Full-scale Activation of
'Mobile Smart Life Service' based on NFC

o "Grand NFC Korea Alliance" organized with mobile telecom companies, credit card companies and manufacturers

o Promoting the construction of common infrastructure for 'Mobile Smart Life Service' based on NFC

o Pilot application services based on NFC such as mobile payment, ticketing, tourist information, authentication of personal information, and construction of a test bed

o Expected to generate KRW1,034 billion in productions, KRW347.5 billion in added values, and 5,707 jobs for the next 5 years.

On March 29, 2011, Korea Communications Commission announced the Mobile Smart Life Activation Plan based on NFC which is emerging as a new growth engine to prepare in earnest for mobile payment and various application services using NFC.

※ This plan will be carried out as part of the implementation plan for "Smart Mobile Korea Vision 2010 (Apr. 2010)."

< Concept of and Outlook for NFC >

NFC (Near Field Communication) refers to the technology that enables bi-directional data communication within about 10 cm

between two smart terminals. The NFC-related market is predicted to account for a third (US$370 billion) of the global mobile payments which is estimated to have the market value of $1,130 billion in 2014 (IE Market Research, July 2010), and it is predicted that NFC function will be implemented in at least 85% of all mobile phones in 2015 (H.I. Business Partners, February 2011).

These 'Mobile Smart Life Services' based on NFC are expected to develop the mobile services on terminal screens to on- and off-line living convenience services through the use of various authentication/information reader functions such as mobile payment, physical access control and management, customized smart payment that helps the best choice among the coupons and cards of the user, various ticketing services assisted with information, tourist information.

< Main Contents of the Plan >

Mobile payment has been promoted since early 2000s, but it was not activated due to lack of standardization and duplicate investments as a result of the conflict of the interests among mobile telecom companies and credit card companies who wanted to take the hegemony of the mobile payment market.

Recently global companies such as Apple and Google are directing all their energy to various NFC-based services as the next core business after smart phone. In Korea, however, the infrastructure and promotion system for NFC are still inadequate

and these plans were prepared to systematically promote NFC.

Korea Communications Commission set up the vision of 'A **leading nation in the smart mobile near field communication (NFC) services,'** and presented 9 core projects in three areas: ▶ Construction of the infrastructure for new mobile smart life services, ▶Discovery and Propagation of Mobile Smart Life application services, and ▶ Leadership in the next-generation mobile payment and application services market.

▶ (Construction of the infrastructure for new Mobile Smart Life services) ① **Grand NFC Korea Alliance,** an NFC consultative body to carry out the construction of smart mobile payment service infrastructure, the discovery of application service models, and technical support, will be organized and operated to spread the common infrastructure for smart mobile payment to the entire nation. The members of this Alliance include three mobile telecom companies (SKT, KT, LG U+), credit card companies (Hana SK Card, BC Card, Shinhan Card, Master Card, KB Kookmin Card), manufacturers (Samsung Electronics, LG Electronics, Pantech, UbiVelox, KEBT, MtekVision, 3A Logics), telecom billing service providers (Danal, Mobilians, KCP, Galaxia), and related organizations (KISA, ETRI, TTA, MOIBA, Korea Internet Companies Association, etc.). As this Alliance is open, any interested companies can participate in it. ② To accelerate the propagation of terminals equipped with NFC, KCC will recommend manufacturers to add NFC function to newly released terminals. They also plan to prepare guidelines to the implementation of NFC to existing terminals through various methods such as stickers,

mobile phone rings, and battery cases. ③ KCC will develop standards for various application services based on NFC in connection with pilot projects.

▶ (Discovery and Propagation of Mobile Smart Life application services) The Mobile Smart Life application services will be carried out largely in three areas. ④ First, to build the basis for electronic payment services between using mobile terminals (payment between smart phones, coupon transfer, etc.), KCC will promote pilot services for small merchants through the development of an NFC-based payment service model between mobile terminals. ⑤ KCC will also develop various application service models through user authentication based on NFC such as ticketing, door lock opening/closing, user authentication, and coupons. ⑥ KCC will discover various information offerings (ticket reservations and tourist information through NFC tags for movies, museums, and articles) and customized advertisement application services through the use of readers that can read tag information from NFC terminals and the combination with location-based services.

