Framework for the Strategic Analysis of the Mobile Internet Business

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Abstract

Internet services are gradually expanding to mobile devices. This is driven by the evolution towards Internet-based mobile networks (i.e. the ongoing mobile broadband diffusion), compelling value already embedded in existing Internet services (e.g. instant messaging networks and communities around Web 2.0 services), and changing business logic in capitalizing on mobile services (e.g. advertising, emergence of mobile software platforms, device/service/subscription bundling). Given that the technical conditions (e.g. devices, user interface, performance, connectivity) are fulfilled, the uncertainty on the emergence of the mobile Internet is born in the changing dynamics of the mobile business landscape.

This paper studies the emergence of the mobile Internet from six strategic perspectives, thereby formulating a framework through which to highlight the ongoing transformations of the mobile industry. The study introduces recent case examples in elaborating each of the perspectives. The theoretical foundation of the paper is based on strategic analysis of competitive environments, ICT (information and communication technology) business and value networks.

The paper suggests that companies of the mobile industry can reconstruct their business models in light of the emerging mobile Internet with six different kinds of choices: 1. Positioning of the company differently in the value network, involving both vertical (e.g. from hardware to services) and horizontal (e.g. provisioning new kinds of services) movements. 2. Acquisition and development of critical assets (content, network infrastructure, IPRs, brands) and competencies (e.g. creation of software platforms) to build sustaining and dynamic competitive strategies. 3. Inventing new mobile business models by utilizing the lessons from the Internet, e.g. bundling products, utilizing two-sided markets and advertising revenue logic, using new revenue sharing schemes, dropping of old business logic or radically restructuring it. 4. Integration of end-users in making and redefining services, optimizing pricing logic, introduction of new business models with end-users in mind, and making services easy to adopt by end-users. 5. Leveraging and focusing on disruptive, winning technologies that are changing the rules of the business. 6. Adaptation to relevant policy schemes, and proactive business planning and reconsideration of business decisions under a dynamic regulatory environment.

Keywords: mobile business, mobile Internet, mobile services, operator business


1 Changing dynamics of the mobile industry

Mobile services constitute a growing market because of two reasons. First, mobile devices in their various forms are growing in number rapidly. Advanced devices (including e.g. “smartphones”, “converged devices”, “internet tablets” and “multimedia computers”) that have capabilities for multimedia, Internet connectivity and modular service design (with e.g. user-installed applications and computer-like operating systems) are increasing in penetration in developed markets. Second, along with the diffusion of more capable mobile devices also the variety of mobile services is increasing, ranging today from mobile Internet browsing to streaming music, and from mobile gaming to location-based services. Communication services are just one group of mobile services. Technologies are available to capitalize on the mobile dimension of internet technologies. These enabler technologies include e.g. wireless broadband connectivity, advanced operating systems of mobile devices, and architectures such as IMS (IP Multimedia Subsystem) and mobile web servers (Nokia S60 Apache). Commercial challenges of WAP (wireless application protocol) and MMS (multimedia messaging service), however, suggest that the technology push model is not enough, and it is increasingly important to understand how users perceive new services. The openness that could be provided through the mobile Internet connectivity and advanced devices is likely to shift the mobile service industry towards the pull model, in which people handpick and customize the solutions they prefer using.

Traditionally mobile services have been provided through the “silos” model, meaning that typically one company (or a closely networked “group” of companies) have provided the different elements of mobile service delivery. This delivery typically encompasses network access solution, core network operations, service provisioning and maintenance, content creation, both service and network management functions and customer accounts (including marketing, charging and billing). The silo model has highlighted the vertical integration of the value chain (Vesa 2005; Verkasalo 2007a). Mobile operators as we know them today, including the likes of Vodafone, TeliaSonera and Sprint, have typically represented the role of focal actor in mobile service delivery. Mobile telecom operators have managed this “silos delivery”, participating in the different layers on the supply side of mobile services.

The Internet world is different in that it has little vertical integration. In rare occasions “silos” have emerged. Broadband operators have focused on their bit-pipe strategies and provisioned the network access, while the services itself (e.g. Google, Skype, Ebay) are provided by other companies on another conceptual layer, on the “edge of the Internet”. The Internet model strongly emphasizes the customer pull model of business. For example, people visit the Internet sites they want, subscribe to blogs and social community sites they prefer the most, and choose their online stores based on price comparison engines. Technologies exist in the background, but end-users care only about services and their value-added. The Internet makes it easy to choose among a high number of alternative services that are completely independent of e.g. local broadband operators.

Now the worlds of Internet and mobile services are clashing, as wireless broadband connectivity and technologies for modular mobile device architectures (i.e. computer like evolution) are diffusing rapidly and providing the push for the “horizontalization” of the mobile services business (Verkasalo 2007a). In addition, the rapid emergence of services around e.g. entertainment (digital music, blogging), productivity/office (email services, calendar synchronization) and location (Google Maps, Nokia Maps) are touching both the Internet and mobile worlds. Therefore, rather than being just an extension of the traditional “wired Internet”, the mobile Internet provides more with e.g. truly ubiquitous, location-based,
personal and context-sensitive nature of mobile devices. All this puts pressure towards major transformations in the conduct of mobile business and the roles of different companies. The transformations of the mobile business have high impact, as some estimates claim that the value of the general mobile communications market will approach $200 billion in 2009. (iSuppli 2005).

This paper introduces a framework to model the transformations taking place in the mobile industry. The framework provides an “external angle” at industry dynamics, this meaning that instead of providing tools to understand a given company’s internal operations, the framework helps in understanding the dynamics in the competitive environment of the changing mobile services industry. The main research question of the paper is:

“How to model the transformations taking place in the competitive environment of mobile service business and in the roles of the different actors?”

The paper first provides background on modeling competitive business environments and business models. In addition, the specific change drivers of the mobile services industry are identified. The research paper then presents a framework leveraging six strategic perspectives of the mobile services industry. The paper provides examples in each of the perspectives, thereby claiming that all the perspectives are relevant in modeling the ongoing mobile industry transformation. Finally, the paper provides insights on the possible future scenarios that reflect competitive outcomes and long-term impacts of the industry transformation. The paper presents findings from the Finnish smartphone studies (see e.g. Verkasalo 2008b) that provide empirical observations on the emergence of the mobile Internet.

