Open or closed technological environment?	Not an issue	Not an issue	Interoperable with other messaging services?	Closed environment with firewall or open environment (Internet)?
Access to the back office services	Security of connections, devices and applications	Available bandwidth Connection time	Not an issue	Connecting with existing back-office systems	User interfaces that fit with users
Payment services	Authentication and authorisation	Speed of transactions	Not an issue	Integration with existing payment solutions	User interfaces that fit with users