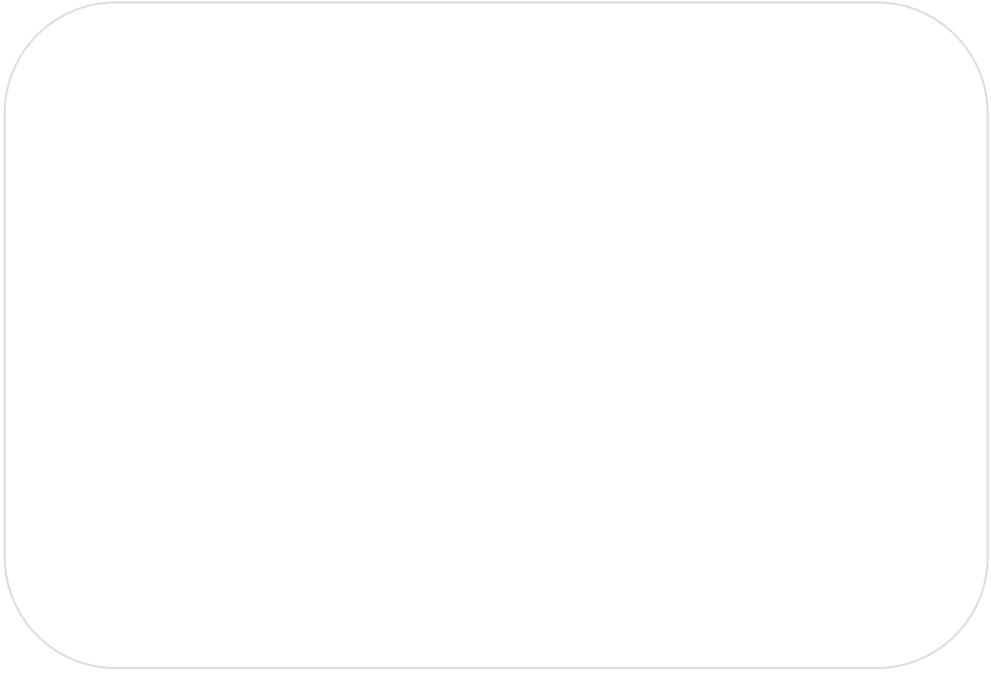




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**DIVERGENT PATHS OF MOBILE INNOVATION:
DEVELOPMENT OF MOBILE MUSIC BUSINESSES IN JAPAN AND KOREA***

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Abstract

This paper examines how mobile music businesses have been developed in Japan and Korea, two countries that have led the world in creating and developing the mobile music industry. We pay attention to the music copyright institution as a “reverse salient,” which we argue has played an important role to determine the direction and timing of mobile music innovation in the two countries.

Keywords: Mobile music; Internet music; Music copyright; Large technological system; Reverse salient; Japan; Korea

1. Introduction

The goal of this paper is to compare development process of the mobile music industry between Japan and Korea. This paper provides materials to examine how an industry develops, in particular in the field where technologies rapidly change. To build strategies to survive intensive competition, it is critical for managers to have better understanding on the mechanism of industrial development and changes. Good understanding of industrial development is also invaluable for policy makers to design

effective policies.

Although Japan and Korea have led the world in creating and developing the mobile music industry, they have taken interestingly divergent paths of development. Initially Japan took the lead in launching the mobile music business, which has become the largest Internet content service in the world. However, as technologies advance, the Korean mobile music industry has introduced new mobile businesses more rapidly. In 2003, the market size of the Korean mobile Internet music business exceeded that of the off-line music, a significant change in the music distribution. Although Japan continuously introduces new mobile music services, the pace has been slower than in Korea, and the mobile music business is still regarded as complementary to the existing off-line music business.

The empirical research question of this paper is what causes such different patterns of development between the two countries. As an analytical framework for the comparison, this paper takes the “Large Technological System” (LTS) perspective proposed by Hughes (1983, 1989). Especially, this paper perceives music copyright institutions as a *reverse salient* of a large technological system, and shows that different copyright institutions play a critical role in driving divergent industrial development paths in the two countries.