2 Background

This section provides background on two separate fields, which are both important from this paper’s perspective. First, earlier academic literature on the dynamics of competitive business environments and industry transformations is introduced. Second, the ongoing changes in the mobile Internet business are identified and relevant concepts are provided to the reader. The mobile Internet is defined in this paper as the provisioning of services to mobile devices via Internet technologies (e.g. TCP/IP, WWW). The mobile device is considered as a handheld, pocket-size device that includes at least the functionalities of a phone. Primarily the assumption, however, is that these devices provide in the future operating systems that can run Internet-based services with either dedicated clients (e.g. Google Maps in S60 devices) or via standardized Internet interfaces (WWW), like Google’s standard mobile search engine.

2.1. Modeling of competitive business environments and industries

When studying competition between companies, business model is a key concept. Business models have been extensively studied in the past (for a good review, see e.g. Pateli and Giaglis 2004). There are many definitions for a business model. Some of the popular ones include the consideration of a business model as a description of components defining a business idea consisting of products, services, actors, roles, information, revenues and benefits (Timmers 1998 and Weill & Vitale 2001); Linder and Cantrell’s (2000) approach of considering a business model as the company’s core logic of creating value; Magretta’s

1 http://www.google.com/mobile/
(2002) definition of business model being a story that explains how a company works; and Osterwalder’s and Pigneur’s (2002) consideration of a business model as a link between practical business processes and a company’s strategy plan. Traditional research on business models has faced a new fresh wave of papers highlighting the complexity and uniqueness of business models in electronic and Internet based services (see e.g. Afuah & Tucci 2001; Rappa 2003; Petrovic et al. 2001; Timmers 1998; Papakiriakopoulos et al. 2001 and Weill & Vitale 2001). Zero marginal costs of production (Shapiro & Varian 1998), complex relationships between companies (Verkasalo 2007), and constant technical innovation around these kinds of services (Christensen 1997), among others, raise the concern for new theoretical frameworks in understanding the business models of new mobile Internet services.

A business model is a key object of study in this research paper. In this paper, a business model is defined to mean everything that specifies how companies are to make profits in the industry. In this paper the business model is considered as both a strategic and operational issue. In addition to defining the organization of company operations to produce the products, this paper sees business models as ways of positioning a company’s value offerings in relation to competitors, suppliers and customers of the industry. Because of this definition two important strategic questions arise. First of all, how to model a company’s relationships with external companies in competitive environments? Secondly, how to model the industry evolution trajectories and transformation, and relate these things to business model analysis?

Probably the best known work on modeling of competitive environments is Michael Porter’s work on the so called five forces analysis (Porter 1979 and 1980). Porter identified five distinct dimensions in which companies should consider their position in the market: threat of substitute products, threat of the entry of new competitors, intensity of rivalry in the industry, bargaining power of customers, and bargaining power of suppliers. According to Porter, the company’s strategic consideration and positioning in these dimensions could establish a competitive advantage inside the industry. In line with his view on modeling competitive environments, Porter has also highlighted the role of value chain in explaining how products and services cumulate value-added and how different companies are needed in the linear processing of products from raw materials to end-users. (Porter 1980)

This classical view on value creation dynamics has to be reconsidered in the modeling of today’s mobile services (or any other electronic services). These services should be understood through the idea of value networks (see e.g. Feng & Whalley 2002; Allee 2000; Christensen & Rosenbloom 1995 and Stabell et al. 1998) or value webs (Tapscott et al. 2000). Instead of a linear view of value-creation, value network concepts typically assume that value is created in complex networks of companies collaborating with each other. Feng and Whalley (2002) argue, however, that it is difficult to construct a holistic value network of the whole industry, as all companies involved in the industry construct a unique value network around themselves.

A transaction cost theory (Williamson, 1975, 1985, 1989) explains the logic of moving from value chains towards value networks. The transaction cost theory suggests that companies bear costs in organizing their internal operations (transactions inside the company) and external relationships (e.g. suppliers). The Internet technology forces all kinds of transaction costs down to zero, provided that the company utilizes the Internet as a medium of organizing its activities and providing products and services (Butler et al., 1997). In essence, the Internet has favored the birth of more complex value networks, in which companies increasingly specialize and integration of separate activities inside one organization becomes economically suboptimal. In the era of the expansion of electronic services industry, and
particularly in Internet service businesses, the movement towards value networks is evident. This is what is happening in the mobile Internet business (see e.g. Müller-Veerse et al. 2001 for mobile data service value webs) currently, too.

Industry evolution is an important concept, particularly in light of the context of this paper as the object of the study is the transforming mobile industry. McGahan (2004) argues that there are four kinds of industry evolution: progressive change, radical change, intermediating change and creative change. In the progressive change the key assets of the industry are easy to understand and they do not face threats. In this kind of industry change companies should set out to only organize their operations optimally. In Christensen’s *The Innovator’s Dilemma* (1997) the concept of “sustaining technological change” is all about surviving through progressive, stable, change of the industry. The radical industry change presents another end of the spectrum. In this industry evolution process all the relevant assets and business processes of the past become rapidly worthless. The mobile operator business is facing this kind of evolution if you look at it from the correct angle. For example, the earlier dominant way of providing mobile messaging services to subscribers through SIM cards (SMS) is facing a threat from completely Internet-based messaging services (e.g. instant messaging or email). Particularly assets related to the provisioning of services (that typically involve older technologies) now face a relatively strong threat from a number of Internet services that are easy to “port” into the mobile domain. So called intermediate change occurs when the companies of the industry face serious threats on the way they do business – but many of the underlying assets are still relevant. If you look at the mobile business from another angle, you could call the industry evolution as intermediate. For example, mobile operators who still have a wide user domain using their voice services (and phone numbers) face a threat from Skype kind of VoIP services that might be free-of-charge to the end-user. However, the voice service infrastructure (networks and centralized management) and phone number domains are still important assets, and regulation of voice services has still not made it possible for Internet voice services to e.g. use similar number space than cellular voice services, neither does the gateway regulation regarding interconnectivity from Internet to PSTN voice services provide any advantage to Internet-based voice. No doubt, however, there is a serious threat from mobile Internet voice to cellular voice – through intermediate change. The last kind of industry evolution – creative change – involves relatively mature industries that do not face threats of intermediate or radical change – but neither are they dying. In other words, in creative change you invent new ways of making money or change your way of doing business, but your relationship with customers stays the same. The mobile industry can be seen to experience creative, intermediate or radical change – depending on the standpoint.

