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A New Trend in the Digital Economy: A New Era of Digital Convergence Business

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Abstract

The convergence of several digital industries into one has produced new business opportunities. Digital convergence business has existed since the advent of e-business. This study considers digital convergence business from various perspectives and examines its current trends and consequences. The study evaluates the factors attracting customers to digital convergence and investigates various opportunities and challenges associated with digital convergence. In addition, the study discusses new business trends and models in the current digital space and examines the adoption of digital convergence business in the developing world.

Key Words: Digital Convergence Business, Convergence, M-business, U-business

1. Introduction

Convergence refers to the process of merging distinct technologies, products, policies, businesses, processes, and/or channels. Although there is no generally accepted definition of convergence, The International Telecommunication Union (ITU) defines it as "the technological, market, legal or regulatory capability to integrate across previously separated technologies, markets or politically defined industry structures. Convergence also involves an important international component, as many services and information sources that were traditionally controlled on a domestic level are being provided on a global basis" [1].

Knowledge convergence, technological convergence, applicational convergence, and industrial convergence are the four stages of convergence based on the notion of evolutionary economics in Nelson et al. [2], Hacklin [3], and the European Commission [4]. Knowledge convergence is the emergence of a serendipitous and co-evolutionary spillover between previously unassociated and distinct knowledge bases, giving rise to the erosion of established boundaries that isolate industry-specific knowledge. Technological convergence is the

transition of knowledge convergence to potential technological innovation and allows the dissemination of inter-industry knowledge to facilitate new combinations of technologies. Appplicational convergence is the transition of technological convergence to opportunities for value creation such that it, with respect to a majority of metrics, outperforms the sum of original parts. Industrial convergence denotes the transition of applicational convergence to a shift in industry boundaries such that firms from previously distinct industries suddenly become competitors through the emergence of common applications.

Nonetheless, the meaning of digital convergence varies across individuals based on their perspectives. In general, however, digital convergence refers the technological merger of several digital industries such as computer communications, consumer electronics, entertainment, the mass media, sensors, surveillance, and computer software through various devices that facilitate the exchange of information in common electronic or digital domain. Digital convergence business integrates diverse business techniques in the electronic space and touches almost all aspects of business, including digital marketing, the management information system (MIS), human resource management (HRM), customer relations, supply chain management, e-business (electronic business)/m-business (mobile business)/u-business (ubiquitous business), e-governance, management education, banking, and international trade, among others. Digital convergence offers a plethora of benefits and opportunities for firms and consumers. The easy access and penetration of various converged platforms can help e-business, m-business, and u-business achieve their objectives and provide convenience to customers. These nontraditional platforms have wider coverage and have the potential to foster a substantial socioeconomic transformation. Fig. 1 shows the convergence of various industries.

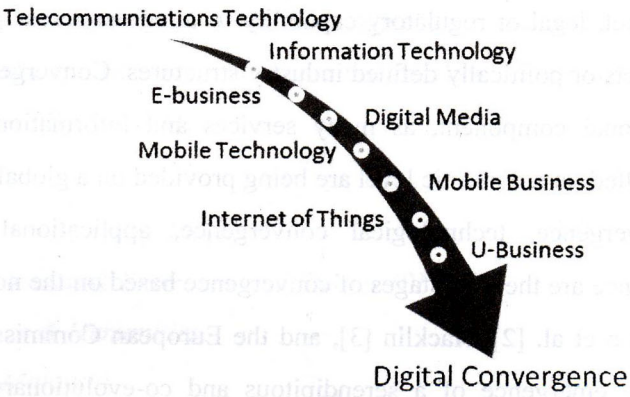

Fig. 1. The convergence of various business industries

Not too long ago, no two distinct devices could really "talk" to each other. For example, there was basically no connection between a telephone system and a surveillance camera, and similarly, a computer had nothing to do with watches. In addition, wall calendars did not interrupt meetings to alert people of upcoming events. However, times have changed. Many digital versions of these devices have converged into tiny but smart devices, and some of them have their own network called the Internet of Things (IoT). These technologically converged devices have become an integral part of people's daily lives, and it is difficult to imagine a life without them.

