1E16 The Co-evolutionary Mechanism Between Handset Vendors and Telecommunication Service Operators in Japan

○陳　昭蓉，渡辺千仭（東工大社会理工学）

1. Introduction

While Japan's rapid advancement of mobile phone service is expected to be an important model for similar advancement in other countries, applying solely the experience of Japan to other markets does not promise the same level of success due to various attributes of the markets. First, even if it is noticed that Japan has achieved a relatively high performance in the diffusion and innovation of mobile phone, the attributes of the market that made this possible are unclear. How to identify the quality and level of this market requires careful examination. Next, what are the factors that determine such an advanced market? Both the customer side and supply side should be taken into consideration. Is R&D of the service operators and handset vendors or the customers' demanding attitude toward new features the reason that enables high growth rate of new mobile services, such as mobile Internet, and innovative handset features, such as the mobile camera? Last, the mechanism that continues to drive the success of the mobile phone market in Japan should be the key factor to elucidate for the future of other mobile phone markets. Demonstration of the foregoing three hypothetical views is expected to lead a way in revealing the above points in the veil.

Therefore, this research attempts to identify the uniqueness and quality of Japan's mobile phone market. By classifying the handset models into three classes, the extremely close and mutually dependent relationship between the service operators and handset vendors in Japan is demonstrated. Based on the analyses, the reason why the worldwide handset vendors are unable to perform in Japan as they accomplish in other countries is explained. Finally, a co-evolution mechanism between the customers and the supply side, including handset vendors and service operators, is elucidated in order to point out the barriers for worldwide handset vendors in penetrating such a well-defined market. This research also aims at explaining how Japanese "inflexible" institution can drive the growth of penetration rate and enable the high-quality/advanced-features of the mobile phone market while impeding the Japanese service operators and handset vendors to succeed in foreign markets.

2. Analytical framework

2.1 Methodology

In order to elucidate the relation between domestic handset vendors and service operators in Japan, it is necessary to clarify the pattern of how handset vendors provide handset models to the service operators. This analysis aims at classifying the handset models into three types: global, localized and customized model. Here "customized model" means that the handset vendor provides that handset model only to one service operator in the same country. "Regional model" means that the handset vendor provides very similar handset models to different service operators in the same country. "Global model" means that the handset vendor provides that handset model to different service operators in different countries.

2.2 Data

The target handset models are those listed in the catalogs and websites of the handset vendors in October 2005; the spec information and photos of those handsets

are collected from the catalogs and websites of NEC, Sharp, Panasonic, Fujitsu, Mitsubishi, Sanyo, Toshiba, SonyEricsson in September 2005). After the information of each model is collected, all the models are listed by handset vendor and then by service operator. By comparing the spec and style of the same handset vendor, it can be observed whether the same or similar model is provided to different service operators. If the model is provided to only one service operator, it is categorized as "customized" model. If it is provided to multiple service operators in Japan by only minor changes, it is considered as "regional" model. If it is also provided to other service operators in other countries, then it is classified as "global" model.

3. Results and discussion

3.1 A "customized" model oriented market

The models analyzed are listed in **Fig. 1** by handset vendor and then by service operator. Some handset vendors, such as Panasonic and Fujitsu, only provide handsets to a specific service operator, so the models are clearly classified in "customized" models. Mitsubishi once provided handsets to two service operators, but tend to concentrate on one service operator after 3G models become the main stream in the market. Other handset vendors, including Sanyo, Toshiba, and SonyEricsson, provide handsets to multiple service operators. However, by comparing the spec and style of the models, it is observed that these handset vendors provide completely different models to different service operators. Only N900iG and 802N made by NEC as well as 802SH and SH506iC made by Sharp provide similar models to different service operators and are classified in "regional" models. Other models made by Sharp and NEC except these two pairs of models are, similar to Sanyo, Toshiba, SonyEricsson and Mitsubishi, classified in "customized" models.

