The Study on the Conversed Remediation between Old and New Media in Case of Smart Phone and PC in South Korea

Jinhwan Yu, Jooyeon Yook

Abstract—After Apple's first introduction its smart phone, iPhone in the end of 2009 in Korea, the number of Korean smarphone users had been rapidly increasing so that the half of Korean population became smart phone users as of February, 2012. Currently, smart phones are positioned as a major digital media with powerful influences in Korea. And, now, Koreans are leaning new information, enjoying games and communicating other people every time and everywhere. As smart phone devices' performances increased, the number of usable services became more while adequate GUI developments are required to implement various functions with smart phones. The strategy to provide similar experiences on smart phones through familiar features based on employment of existing media's functions mostly contributed to smart phones' popularization in connection with smart phone devices' iconic GUIs.

The spread of Smart phone increased mobile web accesses. Therefore, the attempts to implement PC's web in the smart phone's web are continuously made. The mobile web GUI provides familiar experiences to users through designs adequately utilizing the smart phone's GUIs. As the number of users familiarized to smart phones and mobile web GUIs, opposite to reversed remediation from many parts of PCs, PCs are starting to adapt smart phone GUIs.

This study defines this phenomenon as the reversed remediation, and reviews the reversed remediation cases of Smart phone GUI' characteristics of PCs. For this purpose, the established study issues are as under:

- what is the reversed remediation?
- what are the smart phone GUI's characteristics?
- what kind of interrelationship exist s between the smart phone and PC's web site?

It is meaningful in the forecast of the future GUI's change by understanding of characteristics in the paradigm changes of PC and smart phone's GUI designs. This also will be helpful to establish strategies for digital devices' development and design.

Keywords—Graphic User Interface, Remediation, Smart Phone, South Korea, Web Site

I. INTRODUCTION

A. Research Background and Purpose

TODAY, we are experiencing developments of technologies and the digital age and encountering the digital convergence with the new paradigm change. As the internet's introduction in 1990's, the smart phone's appearance in the end of 2000's provides a paradigm for another change. Using smart phones, people's life style is influenced on methods and formats of communications between individuals and an individual and a society.

Jinhwan Yu is graduate student at Hongik University, Seoul, South Korea and majoring in visual communication Design (phone: +82.10.9958.2989; e-mail: yujinhwan@gmail.com).

Jooyeon Yook is graduate student at Hongik University, Seoul, South Korea and majoring in visual communication Design (e-mail: 666666ju@gmail.com).

Especially, various application contents through the smart phone made the phone itself as an indispensable and important daily necessity in every consumer's life providing new experiences.

Due to the development of smart phone device, the service provided on PCs is becoming available. Through the developments of adequate interface for device characteristics, the smart phone's usability is improved. Many concepts from the existing media, PCs have been employed to the smart phone's interface development. And, in iPhone's case, the interface is designed to be easy even for new smart phone users through using already familiarized features such as Home button, Icon and mac OS's Dock. Despite the smart phone's interface's many feature adaptations from the PC, independent methods are also utilized. For example, to improve the small screen, home display is provided in many pages, or space is expanded by combining similar applications. The smart phone's main input device is the touch screen. And, due to the different input environment and the small screen, a GUI considering the icon size, input and control methods for information is required. Unlike the smart phone OS provided adequately to the smart phone ever since the smart phone's first release, web sites used to provide the same screen as PC versions. Since the same screen with PC versions was provided to the small display, users adjusted displays with enlargement or reduction in general. However, after Apple's iPhone introduction in the end of 2009 (Korea), as the smart phone's popularization due to various features and easy usability, the mobile access to web sites increased so that mobile exclusive web sites started to open to improve the inconvenience. Some mobile exclusive web sites give similar feelings as smart phone applications by using frequently used GUIs in smart phones. And, this characteristic provides the differentiated character to the smart phone GUI from other media's GUIs enabling the unique GUI characteristic of smart phones. The half of Korean population are using smart phones, and the smart phone users' rate is expected to be 79% at the later half of the year. As the influence of smart phones is increasing, the GUIs specialized for smart phones were started to be used for the PC based applications and web sites reversely. The series of process in which the smart phone adapted the PC's features first followed by the PC's re-adaptation of the smart phone's feature are explainable with ' remediation' described by Bolter and Grusin. 'Remediation', asserting new media adapt what had been done for the previous media, represents itself that new media are the refashions and the improvements of other media. In the remediation described by them, media is not viewed in a linear development, but approached from the aspect of relational genealogy to view that new media is refashion existing media. All mediation phenomenon occurs in the refashion is defined as remediation, and interpretation of the mediation phenomenon is considerable in the relation between the new media and the existing media.

