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Editorial

Convergence in the digital age

Digital convergence takes different forms such as network convergence, market convergence, product convergence, service convergence, industry convergence, and technology convergence. It is an ongoing phenomenon and has different impacts on the industry, market, consumers, and policy (Fransman, 2000). While the Green Paper published by the EU (1997) defined convergence as "the ability of different network platforms to carry essentially similar kinds of services, or the coming together of consumer devices such as the telephone, television and personal computer." Pagani (2003) described digital convergence as an evolutionary process where "different sectors and technologies—which were originally more or less independent…merge." For instance, consumers can now watch programs or movies via their televisions, personal computers, mobile phones and tablet PCs. Their broadband services can be provided by fixed networks, ISPs, or cable operators.

The convergence of voice, video, and data has proved to be the trend. In fact, drivers of convergence include many aspects. Regulations, corporate strategies as well as the change in technology all contribute to the motivation for convergence (Bauer, Weijnen, Turk, & Herder, 2003). As more advanced development occurs with mobile devices, the consumption and viewing behavior of the users are changing, as are the marketing strategies of different platforms. Technology advancement is one of the biggest driving forces in digital convergence. Communication laws and regulations have to be amended in order to cope with the converged services. The US communication laws and regulations have been applying the silo model (sector-specific regulation), while the EU adopts the horizontal or layer model for their regulations (Whitt, 2004). With regard to the impact on the users and the existing media, there have been debates about the complementary effect and displacement effect (Dimmick, Chen, & Li, 2004; Dutta-Bergman, 2004). While the impact of digital convergence is ubiquitous, this phenomenon definitely brings forth new challenges and opportunities.

The articles in this special issue were presented at the 2011 Asia-Pacific Regional Conference of the International Telecommunications Society in Taipei, Taiwan from June 26–28, with the theme "Convergence in the Digital Age." The regional conference was hosted by the College of Communication, National Chengchi University, the College of Journalism and Communication, Shih Hsin University and the Department of Communication & Graduate Institute of Telecommunications, National Chung Cheng University. Among all the presentations at the conference, the following six articles specifically addressed the ICT policy and the digital convergence in East Asia. Topics covered by the special issue included the analysis regarding ICT infrastructures, such as drivers and barriers to fixed broadband access, ICT policy and multi-screen TV policy, the adoption of Internet-related technologies, the consumers' willingness to pay, and teenagers' Internet use through the mobile phone. Examples and cases were also drawn from East Asian countries such as Thailand, China, Taiwan, Japan and Singapore.

According to reports released by the ITU in 2009, Internet penetration rates have grown over 21% in developing countries. However, Internet services in Thailand are still at an early stage when compared to other Southeast Asian nations. While it is common knowledge that ICT technology such as the Internet can contribute greatly to economic growth, the first article "Analysis of Fixed Broadband Access and Use in Thailand: Drivers and Barriers" by Chalita Srinuan and Erik Bohlin discusses the demand for fixed broadband in Thailand. A number of studies indicate that fixed infrastructure, income, gender, age, the education of consumers, and residential area may help determine drivers and barriers to the penetration of broadband services. Currently, DSL is the most prominent connection platform in Thailand. While it is known that broadband access can bring tremendous benefits to consumers, this article attempts to investigate the factors that may contribute to broadband growth in Thailand. To collect data, quantitative individual interviews were conducted by the National Broadcasting and Telecommunications Commission (NBTC) in Thailand. A face-to-face interview-based survey was conducted between May and June 2011 and resulted in 1021 valid samples. Internet services in Thailand are owned by a government monopoly, just like the fixed phone companies have been for nearly seven decades. This article indicates that there is a high probability of citizens having the Internet at home if they are male, aged below 35, and already equipped with

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a fixed phone line. It also suggests that applications play a role in attracting users of broadband connections. Nonetheless, the authors propose that the NBTC should establish basic infrastructure for broadband use by encouraging competition, and minimize the usage gap through the subsidization and training of the users in order to promote Internet use in the era of digital convergence.