It demonstrates that 93% of the models in September 2005 can be classified in "customized" models. This analysis demonstrates the relationship between handset vendors and service operators in Japan is proved to lie in the order-made pattern of cooperation resulting in depending on "customized" model. It is not an open environment for a handset vendor to develop one universal model and simply provide it to different service operators. It is also observed that NTT Docomo, with its longest history of mobile phone business in Japan, demonstrates the highest ratio of customized and high-end handsets. On the other hand, Vodafone, the latest comer among the top three service operators, demonstrates the lowest ratio of customized and high-end handsets. This is considered as one of the differences of traditional Japanese service operator and global-business oriented service operator.

	NEC		SHARP		Panasonic	Fujitsu
	Docomo	Vodafone	Docomo	Vodafone	Docomo	Docomo
3G/2.5G	N901is N901iC N701i N700i *N900iG* N900i N900iS	*802N* V-N701	SH700iS SH901iS SH700i SH901iC SH900i	703SH 903SH 902SH 801SH *802SH*	P901iS P700i P901iS P900iV P900i	F901iS F700iS F901iC F700i RakuPhoneII
2G	N506iS N506i N253i	J-N51 V601N	*SH506iC*	V302SH V501SH V603SH	P506iC P252iS P253i Lechiffon Prosolid	F506i F505i(GPS) F672i

	SANYO			Toshiba	
	Docomo	AU KDDI	Vodafone	AU/Tuka	Vodafone
3G/2.5G	SA700iS	W32SA W31SA W22SA	V801SA J-SA701	W31T W21T	902T
2G	D253i D506i	Sweets A5505SA A5507SA	V401SA J-SA06 J-SA51 J-SA05	A5509T A5511T A5504T	V603T V501T V601T V303T V602T

	SonyEricsson			Mitsubishi	
	Docomo	Vodafone	AU KDDI	Docomo	Vodafone
3G/2.5G		802SE	W32S W31S	D701i D901iS D901i	
2G	Premini Rediden SO506i		A1404S/S A1402S	D253i D506i	V301D

Fig. 1. Categorization of handset models by vendor and operator *(Sep. 2005).*

Sources: Website and catalogs of NEC, Sharp, Panasonic, Fujitsu, Mitsubishi, Sanyo, Toshiba, SonyEricsson.

3.2 Institutions molding Japan's market

In Japan, the mobile handsets are sold with both the name of the handset vendor and the service operator

Therefore, from the service operators' perspective, which model they should adopt is also a decision that will affect their share in mobile service market. For service operators, it is considered as an important strategy to obtain new subscribers and maintain the existing users by launching more attractive handset models (NTT, 1999). Moreover, the models that the service operators adopt from the handset vendor to launch in the market also determine the structure of customers' subscription by digital segment.

Since the relationship between service operators and handset vendors is an important key factor to determine the provision of handset models in Japan's market, the ratio of high-end handset models adopted by the service operators also affect their own 3G subscription rate. As illustrated in Fig. 2, the ratios of high-end handset models by service operator are 50%, 40% and 21% for NTT Docomo, au KDDI and Vodafone respectively. Consequently, by the end of September 2005, more than 70% of NTT Docomo subscribers communicated through 3G wireless technology and have the accessibility to various advanced application service while only 55% of au KDDI and 40 % of Vodafone did so as illustrated in **Fig. 2** (GfKMSJ, 2005). The level of models adopted from handset vendors by the service vendors definitely affects the level of application services offered by the service operators.

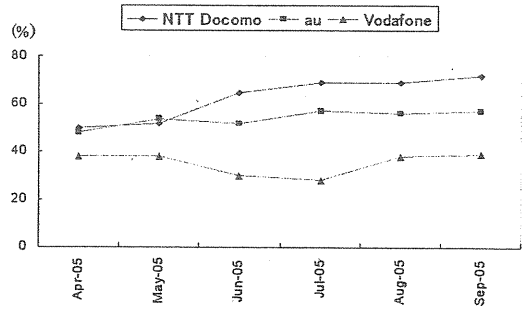

Fig. 2. Trend in the ratio of 3G mobile phone service subscribers of each service operator in Japan *(Apr. 2005 - Dec. 2005).*

Sources : Database of subscribers by service operator (GfKMSJ, 2005).