The criteria identifying new media and existing media is determined by a specific media's possibility of refashion of other media regardless to the media's development order.

In this study, the phenomenon is defined as 'reversed remediation'. Although Bolter and Grusin didn't separate along with media directions, it is assumed that the characteristic of new media's impact to existing media is different from the past's reversed remediation phenomenon, and is based on the characteristic of digital. Therefore, this study defines the difference between general remediation phenomenon and the reversed remediation phenomenon, proves the difference through cases found in the two media, the web and the smart phone and reviews the cause for the difference.

B. Research Method and Questions

In this study, to analysis the paradigm changes of GUI design, the remediation theory of Bolter and Grusin is reviewed. Although the remediation theory has difficult advantages for dichotomous analysis due to more or less ambiguous logic between the mediation and the remediation, the logical characteristic is close to today's media development trend with no barriers between the fusion and the innovation in media so that the theory may become a proper theoretical reference to analyze the interface paradigm.

Also, according to McLuhan's media theory, a theory focusing on the relationships between media and human, society and culture, the media, compared to the message contained in the media, is viewed more importantly on changes of human's taste formation. Therefore, in this study, every objects, spaces and relations surrounding the human's taste is defined as the media, and every tangible and intangible concept mediating the media and the human is defined as the interface. Based on the definition of the interface, the paradigms of the definition are classified, and the methods and the characteristics of the remediation process included each interface is analyzed. As the last, the ultimate direction of GUI's paradigm change is reviewed by generalizing the methods and the characteristics of the remediation.

As the study's subjects, the phenomenon using the smart phone's GUI for PC version web site displays is investigated. Through the investigation, the remediation of smart phone's GUI characteristics to the PC version is reviewed.

II. REMEDIATION AND CONVERSE REMEDIATION

A. Remediation: Smart Phone remediating PC

Mediation means a medium's mediation of communication. Bolter and Grusin viewed, "the contents of new media started from the concept, and is viewed not in the aspect of linear history development, but with the approach from the relational genealogy as refashion of the old media by the new media." Therefore, all mediation is described to be the remediation since interpretation of mediation phenomenon on any media can be considered in the relation between new media and old media. In the remediation theory, the concept of remediation can be summarized as the following three methods:

First, the remediation is the mediation's mediation. The media is remediated with the inter-dependence including comments, reproductions and confrontations between each others.

Second, the remediation cannot separate the mediation and the reality. Although all media is depending on other media in the remediation cycle, all media is the real with itself. As the media is impossible to be removed, the real is impossible to be removed as well.

Third, the remediation has dual logics of Transparent Immediacy and Hypermediacy that is referred as Two Strategies of remediation by Bolter and Grusin.

Transparent Immediacy means the method to hide the presence of mediated media. Since the media has the characteristic of 'interfaceless interface' which makes media users forget its presence, it is also called as Media Immersion. In other words, the transparent immediacy means the strategy to make a mediated media be felt as unmediated. On the other hands, Hypermediacy refers the expression style making viewers to recollect or recognize the media. Today, the hypermediacy appears in the form of window or visual expression in digital media such as www, desktop interface and game. The hypermediacy's expression methods shown in the space perform the functions with expressions in other spaces and the opened window to other media as well.

First, the mediation is the mediation of mediation. The mediation is depending on other mediation's role and completed through processes of comment, replacement and reproduction. The media's remediation independent, yet in need each other, to function as media is the remediation.

Second, the mediation is the inseparability of the mediation and the real. In remediation processes, all media depends on other media, but, is the object and the object existing as real in the reality's linguistic, cultural, social and economic exchange systems. The media is hybrid, and is the culture appeared as the result of concurrence among the society's members while existing in the reality where the media is produced and used.

Third, the mediation is a reformation. The purpose of remediation is to refashion or rehabilitate of other media. And, all mediations are real and the mediations of the real items. Therefore, the remediation can be understood as a course of the reality's reformation. Converse Remediation: PC remediating Smart Phone.

