# Turning the Mobile Multimedia Offer into an Ecosystem: The Nippon-Korean pattern

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While the mobile telecommunications sector in Europe has entered a phase of maturation leading to lower ARPU and market saturation, with 3G failing to trigger fresh growth in this market, Japan and Korea are now considered the "champions" of the mobile telecommunications sector, playing a leading role in terms of technology and services, while enjoying some of the highest and steadily growing ARPU levels in the world. In the meantime, the rest of the Asian zone followed the trend seen in Europe: after strong take up in their mobile markets, penetration rates began to level off in 2000-2001, reaching saturation point in most countries. Since then attempts by mobile operators to foster a new cycle of mobile consumption through the launch of data services have failed desperately, causing financial damage and a strong wave of restructuring in the sector.

However, Japan and Korea have not always been at the forefront of mobile success and for several years they even lagged behind Europe and the United States in terms of both penetration rates and services. In fact, these two countries took the lead with the arrival of data services and the launch of 2.5, followed by 3<sup>rd</sup> generation networks and handsets. The purpose of this article is consequently to determine the success factors for these two countries and to discover if there is a "Nippon-Korean model" in mobile multimedia services that could be adopted by European telecommunications players. Indeed, our thesis is that Japanese and Korean economic models (even if these two economies are still in crisis) have functionalities that facilitate the appropriate modes of coordination between economic agents in a context of greater "complexity."

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The aim of this article is to investigate how Japan and Korea managed to successfully develop their mobile multimedia market to a unique level in order to determine if a Nippon-Korean pattern does exist and if so, to determine its rules.

Our thesis is that Japanese and Korean economic models (even if these two economies are still in crisis) have functionalities that facilitate the appropriate modes of coordination between economic agents in a context of greater "complexity". Success factors already used by these two countries on many occasions after World War II include: a protected domestic market, limited domestic competition in the initial phase of a new product launch, an accomodating government in the Japanese case and voluntarist (even authoritative) in the Korean case, as well as the traditional trend for Korea to follow Japan's experiences (sometimes surpassing Japanese firms in the end) (CORIAT & GEOFFRON, 1999).

Following recent works by KODOMA (2003) or CHUNG & *alii* (2003), we will try to highlight and analyse specific patterns of interaction between firms<sup>1</sup> and between firms and consumers in Japan and Korea in the development process of mobile multimedia services. Our aim will also be to determine, in conclusion, the transferability of some parts of this pattern to the European market.

# ■ Japan and Korea succeeded in favoring coordination modes adapted to the complexity of the new 3G value chain.

The evolution towards a higher degree of complexity from 2G to 3G is obvious. Europe has led the development of the mobile market since its emergence in the middle of the 1990's. The success of European players was due to the fact that they succeeded in developing a well-functioning ecosystem. The service offered to the public was roughly the same as in the fixed telephony (voice) market. There was no education period for the public. The service was recently extended to a basic data service (SMS) due to demand for this evolution (especially from young people). As a consequence, there were few players in the value chain: manufacturers

 $<sup>^{1}</sup>$  And their differences compared to the experience of Nordic countries (ANDERSEN & FJELDSTAD, 2003).

(networks and terminals), application providers (engineering companies) and mobile operators. These three players succeeded in coordinating themselves to launch an efficient service.

However, with the arrival of mobile data services, the mobile ecosystem became far more complex with the emergence of:

- a wider range of services, which for the most part did not exist in the fixed telephony market and thus will not emerge before a long iterative testing process of trial and error has taken place throughout the entire value chain;

- new players (content and services providers, new manufacturers, new application providers, mobile OS providers, etc.) in a sector which, in Europe, was already structured around 2G players;

- competing technology standards and platforms (different OS, GPRS/Edge networks, cdma/wcdma etc.).

A short time before the emergence of the mobile telecommunications as a mass market economy, European countries had embarked upon a major process of liberalizing their telecommunications sector. Mobile telecommunications have thus become the epitome of competition between market incumbents and new entrants. In this context, the arrival of data services has helped exacerbate the confrontation, not only between incumbent and new entrants in each national market, but also into a paneuropean oligopoly. Mobile technologies consequently became a new tool to capture customers and struggle for market share.<sup>2</sup>

At the same time, European governments tried to preempt the value presumably created by new data services by allocating spectrum licences at a high cost for operators. The conjunction of those elements led to an increase in the risks for players, which were highly prejudicial to efficient anticipation of the changes triggered by the switch from the world of GSM to 2.5 and subsequently to 3G.