This paper is organized as follows. In Section 2, we briefly overview mobile music businesses in Japan and Korea. In Section 3, in order to understand how these businesses have been developed, we introduce the concept of a reverse salient in a large technological system (LTS) as an analytical perspective, and explain why we focus on copyright management institutions in the analysis that follows. In Section 4, we explain the characteristics and development process of the mobile music businesses in the two countries, with a primary focus upon music copyright institutions. Section 5 concludes this paper by providing some implications.

2. An Overview of Mobile Music Businesses in Japan and Korea¹

Regarding mobile telecommunication, Japan and Korea have been a frontrunner not only in service diffusion but also in technological advances. At the end of 2002 mobile communication subscribers reached 63% of the total population in

¹ For more detailed description of Japanese mobile music businesses and their development process, see Takeishi and Lee (2003).

Japan and 69% in Korea. Among the subscribers, those owning handsets with a mobile Internet function accounted for 93% in Japan and 90% in Korea. The mobile Internet services, embodied in the 2.5 G mobile communication system, were first launched in February 1999 in Japan and September 1999 in Korea, and have grown rapidly with E-mail and content services. The both countries then moved into the 3G mobile communication system — in October 2001 in Japan and June 2002 in Korea — with an expectation for further growth and development of mobile Internet businesses. Such rapid diffusion of mobile Internet infrastructure provided a technological platform to explore a variety of mobile businesses.

Among various mobile Internet content services, music related services have been the most important businesses in the two countries, commonly having driven the development of mobile Internet businesses as the largest market. So far, there have been five types of mobile music businesses available in Japan and Korea (Table 1).

In Japan, ringing melody and ringing song services have driven the growth of the mobile Internet businesses. Japan's ringing melody ("Chaku-Mero") service has commanded the largest sales in mobile Internet services. It was estimated that in 2002 the three carriers' total revenue from (that is, subscribers' total payment for) paid mobile Internet services was approximately 1.5 billion US dollars, and the revenue from Chaku-Mero sites was 800-900 million US dollars. It is a very rapid growth from zero within three years², building the world's largest Internet content market. More recently, KDDI's ringing song service (*Chaku-Uta*) has proved to be the first killer application in its 3G mobile service (CDMA 1X), creating 50 million US dollar market in 2003. In November 2004, KDDI also began to offer full-track music download service (*Chaku-Uta-Full*).

In Korea, as technologies in mobile communication advances, new mobile music services have been introduced rather quickly, from ringing melody, ringing song, and full-track music download to Ubiquitous-Music. The ringing melody service has been the most popular mobile content service, accounting for about a half of 230 million US dollars of total mobile content market in 2002. The ringing melody accounted for about 80 million US dollars and the ringing back song about 30 million

² For reference, Apple's iTunes Music Store, the most successful music downloading service on the PC Internet, sold for the first year about 70 million US dollars.

US dollars, together creating in total 110 million US dollar mobile music market³. The total size of the mobile music business increased from 118 million US dollars in 2002 to 254 million US dollars in 2003. A most notable feature of Korea is that the mobile Internet has occupied the central position in the music industry. As a distribution channel of music to consumers the mobile Internet surpassed off-line in sales volume in 2003. In Japan the sales volume of the mobile Internet music business is still much smaller than that of the off-line music (Table 2).

3. Analytical Framework: Large Technological System and Reverse Salient

How have these mobile music businesses been developed in the two countries? To deal with this question, this paper takes as the analytical framework the “Large Technological System” (LTS) perspective proposed by Hughes (1983, 1989). A large technological system is a collection of distinct but interrelated sub-systems. Each of the subsystems is designed to perform independent tasks but all are structured and coordinated so as to achieve a common goal (Hughes 1983). Examples of large technological systems include the air transportation, railroad network, electric power system, telecommunication network, and electronic commerce system. In advanced economies, large technological systems not only constitute a significant proportion of industrial output and fixed capital formation, but also serve as infrastructure upon which goods and services are produced and traded (Hobday 1998).