▶ (Leadership in the next-generation mobile payment and application services market) ⑦ KCC will promote the development of security technology for safe mobile payment services such as terminal platform technology to prevent the leakage of personal information and unauthorized access to data by theft or loss of mobile devices. ⑧ KCC will also promote the development NFC-based Smart Wallet technology to safely manage various

payment information, ID information, and authentication information in smart phones, ensure privacy protection and provide personalized services. Furthermore,⑨ KCC will build a test bed for pre-tests of the compatibility and service performance of SMEs' NFC payment machines and terminals before they advance to the global market.

< Expected Effects >

It is expected that NFC-based services will generate KRW1,034 billion in productions, KRW347.5 billion in added values, and 5,707 jobs for the next 5 years. <Mar. 2011, ETRI>

We anticipate that various application services that have been implemented separately on- and off-line will be integrated into mobile phones, which will enable new business models and actual life services combined with various industries such as transportation, credit card, and distribution. This way, mobile services will evolve into smart life services. Furthermore, this will enable domestic telecom and financial companies, terminal and chipset manufacturers to acquire global competitive advantages through preoccupation of the new service and equipment markets.

A KCC official said, "The NFC-based Mobile Smart Life services market is still in its infancy. Thus, if our service providers can make the best use of their technical competitiveness and accumulate application service experiences, they will certainly stand out in the global market."

< Future Schedule >

KCC plans to set up four departments in the Grand NFC Korea Alliance, including Infrastructure Propagation, Pilot Business, Technical Development and Application Service Standardization and to prepare detailed action plans within the first half of this year. Furthermore, KCC will continuously consult with Financial Services Commission and Korean Agency for Technology and Standards to successfully carry out these projects.

< Attachments >

1. NFC-based Mobile Smart Life Services Activation Plan (Summary)
2. NFC-based Mobile Smart Life Services Overview
3. NFC-related Market Forecast
4. Current Status of Major Service Providers
5. NFC-based Application Services Cases (Examples) The End.

< **Attachment 1** >

NFC-based

Mobile Smart Life Services Activation Plan (Summary)

March 2011

KOREA COMMUNICATIONS COMMISSION

Ⅰ. **Background**

☐ Mobile services are evolving to 'convenient living' services based on smart phones from the voice call and data communication services (SMS, e-mail, Web surfing, etc.) in the past.

o NFC-based mobile payment has been promoted since early 2000s but did not become activated owing to lack of standardization and duplicate investments resulting from conflict of interest between service providers.

- With the propagation of smart phones, the advent of bi-directional electronic payment technology, and global companies' strategy to preoccupy business payment market in recent years, the conditions for activation of mobile payment services have been formed.

o In particular, NFC-based mobile payment is recognized as the core of mobile business which can generate various application services such as personal information authentication and advertisement.

  ※ NFC (Near Field Communication) refers to the technology that enables bi-directional data communication within about 10 cm between two terminals such as smart phones.

☐ Global companies such as Apple and Google are directing all their energy to various NFC-based services as the next core business in the smart phone market. In Korea, however, the infrastructure and promotion system for NFC are still inadequate.

o Apple and Google are embedding NFC feature in smart phones, and they are expected to emerge as the key players in the new services market based on their existing infrastructure and customer base.

o On the other hand, the standards and services for smart mobile payment are still insufficient and the infrastructure has yet to be created. Thus, we need a powerful consultation body to promote this.

□ A general plan is needed to lead the NFC-based mobile smart life service market.

    ※ This plan is part of the implementation plans for "Smart Mobile Korea Vision 2010" (April 2010).

o Drawing a lesson from our falling behind in smart phones, we need to preoccupy the new NFC-based Mobile Smart Life service market which is emerging as a new growth engine.

o Systematic support will be provided for the development of NFC standards, infrastructure, and application services based on partnerships among mobile telecom companies, credit card companies and other related companies.

Ⅱ. **Progress**

□ Status of Mobile Payment Services before NFC

◇ Failed to activate the market due to the competition between mobile telecom companies and credit card companies over the hegemony of the mobile payment market.

- System compatibility is lacking owing to the lack of NFC standards. Two or three mobile payment machines are installed per member shop as a result of competition between service providers. However, only a small portion of over 200,000 payment machines by mobile telecom companies are being actually used.

o April 2002: Three mobile telecom companies and some credit card companies joined in a discussion on irFM-type mobile card services.

