

Mobile Service Delivery Business Models in Europe and Japan: The shift from “wherever and whenever” to “right here and now”

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ABSTRACT

We apply a utilitarian concept of business models to strategy and service innovation in Japanese and European mobile services with a focus on value network integration. Mobile service delivery remains a quandary to be solved in the mobile Internet system: infrastructure and handset products have both entered mass production, dominant designs prevail, and open APIs for third parties are provided. Massive resources are currently being invested in both the mobile and PC industry to achieve new mobile service delivery innovations on the assumption that solutions will result in a higher net output and load factor of the mobile Internet system as a whole.

Initial industry consensus goals around 1999 focused on base service technology enabling device support and always-on features. The technical priorities of carriers and key content providers have since then gradually changed to support a spatial and temporal shift among user preferences: A migration from 'whenever and wherever' to 'here and now'. The analysis is supported with cases in music and commerce from the leading mobile market: Japan. We conclude with a discussion of how the Japanese service value network has enabled mobile commerce transactions that exceeded Euro 2.8 billion in 2005.

I. INTRODUCTION

Mobile telephony is an industry built on industry-wide standards which has spurred sales and induced economies of scale for equipment and distribution. Consumer entertainment services have until recently been the most important driver of demand and stimulus of new technologies. However, as we will show in this paper, the use of service delivery technologies to trigger purchases of products and services (mobile commerce) is increasing in importance. Since Japan is among the most advanced markets for mobile commerce usage we focus on iterative innovations that have led to an integrated value network.

This paper deals with the following research questions: a) *What lessons can be drawn from successful cases of Japanese mobile service distribution since 1999 and b) how do service delivery technologies support (spatial and temporal) shifts in business models from 'wherever and whenever' to 'here and now'?* Due to the limited scope of this paper we focus on mobile payment delivery mechanisms in use cases featuring mobile music and commerce.

Japanese service innovations rest on service integration and on an ecosystem with low entry-barriers for users and content suppliers. A consistent effort in preparing users for new product upgrades (“user education”) has resulted in NTT DoCoMo releasing about one new series of handsets every year. In Japan about half of all users subscribe to mobile contents for USD 3 or more a month [1]. Today’s mobile payment technology originates from two eras, each with a different technology and business focus; from the mid-1990s, carriers applied fixed phone billing with circuit switched networks. In this era payment systems emerged for unit charges of Short Messaging Service (SMS), and data/voice transmission billed per time unit. The second era emerged with data packet networks (GPRS). The packet network era and its associated base innovations acted as a catalyst for micro billing and value creation from access to information and downloadable contents. Both base technologies and eras have their typical characteristics of consumer behavior, industry value networks, and enabling technologies. Mobile payments are important enablers for the mobile commerce offerings of service providers. As such, mobile payments is suitable as a study area for how information systems innovation emerge, diffuse and interact with other actors in a value network, contained in a socio-technical innovation system (the mobile telephone Internet in our case).

II. MOBILE SERVICE DELIVERY PLATFORMS: BRIDGING DISRUPTIVE TECHNOLOGIES

The major technologies enabling the mobile Internet can be thought to be, and include the interfaces between: infrastructure networks, handsets, and service (or content) delivery systems. The process of delivering mobile content from the network to handsets is becoming increasingly standardized over different commercial products as proprietary delivery mechanisms are being exchanged by components making up delivery platforms. This trend is supported by content formats migrating from mobile-specific into mainstream Internet formats. An increased interaction between mobile value chain actors has developed since 1999 involving telecom operators, consumer brands, and technical enablers, amongst others. Mobile service delivery technologies have become the glue between previously secluded “telecom” and “IT” domains as strategic products for leading IT systems providers as exemplified by large players who have wholly or partly integrated mobile delivery offerings (Oracle, Amdocs, Microsoft, Ericsson, Matsushita/Panasonic).