Since all models are sold with both the names of the service operator and the handset vendor, both the service operator and handset vendor bear responsibility for the handsets in Japan. In other countries where the customers choose the handset models with only the handset vendor's name, the handset vendors can focus simply on satisfying the demand of the immediate customers. Contrary to such a structure, the first step of the handset vendor to keep a place in the market in Japan is to satisfy the service operators and persuade them to adopt the handset models. Consequently, each model must meet the technical need of the service provided by the service operator as well as the brand image of both the handset vendor itself and the service operator. One manager of Fujitsu confessed, "While we would like to cooperate with multiple service operators, too; it is really difficult to afford the huge amount of R&D invested separately for each service operator." The one-to-one close relationship between the handset vendors and service operators can be considered as a consequence of supply-side co-evolution in order to maintain high-quality and rapid innovative process. In order to satisfy the demand of picky customers, service operators use high standard in choosing handset vendors and are the "real" customers of handset vendors in Japan. Handset vendors must develop and produce handset to meet the technical specification and infrastructure of the service operators, and they also have to design fashionable products that can attract the end-users. Customers, handset vendors and service operators form a strongly intertwined relationship where handset vendors and service operators supervise each other and the customers dominate both handset vendors and service operators as illustrated in **Fig. 3.** Customized production and model development combine the handset vendor and service operator tightly leading their branding targets to converge thereby satisfy Japan's demanding customers' qualified functionality requirement. Such a supply structure, together with

customers' high level of demand structure, constitutes a sophisticated institutional system leading Japan's rapid increase in high functional mobile phones in a self-propagating way.

4. Conclusion

Due to Japan's social institution, consumers' strong consciousness toward high quality, and innovative functions driving both service operators and handset vendors' commitment to quality, a closed but high-standard relationship between handset vendors and service operators has been developed which works closely with consumer demand. This mutually dependent relationship pushes the virtuous cycle of technological innovation so that it works smoothly and efficiently. Japan has also become a market dominated by order-made handset development between service operators and handset vendors whose close tie-up supports this demanding market. Both the service operators and handset vendors are responsible for the quality of handset, and the service operators, not the mobile phone end-users, are actually the immediate customers of the handset vendors.

Handset vendors in Japan rely on the service vendors very much. This close relationship of R&D, manufacturing and sales cooperation drives the progress of the mobile phone in Japan, but may not be applicable in other markets where the service operators and handset vendors have to face the market separately. Japanese vendors and service operators should learn to be more independent from each other and more flexible in order to adapt themselves to the local supply side structure in other markets.

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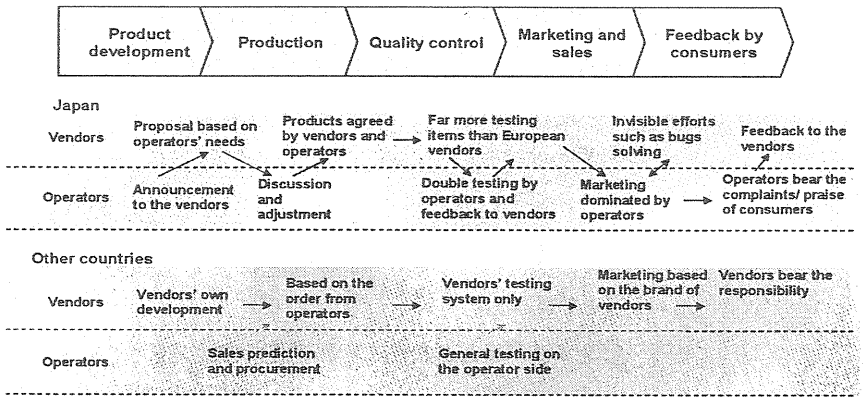

Fig. 3. The comparison of the mechanism under the mobile phone markets in Japan and other countries.