　※ IrFM: Infrared Financial Messaging

o 2004~2005: Three mobile telecom companies discussed on the construction of a common mobile payment infrastructure, but it failed due to failure in standardization.

o May 2007: Mobile credit card services based on 3G USIM were launched (KT, SK Telecom), but it did not have international compatibility and the infrastructure propagation was insufficient.

□ Progress of NFC-based Mobile Services

◇ NFC was developed in 2002 by Sony and former Philips Semiconductor. Although it attracted worldwide interest, it failed to produce actual success stories.

- Recently, however, as it is expected that global players Apple and Google will introduce NFC payment, many countries are paying attention to NFC technology in a move to take the leadership in the related markets.

o Nov 2011: 'NFC Forum promoted international standards for NFC and test procedures.

　※ NFC Forum consists of over 60 mobile telecom companies and manufacturers across the world.

o Apr 2010: 'Smart Mobile Korea Vision 2010' was established (including NFC)

o Oct 2010: Consultation on NFC among service providers was promoted.

o Dec 200: An NFC-related expert task force was organized.

　※ Members included private, government and research experts from KCC, KISA, ETRI, TTA, and MOIBA.

o Jan 2011: Five companies related to mobile payment formed a consultation body and held a beginning-of-the-year business report meeting.

o Feb 2011: Opinions were collected from domestic NFC chipset and USIM manufacturers, mobile telecom companies, and academic circles.

Ⅲ. Major Policy Projects

| A | Construction of the Infrastructure for New Mobile Smart Life Services |

1. **Promotion of nationwide propagation of common infrastructure for smart mobile payment**

o **(Formation of a body to build a common infrastructure)** Form and operate Grand NFC Korea Alliance that will take general responsibility for the construction of smart mobile payment service infrastructure, development of service models, management and technical support.

o **(Development of infrastructure)** Propagate the smart mobile payment infrastructure to the entire nation by service providers to voluntarily join the NFC Alliance through the development of new business models.

 - Step 1 (Draft): Create a common fund for national propagation of the infrastructure with funding standards defined by the NFC Alliance with mobile telecom companies, card companies, VAN companies, and manufacturers.

   ※ AT&T, Verizone and T-Mobile in the USA established a mobile payment venture called 'ISIS' to promote the related business <WSJ, Nov. 2010>

 - Step 2 (Draft) Propagate mobile payment machines to the entire nation through the fund prepared by participating service providers under the leadership of NFC.

   ※ Commission profits will be distributed as per the percentage of payment machines in principle.

   ※ Latecomers can join after paying certain charges for using the infrastructure.

- Step 3 (Draft) Support the integrated reception and handling of civil complaints related to smart mobile payment and provide general consulting (guidelines and mediation of civil complaints) for relief of complaints and damages.

· Support for the maintenance, repair, and upgrade of computer systems in supermarkets, etc.

② **Construction of the infrastructure for the propagation of terminals equipped with NFC feature**

o **(Terminals to be released)** Prepare and recommend guidelines to wireless transmission (RF) such as NFC for domestic terminals to expand the infrastructure for NFC services.

o (Already released terminals) Propagate and advertise alternative technologies to provide mobile payment services to existing terminals.

③ **Development of standards for NFC-based Mobile Smart Life services**

o **(Propagation of international standards)** Recommend international standards with guaranteed interoperability to create various smart mobile application services.

※ Over 60 mobile telecom companies across the world have established the Wireless Access Interface and Protocol as international standards (ISO/IEC) in NFC Forum ('04.4), but standards for application services have not been established.

o **(Development of application service standards)** Acquire service competitiveness through the development of national standards for NFC-based Mobile Smart Life application services

o **(Establishment of Forum)** Establish a standardization team with mobile telecom companies and card companies to develop NFC-based application standards and analyze and cope with domestic and international technologies.

| B | Discovery and Propagation of Mobile Smart Life Application Services |

① **Formation of the infrastructure for using electronic payment services between mobile terminals**

o **(System improvement)** Promote the development of service models for NFC-based payment services between mobile terminals, the preparation of guidelines and the improvement of systems.

o **(Authentication system)** Prepare authentication system for NFC-based mobile payment to clearly determine the responsibility for card payment-related accidents.

o **(Pilot services)** Develop and propagate solutions for using electronic payment services between mobile terminals and promote pilot services for small merchants.