A feature of the LTS perspective is that it brings complex interconnections and interactions among heterogeneous sub-systems into a unit of analysis. It broadly encompasses not only technological sub-systems and components such as various technological products and services, but also organizational actors (firms, public research organizations) and social institutions (laws, government policies, and regulations).

Usually, the sub-systems of LTS are interrelated in a stable manner with each performing its own distinct functions. However, when a subsystem changes because of

³ It should be noted that 80 million US dollar market of ringing melody service in Korea includes not only the service on mobile Internet but also the one with ARS (Automatic Response System). The Korean market of ringing melody service on mobile Internet was smaller than 80 million US dollars.

for example, technological innovation or environmental change, other components are required to be changed correspondingly. Dynamism of the large technological system is accompanied by differential growth rate of each component in relation to the others and to the system as a whole.

Given complex interdependence, the concept of reverse salient becomes a key to understand how a large technological system develops and evolves (Hughes 1983, 1989). A reverse salient refers to a component in the system that has fallen behind or is out of phase with the others. In a sense, a reverse salient shares conceptual grounds with “bottleneck” presented by Rosenberg (1976), which refers to imbalance in an interdependent technological system. In this approach Rosenberg focused on a “technological” imbalance for the explanation of innovation process, especially delving into timing and direction of new technological innovations. Application of reverse salients, however, goes beyond technological components to include organizational and institutional components of the system. The way in which a reserve salient, or a lagging component and part, of the system adapts to the others could be a decisive factor for the direction and timing of large technological system development.

To analyze the developmental process of mobile music businesses in Japan and Korea, this paper draws on the LTS perspective. Consumers simply and mindlessly download their favorite music from content providers by way of the mobile Internet network. All these electronic transactions, however, are materialized only by complex but somehow coordinated operation of the large technological system behind.

A general picture of the technological system of mobile music service consists of the following sub-systems: mobile communication networks and carriers building and operating the network; mobile handsets and their manufacturers; mobile communication network systems and their manufacturers; music and their creators (artists and record companies); mobile music content files and their providers; music copyrights and institutions managing them; and public policies and regulations on mobile communication and government bodies that design and implement them.

Within these sub-systems, Figure 1 shows some of critical ones as illustration; technological components, which progress rapidly, such as music playing chip, handset memory, and communication network, and music copyright institution, to which we pay special attention in this paper as a reverse salient. We argue that copyright institution has been a critical factor causing national differences in the

development paths between Japan and Korea. When advanced music services such as ringing song and full-track music download require highly complicated copyright coordination, the traditional copyright institution may work as a reverse salient, pulling back further development of the mobile music businesses as a whole.

In Japan, the copyright institution has been strongly established and has smoothly promoted rapid development of the ringing melody business. However, as technological development brings new possibilities, rigidity of the institution has emerged as constraints in exploring new businesses.

Although the Korean copyright law was largely similar to the Japanese, there have been substantial differences in actual management. The Korean copyright institution has been weak and thus flexible to adapt to technological innovations, timely giving birth to new mobile music businesses. However, Korea's weak protection of copyright holders, in turn, causes continuous conflicts and confusion among copyright owners, contents providers, and users. Focusing on the copyright institution as a reverse salient, the following section analyzes diverging paths of industrial development in Japan and Korea.

4. Comparison of Mobile Music Business Development in Japan and Korea

4-1. Ringing Melody Service

Ringing melody emerged as the first successful business in the early mobile music industry. The ringing melody service needs relatively simple copyright coordination as it involves only the copyright of composers. In Japan and Korea the composers' copyright are entrusted to a central institutional body, which takes care of charging and collecting the copyright fee on behalf of the composers. Content providers (CP) pay copyright fee and provide melody files according to different technological specifications of handsets and telecommunication networks. Although the relationship may change as the industry develops, close relationship between CPs and mobile carriers has been critical in expanding the whole market.