2. Trends in digital business

Many firms have adopted digital platforms. To survive and thrive, service providers, stakeholders, and firms must start and maintain conversations with their customers across multiple channels and devices. Early leaders have demonstrated the considerable advantage of business in the electronic space. Not only young consumers but also middle-aged ones now prefer online shopping. A survey tracking 250 million transactions on eBay Korea's auction site from 2010 to 2013 showed a three-fold increase in online transactions over the period for women in their forties and fifties [5]. Fig. 2(a) shows the number of food and necessities purchased online. The same survey also showed that number of people ordering through their smartphones increased by 10 times over the same period. According to the Korean Online Shopping Association, Korea's online shopping industry was expected to exceed $62.8 billion in 2014, a 18% increase over 2013 (Fig. 2(b)) [6].

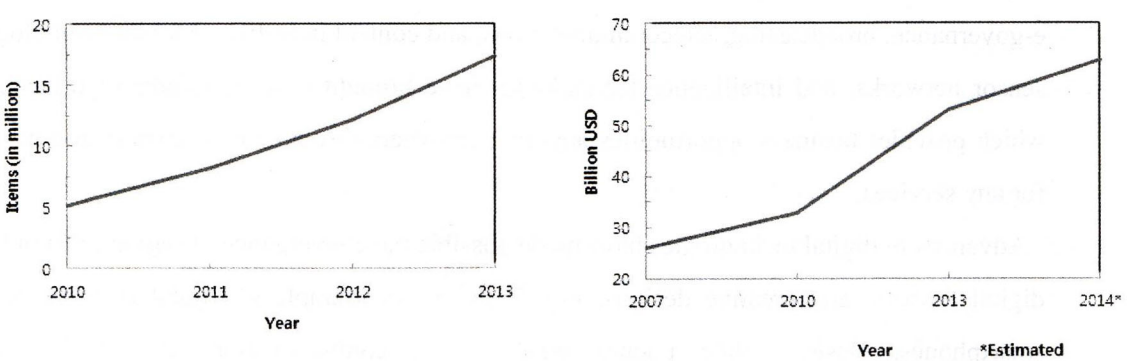

Fig. 2 (a) Food and necessities purchased by women in their forties and fifties on eBay Korea (auction site) from 2010 to 2013 [5] and (b) the total value of Korea's online shopping industry according to the Korean Online Shopping Association [6] ($1 = KRW 1035.05)

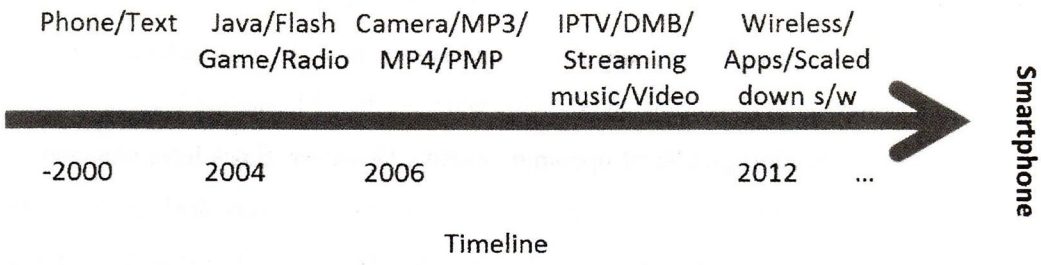

Fig. 3. The timeline of digital convergence for the smartphone

This trend shows that people are quickly adopting the digital and electronic space to purchase goods and services. Many firms have converged their products and services with new types of IT applications, fresh designs, and creativity. An increase in competition in the offline market and various advantages of digital business have led to potential reductions in business opportunities in the offline market, which in turn is increasing the accessibility and quantum of digital space use.