 $<sup>^2</sup>$  The "walled-garden" model of the first WAP services is an example of how competition led to attempts by mobile operators to use proprietary technologies as a means of capturing customers.



Value chain of a wireless voice service (2G)

Value chain of a wireless data services (2.5 G and 3G)

Network Handset Service Content Data management configuration and operation and shipment gement	Independant 3 <sup>rd</sup> party content integration Marketing and Sales of the services	Revenue collection and distribution between and all the service providers
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This conjunction of events in Europe was all the more inopportune given that with 3G, the key success factor was to favour a true collaboration along the new value chain to avoid the emergence of individual, risk-adverse and thus unsuitable strategies:

"The increased asymmetry of information and business logic would probably result in the separate companies of a supply chain trying to myopically reduce their own risk. A lack of effective incentive structure to induce global supply chain optimisation may promote the opportunistic and myopic behaviour of the chain firms." (AGRELL & *ali*, 2003, p. 2).

By contrast, Japan and Korea succeeded in collectively assuming the risks brought by data services thanks to dense and complex interfirm relationships, which are not necessarily trading relationships, and thanks to the implication of their governments which, at some level, shared the risk linked to the uncertainty of the mobile environment with the companies. This collective strategy was structured by the willingness of both countries, after the economic crisis they both suffered during the 1990's, to place the information and communication technologies (fixed and mobile) at the centre of their economic recovery process in a perspective of endogenous growth.

We will explore the strategy pursued by Japan and Korea to reach the cutting-edge of international mobile telecommunications in greater detail

later, but can already underline a common and fundamental characteristic of their industrial structure, namely the background of dense interfirm relationships that both countries enjoy as a historical pattern of development for their economies; be it the "keiretsu" model in Japan or the "chaebol" model in Korea (CORIAT & GEOFFRON, 1999).

Keiretsu is basically the Japanese term used to describe a loose conglomeration of companies organized around a single bank for their mutual benefit. The companies sometimes, but not always, own equity in each other. Companies form a tight-knit alliance to work toward each other's mutual success. The keiretsu system is also based on an intimate partnership between government and businesses. It can best be understood as the intricate web of relationships that links banks, manufacturers, suppliers, and distributors with the Japanese government. Chaebol is the Korean term for a conglomerate of many companies clustered around one parent company. The companies usually hold shares in each other and are often run by one family. The Chaebols were at the origin formed on the Japanese keiretsu pattern, the Japanese having introduced this model during their occupation of Korea that ended in 1945. These industrial models are at the origin of the recovery of the two economies after World War II. Today, although crises have demonstrated that these models have their limits (the most visible sign of these limits being the collapse of the banking system of both countries at the end of the 1990s), some characteristics of the keiretsu and chaebol organizations still explain the ability of Japan and Korea to play a leading role in the development of mobile multimedia services.

# ■ The Japanese pattern: a revolution led by NTT DoCoMo with government "complicity"

If the development of 2G in Japan cannot be considered a remarkable success on an international level, Japanese operators did succeed in innovating by experimenting first with mobile Internet services whose structure and business models prefigure those of 3G services. This national-scale trial was achieved by the incumbent operator, NTT DoCoMo, which dominates both the fixed and mobile markets, with the protective behavior of the government. Indeed, the government was more focused on the introduction of new and high-potential technologies than on the introduction of rules to guarantee true competition in the sector. However, this

"complicity" does not explain everything: NTT DoCoMo succeeded in organizing original modes of collaboration to explore the potentialities of mobile Internet.

## Japanese mobile telecommunications before i-mode

In Japan, the take up of multimedia services stems from two important weaknesses in the ICT sector in the early 1990s. Firstly, very expensive access to fixed Internet deterred consumers from using it. Secondly, after a slow take off, the mobile network of the dominant mobile operator became saturated (NTT DoCoMo, a subsidiary of the fixed incumbent NTT), leading to a deterioration in the quality of service.