Hardagon (2003) claims that revolutionary breakthroughs in technology and business take place when different paradigms are combined together. When applied to mobile industry evolution, there is basically the force of the open Internet innovation and business that is now emerging against the “silo” mode of mobile telecom business, and raising thus a threat of radical change in the ways of doing business (Verkasalo 2007b). However, a static look at industry dynamics is not the only thing that matters. In today’s academic research the so-called dynamic strategy view is pressed (Rumelt 1991). This strategy discipline claims that a static analysis of the industry does not help. Instead, companies should develop a dynamic and interactive process of strategy making, in which they evolve together with the industry and create the business opportunity by themselves. This contrasts with the approach of considering the competitive environment as static. Companies can do well in unattractive industries – and equally well it is possible to do poorly in attractive industries. Therefore in the long-term the company should look for e.g. company-specific superior sources of long-term success (i.e. resource-based view, see e.g. Wernerfelt 1984 and Grant 1991). Also
Mäkinen and Seppänen (2005) conclude that future business model conceptualizations should better provide answers regarding how to utilize the company’s unique resources and competencies as the foundation of a successful business model. Essentially the new rules of building sustaining advantage become relevant in today’s emerging business models of the mobile industry, that challenge the earlier perceived difficult nature of mobile telecom markets that were dominated by large telecom operators. Not only have the conditions of the industry changed, but also the possibilities have expanded for individual companies to evolve interactively, possibly through trial-and-error logic, but with unique business models.

2.2. Clashing mobile and Internet businesses

Traditionally the mobile telecom industry has been dominated by large telecom operators (e.g. Vodafone, TeliaSonera, Telefonica). They have typically provided both the network access and core services. This has been possible because of two things. First, it has been expensive to establish a mobile access network from scratch. Second, once network has been in place, it has been a proprietary one, in most cases a local entity (e.g. national), and typically it has been easy to restrict the utilization of the network without the permission of the network operator (consider the SIM card technology of 2G/3G networks). In other words, many fundamental factors have driven the mobile telecom world towards operator dominance. (Verkasalo 2007a; Vesa 2005; Kiiski 2007)

Even before the era of mobile communications, internet technologies were able to push the evolution of the wired communications industry towards a new direction. Due to the rapid innovation at the edge of the Internet the providers of wired broadband connectivity (typically old telecom operators) saw that it is not viable to keep on doing business on the service layer of the industry. Instead, broadband operators pushed for bit-pipe strategies, and quickly deployed flat-rate charging schemes and optimized their wired broadband networks for a variety of Internet traffic. Internet service businesses - the likes of Google, Yahoo, Amazon and Skype – then developed unique business models that relied on e.g. advertising revenue instead of consumer charging. This business model utilized the ideology of two-sided markets (see e.g. Rochet and Tirole 2003; Eisenmann et al. 2006), in which the services could be provided in subsidized form to consumers, provided that some other party (e.g. advertiser) is more willing to pay for the service given that they receive benefits in another form (e.g. the attention of the consumer) from the value network.

Fundamentally this wired Internet world is based on a horizontally layered mode of operation, whereas the classical mobile telecom market is more vertically oriented. Jarkko Vesa (2005) discussed the silo model of mobile service delivery and its applications in three separate markets. There are papers that have studied the ongoing transition of the mobile industry towards more horizontally oriented ecosystems (see e.g. Verkasalo 2007b; Saarikoski 2006). Verkasalo (2007b) studied the topic from both theoretical and empirical standpoints, suggesting that some early signs of mobile Internet diffusion can be seen among early-adopter mobile subscribers. Saarikoski (2006) favored the Japanese way of rapidly pushing content and truly Internet like services to mobile networks, criticizing the western operators’ strategy of pushing “non-scale-free” services such as SMS and sticking to usage-based charging in mobile data services.

Essentially the mobile Internet business logic (accompanied with free or flat-rate connectivity charges, advertising-based business logic, network edge based open innovation etc.) is being pushed by several forces. According to Maitland et al. (2002) the evolution of the mobile data
industry structure is shaped towards the Internet because of economic, regulatory and technical factors. In addition, Maitland et al. suggest that the structural changes of the mobile data market rely on value network kind of inter-organizational structures. Therefore a holistic view is needed in modeling the business dynamics of the mobile market evolution.

From the technology perspective, the overall increasing complexity of mobile services market pushes the industry towards open innovation and mobile Internet. Advanced devices that support add-on applications play an important role here, as they force the whole industry towards more computer like industry evolution. The industry is facing disintegration of vertical value structures and modular design of technologies is emerging. Advanced devices support modular services and applications that do not rely on any specific kinds of networks or proprietary interfaces.

The evolution of the mobile communications industry can be perceived from Maslow’s hierarchy of needs point of view (Maslow 1943). The first mobile communication services were to fulfill the basic needs of communication. The ongoing merging of industries moves mobile services towards the next steps, in which people fulfill also their social belongingness needs (e.g. mobile Web 2.0 services) and the need to consume entertainment content (purely hedonic services, e.g. multimedia streaming or mobile games). Along with increasing complexity of mobile services also the positioning of services becomes easier. For example, mobile multimedia portals providing social community aspects, or secured enterprise mobile email connectivity solutions, could be positioned as premium services targeted at specific segments of the market, in contrast to simple text messaging services that are perhaps provided free-of-charge to all customers in the future.

![Figure 1 – Global growth of mobile phone and Internet users (adapted from ITU 2006)](image)

Accenture divides the mobile handset industry evolution into two phases (Accenture 2006). In the first phase the overall diffusion of mobile handsets will proceed, and more advanced handset capabilities will be pushed to the market. In the second stage of the industry mobile phones will emerge as personal computing devices, leveraging different kinds of services. The figure above suggests the first phase has already taken place and the mobile subscriber penetration has for long grown faster than the global Internet penetration. Accenture’s view corresponds well with the overall perspective of this paper of foreseeing the movements to
computer like evolution path in which both advanced features and overall modularization of technologies will evolve further. This technical point of view should be understood along with the ongoing merging of industries and services in the mobile domain. Traditional communications industry is merging with entertainment and media industries. The introduction of e.g. TeliaSonera Surfport, Google Android, Nokia Ovi and Operator Three’s X-Series suggests that the key players are looking for new ways of doing business in the mobile domain. Depending on the role of the company in the mobile service value network, different strategies should be applied (Camponovo & Pigneur 2003).

3 Modeling of mobile industry transformation

This section discusses the framework of modeling the mobile Internet business dynamics. The framework is constructed through an analysis of the mobile Internet business opportunities and challenges. The framework sheds light on industry transformations and helps in assessing the key drivers having an impact on the competitive environment. From each perspective of the framework the key challenges for existing/new companies of the mobile Internet service market are identified. The section also identifies exemplary scenarios for the future, and provides empirical insights and observations from the actual transformation of the industry.