3. Digital convergence business

Digital technologies such as broadcasting, telecommunications, information, and communications have become an essential element of daily life. The convergence of these technologies has catalyzed growth for new and existing firms, provided facilities for the general public, and facilitated the emergence of new economically productive partnerships. In fact, digital convergence can foster business synergies.

Advances in broadband technologies have led to the convergence of e-business, m-business, e-governance, broadcasting, telecommunications, and content industries. Mobile technologies, sensor networks, and intelligence technologies have brought new paradigms of u-business, which provides business opportunities anytime, anywhere through any networks and devices for any services.

Advances in digital technologies have made possible the convergence of digital technologies, digital devices, and creative designs. Fig. 3 shows an example of digital convergence in smartphones. Basic mobile phones were just a communications device for voice communication and text messaging in the early 2000s. After the mass adoption of smartphones, digital convergence has become a vital part of smartphones in terms of games, cameras, MP3 players, digital multimedia broadcasting (DMB), portable media player (PMP), mobile digital media player (M-DMP), wireless networks, instant messaging (IM), social networking services (SNSs), maps, navigation, and apps, among others.

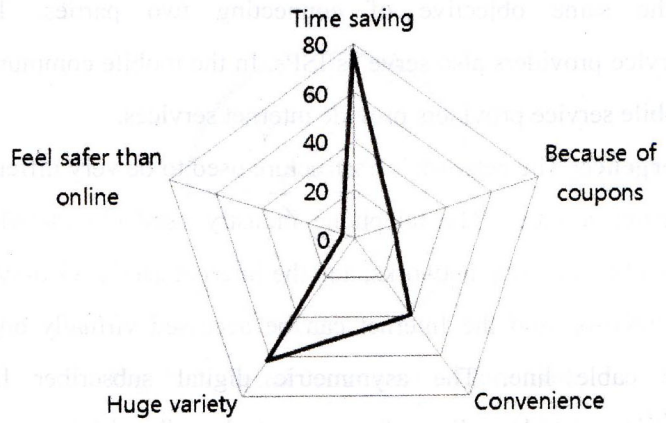

Fig. 4. Reasons why people prefer mobile shopping to online shopping

Smartphones are powerful computing devices, and they are more powerful than personal computers available a decade ago. For instance, because mobile banking and payment systems are possible and widely accepted, it is convenient to use mobile payment systems instead of other online payment systems. Many people prefer mobile transactions by using smartphones to offline transactions, bank/wire transfers, ATM machines, and internet banking. The ubiquitous nature of smartphones is the main factor in the increased popularity of m-business. Many people chose mobile shopping over offline shopping because of mobility and convenience. In Korea, mobile shopping showed a 136.9% increase from the second quarter of 2013 to the same quarter of 2013 [7].

Service providers, business owners, and marketers have extended their campaigns to reach to mobile users, and the number of mobile shoppers has continued to increase. There are several reasons why people prefer mobile shopping to online or offline shopping. One reason is that mobile shopping is convenient. Many business sites have started mobile apps and become mobile friendly. Consumers can compare hundreds of items from many online marketers. Only the most competitive prices can attract consumers. Other reasons include the ubiquitous and time-saving nature of m-business and more detailed descriptions of products and services, among others. According to a recent survey of 200 mobile shoppers (university students in their twenties and thirties), these shoppers generally preferred mobile shopping to online shopping to save time, enjoy large variety, and achieve convenience (Fig. 4).

There are three major forms of digital convergence.

(a) Service or industry convergence: Several industries have been engaged in identical businesses in communications. An internet service provider (ISP) offers VoIP services, and mobile phone companies provide 3G and 4G long-term evolution (LTE) services. Both

industries have the same objective of connecting two parties. Therefore, many communications service providers also serve as ISPs. In the mobile communications industry in particular, all mobile service providers provide internet services.

(b) Network convergence: The network infrastructure used to be very different for telephone, television, and internet services. The telephone industry used circuit-switching networks, television had its own broadcasting networks, and the Internet used packet-switching elements. Today, however, television and the Internet can be accessed virtually anywhere, anytime through only one cable line. The asymmetric digital subscriber line (ADSL) of communications service providers allows for access to broadband internet connections over circuit-switching networks.