As a consequence, at the beginning of the 1990s, the mobile market in Japan was declining. Ten years after the launch of the first services, Japan was lagging behind the USA and Europe with only 2 million users. At that time, the market was heavily regulated, subscription fees were very high and handsets could only be leased. In 1992, when new common carriers (Au and J-Phone) were accepted into the mobile communication industry and when DoCoMo was spun off from its parent NTT as an independent mobile communications entity, the primary uses of mobile services were the car phone and business uses. There was no expectation of the mass market success that services would encounter a short time later. In this context, NTT Docomo did have an advantage over new operators thanks to assets inherited from NTT. This advantage was not as great, however, as the lead it enjoyed in the fixed-line communication market. In fact, NTT Docomo saw its market share drop sharply after new operators with strong corporate backings (fixed operator KDDI and manufacturers Kyocera and Toyota for Au, long-distance fixed operator Japan Telecom and later, international operator Vodafone, for J-Phone) started entering the market.

To remedy the situation and satisfy demand from end users who expected to be able to call from anywhere in the country, NTT DoCoMo deployed a PCS network in 1993 (a standard used only in Japan). In 1994, the conditions governing the purchase of a mobile terminal (necessity of a deposit, heavy subscription formalities, leasing etc.) were eased, with personal handyphones (PHS) and pagers replaced by mobile phones, whose price dropped rapidly. At the same time, DoCoMo's two competitors, AU and J-Phone, launched their own nationwide services. The general success of mobile services was striking. The number of mobile users leapt

from 2.1 million in 1993 to 31.4 million in 1997 and the PCS network of DoCoMo rapidly reached a saturation point (due to the concentration of endusers in the Tokyo-Osaka-Fukuoka connurbation). As early as 1997, DoCoMo had to deal with a poor quality, expensive network whereas its competitors had rolled out more efficient networks based on world technology standards.



Cellular service subscribers in Japan (in millions)

Source: MITI, 2003

The solution for DoCoMo was then to create a data service as a superficial layer to its network, in order to be able to gain additional customers while substituting some data usages (short messages) for voice usages to relieve the network of voice traffic congestion. Thus, the historical aim of i-mode was gaining time to amortize the costs of the PDC network, while building another brand new network. However, the i-mode service was so efficiently marketed, and the data services offered corresponded so closely to the expectations of end users who rapidly saw a substitute for fixed Internet in the possibility of sending messages through their mobiles, that i-mode finally became the service at the core of DoCoMo's strategy and a precursor to the future development of mobile services.

The success of the i-mode service proved the ability of NTT DoCoMo to overhaul their whole organization. The mobile operator also benefited from a comfortable financial situation due to its leadership of the mobile market. By 2002, although all three companies turned a profit, those of AU and J-Phone were less than one-tenth of DoCoMo's. DoCoMo also benefited from the dominant status of its parent company, NTT, which, as the incumbent fixed operator, always enjoyed protectionist regulation preventing competitors, at least up to 1997, from threatening its fixed revenues.

However, DoCoMo would not have been able to succeed with i-mode if it had developed this service as a standalone company. DoCoMo needed to find the technical and marketing knowledge necessary to launch a service whose success was highly uncertain from outside the company. Thus, the key of the success lay in DoCoMo's ability to gather external and internal resources and combine them to produce a coherent and well-defined service. This organization took the form of the "strategic community" (KODAMA, 2002).

### A collaboration centered around the "strategic communities"

DoCoMo was able to setup an organization (i-mode business unit) focusing on the design and launch of the i-mode service with the aim of adapting to the context of an uncertain environment (trial of a new product, uncertainty about demand, no experience in the field etc.).

The organization was directed by a top manager (Mr Enoki), who was assigned the task of recruiting human resources within and outside the company and was empowered with financial management to start up the new service. The i-mode business unit was at the center of a network implying DoCoMo's traditional organization, content providers and customers of DoCoMo, terminal manufacturers and platform vendors. These various communities of players were brought together in order to provide the business unit (BU) with hardware and software knowledge and a strong vision of the expectations of the outside world. These relationships with outside providers allowed the i-mode BU to understand the core competencies both inside and outside of the BU and the content business from the viewpoint of IP. IPs, on the other hand, also adopted the i-mode business model and learned what sort of content they could provide offering added value and real enjoyment to end users.

The i-mode BU itself was divided into 7 working groups led by project leaders. These formed the community competencies inside of the BU. This creation of community competencies working with outside partners gave and understanding and enabled the acquisition of new competencies (marketing

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1999

2000

strength from PlayStation, platform technology from Sun, etc. for example). After the launch of i-mode (in February 1999), the business unit formed a 3-prong strategy consisting of a "portal strategy" (to develop content), a "terminal strategy" (to develop terminal features) and a "platform strategy" (for i-mode on other than mobile terminals).