The remediation types are not mutually exclusive, but tangled with each others. For instance, the result of a borrow may become improvement or produce an attack or competition relationship.

Bolter and Grusin explain the digital media's characteristics that interpret, refashion and revise existing media in the remediation concept based contents and formations. They discuss the reinterpretation method of existing media and the method for its coding into the interface of new media. The attempts to understand new media and the characteristic of its relationship with old media through old media's method borrowed by new media is helpful in understanding the characteristic of the media interface highlighted with the media fusion phenomenon such as smart phones.

TABLE I
CHARACTERISTICS OF REMEDIATION

Characteristic	Description
Borrowing	Reuse of characteristics appeared in a medium in other medium. Occurs only when users can identify and compare the two versions.
Representation	Direct application of old media's characteristics in new media.
Fidelity	The expanded concept of the representation. Emphasis on the differentiation by expanding old media's characteristics into progressed forms.
Aggressive	Having users experience new with removing or hiding other media with new media.
Absorb	Digital media's provision of experiences as if non-mediated hiding old media's characteristics.
Refashion	Remodeling of borrowed formation(s) of old media in a media genre.

The most of above mentioned characteristics can be found in the case of smart phones and PCs. The early day's smart phone UIs borrowed many parts from PCs. Also, the PC version web experienced with smart phones delivered similar experiences by reproducing the same web display with existing PC version's web. Later, the existing web sites were evolved through remodeling the original style due to increase of smart phone's influence. Therefore, the websites accessed from smart phones are having different displays with the PC versions.

III. UNDERSTANDING OF UI ON PC AND SMART PHONE

A. Understanding of UI on PC

1. Concept of PC UI

The user interface on the web is the interactive communication between computers and their users enabling the users for easier and more convenient controls in using the computers and performing the roles to provide desired information easier by reducing errors.

For the interface on the web, not only the provision of interface, but fast and accurate search of desired information for users are important which is connected to issues of how much users' accessibilities are considered.

In other words, if users' needs are well defined and continuous researches are conducted for speedy and accurate information searches for users with steady error corrections and supplements, the interface with improved accessibilities of users can be implemented.

The Interfaces for webs are the screens showing the web sites generally. The web interface is basically consisted with web browser elements (tools, address bar, status bar and scroll bar), navigation elements (main menu, sub-menu, search and history bar) and various contents (logo, images and texts).

2. Consideration Factors of PC UI

The most important issue of a web UI is on how convenient for users can use.

The site purposed to provide information should be designed for fast and easy searches for desired information by users. And, the site to provide fun should be designed for users to fee a lot of interests and funs. Although the purposes are different, it should be remembered always that users are always at the center of design. And, adding visual entertainments to convenient interfaces is important to provide fun to be remembered by users. When a web UI combines all elements for consistency, connectivity, information arrangement, color, text clearness and artistic factors, a wonderful website is produced.

TABLE II
CONSIDERABLE FACTORS OF WEB UI

Classification	Description
Consistency	The maintenance of consistency is the most important principle regardless to the types of pages. The ultimate goal is to make an easier web to use as much as possible. In web page design, information arrangement and interaction procedure should be designed with consistency..
Connectivity	Refers the issue of how easily a visitor manages information and performs related tests. If contents have high density and the overall composition is not systemized, information confusion occurs to users and decreases users' performances.
Information Arrangement	Regardless to types of pages, the page should be composed to enable a visitor identify major elements. At this point, a design to make visitors easily identify pages based on their experiences is important.
Color	Colors structure information on pages and enable visual focus. In general, the number of color to be used efficiently in one page is 5 to six colors.
Text Clearness	Paragraph, word, title, label, line name, field name and icon name should be selected carefully considering specific users. During a content product, the words well known by specific users should be used. A document should be viewed in one glace of a reader shouldn't have more than 35 characters on one line..
Artistic Factors	The artistic level, emotional requirement and balance of information provision expected by users for a website are the items for which a web designer should consider always. Based on users' desire for a site, the site's artistic factors changes.

B. Concept of UI on Smart Phone

1. Concept of Smart Phone Device

'Smart phone' is the combined word of 'smart' and 'phone' referring the mobile phone providing the same features like PCs.