(c) Device convergence: Several digital devices such as navigation, DMB, M-DMP PMP, TV, FM radio, and tablet are available in a single device. Fig. 3 shows how several digital devices have converged into the smartphone. Although their networks are different, 4G LTE and DMB have converged with voice communications in a single device.

Challenges facing these industries are almost identical except for those specific to their domains. Each industry has expanded boundaries of its business, thereby entering unfamiliar areas, which has led to not only challenges but also opportunities.

The digital convergence framework consists of creativity, humanism, design, and technology. Every form of digital convergence is an act starting with something new, imaginative, and valuable in a humanistic way. The conception for the creativity of a system with the application of processes, inventions, and methods for practical outcomes completes this convergence. Fig. 5 shows the digital convergence business framework.

4. The adoption of digital convergence business in the developing world

Most of the developing countries have been slow to adopt u-business, but the trend is changing rapidly. According to the 2014 World Bank Enterprise Survey, 26.1% of Nepalese firms had their own websites [9]. Although this level is much lower than that for the world (40.3%) [9], it is a positive sign for these countries, where the penetration rate of fixed broadband internet services is only about 0.75%, according to the ITU, the World Telecommunication/ICT Development Report and database, and the World Bank [10]. Fig. 6 (from the ITU World Telecommunication/ICT Indicators database) shows the mobile subscriptions per 100 inhabitants from 2001 to 2014 and indicates that, even in developing countries, the mobile subscription rate is about 90%, which is about 73% higher than a decade ago.

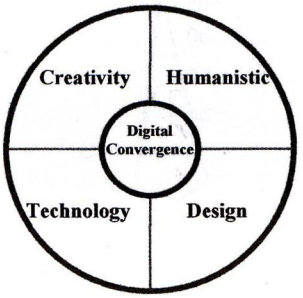

Fig. 5. A digital convergence framework

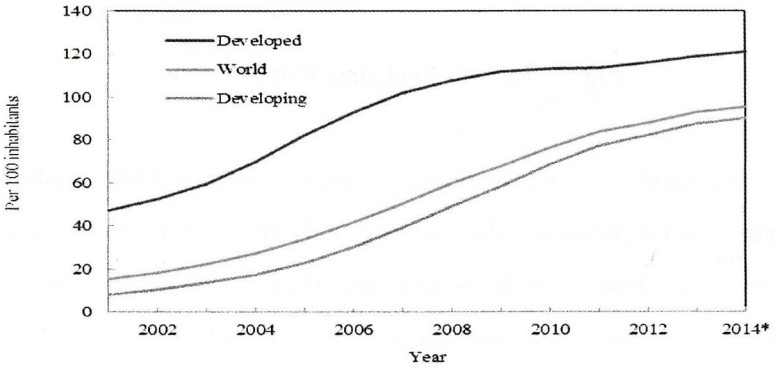

Fig. 6. Mobile phone subscriptions per 100 inhabitants [8]

A 2014 study by TNS Infratest Germany showed that 22.1% of all adults in India had smartphones, indicating a 9.3% increase over 2013 [11]. This trend shows that a majority of the population connected through mobile phones. However, the increasing trend in smartphone users allows for new digital markets and eventually for digital convergence.

5. Major players in digital convergence

Except for digital limitations, digital convergence depends mainly on what the public is interested. Merging several services, networks, or devices is not enough. Market trends, current fashion trends, and human behaviors toward technologies are also important factors.

Key market players (or market giants such as Samsung, Apple, LG, and SONY) play vital roles in digital convergence and have considerable influence on market and fashion trends. Although multimedia systems are embedded in every smartphone, there remains a market for MP3 players and portable multimedia players (PMPs). Similarly, many Java- and Flash-based online and offline games are available for free or fee, but people remain attracted to game consoles such as Xbox 360, PlayStation 4, and Wii U.