Evolution in the number of i-mode subscribers in Japan (in millions)

Source: NTT DoCoMo, 2003

2001

2002

Before the successful i-mode, NTT had already used this form of organization, to a lesser degree, for the launch of an ISDN-based video terminal products (KODAMA, 2002). More globally, this form of cooperation was copied by other companies in the IT sector in Japan, particularly by DoCoMo's competitors and with the support of manufacturers, which see in these co-developments an excellent way of enhancing their own business.

Such tight cooperation can be seen as the heritage of the collaboration that keiretsu groups formerly adopted between their various entities. However, in a context of economic crisis, loss of confidence in the traditional circle-based corporate governance (following the collapse of the banking sector) and general loss of competitiveness in the IT sector compared to the USA, this capacity to foster creative behaviour among entities belonging to different firms was unexpected. It also presented an alternative to the classical measures taken to give to the various industrial sectors of the

2003 (e)

country a new impetus (downsizing, restructuring, M&A with foreign firms, etc.).

Strategic Community Creation	Community Competencies		
	Sharing	Creation	Renewal
In-house Strategic Community	Sharing & understanding of technical issues required to implement i-mode business model Sharing of information & knowledge through nation- wide content editing meeting	Development of system (server/terminat) to implement i-mode service Acquisition of skills of nation- wide content editing meeting personnel	Implement creation of customer value through new services by leveraging IMT- 2000 technology
Strategic Community through Portal Strategy	Understanding & learning by both partners aiming to integrate i-mode business model & diverse content	Implement new mobile EC platform Implement i-mode online service through Internet bank	Implement high-speed animation content delivery service in i-mode by leveraging IMT-2000 technology
Strategic Community through Terminal Strategy	Sharing & integration of planning capability of terminal products from service side and technology of terminal makers	Implement new i-mode compatible mobile phones (Example: Java-equipped i- mode mobile phones)	Implement new mobile phones (including animation delivery feature & videophone features) by leveraging IMT- 2000 technology
Strategic Community through Platform Strategy	Sharing & understanding of technology expertise of both partners and service concept	Implement new services combining car navigation, game machine, and i-mode mobile phone features	Implement more advanced services combining i-mode with "car," "home," and "position in town" by leveraging IMT-2000 technology

### DoCoMo's organization in "strategic communities"

Source: KODOMA, 2002

# The macro-environment in Japan: elements promoting the take off of mobile services

The success of i-mode, followed by significant successes for followers Au and J-Phone (DoCoMo and J-Phone have now respectively the first and the third highest ARPUs <sup>3</sup> in the world), was supported by a series of positive elements, be it at the regulatory level or in the structural situation of the country's economy.

At the regulatory level, after a long period of monopoly, the government headed for the development of the mobile sector starting from 1994, when the ministry of Post and Telecommunications liberalized the market. As an example, the 3G licenses were attributed to the three mobile operators at a

<sup>&</sup>lt;sup>3</sup> Average Revenue Per User.

low cost, after a "formal" beauty contest. Aware of the current frequency shortage that threatens the future development of the wireless sector, the Ministry of Telecommunications has recently begun a fundamental review of the allocation of frequencies, with a view to backing the development of wireless telecommunications. It has already decided to earmark a frequency band vacated through the digitization of terrestrial broadcasting to mobile phones.

At a more general level, mobile operators and handset manufacturers in Japan benefited from the possibility of testing their services and amortizing their investments in the national market where barriers to the entry of foreign competitors are very high. Moreover, unlike European operators, Japanese operators did not have to devote considerable financial resources to struggling for market share outside their domestic market: they began to focus on foreign markets only once they had generated high revenues in the domestic market. Like other industrial sectors such as the Japanese car industry:

"The Japanese market acted as a powerful conditioning environment, which shaped the competencies of the Japanese ICT companies. In turn, it was these competencies which determined the international strengths and weaknesses of these companies" (FRANSMAN, 1999, p.74)

This favourable environment allowed mobile operators to anticipate their future needs in network capacity and to be the first in the world to roll out 3G networks. After having been the first to roll out 2.5 G networks (using cdmaOne for Au as early as October 2001 and using w-cdma for DoCoMo and J-Phone in 2001-2002), the three operators launched their 3G services, the first being DoCoMo with FOMA, followed by J-Phone over w-cdma and Au with a cdma1x network. At the same time, the domestic market began showing signs of saturation, so the three operators started to search for new markets for their activities abroad. DoCoMo consequently bought a stake in the Dutch operator KPN and has licensed the i-mode platform to several European countries. Japanese operators and manufacturers are also seeking partnerships in Asia to develop their services; DoCoMo has thus been in contact with the Korean operator SKT to jointly develop services based on the w-cdma standard.