The origin of 'smart phone' is a PAD development company calling its PDA with mobile communication module as 'smart phone'. Later, the first smart phone, Simon was introduced and 'Blackberry' introduced by RIM(Research in Motion) in 2004 were distributed via office workers in large cities of the U.S.. The comparison of smart phones with general mobile phones is as shown below on Table III.

TABLE III
COMPARISON BETWEEN GENERAL MOBILE PHONE AND SMARTPHONE

Division	Smartphone	General Mobile Phone
OS	Real Time Operating System (RTOS), Closed Type	General Operating System (GPOS), Opened Type
Access to Content	Limited to certain contents available on Closed Platforms such as WIFI	Enabled to use various contents provided based on Open platform almost with no limit.

While showing increase, the smart phone's spread rate is investigated to be 10% in the entire world and 47% in Korea. Samsung Economy Institute (2010) expected that the smart phones would lead various changes by rapidly changing the information use and the communication method, and forecasted changes in life style as following:

First, the traditional information media's consumption pattern will change rapidly to the digital consumption pattern, and the generation equipped with the most powerful information power in history will appear.

Second, as the work used to process with the PC became available to conduct with using smart phones, the implementation of 'moving office (every time, everyplace office)' becomes possible.

Third, while the integration of resting spaces in offices and moving works with flexible space designs become convenient, "Hybrid Space" trend will be boomed by increases of wireless LAN establishments in cafés and parks and white board desk installation, and the traffic flow will be dispersed with diversification of work places.

Fourth, due to real-time communication through mobile internet communities, the base and the speed of social communication will be remarkably improved. As it is, the smart phone is suddenly risen as a media greatly influencing to people's live in the modern society.

2. Concept of Smartphone UI

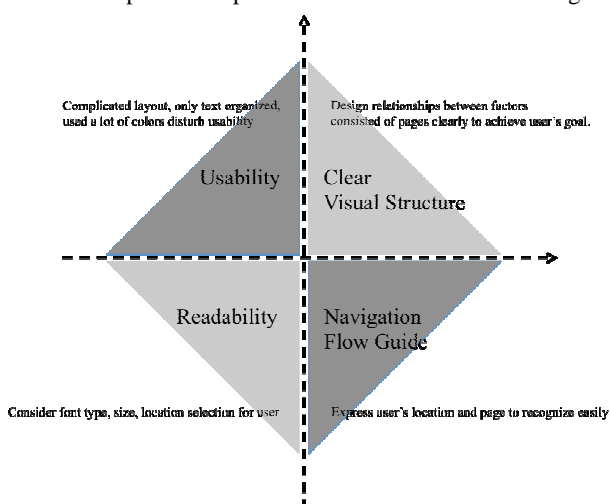The concept of smartphone UI is as shown below on Fig. 1.

Fig. 1 Concept of UI on Smartphone Web

TABLE III
CONSIDERABLE FACTORS ON WEB UI

Classification	Description
User Convenience	The layout with busy display, inclusion of excessive elements, only-text composition and diffused color use disturb the user's convenience and cause uneasy feelings to the user.
Clear Visual Structure	The user interface is not a simple arrangement of components in the display, but the design of all to be experienced by users. Therefore, for users' efficient achievements of desired goals, pages should be designed with clear relations among the components (title, menu and content area) for users' easy understanding.
Readability	The fonts used in sites are the most typical and frequently used visual element. Since only displays in limited sizes should be used in mobile, the interface considering users' readabilities with font selection, size adjustment and space arrangement is required.
Navigation Flow Induction	The current location should be indicated for users to recognize the current location and page. And, differentiating of the expression intensity in the page composition, the navigation flow allowing users' natural moving should be provided.

To prove GUI mediation phenomenon between the web and the smart phone, a comparison groups is built after figuring out what are the mostly used visual design elements in digital contents and classified into two levels based on the complexity.

The basic visual design elements include color, formation, layout, typography and graphic, the most fundamental and simplest elements included in all visual designs. The object combining these basic elements and collectively working is called as Visual Composition. The visual composition can be considered in separation of the principle related to the composition in one page and the principle related to the composition between many pages. Also, the relationship between visual interface elements and the effects achievable through the elements are explainable by separating the relationship into cognitive and emotional effects.