3.1. The overall framework

The framework is structured on six different elements. These elements reflect the different perspectives through which to look at the transformations of the mobile industry. Ownership of critical assets and competencies is a critical point of view with regards to understanding the elements on top of which to build competitive advantage. It equally concerns all actors. Changes in value network structure and power positions provide room to either extend or focus business – at the same time this introduces new competitors to incumbent players. A more technical concept – emergence of supporting infrastructure – deals with the new technical innovations emerging in the mobile domain and possibly changing business dynamics. Regulation and policy on mobile Internet is a concept covering both supply and demand sides of the market, and the role of policy making, legal systems and regulation is non-trivial in the evolution of the industry. Business model transformation and service demand modeling are concepts that are relevant in studying how to really capitalize on customers and the demand side of the market.

![Figure 2 - Framework of mobile Internet business dynamics](image)

Figure 2 - Framework of mobile Internet business dynamics
The different perspectives provide a break-down of the larger strategic change that is happening around the phenomenon of the mobile Internet. The perspectives also help in the postulation of business challenges arising from the emerging mobile Internet business opportunities.

3.2. Value network structure and power positions

The first perspective is value network structure and power positions. The number of players in the wireless industry is increasing. Handset vendors are exploring the possibilities of vertically extending to mobile services and content. Nokia has launched several new mobile Internet services and announced acquisitions of upstream companies such as Navteq. Apple has brought turbulence into handset business with its new iPhone and associated business models with mobile operators. Internet players are speculating on the possibility to participate in the mobile business by capitalizing on their services that already exist in the Internet. For example, Google has speculated on contributing to the development of more open mobile phone software platforms and purchasing of wireless spectrum. Google wants mobile devices to openly support Internet-based services. Nokia complies with this public commitment to push mobile Internet services, though the two companies have different backgrounds.

Incumbent telecom operators defend from “truly open mobile Internet platforms” by using emerging mobile Internet platforms such as IMS or technologies such as UMA/GAN, and forcing their own interfaces to handset browsers (e.g. TeliaSonera’s new mobile SurfPort implementation). Telecom operators can leverage their existing “ownership” of the end-user domain and orchestrate service provisioning networks around them like NTT DoCoMo in Japan. Orchestrator players are players that have power and in a way or another orchestrate companies around them in the value network (see e.g. Van Liere et al. 2004). On the other hand, operators also have the possibility of having more business focus by implementing e.g. bit-pipe strategies in which they only sell connectivity and forget services.

The strategies of major players of the wireless industry and consequent form of the mobile ecosystem determines who is going to own the customers and who is best able to capitalize on new services in the future. Regarding future research, e.g. traditional perspective on handset and subscription bundling should be extended to handset and service bundling, as some dominant players such as Nokia can nowadays bundle services and devices, thus having strong levers in strengthening their own brands and services in the mobile market.

The position of operators in the past can be considered strong (Vesa 2005). However, now the general mobile business is moving towards more open environments. The threat to operator-controlled mobile business can be illustrated with three examples.

First, Apple was able to prove that also vendors can push their brands in the eyes of the customers. Apple established a new business with its iPhone, and they arranged for a significant share of partnering mobile operators’ service revenues to themselves. Certainly Apple optimally levered its position as an innovative company pushing cool, new and refreshing devices to the market. Apple was able to lever its brand in the most complete way. It pushed its own devices to the portfolios of operators. Operators agreed to share revenue with Apple based on the assumption of selling more subscriptions and perhaps by increasing ARPU through increasing use of add-on features such as mobile Internet browsing. Nokia, though making significant profits by simply selling devices, has rarely been able to steal a
share of direct operator revenues. In general, handset vendors and mobile operators are re-evaluating their relationships today, thanks to Apple.

Second, vendors of technologies have been pushing strongly to the services market. Perhaps the best example is Nokia together with its highly promoted mobile Internet services strategy. Nokia has been aggressively promoting its Ovi Internet service and Music Store, N-gage, and Gizmo VoIP solutions. With these moves it has positioned itself as a direct competitor of operators. Naturally Nokia’s communications strategy has stressed close collaboration with operators – though it is clear that not all operators have appraised Nokia’s ideas. All in all, technology providers are actively extending vertically in the value network.

Third, the purely Internet-based companies like Google and MSN have been awaiting the emergence of truly open mobile Internet. As the diffusion of truly open Internet has not yet been reaching the mass market, these companies have taken some moves to help the market. For example Google has introduced its vast alliance of companies supporting the upcoming Google Android mobile software platform, based on which they aim to sell truly Internet-based mobile services. Google attempts to break the still existing binding to the past of the mobile telecom business, and push instead the movement towards horizontal ecosystem structures. In general, new technologies, business strategies and market opportunities in the mobile market have driven a path towards more horizontally layered ecosystems. In this evolution, also network operators are forced to consider whether they should only focus on vertically narrower bit-pipe strategies, like most broadband operators of the Internet today.

The examples above suggest that there are two main kinds of strategic possibilities to change value network (and power) positions. First, in the vertical dimension companies can either extend (Nokia is moving to services, operators are selling handsets manufactured by subcontractors, Google is considering the possibility to participate in radio bandwidth
auctions) or narrow down (some mobile operators narrowing down to bit-pipe strategies, Nokia withdrawing from network hardware manufacturing, Google not extending to devices but narrowing their strategy down to fostering the success of Google Android software platform) vertical value network positions. The other possibility is to consider horizontal movements. In a way mobile devices can be just understood as just one horizontal extension of providing instant messaging services, for example. The so-called spill-over strategies of the Internet service domain belong to this category, as mobile devices are just seen as one new terminal category to which to port services. On the other hand, another kind of example on horizontal extension comes from operator business, as operators have for long considered the movements to other than mere voice and messaging services, good examples being e.g. content selling and multimedia services. The figure above illustrates the possibilities in re-evaluating the positions of the value network.

All in all, along with the reconsideration of business models as complex value networks, the turbulence in the market raises the question of dominant power positions and changing forms of value network positions. Indeed the optimal positioning in the value network and strategic consideration of partner companies is relevant (Gulati et al. 2000). In Netsize’s most recent report (Netsize 2008) almost all of the key mobile market events of 2007 involved some sort of value network changes for the companies in question (e.g. acquisition of companies, moving to new areas of business etc.).