Evolution of the ARPU of NTT DoCoMo (in Euros)

Source: NTT DoCoMo

# The Korean pattern: private firms under public rules

South Korea offers an even more direct approach to the wireless sector development than Japan. Investment in mobile telephony and the focus on the 3G success are two of the main axes of Korean industrial policy. This strategy was reinforced by the lessons learnt from the 1997-1998 crisis. Although collaboration between firms adopts the perimeter of the chaebols, the strategy itself is the result of a highly voluntarist policy. One sign of this voluntarism is the way 3G licences were granted to mobile operators.

# The leading role played by the government in the development of IT, especially the wireless industry

Like most of the region's economies, Korea had to face a severe downturn in the late 1990s. In this context, the Korean government concentrated its efforts on a selection of high-potential sectors, including the IT sector (both fixed and mobile). South Korea has a long history of public involvement in long-term development strategies for the economy of the country. As early as the 1960s, the adoption of an outward-looking strategy implying government industrial initiatives, the inflow of foreign capital and the control and support of the chaebols, enabled South Korea to achieve rapid growth in exports and subsequent increases in income. Ten years later, after having relied on low-value added and labor intensive products, South Korea put the emphasis on heavy and chemical industries by promoting investment in high value-added, capital-intensive industries. Up until the 1990s, Seoul administered a series of economic development plans. The government mobilized domestic capital by encouraging savings, determined what kinds of plants could be constructed with these funds and reviewed the potential of the products for export. In this sense, the will of the government to undertake economic development played a crucial role.

In this context, the telecommunications sector developed as a result of several factors: strong internal demand for telecommunications equipment as of the 1970s, foreign investment (mainly from Japan) in this sector and the strong development of the electronics sector, whose products enjoyed a significant price competitiveness compared to Japan and other Asian countries up until the 1990s. Thus the 5<sup>th</sup> and 6<sup>th</sup> economic plans (1982-1991) shifted the emphasis away from heavy and chemical industries to technology-intensive industries and information. More attention was devoted to building the high-technology products in greater demand on the world market. Like in Japan, the Korean market being largely closed to foreign competitors, national telecommunications players, both in the fixed and mobile communications, were able to develop their knowledge without any strong pressure on prices. In that time (1980s and early 1990s), Seoul began to focus its attention on small and medium-sized enterprises while raising the level of investments in research and development (from 2.4 percent of GNP to over 3 percent by 1991).

As of 1983, Seoul selected a number of the more promising smaller firms to receive special government assistance. These businesses were eligible for a number of tax breaks, help in securing financing, and consultations and technical education from the Ministry of Trade and Industry. Small businesses were central to the government's policy of producing more sophisticated technology locally. They were also critical to the government's strategy of encouraging regional development away from the overcrowded area around Seoul. In 1989 the government announced a plan to spend billions of won to help small and medium-sized industries seeking structural improvements so that they could move away from labor-intensive production towards technology-intensive production.

Today, the goal of the South Korean government, helped by the important financial resources of the chaebols, is to turn Korea into one of the leading exporters of high-value technology-based products (mainly to the USA, Japan, China, Hong Kong and Singapore). In this perspective, Korean wireless companies are in the frontline of the government's strategy. Thus, Korean Mobile Vision Plan 2005 aimed at targets of USD 15 billion in mobile technology exports in 2002 and USD 35 billion by 2005.

In the mobile telecommunications sector, the government rapidly decided that Korea had to be a leading country in defining worldwide telecommunication standards. The country then signed an agreement with U.S. manufacturer Qualcomm to jointly develop the cdma standard. Having paid a large amount of money to Qualcomm in licensing rights to acquire the cdma technology knowledge, Korean manufacturers are now the producers of 50% of the cdma handsets sold worldwide, which has made two of their main national vendors (Samsung and LG Electronics) worldwide players. However, the country is also one of the first global players to export GSM handsets and its market share in global handset production has leapt from 6% in 2000 to 10% in 2001.