While the first article focuses on the infrastructure for broadband access in Thailand, the second article "ICT Policy for the 'Socialist New Countryside'-A Case Study of Rural Informatization in Guangdong, China" by Yi-Feng Ting and Famin Yi addresses similar issues in rural China. Like Thailand, rural China lacks infrastructure for information communications technology. The authors choose Guangdong as an example to illustrate the issues involved in rural areas when it comes to implementing infrastructure for Internet or broadband. Guangdong signifies an excellent case for rural informatization in China. Given the preeminent political and economic role, it is also a province with diverse geography with economic inequality between the Pearl River Delta and the mountainous regions. However, rural areas lack explicit subsidies so the residents cannot afford the high price of broadband. Other disadvantages for the rural residents include a lack of computer training and skills, not to mention the insufficient content and application available to them. Since research in the Chinese context regarding informatization is still at an early stage, this article employs a series of in-person interviews with 4 provincial level officials and 14 local officials along with fieldwork in Guangdong province between the summers of 2010 and 2011. The study addresses the various programs currently existing in Guangdong, such as the Mountainous Region Information Project (MRI) and Information Express Project (IE) to coordinate supply of access. While these programs do have some success in helping to implement infrastructure and to bridge the gap between areas, the article suggests that the government should employ more outcome assessment and coordination in implementing infrastructure for Internet services. By doing so, the government may tackle inefficient spending, the lack of policy continuity and accountability, as well as the gap between services and local needs in rural areas.

The next three articles focus on different aspects of user behavior and the adoption of internet-related technologies or mobile phones. The third article "Lifestyles and the Adoption of Internet-Related Technologies in Taiwan" by Shu-Chu Sarrina Li uses Roger's diffusion of innovation model to examine the relationships between lifestyles and the adoption of nine Internet-related technologies. In the era of digital convergence, different types of digital content can also contribute to how consumers use the particular technology. Based on previous studies, nine Internet-related technologies are included and categorized into three types, namely, entertainment-oriented (such as IPTV and digital cable), interpersonally-oriented (such as Facebook and email) and information-oriented (such as printers and laptops) technologies. The study was conducted via telephone survey in March 2010, for which 506 valid questionnaires were collected. It finds that lifestyle is a powerful predictor for the adoption of information-oriented and entertainment-oriented technologies, but not for interpersonally-oriented technologies. Demographics, on the other hand, are the most powerful in differentiating adopters from non-adopters of new technologies. Meanwhile mass media use offers few insights in this regard. Although this particular study has its limitations in terms of the sample size due to the limited budget, the results do confirm Roger's model.

There have been debates regarding the impact of new media on existing media related to user behavior which can give rise to either a complementary or displacement effect (Dimmick et al., 2004; Kayany & Yelsma, 2000; Dutta-Bergman, 2004). In the fourth article entitled "From the Wired to Wireless Generation? Investigating Teens' Internet Use through the Mobile Phone" by Wan-Ying Lin, Xinzhi Zhang, Joo-Young Jung and Yong-Chan Kim, the authors recognize that teenagers are nowadays part of the digital generation. They attempt to investigate the patterns of mobile use by teenagers and examine whether the mobile phone is replacing or complementing the teenagers' traditional use of the Internet through computers. Based on previous studies on the "displacement hypothesis" and "complementary relationship", the authors argue that the previous inconclusive findings suggest that there may be conceptual and methodological problems in using a simple time frame to measure media usage. They therefore draw upon niche theory to argue that new media may replace or complement existing media in terms of their various functions and usage. A survey is then conducted on 1875 young people between the ages of 12 and 17. To be more specific, the teenagers are surveyed across five digital cities in East Asia, namely, Hong Kong, Seoul, Singapore, Taipei and Tokyo. As a result, the study indicates that mobile phones are widely used in all five cities.