② **Discovery of application services related to personal information and authentication**

o Discover and promote on- and off-line integrated authentication based on NFC using personal information, personalized smart application service models and pilot services.

  - (Integrated authentication) Physical access control, PC log-in, and work environment personalization services using various means of authentication saved in smart terminals

※ Integrated processing of passport, boarding pass, and credit card at airports is possible with smart phone

- (Customer management) Various CRM (customer relationship management) services such as discounts through the optimum choice of coupons and credit cards of users

③ **Development of information offerings and advertisement-related application services**

o Discover various information offerings, customized advertisements, and application services combined with location-based services using the reader feature of NFC terminal, and promote pilot services.

- (Smart mobile guide) Provide ticket reservation and tourist information and personalized advertisements using NFC tags attached to movie posters, museums, and articles.

- (One-touch call) Call is automatically made when a smart phone touches picture frames, telephone books, or desk clocks

| C | Leadership in the Next-Generation Mobile Payment and Application Services Market |

① **Development of security technologies for safe mobile payment services**

o **(Terminal security platform)** Develop terminal security platform technology to prevent leakage of personal information by theft/loss of mobile devices and illegal access by unauthorized users.

o **(User protection technology)** Develop technology to protect smart phone users and mobile services from arbitrary operation by other users and from malignant traffic.

o **(Security platform software)** Develop security platform software technology to ensure the safety of smart mobile payment services.

② **Development of NFC-based Smart Wallet**

o **(Smart wallet)** Develop smart wallet technology for NFC-based payment and authentication.

　※ Smart wallet solution provides safety management and convenient use of credit cards, certificates, and personal information in smart phones.

　※ Google acquired the mobile payment company Zetawire, and Apple is embedding NFC in iPhone 5.

o **(Smart payment and integrated authentication)** Develop smart payment and integrated authentication technologies to attain competitive advantage of domestic technology in response to the growing NFC-based industries.

③ **Construction of a test bed for development of NFC-based application services**

o **(Test bed)** Construct and operate a test bed for the win-win partnerships of large, medium and small companies through the cooperation of the government, local governments and companies.

※ The construction of an environment in which small and medium companies can pre-test the compatibility and service performance of NFC payment machines and terminals.

Ⅳ. Implementation System and Future Plans

☐ Implementation System

o Organize and operate **Grand NFC Korea Alliance** for the construction of smart mobile payment service infrastructure, discovery of service models, management and technical support.

  ※ Expected Effects

  - It is expected that NFC-based services will generate KRW1,034 billion in productions, KRW347.5 billion in added values, and 5,707 jobs for the next 5 years (ETRI, March 2011)

  - Various on- and off-line application services that were implemented separately can be integrated into mobile services to realize smart life, acquire leadership in new equipment market and technology, and improve business.

☐ Future Plans

o March 2011: Announce a plan to activate NFC-based mobile payment and application services.

o First half of 2011: Organize an NFC task force to prepare implementation plans.

  - Cost sharing method regarding implementation systems and infrastructure construction, details of pilot services, etc.

o Second half of 2011: Construction of NFC infrastructure, etc.

< Attachment 2 >

NFC-based Mobile Smart Life Services Overview

o **(Outline)** '**NFC-based Mobile Smart Life Services'** enable easy, convenient exchange of information by just touching a mobile terminal to reading devices (payment machines) and are divided into ① mobile payment services and ② application services.

 - To implement 'NFC-based Mobile Smart Life Services,' we need ① USIM/SD of mobile phone, ② mobile terminal (chip), and ③ reading device (payment machine, tag).

o **(Smart mobile payment services)** It is expected that the convenience of payment function will be improved and various additional services will be created as credit card functions are integrated into smart phones.

 - As bi-directional communication is possible unlike the existing payment services, various additional payment services and high-level security are possible.

o **(Smart mobile application services)** It is anticipated that various high value added application services such as contact between mobile terminals, personal information authentication, information offering and advertisement will be expanded.