Pursuing its strategic vision for the wireless development of the Korean market, the Government also obliged the three mobile operators to adopt a common application platform for mobile services (the WIPI platform, developed by a network of firms and public laboratories). Indeed, up to now, mobile operators had distinct, non-interoperable platforms (SK-VM for SKT, BREW for KTF and JAVA for LG). This standardization aims at setting more balanced relationships between operators and solution providers, which will not be tied by technological constraints to one specific operator anymore and will instead be able to develop new products for the three players.

### A pragmatic regulatory framework for industrial policy

As a result of the entrance of Korea in the OECD in 1996 and the financial crisis of 1997, the market was liberalized. The leader in this market since 1984 has been SK Telecom (SKT), a subsidiary of the fixed incumbent Korea Telecom, which has had to face competition from late comers Korea Telecom Freetel (KTF), LG Telecom (LGT), and Hansol M.Com (HMC) since 1997. Foreign investors in wireless telephony are allowed to own up to 49% of a firm's shares.

Having started its true take off three years later than Japan (1997 versus 1994), the Korean mobile market has reached a penetration rate of 68% (33 million users at end 2002) inside 5 years, which ranks as one of the highest

rates in OECD countries. The take off has thus been as fast as in Korea as it was in Japan and the market is now slowly reaching saturation point.

South Korea was the first country to launch 2.5G services based on the CDMA 1x standard in October 2001. After a beauty contest, the government granted three 3G licenses: 2 for the w-cdma norm and 1 license for cdma 2000. The two w-cdma licenses were granted for EUR 1.1 billion each, whereas the cdma 2000 license was granted for EUR 970 million. The fact that two different technical norms coexist for the 3G licenses reflect the government's desire to keep national firms ready for market developments with both European and Asian countries having chosen wcdma technology (as a continuation of GSM) and the United States opting for cdma technology. It also indicates the government's concern over Korea's ability to innovate in both technologies. However, to compensate for the potential difficulties encountered by the last entrant, which is the only player to hold a cdma 2000 license, the government granted the operator some advantages in the fixed telephony market. Before granting the licenses, the government also contemplated the advantages and the difficulties that will be encountered by each of the three mobile operators and was ready to encourage initiatives aimed at making the 3G roll out more efficient and rapid in the territory (as an example, the government recommended site and network sharing to avoid over duplicate investment). Lastly, the government managed to make the spectrum allocation compatible with Japanese allocation for frequency coordination.

In parallel with the macroeconomic policy of the Korean government, a pragmatic policy has also been set up more particularly in the telecommunications sector, at a regulatory level. Thus, in mobile telecommunications, the government has pursued a harmonized spectrum management policy since the 1990s consisting of planning efficient use of radio frequency by reallocating frequencies for bandwidths with little demand and introducing state-of-the-art technologies to minimize required bandwidth with high demand. The government's policy concerning mobile telecommunications is mainly dictated by economic objectives (SEUG-HOON, JUN-SANG & TAI-YOO, 2001). As a result, at the end of the 1990s the Ministry of Information and Communication began discussions to introduce market principles into frequency allocation, making more frequencies available for use without licensing or approval restrictions in order to stimulate technology development based on creative and innovative ideas.

In a move designed to address any imbalances in current usage following the capacities of radio frequency bandwidth and their respective usage, the ministry introduced reallocation systems of any frequencies not frequently used in 2001 and announced plans to introduce a new regulatory framework for limiting the ownership of radio frequencies.

Aware of SKT's dominant position in the mobile market, which could last a long time, the government is regulating the prices charged for the incumbent operator's services in order to support the principles of effective competition and also applies the principle of number portability, making it easier for en users to switch from one operator to another. To encourage competition and minimize structural differences between the three mobile operators, the government has also set up standardized numbering for any mobile call: by 2008, users will have to dial 10 as a prefix for any mobile call and will thus be unable to know via which network they are calling.



Market shares of the 3 mobile operators for 2G and 2.5 G services at the end of 2002

Source: Korean Information Strategy Development Institute

However, there are still institutional barriers for new carriers to entry and for users to change their carriers (for example, there are no SIM cards in the handsets). Thus, as for European countries, difficulties and the risk of market monopolization by the incumbent still exist in this field. Explanations for 3G success therefore do not lie directly in the existence of a strong competitive environment and pressure on prices.