Challenge for companies: How to build value-adding relationships with other companies through reconsideration of their positions in the value network? How to best prevent other companies increasing their negotiation power and to best increase the company’s own negotiation power by e.g. partnering with orchestrator companies? How to optimally either focus or extend business strategies in both vertical and horizontal dimensions?

3.3. Ownership of critical assets and competencies

The second perspective is ownership of critical assets and competencies. The fact who controls critical assets and who can best commercialize new services remains ever more relevant. Critical assets in the future of mobile industry include e.g. ownership/contracts of content (digital maps, music, videos, movies), contracts of key distribution channels (e.g. handset distribution, ownership of retail stores) and brand value/extent (value already embedded in the brand). The emergence of mobile content business raises the question of being able to control the new channels from content providers to end-users. This is a new challenge to the players of the mobile market.

On the other hand, one should not overlook the skills of bringing new services quickly to the market, business insights in doing the right business moves with correct timing, management competencies is acquisition/outourcing decisions etc. Network edge based innovation has prospered in the Internet due to open interfaces and platforms. As the mobile industry is likely to move away from walled garden kind of business models, the choice of optimal strategy with regards to service and content deployment is important. The mobile Web 2.0 provides a new angle to look at mobile services and content business. Companies who already understand this new business (like Google) have strong intellectual, technology and business assets already in place.

New skills are also required among older telecom players such as operators to understand in which assets to invest and what competencies to acquire, because organic growth in most
cases in not enough. Also Nokia is pushing its Internet strategy. Despite high profits from its device business, only the future will show whether Nokia will be able to make profits with Internet services. Needless to say, services and software are totally different from consumer electronics. In the optimal situation Nokia could lever efficiently its valuable brand and possibility and power position in bundling services and applications with Nokia devices. In addition, Nokia’s high market share in devices makes it possible for them to establish critical assets, such as the newly introduced global mobile advertising network.

Though many new phenomena (mobile Internet services, mobile content) have been mentioned above, one should not forget the critical question of connectivity. Still today the operators are the ones who own the national wireless broadband networks (e.g. 3G). This is one of the most fundamental assets they have, and they are likely to have it for years to come. A more important question is whether an operator emerges who wants to play a pure bit-pipe strategy. Wide-scale emergence of this kind of operators would provide a window of opportunity for Internet companies to make money in the mobile market. In the other end of spectrum is the situation in which mobile operators collectively agree to sustain their walled garden business models by not collaborating closely with Internet actors. In its rudest form mobile operators have the possibility to block other IP traffic than their own. The competition from alternative radio access technologies (e.g. WiFi) is likely to decrease the value of existing wireless broadband networks of e.g. 3G evolution (Accenture 2006).

In addition to network infrastructure, also the ownership of common platforms provides a possibility to rule the market. Nokia has established a strong position in the converged device market through its Symbian/S60 platform. Because of the significant installed base of S60 devices globally Nokia has already been able to build viable business models in selling applications and software through e.g. Nokia Download client. Because the platforms can be pushed through the diffusion of devices, there is also link to e.g. manufacturing scale economies (Accenture 2006) that Nokia currently possesses. Nokia can push not only high margins with its device business, but it can also push its software platform solutions in ways that best contribute to its own entry to services and software business. Nokia has the advantage of controlling the user interface. To take a recent example, dedicated Google Search has been now agreed as part of Nokia Search service concept. Although this is a new kind of entry from Google into the mobile search market, Nokia is the company owning and controlling the customer interface, and thus Nokia has the real power in the delivery of this particular Internet service.

User domains should be considered as valuable assets. Mobile operators have significant customer domains. These user domains can be leveraged in pushing new services, content, or mobile advertising. It is easier to promote new services to existing customers than to build new customer domains from scratch. In the future the information and understanding of customer domains becomes even more valuable. For example, mobile advertising is likely to play an important role in the future, and along comes a need to better understand the differences between customer segments. Not only advertising, but also product and service differentiation, price discrimination and optimal bundling strategies ask for more information regarding customers.

Challenge for companies: How to build new dominant designs and platforms? What constitutes of a critical asset/skill in the mobile market of the future? How to convert the

http://www.nokia.com/A4136001?newsid=1190585
3.4. Business model transformation

The third perspective is business model transformation. Business models are likely to be reshaped in the future of mobile industry. In this paper a business model was defined to mean the logic through which a company aims to position itself with regards to existing or emerging competitors, suppliers and customers. In essence the business model transformation boils down to three things.

First, companies can decide on the operational structures of their value networks (not only strategic positioning in the value network that was explained above). The decision of collaborating actively with external companies (e.g. operator Three’s X-Series service platform is closely integrated to the services of actors such as Skype) should be balanced with the decision to do things internally. Operators are outsourcing service development, whereas e.g. Nokia is trying to orchestrate more things by itself than earlier. Nokia and Telefonica, for example, have agreed that Nokia deploys its Ovi service in Telefonica’s network with a solid revenue sharing idea. This is a good way of transforming business models through restructuring the operational logic with suppliers and collaborators. Apple IPhone has showed that it is possible for handset vendors to push a new kind of revenue logic and to better promote their brands – with or without operators.

Secondly, companies can change their relationships with customers (i.e. customer revenue logic). Not only can service and product portfolio be changed, but the delivery logic can be radically changed. Advertising provides promising business opportunities in the mobile domain (see e.g. Blyk’s³ idea). Mobile devices are personal devices, and they provide certain authentication functions built-in. In addition, people carry mobile devices everywhere. Therefore the idea of capitalizing on mobile advertising based business models remains trivial – but still it has not really kicked off. Another example of changing customer relationship logic comes from bundling of software and content with devices. With bundling some power can be transferred from the customer to the service provider. In economics this phenomenon is called as one form of price discrimination. On the other hand, bundling makes e.g. service adoption quicker and easier. Nokia is a good example of a company who has been looking for new business models with customers. It not only sells handsets, but bundles various kinds of content (new Nokia N95 8GB includes the new Spiderman movie) and applications (e.g. Gizmo and Nokia’s application portfolio available at the Nokia Download client), and looks for more service-oriented (continual) revenue instead of mere product-specific (transaction-based) revenue flow. The new Nokia advertising network (Nokia 2008) is a new example of Nokia’s search for new kinds of relationships with both customers and other players of the market.