The cognitive effect refers the effect allowing effective performance of desired tasks by users through rapid and easy understanding of delivered information through the interface design. On the other hands, the emotional effect means the effect for users' clear feelings of the artistic impression or uniqueness intended by the developer regarding the system through the interface design.
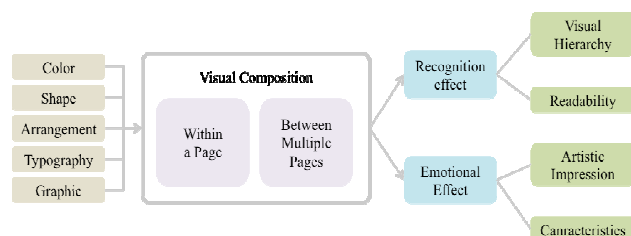

Fig. 2 The Relationship between Visual Interface Factors and the Effects

IV. CASE STUDIES

To consider the phenomena of converse remediation carefully, GUI of PC and smart phone will be examined. Case studies focus on the web sites that have characteristics of smart phone GUI. Primary case is NAVER (http://www.naver.com) that is the major portal site in South Korea and some other cases will be added. NAVER is the best case because the site sets the web design trend on South Korea.

A. Icons

The basic factor consisted the web site is icon. Icon on smart phone have utilized from Microsoft OS Windows on PC and applied to smart phone. It has the function of power button representing the concepts and usages of service. NAVER utilizes the similar icons on PC and mobile version.
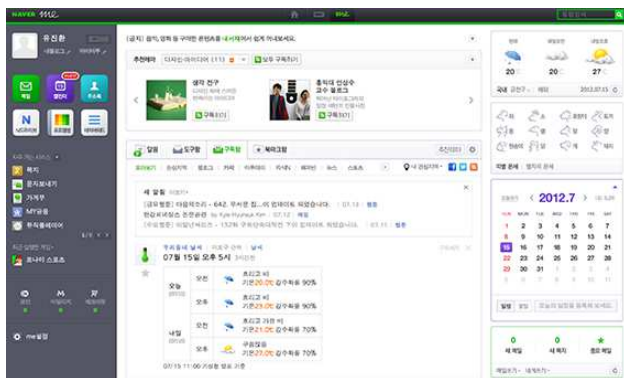

Fig. 3 Screenshot of NAVER me

The part of the left side on NAVER me service look like application button on iPhone. This is the case of utilizing mart phone's GUI.

TABLE IV
ICONS USED IN NAVER ME AND SMART PHONE APPLICATION

Icons on PC	Icons of Smart Phone

In addition, small icons in favorite service are similar design with favorite service in NAVER application on iPhone. Fig 4. is the comparison between icons from NAVER me and smart phone. The characteristics of smart phone GUI can define combination of rounded rectangle shape, metaphor and text. As the method of exploiting the small display efficiently, the style originated from iOS on iPhone clearly divides the each application area and provides diverse kind of service. The size of icons on smart phone is designed for control by finger on touch screen environment. On the contrarily, icons on PC do not need to have the same size on smart phone because PC user uses mouse and bigger display.
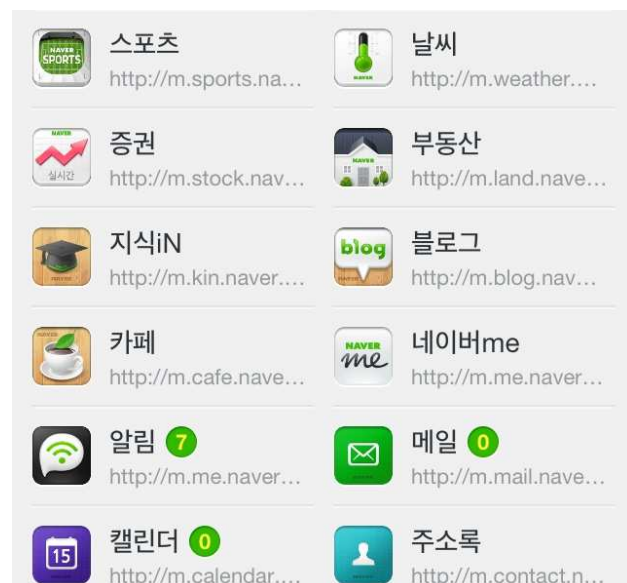

Fig. 4 Screenshot of favorite service on PC

Fig. 4 Screenshot of favorite service on smart phone

The next case is Evernote(http://evernote.com) known as note application. Evernote case is different from NAVER. NAVER utilizes to maintain user's consistency. Evernote, however, just apply smart phone's icon style on its web site. The icons look like icons on smart phone and exploit menu button.