Some key driving forces for integration and convergence between the mobile and fixed Internet can be summarized as [2]:

- 1) Technology components of the service delivery platform are becoming standardized and smaller players are merging into larger ones as margins decrease.
- 2) Carriers want to buy standard and exchangeable components after many experiments with small and proprietary systems.
- 3) Established media companies want to deliver their content by themselves, not only directly to carriers. They desire to plug into the carrier's billing systems (through billing mediators), but deliver contents to end customers by themselves.

Plain messaging (SMS and email) have attracted most users and the highest volumes of sales in Europe and Japan, but premium services (until the introduction of mobile TV 2006 in Japan) has attracted most resources from content providers, enablers, and carriers alike. During the period of mobile service expansion in 1999-2007, premium SMS and charged mobile Internet downloads provided the bulk of revenues for content providers. However, there is no doubt that carriers have reaped most of their profits from bulk SMS and email, which constitutes a natural "incentive gap" between carriers and content providers.

Here we divide mobile services into two components:

- 1) The service delivery mechanism (starting from its origination with a content holder and terminating on the mobile phone).
- 2) The actual intellectual property object (the file or "content"),

Both infrastructure networks and handsets have entered a high level of standardization across markets, and mass production for the global market. But service delivery platforms are only partly standardized, and have only recently started to develop from proprietary and local systems, towards generic modules and the mass market. Content delivery systems are technology components that can be seen to be holding back systems growth. In an effort to counter this, massive resources are currently being invested by key actors to achieve new service delivery innovations that would enable a higher output of the whole mobile Internet system. There have been many technical changes since 1999 but the service delivery platforms can still be seen as attracting. When the mobile Internet became available around 1999 in both the EU and Japan, delivering content was a disruptive set of technologies for all content holders other than new content start-ups. None of the contents (images, sound, text) used on the Internet could easily be applied on mobile phones due to different browsers, mark-up language, file formats, or due to general constraints from the handsets. For users the content was expensive, difficult to use, and of poor quality. Continuing standardization and convergence of content formats and delivery technologies have been instrumental in providing the basis for new business models.

This makes the mobile Internet decreasingly disruptive for several actors in the mobile delivery value chain, and will spur new entrants. Funk claims [4] that the mobile Internet can still be disruptive for PC Internet content providers, as they must simplify their contents for small screens and keyboards, thereby creating a discontinuity with the previous service. He shows how this enabled new entrants into mobile shopping, for example, by firms who are relatively weak in the PC Internet like Tsutaya Online (records, books) and Index (perfume) in Japan. In this way technologies can be disruptive for some firms and not others.

Now we consider service delivery mechanism on billing, or so called micro payments. The analysis of the content part will mostly be limited to music and games. A conceptual model of the full service delivery mechanism is provided below.

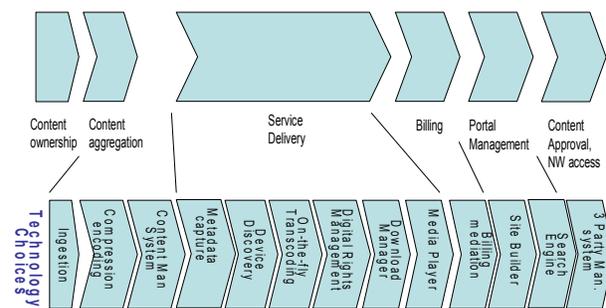


Figure 1. Technology choices for service delivery platforms

To some extent service delivery platforms emerging as system products in 2002-2005 was a disruptive technology to most content aggregators and even to carriers who had developed their own proprietary service delivery mechanisms. However, many carriers in the EU (Japanese carriers only share their billing API) chose to procure new service delivery platforms, or at least provide open APIs to their SMS and lesser WAP billing systems to trusted partners between 2003 and 2007. Most retail brands (including game makers) by 2003 hadn't ventured into mobile service delivery, so service delivery platforms (SDPs) were not a disruptive technology to them. To some extent service delivery platforms emerging as system products in 2002-2005 was a disruptive technology to most content aggregators and even to carriers who had developed their own proprietary service delivery mechanisms. However, many carriers in the EU (Japanese carriers only share their billing API) chose to procure new service delivery platforms, or at least provide open APIs to their SMS and WAP billing systems to trusted partners between 2003 and 2007. Carriers and brands launching mobile services are increasingly concerned with commercial aspects of content editing and retailing rather than the basic functionality of handset rendering and content management. Customer business benefits rather than technology have become selling points and the main source for coordination costs for the SDP providers.