In Japan, Japanese Society for Rights of Authors, Composers, and Publishers

(JASRAC) centrally took care of the management of composers' copyright fee⁴. The specific copyright rule for ringing melody (or *Chaku-Mero*) was established through the negotiations between JASRAC and content providers, and related parties. For every download, 5 US cents per melody is charged for melodies shorter than 45 seconds, and 7.7 US cents for melodies longer than 45 seconds. Although a large number of illegal sites for free ringing melody sprung into existence in the beginning, vigorous monitoring by JASRAC eventually cooled down the undesirable movement and contributed to smooth development of the business.

Taking first movers' advantages in the new market, Karaoke companies became leading content providers. Companies in the Karaoke business accumulated a large number of digital music files, had know-how to create these files of popular music very quickly and effectively, and built close relationship with mobile carriers. As the market grows and the performance of music playing chips advances, the relationship between content providers and carriers became more open.

Like Japan, it has been principle that all copyright fees are to be collected by Korea Music Copyright Association (KOMCA) and to be redistributed to the copyright owners. Different from JASRAC, however, KOMCA did not have specific copyright rule for ringing melody (or *Bellsori*) and content providers are usually supposed to pay 6.5-8% of download service revenue on monthly basis. The copyright fees are not charged per individual melody downloaded, but a certain ratio of the aggregated revenue is paid to copyright owners. This rule gives mobile content providers in Korea flexibility in designing their music business model and pricing. As a result, both content providers and carriers have often provided free music services in promotional purposes. Only carriers have accurate information of how many and what ringing melodies were downloaded. They do not make the information open, causing some problems of limited transparency in copyright control and transactions. Less strict management of music copyrights has brought some disorder in the business and given some damage to the market growth

In the Korean ringing melody business, start-up companies specialized in mobile or ICT technologies became major content providers, taking first movers' advantages. Although content providers established open relationship with carriers,

⁴ After the enactment of the Laws on Management Business of Copyright and Neighboring Rights in October 2001, a number of commercial organizations have been permitted to enter the business of musical copyright administration. Before that, JASRAC had been a sole institution for musical copyright administration in Japan. Despite this change, JASRAC has still maintained its position as a dominant institution for music copyright management.

they closely cooperated in order to expand both mobile telecommunication and music content market together.

4-2 Music Download Services

As mobile communication technology advanced from the 2.5G to 3G systems, the data transmission capacity increased substantially. Similarly, the performance of music playing chip advanced and the size of memory to save music files on the handset increased significantly. These technologies together have made it possible to support the download service for original full-track music, not just melody. However, the transition is not so simple as it may look, not because of technological challenges but because of institutional challenges. Whereas the ringing melody service only uses melody, the ringing song and full-track music download services use original music, usually including sound of singing and instrumental performance. Thus, a full set of copyright fees should be paid to multiple parties such as composers, lyricists, singers, musicians, recording companies, and artist management offices. All these participants hold related copyrights, including 'copyright in sound recordings' or 'neighboring copyrights.' Copyright issues for mobile services to download musical songs are therefore much more complicated than for those to download simple musical melodies.

In Japan, as almost all copyrights of composers and lyricists are centrally and openly managed by JASRAC, content providers could freely enter into the ringing melody market by paying due copyright fee to JASRAC. However, the ringing song (or *Chaku-Uta*) and full-track music download service (or *Chaku-Uta-Full*) should pay copyright fee in sound recordings, which are often owned by a variety of claimers. Neighboring copyrights are individually managed by recording companies and/or artist management offices. Thus, the process to get permission from copyright owners becomes highly complex and burdensome for potential content providers, causing differences in the development process and emerged structure between the ringing song business and the ringing melody business.

A first distinguishing point of the Japanese ringing song business is that major recording companies could take full advantage of owning relevant copyrights in the market. In the ringing melody business, recording companies could not gain much

benefit from the lucrative market because copyright fees were paid only to composers. In the ringing song business, however, having necessary copyrights in sound recording at hand, 21 major Japanese record companies established a joint venture, "Label Mobile," and have commanded the leading position. Leading content providers for ringing melody could not enter the ringing song business as easily as previously, since they couldn't get permission from recording companies and other holders of neighboring copyrights. Recording companies have thus provided the ringing song service of the music under their control rather exclusively, capturing more than 80% of the ringing song market. They have successfully established the service to complement their mainstream business of off-line music and to gain compensation for the investment and risk they took for producing hit music. In the ringing melody business such benefits have been captured mostly by "outside" content providers.