### Chaebols search for new growth engines in mobile telephony

In 1991, technological cooperation between firms (large conglomerates and SMEs), universities and research institutes in South Korea accounted for 16.3% of all technological developments of SMEs, 29.7% in 1993 and

was expected to amount to 60% in the late 1990s (JIN-WOO, ZONG-TAE & JI SOO, 2001). The purposes of such a collaboration were as follows: to assure stable market conditions thanks to the protection and incentives of the government, to lower environmental uncertainties and to facilitate the development of new products under resource constraints (KIM, 1980).

Tremendously impacted by government policy, the corporate sector (large firms as well as SMEs) reacted positively to these incentives. From the mid-1980s, the government has provided policy funding for SMEs through mechanisms of joint development with public research institutes (JIN-WOO, ZONG-TAE & JI SOO, 2001). These institutes selected promising telecommunication components or devices as items for joint development. This triggered the development of radical new products while shortening time for innovation and sharing cost and risk. Relationships and collaboration between industries and universities or industries and research institutes have played a critical role in these firms' technological performances.

Benefiting from a high level of technology knowledge shared between the various firms in the sector, national manufacturers are often the first in the world to launch new products (as was the case for colour handsets). In this context, although royalty payments paid by Korean companies to Qualcomm for cdma technology now amount to hundreds of millions of dollars each year, national companies cash in some of their own intellectual property rights as well. Korea consequently owns 55 technologies that are included in the MPEG standards.

The three mobile operators themselves are extensions of the activity of conglomerates. In 2000, the mobile market was restructured through several mergers: the mobile subsidiary of the fixed incumbent operator, SKT, merged with Shinsegi Telecom, whereas the second mobile operator, KTF, resulting from the merger between KT Freetel and Hansol, is 42% owned by the fixed operator KT. The new entrant LG Com has not benefited from a merger and is the smallest of the three operators, but is 35% owned by the electronics company LG Electronics.

Pushed by the threat of network saturation (particularly in big conurbations), mobile operators are aggressively building their 3G networks and work mainly with national manufacturers. Thus, for their 3G networks, KT elected LG Electronics, whereas SKT opted for Samsung. In September 2002, the market share of national manufacturers for networks and terminals reached 90%. Moreover, up to recently (2002) and like Japan, mobile

operators have not, unlike European operators, sought to move rapidly into foreign markets. Consequently, they do not have the same financial constraints as their European counterparts which entered, as early as the end of the 1990s, a race for shares in foreign markets, and were able to develop 2,5G then 3G networks sooner than European operators as a result. Korean operators consequently rolled out the first 2,5G networks in the world as early as 2001 (cdma 1x (144 kbps) then cdma EV DO (2,4 Mbps) in 2002 (even before Japan). Offering rich and well-marketed data services, progressively increasing the capacity of their networks and having introduced colour handsets very early, thanks to a tight cooperation with manufacturers, mobile operators were thus able to increase their ARPU ( by 25% between 2001 and 2002) while mobile operators in the rest of the world registered significant falls in their ARPU.



Evolution of SKT's ARPU in line with technology innovations (network and handsets) in Euros

Source: Korean Information Strategy Development Institute

Despite their acquisition of a w-cdma license in December 2000, both KK and KT are focusing their efforts on the cdma2000 standard and numerous sectors of the economy are collaborating with the wireless operators to offer successful applications to the end user based on both technologies: mobile solutions for sales force automation are used by the real estate sector, LG Telecom has tested a mobile credit card system in partnership with Kookmin credit card and an infrared telecommunications startup. SK Telecom has launched an m-payment service in alliance with a conglomerate of banks and Samsung credit card. Daewoo Motor is developing in-car telematic services with mobile operators, as well as its rival Hyundai Motor, in partnership with LG Telecom. etc.

# Are Japanese and Korean patterns idiosyncratic?

Japan and Korea offer a unique example of a development process aiming at inserting their economy into the 3G technology market, with unexpected success given their previous 2G experience. It turns out that this internal dynamics relies on the traditional "attributes" of two economic models that nevertheless went through a crisis. These attributes are, for the most part:

• Internalised coordination between groups related to each other by some kind of solidarity rather than by business contracts. Even if this type of internalisation does not strictly adopts the form of keiretsu and chaebols, it recalls the philosophy of these traditional organisations.