III. BUSINESS MODELS OF TRUST AND VALUE CHAIN INTEGRATION

There was an early focus on performance-based positioning of contents in the i-mode portal, which provided trust with the users and clear incentives for content providers. Overall, Japanese carriers were quicker in interpreting signals of network effects and positive feedback from consumers than its European counterparts. In contrast, the low replacement rate of handsets and lacking customer relationship management from carriers towards service providers in Scandinavia (the leading market at the time) exemplify how network effects were kept back from work in 1999 to 2002 in the EU [5]. In 2006-7 the EU looks very different from the situation in 2000.

Table 1: Business strategies, EU and Japan, 2000-07

	Carrier	Content Provider	SDP provider	Retail Brands
Japan 2000	Portal management, value chain coordination	Carrier biz relations	Systems innovation for content provider (CP)	Distribute to content provider
EU 2000	Content aggregation	Content creation	Systems innovation for carrier	Distribute to carrier
Japan 2006	Portal mgm, coordinate handset releases	Carrier business relation, cost cutting and volume	Cost cutting for content provider	Use carrier portal for revenues, off-portal for customer interaction
EU 2006	Portal management, brand aggregation	SMS for off-portal and WAP for carrier portals	Technology infra for carriers, CP, and brands.	Using off-portal storefronts for revenues

Carrier portals are marginalized for SMS services (that have gone off-portal) and service delivery platforms have become a key element for cost effective mobile Internet sites in the growing competition among carriers, retail brands and content providers. Several carriers have even outsourced portal management and focused solely on wholesale of data and SMS. To some extent service delivery platforms emerging as system products in 2002-2007 was a disruptive technology to carriers who had developed their own proprietary service delivery mechanisms. Carriers and brands launching mobile services are increasingly concerned with commercial aspects of content editing and retailing rather than the basic functionality of handset rendering and content management. Similar and converging technologies have been used in Japan and Western Europe for mobile service delivery between 2000 and 2007. A general convergence in the global market of PC Internet and mobile phone Internet file formats is a major reason for this. Hence, the technical infrastructure itself doesn't explain major differences in service provision of new and innovative service offerings. Music downloading is to 95% done via mobile phones in Japan, while PC downloads more than doubled in 2006. The three major telecom operators, NTT Docomo, KDDI and Softbank, introduced polyphonic ringtones ("Chaku-uta") to the market already in 1999. Music downloads via the mobile has been made easy for users and is therefore very successful. The charging system is the same as for other mobile content. Further, you can

easily transfer music from a computer (MP3 etc.) to a mobile handset. While both NTT DoCoMo and Softbank have similar services, KDDI has pioneered the market and reaped most success during first half 2007 with its "Lismo" (Listen Mobile Service).



Figure 2: "Lismo" logo and handset type (source: KDDI)

Contents in indirect billing systems are generally not charged to the end-user, but paid by advertisers or other information providers. NTT DoCoMo early on set up a joint venture with leading advertising firm Dentsu, to support this part of the business. Offers combining indirect and direct payment systems are also common. An example being a mobile TV broadcast application where the user has access to a synchronized mobile site at the lower end of the screen. Another typical example of integrated service delivery is mobile portals with search engine functionality, where users search for content. Behind the scene content providers bid for popular key words in weekly auctions (arranged by the search engine provider) in order to be on top of the resulting list that the end-user sees upon a key word search. This business model provides incremental innovation towards value network integration and has been explored extensively also in Europe and the US.