Third, user-originated content and social communities are emerging as new forces driving the business evolution of the traditional Internet. These forces are likely to emerge also in the mobile industry. Operators have had the exclusivity of owning charging and billing systems, and the interface to the customer. Now the mobile industry is moving away from transaction-based charging and the idea of mobile broadband with flat-rate pricing is emerging. It will become increasingly difficult to have centralized user domains. People will subscribe to

³ http://about.blyk.com/
services based on their individual preferences. People will also create new services and content by themselves. The real business model of the future will efficiently leverage and involve end-users in “making the service experience”. Good examples come from the Web 2.0 services of the Internet, including e.g. Facebook and Youtube. The mobile industry has compelling elements for the application of Web 2.0 business logic: truly ubiquitous nature, location-based adaptation and personal nature of the device. It would be stupid to ignore possibly the strongest force of innovation and business creation – the end-users themselves.

**Challenge for companies:** How to transfer the business logic of the Internet to the mobile domain with or without other companies, possibly with an optimal modification of business logic to mobile specific opportunities (e.g. personal and ubiquitous nature of devices)?

### 3.5. Service demand and end-user needs

The fourth perspective is service demand and end-user needs. WAP and MMS were both solid and working technologies. In addition, operators and vendors aggressively hyped these technologies. So why did not these technologies emerge as serious cash cows? Perhaps the technology push model was wrong, and companies should listen to customers more than they did earlier?

Even though many transformations are likely to take place on the supply side of the mobile industry, the demand side of the market should not be overlooked. It is still end-users whose needs determine which services are adopted and which are ignored. Even empirical results on early-adopter smartphone users in Finland reveal that only few people explore the high-end features of mobile devices such as Internet browsing, email or streaming multimedia, and even less use these services actively (Verkasalo 2007c). Modeling of end-user behavior in light of new issues such as flat-rate charging of mobile services and emerging advertisement based services remains important. End-users eventually decide whether mobile presence services or mobile content services are going to fly or not. Also, strategically mobile services face the demand of various user segments from early adopters to late adopters. This provides a possibility to position new mobile Internet services strategically. Even Richard Rumelt, the developer of the theory of dynamic strategy making, is suggesting that one of the key essentials in forming sustainable dynamic strategies is to be able to understand customer needs (see Lovallo & Mendonce 2007).

In assessing end-users, two main challenges emerge. First, the adoption challenge is concerned of the ways to get people to use certain mobile services. As implied in the results of the Finnish smartphone study in 2007 (see Appendix B), not all people who intended to use services actually ended up using them. Therefore there is a gap between user needs/motivation and actual use, and this gap is all about the adoption challenge. Second, the question how to push the extent of mobile service usage is relevant. Appendix A from the same Finnish smartphone study shows that only two services (voice and SMS) are used frequently, and most new services do not experience active usage. The challenge therefore is to study how to make the new Internet-based mobile services into people’s everyday use. This is perhaps not possible for other than basic communication services (voice and SMS), and consequently a more relevant challenge is to better identify the relevant segments to which to promote the new services, and achieve success in those particular segments. This leads to an ever-increasing need to better understand customer preferences and segmentation approaches. Future mobile services, in order to be profitable, should know how to capitalize on the needs of niche user segments.
Preferences of end-user are likely to become more heterogenic in the future. Positioning, differentiation, price and timing of new services determine how services are going to succeed. The long tail effect (Anderson 2006 and Kilkki 2007) suggests that there is value in being able to fulfill even small niche needs with low volume content, for example. With Internet services (e.g. on-demand music service, online book sales) it is now possible to fulfill the needs of the “long tail” customers. The long tail is just an exemplary concept highlighting the heterogeneity of customer preferences and how it links to business.

One conclusion of this talk about end-user needs and demand-side understanding is that new, more efficient empirical research methods should be developed. If companies cannot make more money any more by simply developing new services and technologies and pushing them to the market, they have to do it the other way round. In other words, they have to establish relationships with end-users and try to understand what they need, and why are they not using some of the already existing services. Some of the ongoing research on mobile service end-user research (see e.g. Verkasalo 2008a; 2008b; and Kivi 2007) is revealing new observations in the dynamics of service adoption. Models that explain the demand-side dynamics are likely to improve the possibilities to optimally capitalize on emerging mobile business opportunities.

Companies of the mobile domain should in some cases let customers decide what they use, how they use the service, and how they want to customize and recreate their services. These are some of the core ideas of Web 2.0. This is the pull model of service introduction or deployment, rather than the push model. In the future customers should be considered as part of the value-creation process, they create content, customize services, innovate and even implement new features, not to talk about their role as marketers of the services to others (e.g. their role as recommenders or lead users). The earlier concept of early-adopters (Rogers 1962) is being today replaced by the concept of alpha users – powerful influencers of other people and individuals that have a significant impact in promoting services and brands (see e.g. Ahonen & Moore 2005).

Challenge for companies: How to better segment end-users into more actionable groups? How to move end-users from mere intentions to actual use of services? How to push actual service usage? How to optimally involve end-users in “making” the service experience?

3.6. Emergence of supporting infrastructure

The fifth perspective is emergence of supporting infrastructure. New mobile Internet services are dependent on the evolution of certain technologies. Therefore the uncertainties of technical development should be understood. To take two examples, the diffusion of radio access technologies and mobile device software platforms determine who controls services and what kind of services can be deployed in future mobile handsets. The battles between different technologies and platforms are an important topic (see e.g. Suarez 2004; Smura 2006). Standardization battles have taken place for long (see e.g. Shapiro & Varian 1998), but today the different service platforms (Symbian vs. Windows Mobile vs. Google Android) and network technologies (mobile WiMAX vs. WiFi vs. 3G evolution) represent new battles.

The ownership and technical development of WiFi hotspots, UMA/GAN technologies, LTE, HSDPA and mobile WiMAX are all relevant topics on the level of radio access. Earlier in this paper the ownership of critical assets and technologies was found important. However,
these assets can quickly become obsolete or less important; given that some other technology trajectory will take over. Christensen’s disruptive technology theory (Christensen 1997) is one example of a theoretical framework in which even a poor, but radically cheaper, technology might take over dominant technologies. Google, for example, even considered the participation in a radio frequency auction in the U.S., as they might be able to push alternative technologies or more open platforms to the market of wireless broadband.

On the other hand, open software platforms such as Symbian/S60 and Windows Mobile face competition from proprietary platforms such as Apple IPhone that do not support e.g. installation of add-on applications. However, even S60 devices can be said to have elements of control (e.g. the difficult application signing procedure in the development process). Linux has been said to invade the mobile domain, but the truth is that Nokia has maneuvered a strong position through the monopoly of converged handset hardware solutions. In fact Nokia’s situation is similar to that of WinTel (Microsoft Windows + Intel processor combination) in computers, other than in S60 devices Nokia provides both the hardware and software. Serious challenger to Nokia will emerge, most notably Windows Mobile, Linux, and Google Android. Different kinds of technology battles will reshape the competitive environment of the future mobile market. Companies need to develop long-term strategies in choosing technology strategies. Dominance of only one technology provides benefits in terms of interoperability and network externalities, but the setbacks include the weaker competition and possible tipping of relatively inefficient technologies.