Fig. 5 PC version web site of Evernote

Fig. 6 Menu icons of Evernote on PC

B. Navigation

Navigation on smart phone utilized to overcome the limited size of display and it is applied on PC simultaneously.
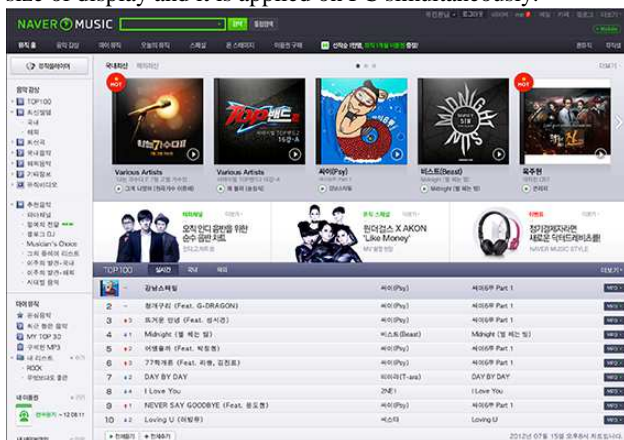

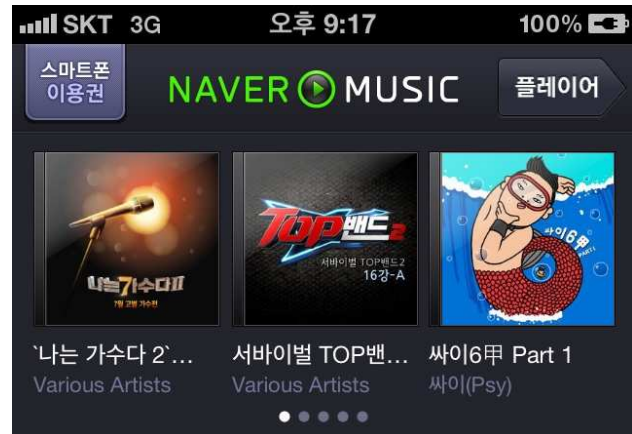Fig. 7 Screenshots of NAVER Music Service on PC

Fig. 8 Screenshots of NAVER Music Service on Smartphone

In case of NAVER music service, page navigator that is circle shape is used on smart phone and PC web site. Both media are made of width scrolling to search several albums. Because of limitation of area, information on smart phone is less than PC, but most of music contents are provided through the similar way.

TABLE V
COMPARISON BETWEEN NAVIGATION SYSTEM ON PC AND SMART PHONE

Web Site	
Smart Phone	

C. Grouping System

Folder style interface on iPhone is applied iMac OS to overcome narrow display. Because main screen usually contain a lot of applications on smartphone, Utilization of main space for organization of applications. Therefore, smartphone offered folder which user can customize.

Fig. 8 Screenshot of Mac OS, Lion

Fig. 9 Screenshot of iOS5.1.1

So, GUI should be developed more similar shape and needs research on it. This study considered about effect on GUI of digital device caused by expansion of smart phone's influence. The research may lead to the strategy for future digital GUI design. But, the study could not examine various kinds of cases and suggest practical plans, which are the critical point. Many research on digital device GUI could went deep into a subject.

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V.CONCLUSION

This study looked into the phenomena of converse remediation discovered from GUI on PC and smart phone in South Korea. Based on the previously research, the answer of research questions raised on the top are as follow. Converse remediation that is the part of remediation remediate new media by old media because of characteristics of digital. In the situation that all of digital contents are made by almost the same graphic tools and design by digital can be utilized on the other media, GUI design has affected by remediation.

The reason why new media remediate old media is improvement of old media. Remediation between PC and smart phone GUI can be defined the application of the same images, which it raises usability both media because of the unity of GUI.

Mountain Lion issued by Apple as next operating system on Mac try to combine PC and Mobile environment. Regardless of device, digital media evolve into sharing the same function and utilizing single platform.