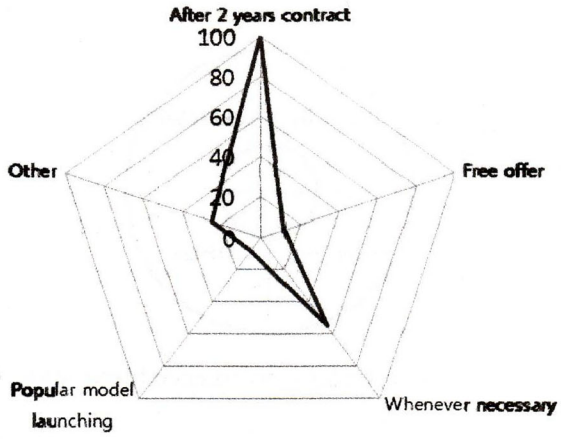

Fig. 7. Reasons to change mobile phones

Recently, not only hardware but also system software has limited the capability of devices, and therefore young generations are likely to frequently change their mobile phones. A recent survey of university students in their twenties and thirties showed that most changed their mobile phones after finishing their contract periods of usually two years. Fig. 7 shows the results, including why and when they changed their phones.

6. Digital convergence objectives and hierarchy

Convergence is time dependent and is unavoidable. Digital convergence has trends, hierarchies, and objectives. Fig. 8 shows convergence domains, trend, and goals.

To improve functionalities, several technologies have converged. Above the technology plane lies the product plane. A new product launches according to the needs and values of customers. Some examples include smartphones, digital TV, the iPad, the iPad, and the Kindle. Similarly, several services have converged in digital TV, including digital advertising, digital TV shows, video on demand (VOD), marketing, TV shopping, the Internet, games, and other entertainment venues, among others.

The process plane describes cost-effectiveness. In general, mostly, only successful market players have those get success in the market who have cost-effective services or products. The business plane is just above the process plane. The main goal of the business plane is to improve business performance.

The application plane is on top of all others. New applications are required because of new market requirements. Considering the market value, several market issues may form or converge.

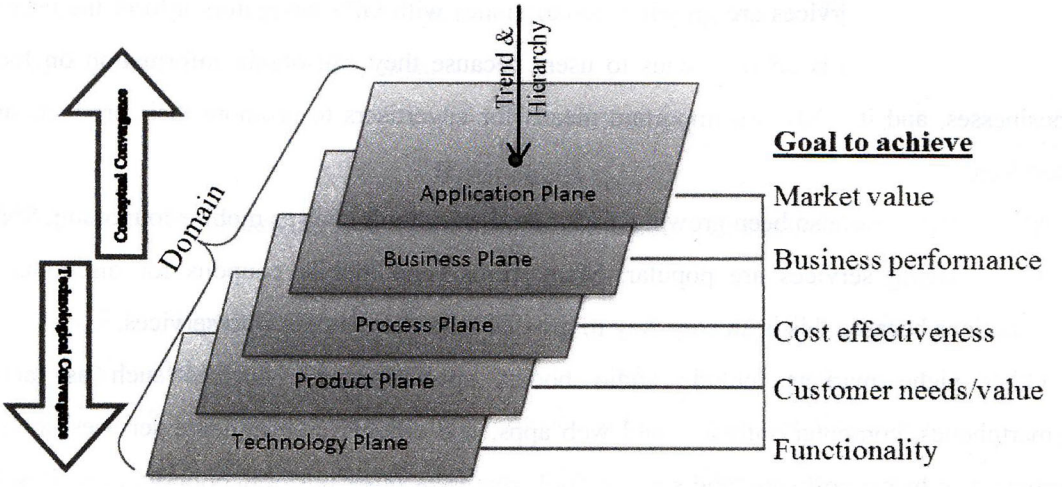

Fig. 8. Types of convergence and its hierarchy

Several factors affect digital convergence business. Some factors facilitating digital convergence business include policies, society, infrastructure, and content, among others. There is no standard thus far in digital convergence business. Because of the convergence of many technologies, products, processes, and markets, there should be some standardization for reference and guideline purposes.