 - As detection range is short and the intent of users can be effectively conveyed in combination with networks based on user behavior, a wide variety of application services can be created.

 ※ Conventional infrared and RFID technologies can only provide simple unidirectional communication services between machines such as history tracking and logistics distribution.

※ NFC services collect the intent of users offline in real time which is linked to services, and through online searches which is linked to Internet services.

- Various application services such as contact between mobile terminals (information and business card exchanges, etc.), door lock opening and closing, information offerings (tourist information), and customized advertisements can be provided.

o (Ripple effects) NFC-based services can realize Mobile Smart Life by innovating not only the daily life of users but also their social, cultural and economic activities.

- NFC-based services are expected to greatly influence the mobile industry as they can be used as means for stimulating mobile marketing and advertisement.

- A large part of daily life and economic activities of people consist of the transfer of commodities and services. As they can be processed with just NFC-based smart phone, it will greatly improve user convenience and bring about big changes in the sales activities of companies.

< Attachment 3 >

Prospects for Future NFC-related Market

o **(Market)** Smart mobile payment services are expected to become the core of future financial and payment services across the world.

 - In particular, the NFC market is expected to account for a third (about US$370 billion) of the global mobile electronic payments which are valued at US$1,130 billion in 2014 (IE Market Research)

o **(Users)** It is predicted that the number of NFC-based mobile payments in the whole world will increase from 326 million in 2010 to 3,572 million in 2015 (Gartner)

o **(Terminals)** It is expected that NFC-based terminals across the world will begin commercialized around smart phones in 2011 and NFC will be embedded in 2.7 billion mobile phones or 85.9% of the global total mobile phones in 2015 (H.I. Business Partners)

o (Application services) Investments are being concentrated in infrastructure for smart mobile payment in the early stage of the market, but it is anticipated that investments will increase in various application areas.

 - It is expected that NFC technologies will be applied to various areas including authentication using personal information stored in NFC terminals, local marketing in connection with GPS, advertisement, and ticket reservations.

 ※ It is forecasted that at least 10% of mobile telecom subscribers in advanced countries will use mobile coupons and the mobile coupon sales will reach US$6 billion by 2014.

< Attachment 4 >

Current State of Major Service Providers

o Global companies such as Google and Apple have released or plan to release smart phones that can provide NFC-based payment and application services.

  - Google has embedded NFC in Android terminals (Gingerbread) (Dec. 2010)

  - Apple applied for many patents related to NFC since 2008 and is preparing to embed NFC.

o The three mobile telecom companies of the US, 'AT&T,' 'Verizone,' and 'T-Mobile USA' founded a mobile electronic payment joint venture called 'ISIS' and preparing for NFC-related business.

o Europe is encouraging the mounting of NFC in a half of all mobile phones released in 2011 to provide smart electronic payment services.

  - Orange, SFR, Bouygues, and the IT service provider Atos Origin in France recently established a new joint venture to conduct mobile electronic payment business.

o NTT Docomo in Japan has been providing mobile electronic payment service since July 2004 and China recently launched pilot mobile credit card services.

o Most major players related to terminal propagation are involved in the mobile electronic payment ecosystem, but not many application service players are participating in it.

Division	Service Provider	Notable Trends
Terminal Companies	Nokia	o Plans to embed an NFC chipset in all smart phone models from 2011.
	Samsung Electronics	o Released the first NFC mobile phone in 2010 in partnership with KT (Dec. 13).
	Google	o Embedded NFC in Gingerbread or Android version 2.3.
	Apple	o Recently submitted many patent applications for hardware and software technologies related to NFC. Expected to embed NFC from iPhone 5.
Mobile Telecom Companies	Verizone, AT&T, and T-Mobile in the U.S.	o Formed partnership with the credit card company Discover Financial and the British bank Barclay. - Will start pilot service from middle of the next year. - Plans to provide NFC services nationwide in 2012.
	T-Mobile, Vodafone, and KPN in Europe	o They are building NFC infrastructure to provide mobile payment service in the Netherlands by 2012 in partnership with the top three banks, Rabobank, ABN Amro and ING.
	SKT in Korea	o Collaborating with Softbank in Japan and KDDI to develop mobile payment and coupon services to which NFC has been applied.
	Orange in France	o They are providing NFC pilot services including transportation, payment, and tourist information through RFID tags using 'Player One Handset' supplied from Samsung Electronics.
	NTT Docomo in Japan	o They are changing payment method from Felica to NFC.
Others	NXP, Inside Contactless	o These two NFC chip manufacturers have released NFC-supporting Android development tool and are providing full support.
	Bank of America, U.S. Bancorp	o They are carrying out an NFC-based mobile payment project in partnership with the credit card company Visa.