Mobile Virtual Network Operators (MVNO)

A growing segment of the mobile service delivery chain and involved actors are MVNOs focusing on data services that have developed relatively rapidly in Europe. The MVNO business model in Japan is oriented to high value-added services based on technologies aimed mainly at corporate users. Japanese policy makers seem to be interested in MVNO data services rather than voice services. Three different MVNO models can be identified [6]:

1. Full: Involves providing a network core including a mobile switching centre, which may connect directly to the MNO.s radio access controller.
2. Intermediate: Where the MVNO acquires a switched service and provides its own home location register (HLR). Alternatively, the mobile network operator and the MVNO might jointly own the HLR and partition it.
3. Thin: Where the MVNO provides bolt-on applications and content platforms, much as with an enhanced reseller.

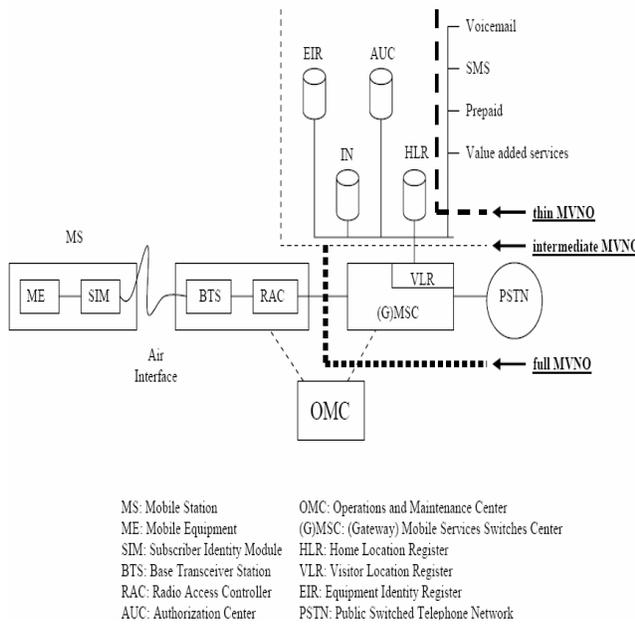


Figure 3: MVNO types [6]

IV. THE SHIFT OF SERVICE FOCUS TO “RIGHT HERE AND NOW”

Similar technology interaction is used in Japan and the EU for content delivery on download contents. Actors need to utilise current base technology capacity to deploy business models where service delivery technologies can support a spatial and temporal shift among users: User preferences migrate from 'whenever and wherever' to 'here and now'. Exemplifying this trend since the launch of the first mobile services are [1]: Ringtones (function indispensable to mobile), route search via GPS (immediately and on the spot), navigation (immediately and on the spot), mobile commerce (viewing with other media and buy by mobile), gaming (time killing), and to watch the headlines of the 6pm TV news (immediate and habitual information need). To support this shift into “here and now” applications, multiple innovation types must be distributed in the value network to retain user confidence in quality of service.

Table 2: Innovation types [7]:

Type of innovation	Strategic advantage
Novelty	Offering something which no one else can
Competence-shifting	Rewriting the rules of the competitive game
Complexity	Difficulty of learning about technology keeps entry barriers high
Robust design	Basic model product or process can be stretched over an extended life, reducing overall cost
Continuous incremental innovation	Continuous movement of the cost/performance frontier

When creating new business models focusing on value chain integration, we assume that innovations will diffuse and involve among actors of different industries. An example of this is the extensive utilisation of convenience stores throughout Japan (estimated to more than 40,000, including Seven Eleven as well as distribution centres for Internet purchases made via PC or mobile phones).

The decisive roll-out of mobile TV in Japan exemplifies an iterative introduction of new service delivery technology answering to the “right here and now”, with over 10 million compatible handsets shipped as of the summer 2007. Rather than marketing radical product innovation to users, the Japanese actor network (mainly represented by the carriers) has introduced new handset and service technology in an iterative and coordinated manner. With the focus on user accepted technology, customers have been involved in the feed-back loop of standardizing usage patterns that have gradually reached more awareness of handset and service capability. The fact that Japan is a unified market comprising almost 100 million mobile post-paid subscribers with roughly 49m handsets sold in 2006 has provided economic incentives.