7. Opportunities

Digital convergence business is a new paradigm. It brings new opportunities for creative businesses. There is a need to focus on innovative ways to achieve sustained success in emerging markets. To gain maximum benefits from businesses, managers, service providers, business owners, and stakeholders should have a better understanding of emerging trends.

Today, people are willing to pay more for TV programs with no advertising. In addition, Youtube and Facebook did not exist until recently but now have millions of unique visitors per month. More videos are uploaded to Youtube every month than TV has been airing programs around the clock since its establishment several decades ago. Current use trends in mobile devices show that mobile devices are likely to be the world's primary internet connection tool in a few years.

These trends have brought about new business opportunities. Some novel business fields include mobile internet businesses such as broadband, WiBro (mobile WiMax), DMB, and mobile TV services, among others. Convergence businesses include IPTV, digital content, and mobile businesses such as games, telematics, payment systems, banking, the Internet, gifting, and music.

Location-based services are growing. Smartphones with GPS navigators inform the user of local businesses. It is advantageous to users because they can obtain information on local businesses, and it is also an important means for advertisers to promote their products and services.

M-commerce has also been growing. Some marketing tools such as mobile couponing, SNSs, and messaging services are popular. Many firms send mobile coupons for discounts or promotions because this is an easy way to provide target consumers with services.

Other niche markets include audio books, special-purpose devices such as tactile smartphones, computer software, and web apps, and ubiquitous healthcare services, among others. Hardware, software, and security tools represent other business opportunities. Despite several security measures, mobile banking is venerable to hacking or malicious entities. With the growth of digital convergence business, the demand for sophisticated hardware, software, and security tools has also increased.

8. Challenges

Because digital convergence makes it is easier to reach large audiences, it is harder than ever to reach and attract target market segments. Digital convergence affects the way people do business. The main question here is then whether people are ready for current and future businesses in the era of digital convergence.

There are two objectives in governing digital convergence business. One is an economic objective. To gain maximum profits from convergence, several conventional policies should be changed.

Another is a sociocultural objective. New trends are emerging in social issues according to the diffusion of digital convergence business. For example, young individuals who use various smartphone applications tend to create a new social culture by making friends, enjoying entertainment options, and engaging in social communities, among others.

9. Conclusions

Digital convergence brings about new business opportunities and affects traditional trends and businesses. Over time, almost all components of society and business converge, including businesses, processes, products, and technologies. To take advantage of current business trends, businesses should adopt digital convergence and adapt to it.

This study discusses industry, device, network, and service convergence and addresses how service providers, stakeholders, businesses, and consumers can take maximum advantage of

digital convergence. The results are expected to be useful for researchers, industrialists, and students interested in this important area.

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Authors' Biography

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Changsu Kim is an Associate Professor at School of Business, Yeungnam University in Korea. He was a visiting scholar at the MIT Sloan School of Management. He received his PhD in Information Systems from London School of Economics (LSE) in the UK. His research interests include ubiquitous computing and digital business.

Sung Won Kim received his B.S. and M.S. degrees from the Department of Control and Instrumentation Engineering, Seoul National University, Korea, in 1990 and 1992, respectively, and his Ph.D. degree from the School of Electrical Engineering and Computer Sciences, Seoul National University, Korea, in August 2002. From January 1992 to August 2001, he was a Researcher at the Research and Development Center of LG Electronics, Korea. From August 2001 to August 2003, he was a Researcher at the Research and Development Center of AL Tech, Korea. From August 2003 to February 2005, he was a Postdoctoral Researcher in the Department of Electrical and Computer Engineering, University of Florida, Gainesville, USA. In March 2005, he joined the Department of Information and Communication Engineering, Yeungnam University, Gyeongsangbuk–do, Korea, where he is currently a Professor. His research interests include resource management, wireless networks, mobile networks, performance evaluation, and embedded systems.

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