※ Source: ATLAS (Dec. 2010)

< Attachment 5 >

NFC-based Application Services Cases (Examples)

Division		Service Type
Application Services for Contact between Mobile Terminals	Payment	Payment of prices
	Bank Transfer	Bank transfer through online account connections, etc.
	Business Card Exchange	Exchange of business card information such as telephone number and e-mail address
	Pairing	Wireless communication for data exchange between terminals
Application Services for Personal Information Management	Personal Authentication	Door lock opening/closing through authentication
		User authentication of electronic products such as notebook computers
	Access Control	Remote control of buildings and vehicles
Application Services for Information Offerings and Customized Advertisements	Tourist Information	Provision of museum and tourist information (voice/text) and location information
	Medical Care	Medical record management
	Parking	Confirmation of parking location
	Reservation	Performance ticketing through poster contact
		Ticketing for public transportation, etc.
	Advertisement/Coupons	Provision of location-based advertisements and coupons
	Product Information	Product information reading, judgment of real products, history tracking, manual provision, after-sales service information provision, etc.
	Contents Purchasing	Downloading of e-books, music and other contents
	Social Network	Transfer of information read from tags to the network

☐ Electronic payment services between mobile terminals

o Provision of payment service between smart phones to small merchants who have difficulty in purchasing card payment terminals and street sellers and general people who move a lot.

  - Card payment and cash deposit services are possible by contacting purchaser's smart phone with the smart phone of the merchant after purchasing goods from traditional markets and street sellers.

  - Merchants who depend on deliveries can receive payments through the smart phones of delivery men without having to possessing a mobile card payment machine.

  - When multiple people must pay in a restaurant, etc., they can contact their smart phones to the smart phone of the payer to contribute their share of the price.

☐ Smart Tourist Information Services

o Smart tourist information and map services through multi-language voice and text to domestic and international tourists

  - Domestic and international visitors to museums, historical sites and tourist attractions can contact their smart phone to get multi-language voice and text information.

  - In trade shows, museums, and tourist attractions, people can contact their phone to get map information including their location and route.

  - In large parking lots where it is difficult to find parking spaces, drivers can contact their phone to find a parking space.

□ **Smart Food Ordering and Delivery Services**

o When you contact your smart phone to a desired food on a menu with NFC tags, the order information is automatically sent to the restaurant and the food is delivered to you.

 - You can order food delivery without having to tell your address and the food that you want just by touching your smart phone to the menu.

 - Patients and elderly people who need health care can get customized food based on their individual health information.

 - Delivery information such as arrival time and delivery man can be provided.

□ **Smart CRM (Customer Relationship Management) Service**

o Users can receive coupons through a smart post and get discounts when using the coupons. Furthermore, these data can be collected and used for CRM.

□ **On-/off-line Integrated Authentication Service**

o Integrated authentication service allows users to use their on- and off-line authentication information for physical access control and PC log-in, as well as to personalize their work environment.

 - Authentication for entrance to buildings and attendance management

 - Only the permitted users can approach their smart phones to protected PCs to use them.

 - A work environment personalized to users can be provided through the user information stored in their smart phone.

 - Exchange of business cards/delegation through contact between smart phones

- Use of cafeteria and restaurant through non-contact payment with smart phones

□ **Unmanned issuance of boarding pass and smart shopping in airports**

o You can use your smart phone to automatically issue your boarding pass and add your mileage. Furthermore, smart purchasing service allows you to present your passport, boarding pass, and credit card through just one contact of your smart phone.

- Submission of passport, issuance of boarding pass, and addition of mileage just by one contact of smart phone

- Real-time baggage confirmation through baggage ID

- Smart payment in duty-free shops just by the contact of smart phone without presentation of credit card, passport, and boarding pass

- Coupons and tourist information can be provided through smart booklets and posters.