Mobile commerce taking off in Japan

The first contact-less E-money systems were introduced in Japan in November 2001, and to date there are more than 55 million cards issued. Some of the leading retail chains have launched their own systems (e.g. Nanaco and Waon) which makes the choice for customers more difficult. This system builds upon the same technical framework as Edy, the market leader, and many of the other systems. The technical solution for these is developed by Sony Corporation. Edy, Suica and QuicPay are available in several of the new mobile phone models. As of the end of May 2007, a total of 25 million cellular phone users of NTT DoCoMo, KDDI and Softbank Mobile, or about a quarter of all subscribers, are estimated to have signed up for e- wallet services, which enable users to make payments using their mobile phones at shops and restaurants that have reader terminals. By March 2008, this number is expected to reach 40 million. New technology enabling a cellular phone to be used as an ATM card has also been developed. Other functions already in use include frequent flyer mileage saved in the phone and retailer point services. Mobile commerce was estimated to exceed Euro 2.8 billion in Japan in 2005 and more than an estimated 40% of users shop by ordering items through their mobile phone. NTT DoCoMo took a 20% stake in leading credit card company Mitsui Sumitomo in 2005, a significant move to integrate a well trusted institution into their network. NTT DoCoMo started offering contact-less E-money service in April 2006. Users of the firm's “Osaiifu Keitai” handsets, featuring built-in electronic wallet functions, are able to pay for purchases of up to 10,000 yen (Euro 65) per month by holding their handsets close to compatible reader devices. Purchase amounts appear on their monthly phone bills. In addition, NTT DoCoMo offers their users to link their e-money enabled phones to either Visa or MasterCard. The users can pay by making the handsets “touch and go” and later they receive the invoice from the credit card companies. Mobile

e-commerce in its most advanced form is taking shape in Japan. This is possible through a combination of careful introductions of new technology and mobile phones that increasingly interact with external payment providers.

Table 3: Types of e-money, number of users [9]

Type	Name	Issuer	2007	2006
Prepaid	Edy	BitWallet (Sony)	28.20	17.00
	Suica	JR East	19.70	15.70
	Pasmo	Train, bus operators	1.16	n.a.
	Icoca	JR West	2.80	2.31
	Nanaco	Seven & I Holdings	Not launched	n.a.
	Wacon	Aeon	Not launched	n.a.
Post-paid	iD	NTT DoCoMo, Sumitomo Mitsui Bank	2.38	0.03
	QuicPay	JCB (credit card co)	1.85	0.03
	Smartplus	Mitsubishi UFJ Nicos (bank / credit card company)	0.14	0.02
	PiTaPa	Train, bus operators	0.64	0.32
Total			56.87	35.41

The majority of mobile shopping of physical products in Japan is “cash on delivery”, i.e. users order their items, get it delivered or pick it up (at the closest convenience store to their home, e.g.) and pay cash. Almost half of mobile shoppers order for USD 100 or more. It is even estimated that a significant minority of “power mobile users” (1-2% of a total 100m mobile phone users) order for more than USD 1000 per year. Somewhat surprisingly, 50% of purchased items are clothes, accessories or fashion articles. Only some 6% of mobile shoppers clear the payment through their mobile operator [1]. A saturating market in OECD countries for mobile services and voice calls give operators further incentive to increasingly tap into mobile commerce transactions for future revenue streams.

V SUMMARY AND CONCLUSIONS

We have described and compared service delivery and related value network integration in Japan since the inception of i-mode. Initial industry consensus goals around 1999 focused on base service technology enabling device support and always-on features. The technical priorities of carriers and key content providers have since then gradually changed. Key actors need to utilise current base technology capacity to deploy business models where service delivery technologies can support a spatial and temporal shift among users: User preferences migrate from 'whenever and wherever' to 'right here and now'. We have used examples from mobile music purchasing and the high-growth area of

mobile commerce in Japan to illustrate how new business models are supported by mobile service delivery systems.

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