It should be noted, however, that the exclusive use of copyrights have raised anti-trust concerns and Japan's Fair Trade Commission has been investigating the issues. In March 2005 FTC issued the recommendation to five major recording companies to permit copyrights to other parties for the ringing song service. Currently, recording companies take objection to the recommendation.

A second distinguishing point of the Japanese ringing song business is that many of popular song are not available for download in spite of strong potential demand. Different from Western countries, neighboring copyrights of popular songs are not always owned by record companies but by individual artists or artist management firms, some of which are not interested in the mobile music business. Therefore, sometimes customers are disappointed to find that they cannot download their favorite songs. While in the ringing melody service most of popular melodies are available with each melody provided by multiple providers, in the ringing song service a limited number of popular songs are available with each song provided by only one provider. A major cause of such differences can be explained not by technological limitation but by copyright management. The same point can be made for the full-track music download service (*Chaku-Uta Full*), which was introduced at the end of 2004 by KDDI. Currently the full-track music service covers about 10,000 songs, provided by six content providers.

In Korea, the copyright institution has long been weak: illegal uses are more widely diffused and the power of copyright holders is more limited. But it also implies that third parties could use music more flexibly and openly (non-exclusively) to take full advantage of technology and market exploration without much constraint of the copyright institution. As early as in November 2002, SKT launched both ringing song (or *Live Bell*) and full-track music download (or *MOD*) service simultaneously as a part of its 3G content services. Thanks to flexible copyright uses, major content providers in the ringing melody business swiftly moved into the new services, where multiple numbers of content providers severely competed with each other. Different from the Japanese case, the Korean mobile carriers did not allow recording companies to enter the market.

How did music copyholders in Korea cope with these rapid changes in the mobile music industry? Why couldn't the Korean recording companies control the process, as in the case of Japan? To answer these questions, we should expand our analysis to the music services on the fixed Internet because some experiences in the fixed Internet music business influenced the process, and recently the two worlds are being merged.

In Korea, PC-based VAN (Value Added Network) network first emerged in the early 1990s and Internet network spread since the mid 1990s. On these networks with growing capacity and speed of data transmission, a substantial number of illegal music files had been rapidly and widely shared among PC-based VAN users. In 1997, Korean VAN service providers not only began fight against illegal music file sharing but also started to offer legal download service on a limited scale. It was in 1999 that recording companies first launched their own music download service, without much success though, in order to cope with online music demand.

During those days, there emerged consensus among recording companies and related IT firms that technological innovations would be unstoppable and more open copyright usage would be desirable to explore music businesses in the Internet environment. This consensus laid the institutional basis to establish public copyright management organization like KAPP, a new institution to cope with emerging music copyright issues. The Korean Association of Phonogram Producers (KAPP) was established in 2001 as a world-first public organization, officially recognized by the

Korean government, to take care of neighboring copyrights. Similarly, the *Manine Media* and *Einsdigital* were established as private copyright publishers jointly by major record companies and music distributors. These institutions have played an important role to have music copyrights used more openly by multiple parties.

Decline of the Korean off-line music market caused by illegal files shared on the fixed Internet also contributed to the development of new mobile music businesses. Since 2000, peer-to-peer file sharing community of *Soribada* has caused substantial damage to the existing music industry. Furthermore free music streaming services like *Bugsmusic* brought destructive impacts to the music industry, another distinctive feature of Korea. Destructive impacts of illegal download and improper services were so prominent that the market of traditional record music in Korea decreased from 373 million US dollars in 2001 to 270 million US dollars in 2003 (it was 4 billion US dollars in Japan in 2003) (Refer to Table 2). Given this situation, the mobile Internet seemed safer and more secure business venue than the fixed Internet. For recording companies the mobile music businesses appeared as new hope to regain some revenues⁵.