Challenge for companies: How to leverage the emerging technologies in capitalizing on new business models? How to strategically determine the optimal technology policy e.g. among competing radio access technologies? How to correctly predict the technology change and technology drivers of mobile business model transformation?

3.7. Regulation of and policy on mobile Internet

The sixth perspective is regulation of and policy on mobile Internet. Regulation and policy making in the transforming mobile industry is likely to have an impact on the emergence of new services. Licensing of wireless spectrum remains critical, as spectrum is a physically limited resource. On the other hand, the emergence of mobile Internet calls by new Internet actors (Skype) is currently facing discriminating policies, as terminal fees to cellular networks are in many countries different for companies operating cellular networks and companies owning mere PSTN access points (VoIP providers). In addition to regulation of issues originating from traditional mobile communication industry, new issues such as digital rights management (DRM) of content and privacy of mobile subscribers in the case of mobile advertising should be addressed.

Regulators of the telecom industry have already taken steps towards the Internet-like world, in which customers should have more freedom to choose among service components that are provided by different vendors (see e.g. Melody 2000 and 2001; Seaberg et al. 1997). Local differences, however, still exist in the regulatory field. Even in the EU the national regulatory agencies have independent power in applying EU-level directives. For example in Finland the national telecom regulator decided to allow for handset/subscription bundling only in 3G handsets, and only for an experimental period between 2006 and 2008.

According to Maitland et al. (2002) there are two important regulatory factors that are likely to play a greater role in the future of mobile business. The first is competition policy, which
takes care that no one company can achieve monopoly rents through a dominant market position. This should be considered with regards to e.g. inflated prices of mobile roaming (particularly e.g. current European data roaming; Kumar & Hämmäinen 2007) in which network operators have received exceptionally high profits. Needless to say, high roaming and interconnectivity charges do not favor truly open mobile Internet diffusion. Competition policy should look into difficult topics in the future of mobile industry. For example, regulators should not only look at telecom operators, but instead to focus on potentially monopolistic positions of more complex networks of companies involving both telecom operators, technology vendors, content providers and Internet players. These companies are likely to do also cross-industry acquisitions, which raise new questions to competition policy. For example Nokia recently acquired Navteq in a multibillion transaction, thereby merging content to its devices. Naturally an extension of the competition policy in mobile telecom markets should look upon the redefinition of the industry itself – as some companies are making an entry to the mobile market from other industries, such as media and entertainment.

The second important piece of mobile business regulation according to Maitland et al. (2002) is access regulation (Maitland et al. 2002), in which e.g. the discrepancies between different types of access networks might affect competition dynamics. A good example comes from mobile VoIP, in which currently the high termination fees to PSTN networks make the business of voice services discouraging for operators deploying solely mobile VoIP (de Bijl & Peitz 2006; Lindqvist 2007).

Another relevant regulatory topic is handset bundling with subscriptions (Tallberg et al. 2007), that has been common in the developed mobile markets for long. The Finnish regulator, however, for long prohibited the bundling of devices with operators’ subscriptions. According to Tallberg et al. (2007), this might have had adverse effects e.g. on mobile data diffusion, as adequate devices were in the market (without bundling the turnover rates of devices are lower). In addition, the prohibition of handset bundling potentially reduced operators’ willingness in Finland to invest in new 3G technologies, as ARPU levels were lower. The whole Finnish market focused on intense price competition instead of service innovations (Kiiski 2007; Verkasalo 2007a). On the other hand, handset bundling has several adverse effects, most importantly the increasing power of operators and decrease in end-user freedom of choice. Currently the Finnish regulator is experimenting by allowing handset and subscription bundling with 3G devices. The issue of device and subscription bundling is complex. For example, some operators have already turned off e.g. WiFi and Bluetooth chips in their lineup of mobile devices in order to prevent customers from using other radio networks than their own. This is against the general ideas of fostering end-user choice and freedom (Intven 2000) with regards to services they intend to use. In the US at least one law suit has been failed due to restriction of consumer choice when an operator has disabled Bluetooth connectivity.

The future of mobile industry is going to face other kinds of bundling issues that also become relevant questions for regulators. One of the emerging issues is the handset vendors’ possibility to prebundle services into devices that favor their own solutions or ones of their partners. For example Nokia is pushing its own Music Store, N-gage and Gizmo services into their S60-based devices. In addition to services and applications, the bundling of content becomes also relevant. Operators and handset vendors can bundle music and movies into handsets, and potentially achieve extra economic rents through price discrimination.

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Last but not least, intellectual property rights are an issue belonging to the regulatory perspective. IPRs will play a role indirectly in technology competition, in which players will wage war in court rooms with patents. Recent examples include e.g. the battle between Nokia and Qualcomm in patents related to 3G technologies. The IPR system can even in the short-term reshape competitive advantages of companies. There are trade-offs. Companies developing future technologies should have the incentive of putting billions of dollars into R&D by knowing that they hold IPRs to the technology as a result of the development process. Otherwise it would be possible to free-ride easily by leveraging technologies developed by other companies for free. This would in the extreme case lead to a system in which nobody wants to do innovation and new technology development.

However, a totally new area of IPR application in the mobile industry is born in the emerging content business, in which the property rights of movies and music should be reconsidered amidst the rapid diffusion of different kinds of legal (Nokia Music Store) and illegal (mobile P2P file sharing networks) media of mobile media consumption. Entertainment, games and multimedia are the key cornerstones of the potential upside in the value of mobile services market. Therefore also the rights and policy with regards to them has direct impacts on the market. Let’s take the example of music, for example. It is clear that music will transform to purely digital format and form of distribution in the future. The policy makers should fight in assuring working conditions for a legal expansion of the mobile industry in this area. Content copyright infringements have been already seen in the P2P space of the fixed Internet, e.g. law suits against Napster and operators and their customers. No copyright infringements by mobile subscribers have been publicly discovered yet. However, there are many things happening in the mobile space today. For example, Warner withdrew from Nokia’s new Music Store service because of the fear that Nokia’s MOSH (Mobile Sharing) service would contribute to illegal distribution of music under copyright (Engadget 2007).