• An accomodating (Japan) or managerial (Korea) public policy to channel the investment efforts of firms into the 3G sector. Furthermore, a protected domestic market allows the firms to keep the positive impacts of their efforts within national boundaries while being protected from outside competition.

Today, Japanese and with an even higher dynamism, Korean telecommunications firms, focus on foreign markets and form new consortia to strengthen this strategy. As an example, LG Electronics and SKT have formed a consortium to create a "cdma belt" in Asia and have already won mobile licenses in Vietnam and Cambodia. Korean manufacturer Samsung is already strongly present in China with cdma handsets. Indeed, it must be underlined that having put the wireless sector at the forefront of their domestic economies, the drawback of this five-year long strategy is now for Japan and to an even greater degree Korea, a strong dependence on the dynamism of foreign countries to sustain their growth.

All in all, these strategies - typical of the way the two national economies were historically developed - turn out to be perfectly adapted to sharing the risks linked to 3G potentialities and to the emergence of new mobile services.

This highlights a fundamental difference between the two countries and Europe, where the conditions for collective risk sharing were determined in a chaotic manner, *ex post* rather than *ex ante* as was the case in Japan and Korea. The way spectrum frequencies were allocated in Europe has contributed to increasing the level of risk taken over by operators (except in some countries like Spain or Sweden), while players in the whole mobile sector understood this government strategy as a sign that all the risks had to be taken by the private sector. This was indeed the case since shareholders in the European operators and manufacturers were the main players to suffer from the destruction of value in the sector. However, given the major importance of these risks, European governments finally had to intervene *ex post* by redefining the conditions of spectrum use and network roll out for example, or more directly, by financially supporting operators (Deutsche Telekom, France Telecom).

Moreover, one has to consider the fact that the "mobile space" in Europe is not suited for in vitro experiments similar to those conducted in Asia. Consequently, no true forms of collaboration emerged in the mobile communications sector in Europe. We can identify attempts at close cooperation between ICT firms in some countries currently leading the European mobile communications market in terms of innovation and services (Scandinavian countries). However, even in these countries, interfirm relations are more based on a hierarchical functioning centred around major traditional enterprises that are historically highly profitable, whose cultural viewpoint dominates and is imposed upon the smaller firms collaborating with them. Indeed, larger firms bet on incompatible networks and services as a source of differentiation (ANDERSEN & FJELDSTAD, 2003). In this context of fierce competition between telecommunications operators based on differentiation and restricted collaboration between firms, solution providers depend more on the mobile operators than vice versa (by contrast, DoCoMo is dependant on the content providers to offer ever richer and more sophisticated services for its demanding customers).

The European interfirm collaboration model lets each partner focus on its core competencies, without trying to understand the core competency of the others. As an example, in mobile data services, European traditional telecommunications companies tend to have a significant role in network and information services, but not in payment services. In contrast, NTT DoCoMo is highly vertically integrated and operates the network, provides voice, message, payment and merchant services over i-mode, thanks to the knowledge acquired through collaboration with a wide range of Japanese startups. Products and services bought over i-mode are charged to the customer's telephone bill; the process is simple and transparent for the end user.

European companies, during the major part of the 20<sup>th</sup> century, were regulated to operate inside well-defined and separated domains, such as national borders. Consequently, European managers in telecommunications industries today are often frustrated by the insufficiency of existing marketing and interfirm relation models (ANDERSEN & FJELDSTAD, 2003). Moreover, few countries in Europe gather in their national boundaries all the players able to provide the telecommunications operators with the whole range of components and competencies they need to offer innovative services. More often, these competencies must be sought in different parts of Europe or outside, meaning that players from different countries must cooperate. This makes the constitution of strategic communities such as that created by NTT DoCoMo even more difficult.

Lastly, if firms in the mobile sector in Japan and Korea can be seen as potential threats for European players, one may also consider that they produced "positive externalities" for the world mobile industry by transferring 3G from laboratories to markets. For the weakened operators and manufacturers in Europe, having the opportunity to benefit from the Asian experience is not an *optimum* if we consider the ambition of the late 1990s, which consisted of transferring European domination in the 2G market to 3G. However, given the circumstances, the situation can be seen as a precious *second best*.

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