Finally, the music industry itself was very small in Korea. Giant mobile carriers like SKT, as the owner of the mobile network, did not allow record companies to directly provide music download services, favoring technology-based content providers. Recording companies did not make successful collective actions to secure better bargaining positions. SKT could therefore launch the ringing song and full-track music download services provided by the third-party content providers without effective objection of music copyright owners when advanced music services became technologically feasible on the 3G network.

In the early 2004, the Korean music industry faced another turning point as major handset makers were about to launch MP3 phones. The MP3 phone is a mobile handset with MP3 player function inside to replay MP3 files downloaded by the handset from mobile carrier's official sites and by PCs from other Internet sites. The key copyright issue regarding MP3 phones was whether the phones should be

⁵ The recording companies in Japan did not experience such a crisis, but those in the U.S. faced the similar situation threatened by Napster. To counter Napster, the recording companies launched downloads services, without much success. They then allowed Apple, which was regarded as a small and trustable third-party music store, to start iTune Music Store, a first successful business of online music.

compatible to the existing MP3 files available on users' PC. It was estimated that more than 80 percent of MP3 files were illegally downloaded, and some people seriously concerned that the compatibility of MP3 phones with the existing MP3 files would destroy the future of both emerging mobile music businesses and fixed Internet music businesses.

Coordination was not easy. While MP3 handset manufacturers were inclined to produce fully compatible handsets to stimulate rapid diffusion, record companies reasonably opposed such a plan and demanded limited compatibility with existing illegal files by constraining re-playable time. Carriers stayed closer to record companies, calculating the future potentiality of the full-track music download market. Yet, LG Telecom, the smallest mobile carrier in Korea, wanted to sell fully compatible MP3 phones to attract more subscribers and gain market share.

The negotiations, mediated by government agency, failed to build any constraints upon MP3 phones in the late 2004 and all carriers allowed their users to enjoy full compatibility with the existing MP3 files. The result then pushed the introduction of new mobile music service to benefit further from technological potentials. SKT and LGT competitively launched the Ubiquitous-Music service at the end of the year. The U-Music service broke down the barrier between mobile and fixed Internet and the carriers emerged as new giant in the Korean music business.

In the U-Music service, the carriers themselves were engaged in the music service without relying on content providers. Because, unlike the ringing melody service, the full-track music service does not need any cumbersome rearrangement of music files to be optimized for different handsets and carriers, the carriers rather easily enter the service. Launching the U-Music service of *Mellon* in November 2004, SKT established inside music license system, which saved music files directly provided from copyright owners. Fully leveraging its bargaining position as the leading carrier, SKT unilaterally decided the service prices without involving copyright owners. In contrast, LGT had made long coordination with copyright owners so that it could provide free service as a promotion to attract more mobile subscribers. LGT launched *Music-On* service, which allowed mobile users to enjoy free music service during the initial six months. For the free service, LGT paid due copyright fee to copyright holders on behalf of the music subscribers.

The Korean copyright institution has been relatively weak in protecting copyright owners, causing conflicts and instability. However, it has been flexible enough to allow others to explore new mobile businesses in accordance with technological progress. Limited control by copyright holders has spurred new technological innovations in mobile handsets, data transmission networks, and data compression technologies. Now, mobile carriers emerge as an influential player in the music industry. The fact that the mobile music business outgrew the offline music business in 2003 symbolizes radical changes in the Korean music industry.

5. Conclusion and Implications

Although both Japan and Korea have been a frontrunner in creating and developing the mobile music industry in the world, they have taken divergent paths of development so far. In Japan, during the early period, the well-established copyright institution successfully helped smooth launch and subsequent growth of the ringing melody business, where multiple content providers competed intensively for better and cheap services. However, the rigidity of copyright institution manifested itself when technologies advanced to realize the ringing song and full-track music download services. Difficulty of coordinating copyrights in sound recording, which are owned by recording companies and some other parties, began to somehow constrain and slowdown the process of exploring new mobile music services.