Challenge for companies: How to optimally leverage emerging opportunities in the rapidly changing industry, in which the regulator is typically a step behind? How to step away from areas in which the regulatory context imposes temporal or sustainable difficulties? How to prevent the company’s own operations from harmful regulatory decisions, and how to optimally participate in making an economically viable market of the future mobile business together with other companies and policy makers?

3.8. Scenarios of mobile industry evolution

For scenario analysis, see e.g. Karlson et al. (2003) and Porter (1985). In scenario analysis fundamental drivers of the industry are first identified. In order to understand the uncertain, one has to first realize what is going to happen for sure. In the main part of this paper many of the uncertain drivers were already discussed. The things that will take place for sure, on the other hand, include e.g. the gradual migration to mobile Internet connectivity, increasing number of services in the market, and overall technological advancement.

In general, the future of mobile industry will be defined by various dimensions, and a given scenario will be along a continuum between a set of extreme outcomes. It would be stupid to

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5 2001 US Dist. LEXIS 2186 (N.D. Cal. Mar. 5, 2001), aff’d, 284 F. 3d 1091 (9th Cir. 2002).
make guess on the most probable outcome. Instead, it is more beneficial to understand the corner solutions, the radical extremes of the future mobile industry structure. Based on the study process, the two most fundamental scenario dimensions were found to be the vertical concentration of power (i.e. how much control does one company have in the vertical dimension of the value network structure) and reliance on platforms (i.e. how dependent are industry actors on certain technologies and their providers). For example, there is high vertical concentration of power today because network operators provide the network access, deploy services and dominate handset preconfiguration through handset and subscription bundling. In today’s broadband Internet market there is little vertical concentration of power, to take another example. Access network operators are not involved in the service layer of the wired broadband industry at all. In the other dimension, there is strong reliance on certain platforms, if a given company who provides the platform can extract monopolistic rents through a dominant software solution or other key platform. Windows and Intel have been commonly accused of ruling the PC world through the dominant Windows-Intel PC platform. In the mobile market the rise of e.g. Nokia’s Symbian/S60 software platform could contribute to other players’ reliance on that particular platform in providing services.

Based on the discussion and research of this paper, and expert interviews, three fundamental scenarios were found (see the figure below):

1. Internet revolution
2. Telecom oligopoly
3. Controlled openness

In Internet revolution truly open Internet competition makes its way to mobile domain. Mobile operators turn to bit-pipe strategies from services, and Internet players will dominate the service layer. There is room for niche, small players, to provide their own services in the mobile market. Strong vendors, such as Nokia, can retain their power, but only in manufacturing electronics (devices) with significant scale economies. In general the mobile hardware industry will go towards computers. Customers choose the best networks, devices, operating systems and services based on their own preferences.

**Reliance on platforms**

![Figure 4 - Scenarios of the future mobile market](image-url)
In telecom oligopoly a handful of players will retain control. A truly open mobile Internet does not emerge, and local (proprietary) networks will remain and represent dominant platforms. The legacy telecom operators do have an advantage in this situation, and they are likely to act in markets with only a handful of big companies (operators) competing against each other. Through bundling strategies telecom operators are able to push their own services, and companies such as Nokia, Google and Apple remain only as providers of technical solutions (devices, software platforms, mobile service technologies). Operators can sustain their vertically-oriented (“silo”) business models, in which they hold central positions and can optimally participate in both the device and services business – if they will.

In controlled openness the market tips because of a certain critical factor. This factor could be e.g. a dominant software platform, like Windows in computers. The dominant actor will act only on a certain (vertical) industry level; otherwise regulators would split its operations because of the principle of fair competition policy or the company itself would lose its competitive focus in the production of the dominant platform. Despite the dominance of one company on the layer of the central platform (e.g. software platform), there is more competition in e.g. hardware manufacturing (devices and networks), network provisioning and application/services markets. Taking lessons from the computer industry, operating systems have the best possibility to represent tipping points. This is basically because of zero production costs and the role of software platforms in linking other layers together (e.g. device hardware and services/applications).

4 Conclusion

The paper presents a framework leveraging six strategic perspectives on the business dynamics of mobile Internet services. The paper provides examples in each of the perspectives, thereby claiming that they are relevant standpoints in the ongoing mobile industry transformation. In general, the paper suggests that there are various perspectives in analyzing the outcomes of the turbulent mobile industry. In order to reduce complexity in the analysis, these perspectives can be discussed as separate topics. In formulating scenarios of the future mobile industry, one should however take into account all of the standpoints. The scenarios should necessarily be extreme ones to illustrate the diversity of possible outcomes, and to encourage discussion around the key themes. In reality the actual scenarios of the future will be along a continuum between the suggested extreme scenarios, and there are service-specific (e.g. broadband connectivity vs. smartphone services) and structural (e.g. vertical layering) standpoints that further define the context of scenario discussion.

The paper finds that companies of the mobile industry have six main ways of changing their business models and adapting to the changing business environment:

1. Positioning of the company differently in the value network, involving both vertical (e.g. from hardware to services) and horizontal (e.g. provisioning of new kinds of services) strategic choices.

2. Acquisition and development of critical sustainable assets (content, network, IPRs, brands) and competencies (Internet business, advertising, software technologies).

3. Inventing new business models by utilizing the lessons from the Internet, e.g. subsidizing and bundling products/services, utilizing two-sided markets and advertising business logic, deploying innovative revenue sharing schemes, dropping
of old business models (e.g. usage-based pricing) and radically restructuring them (e.g. Apple's iPhone revenue sharing logic with operators).

4. Integration of customers in making and redefining services, better optimizing e.g. pricing and new business models with end-users in mind, and making the services easy to adopt (e.g. bundling and preconfiguration of devices).

5. Leveraging and focusing on new, disruptive, and winning technologies that may change the rules of the business.

6. Adaptation to new regulatory schemes and policy initiatives, and proactive application of business in a dynamic regulatory environment.

The future research should focus on two things. First of all, to discuss whether all of the business critical transformations can indeed be discussed under the presented framework – and if not, to redefine the framework. Secondly, to do follow-up studies in looking at the actual market events and industry transformations under the developed framework.

The developed framework helps in elaborating some of the empirical observations and measurements of the mobile market dynamics. This paper provides some theoretical foundation for the deeper discussion around specific (empirical or theoretical) topics of the mobile industry transformation.
References


Appendix A – Smartphone service positioning

Base: 695 Finnish consumers using Nokia S60 devices
Appendix B – Adoption gaps in mobile service usage

Base: 695 Finnish consumers using Nokia S60 devices