The authors also identify three dimensions of the teens' use of mobile internet: task-based activities, information seeking and communication activities, and recreational activities. The subjects surveyed are also found to be more likely to use mobile phones for recreation and entertainment purposes instead of sophisticated purposes. More importantly, although the positive relationship between personal computer Internet use and mobile Internet use is non-linear, the analysis in this study echoes previous studies in which mobile Internet primarily serves as an extension to traditional Internet activities via personal computers.

Broadband access and the diffusion of mobile phones have complicated the universal service policy issue. If universal service is redefined in the modern context, then consumer preferences must be reconsidered as well. In "Retaining Telecommunication Services when Universal Service is defined by Functionality: Japanese Consumers' Willingness-to-Pay" by Akihiro Nakamura, the author attempts to measure Japanese customers' willingness to pay for or retain combinations of five telecommunications services that are considered substitutes to universal service if defined on the basis of functionality. To be more specific, the study employs an online survey with a series of 11 questions, along with the contingent valuation method (CVM). The study collects 2553 observations, although only 672 are used in the calculation due to inconsistent answers. From the data collected, the consumers' willingness to pay to retain plain old telephone service (POTS),

IP telephony, mobile phone service (MOB), fiber-to-the-home (FTTH) and non-FTTH services are measured. In conclusion, the author proposes that current consumers are more willing to pay to retain voice communication than data transmission services. In addition, IP telephony can replace POTS as a universal service. Consumers are also willing to pay more than the current Universal Service Fund charge and they are still willing to pay to retain fixed-line voice services even when mobile phone service is available. This study offers insights in which FTTH should also be managed and considered as a basic telecommunications service due to the equal desire for consumers to keep both FTTH and POTS in the broadband age.

With interoperable and seamless technologies for switching among screens and systems, viewers can watch audiovisual content across multi-platforms. In April, 2007, AT&T delivered Tim McGraw's music festival in a groundbreaking new way—across three screens—the wireless device, the TV, and the PC. Thereafter, multi-screen TV has become a service provided by some IPTV or cable operators which use integrated solutions for video consumption on TVs, PCs, and mobile devices at anytime and anywhere (AT&T, 2007). A global video consumption survey released by Nielsen in 2012 shows that more and more Internet users are watching videos online or with mobile devices. Digital convergence has an apparent impact on video consumption, content creation, distribution and even business models. People can now view the same content on multi-screens. Therefore, communication laws and regulations also have to be adjusted accordingly. In the last article "Convergence and Regulation of Multi-screen Television in Singapore" by Trisha T. C. Lin, the author analyzes the convergent regulatory issues arising from multi-screen TV. The article identifies competition, content regulation and digital copyright as three key issues involved in multi-screen TV development. In recognizing the convergent challenges of multi-screen TV, this study examines the global multi-screen TV regulatory issues and various policies in regard to IPTV and mobile TV. It proposes a "platform neutrality" regulatory scheme to classify various audiovisual services based on the "socio-cultural impact" (i.e., broadcasting & mass market vs. VOD & niche market) and "content production/aggregation model" (i.e., gatekeeping mechanism vs. participatory mechanism). The article concludes by recommending that the Singaporean government opt for a pro-innovative and light-touched approach to encourage the growth of multi-screen TV service in order to keep up with the ongoing digital convergence.

In reading the six articles in the Special Issue, we feel that understanding the users' demand for content and preferences via broadband is crucial, for such content and applications are great pushers of broadband adoptions. In future research, the motivation and willingness of users to subscribe to broadband service, as well as the characteristics of non-users should be examined. Future studies should also investigate other related factors, such as the users' skills or experiences and the quality of service, as well as the contextual factors that shape young people's choices of one type of Internet access over another. Analyzing the content of websites can also help shed some light. When studying the implementation of broadband and its adoption in rural areas, in-depth surveys of best practices and reliable measurements from the regions can also be beneficial. Since there is no perfect model for developing new technology such as multi-screen and next generation TV, future research can deal with topics such as co-opetition, network neutrality, digital copyright as well as the protection of children in the era of digital convergence.

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