In contrast, music copyrights in Korea have not been strictly protected. This nature, however, has given some flexibility to mobile carriers and technology-based content providers to take the leadership in introducing new mobile music businesses to catch up with rapid progress of technologies. The size of the mobile music business market exceeded that of the off-line music. Rapid introduction of new businesses may then promote more technological innovations. Yet, at the same time, we should be aware that conflicts and confusion in the copyright management still remain in Korea and the copyright institution should be restructured in such way that it should properly compensate music creators in order to guarantee the long-term viability of the music industry.

Our description in the previous section shows that the music copyright

institution has played the role of reverse salient in the large technology system of mobile music business. On the surface, the two countries have the similar written copyright laws. However, there exist some differences not only in the operation of the institution but also in the power structure among relevant players. In Japan, recording companies and other copyright owners have strongly upheld the existing copyright institution often by making collective actions. In Korea, copyright owners have been weak and powerful technology-related firms like mobile carriers and handset manufacturers have led the industrial development. These differences have caused the two countries to take divergent development paths in the mobile music industry.

Mobile music business keeps changing and new music business models like *iTune Music Store* in the U.S. will keep emerging. Technological innovations in mobile Internet will continuously initiate further changes of the mobile music industry. Copyright institution is one of the critical factors that would influence the direction and timing of further development.

Success of a potential technological change often depends on institutional changes. Vested interests of the incumbent players would naturally lead to strong resistance with full use of institutional measures (Mokyr, 1992). Nevertheless, new technological innovations keep emerging and pressuring for due changes in the existing institution. Slack music copyright management could endanger creative activities. Rigid copyright management constrains the exploration of new music businesses. To overcome the trade-off between protecting musical arts and realizing new businesses, we need heterogeneous engineering that creatively combines business strategies, technological innovations, and institutional changes. Both Japan and Korea are still in search of such creative solutions.

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Table 1**Mobile music businesses available in Japan and Korea**

Type	Business Structure	Name& Time	
		Japan	Korea
Ringing Melody	Ringing melody is a short melody used for mobile handset's ringing tone. The service has advanced in accordance with the capacity of music processing chip from simple 1-3 chords through 16-40 chords to the current 64 chords of CD's quality. Ringing melody service was first launched in Japan on NTT DoCoMo's i-mode system.	<i>Chakumero</i> 1999/12	<i>Bellsori</i> Summer of 2000
Ringing Back Song	Ring back song service is a service in which a phone call receiver selects and pays for the music to be played for callers. Instead of traditional mechanical ringing sound, callers could listen to about 15-seconds of popular music or humorous voices repeatedly while he/she is waiting for receiver's answering. It was first developed in Korea and in Japan NTT DoCoMo introduced the similar service.	<i>Melody Call</i> 2003/9	<i>Coloring</i> 2002/3
Ringing Song	This is a service in which a subscriber downloads a portion of music, rather than melody, for ringing tone. This service became available on the 3G system only with the introduction of mobile music processing chips that achieve high sound quality closer to CDs. A service for downloading a part of music was launched by KDDI in Japan and by SKT in Korea	<i>Chaku-Uta</i> 2002/12	<i>Live Bell</i> 2002/11
Full-track Music Download	Full-track music downloads service become technologically feasible only with introduction of 3G mobile telecommunication system. It offers original music to mobile users and the users use it as entertainment rather than ringing tone. In Korea a full-track music download service was launched by SKT, offering both MOD and VOD (Video-On-Demand) functions. In Japan, it was introduced as an advanced version of Chaku-Uta service by KDDI.	<i>Chaku-Uta - Full</i> 2004/11	<i>Music-On-Demand</i> 2002/11
Ubiquitous Music	Ubiquitous-Music (U-Music) is a packaged music service blurring the boundary between mobile and fixed Internet with the use of MP3Phone. Paying monthly fee of 5 dollar, the U-music subscribers can download MP3 files through either mobile or fixed (PC) Internet and they can replay them in various devices including MP3Phone, PC, and MP3 player. Furthermore, the users can enjoy the music in the form of streaming music through mobile handset or PC without downloading the large MP3 files. They were introduced by SKT and LGT at the end of 2004.	Not Available	2004/11

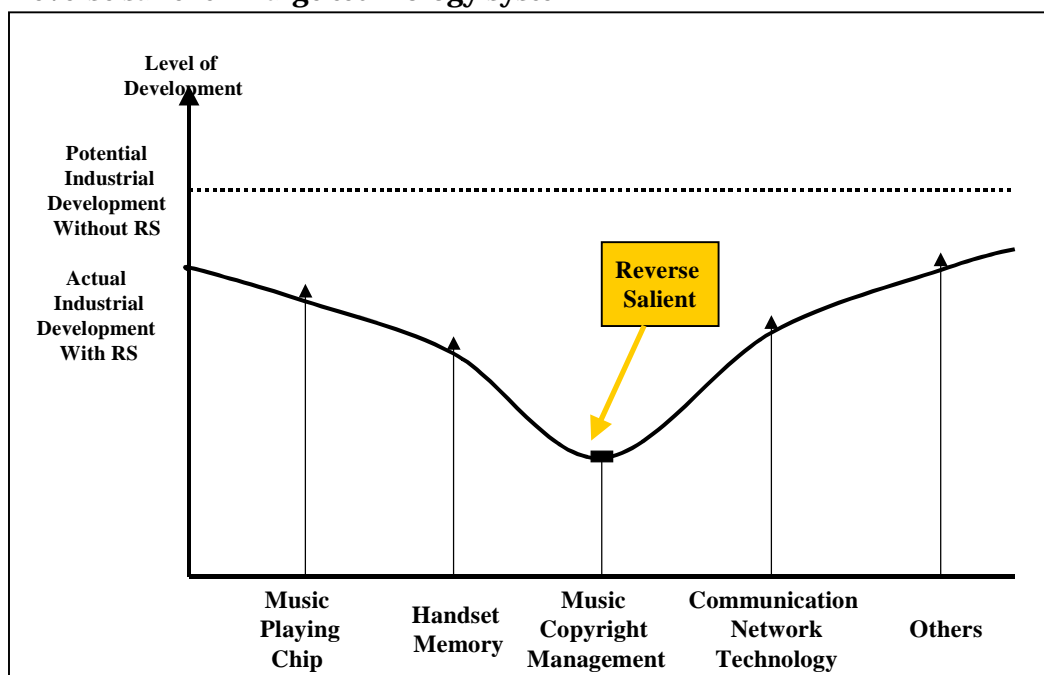
Table 2

Market size of the music industry in Japan and Korea (unit: million U.S. dollars)

Country		2000	2001	2002	2003
Japan	Offline	6,174	5,934	5,446	5,113
	Fixed Internet	351	375	393	422
	Mobile Internet	134	503	852	1,085
	Total	6,659	6,812	6,691	6,620
Korea	Offline	410	373	286	183
	Fixed Internet	14	28	5	8
	Mobile Internet	-	70	118	254
	Total	424	471	409	445

Figure 1

Reverse salient in large technology system



Appendix

History of the mobile music industry in Japan and Korea

Year	Japan	Korea
1998	Feb.: 2.5 G mobile telecommunication	Aug.: 2.5 G mobile telecommunication Dec.: Yaho's ringing melody service in ARS network.
1999	Dec.: Ringing melody service by NTT's DoCoMo	
2000		Aug.: Ringing melody service by mobile Internet
2001	Oct.: 3G mobile telecommunication by NTT	
2002	Dec.: Ringing song service by KDDI	Mar.: Ringing back song by Witcom Jul.: 3G mobile telecommunication by SKT Nov.: Ringing song and full-track music download service by SKT
2003	Sep.: Ringing back song by NTT	
2004	Aug.: FTC investigation on Labelmobile Nov.: Full-track music download service by KDDI	Mar.: Launch of MP3 phones Nov.: U-Music (<i>Mellon</i>) Service by SKT
2005	Mar.: FTC's recommendation to five recording companies for open uses of ringing song copyright	