온라인 소셜 네트워크 서비스의 글로벌 확산에 관한 연구

손인수* · 오진희** · 이동원***

Global Diffusion of Online Social Network Services : A Cross-Country Study

Insoo Son* · Jinhee Oh** · Dongwon Lee***

■ Abstract ■

This study examines online social media diffusion across different countries that will help to provide a picture of current global online social network services (SNSs). Analyzing country-level data drawn from 78 nations, we find that non-technological factors such as culture and language as well as technological factors including Internet penetration rate and smartphone adoption rate have significant effects on online social media diffusion. These findings, derived from a broad range of different countries, not only provide theoretical insights into understanding critical factors that enable successful global expansion of online social media services but also help practitioners plan their marketing strategies more effectively in a global context.

Keyword : Cross-Country Study, Culture, Facebook, Global Diffusion, Online Social Network

1. Introduction

Social network service (SNS), such as Friendster, Twitter, MySpace, or Facebook, has become some of the most popular online destinations these days. These SNSs allow individuals to present themselves, articulate their social networks, and establish or maintain connections with others [8]. Leveraging these potential benefits, social networks have recently experienced exponential growth in membership. For instance, the amount of time it took for different media to attract 50 million users was 3 years for radio, 13 years for TV, and even 4 years for the Internet. However, it took less than a year for Facebook, a leading social network site, to attract 200 million users (www.socialnomics.com). As of June 2011, Facebook holds more than 750 million active users [32], and the site was reported to achieve 2 billion US dollars of revenues in the fiscal year of 2010 [44].

However, such success of SNSs is not a common phenomenon all around the world. As technological innovations, such as mobile phones, the Internet, and e-commerce, have been found to show different rates of diffusion in different countries [4, 21], SNSs conceptually are very likely to penetrate into the global market with varying consequences from country to country. For example, MySpace, another global SNS similar to Facebook, withdrew its business from Korea in 2010 just after 10 months business operation, but the site still achieves fair business performance in the US (chosunbiz.com).

Such contradictory outcomes of SNSs in global markets imply that the successful global expansion of SNSs can be attributed to multidimensional country-specific aspects such as technol-

ogy infrastructure, economic conditions, and cultural environment [4, 22]. Although the idea that the penetration of SNSs is a global phenomenon is now widely accepted [13], relatively little attention has been devoted to identifying the influential factors that affect the global diffusion of online SNSs and empirically evaluating their impact. Exemplified prior IS studies on online social networks are about identity presentation and privacy concerns [13, 35], temporal patterns of use [12], and the relationship between profile structure and friendship articulation [25]. The situation eventually motivates us to investigate the shape of online social network diffusion across different countries. Key research questions that specify our work are:

(1) What factors drive the global diffusion of online social network services? (2) Do these factors provide a basis for explaining differences in the diffusion rate across countries? (3) How do the effects of these factors vary across different economic conditions, especially in OECD versus non-OECD countries?

To answer these questions, we developed a research model of social media service diffusion. More specifically, we used the Facebook penetration rate in each country as a proxy for social network diffusion. This is because Facebook is the most popular social networking site in recent years and has ranked at the top among other social media sites in most countries (socialbakers.com). Socialbakers.com, one of the Facebook statistics portals, revealed that Facebook has covered more than 50% of the social network business in over 120 countries. As such, Facebook could provide rich information with researchers who are interested in the affordance of social networks due to its heavy usage patterns

and technological capacities that bridge online and offline connections. Therefore, we selected Facebook as the main research context for on-line SNS diffusion.

Collecting data from 78 countries, we analyzed the causal relationship between both technological and non-technological factors and the social media diffusion rate. The key findings are summarized as follows. Technological factors, such as Internet and smartphone penetration, were found to have positive and statistically significant effects on social media service diffusion. Also, some non-technological factors, such as language influence and some cultural indices, turned out to have significant effects on SNS diffusion.

The rest of the paper is organized as follows. Section 2 provides a theoretical background for the current study. Section 3 presents our research model and related hypotheses in terms of technological and non-technological factors. Section 4 describes the methods of data collection and analysis. We also present our results with hypothesis testing related to social media service diffusion. Section 5 discusses the empirical results of the study with both theoretical and managerial implications. Finally, we present concluding remarks in Section 6.

2. Theoretical Background

2.1 Digital Divide

Previous IS studies have intensively investigated the diffusion of technological innovations from various perspectives. One of the research streams in this field constitutes an attempt to understand technology diffusion as a global phe-

nomenon. The practice focuses on identifying contextual factors that affect the variation in the diffusion rate of a particular technology across countries and empirically evaluating the level of impact.

One basic concept underlying these studies is the digital divide that refers to disparities in access to information and communications technology (ICT) among different locations and social groups [6]. It has been widely accepted that the development of ICT would enable equal opportunities for enjoying technology benefits such as global communication, commerce, and knowledge sharing that collectively bring about improved social welfare. However, in recent years, studies by business and social science researchers insist that the digital divide exists between those who have access to ICT and those who do not.

In particular, studies on the digital divide at the global level usually deal with disparities in access to ICT across different countries. The motivation of such studies is because “while some countries are heavily invested in ICT and have adopted policies to promote corporate and individual adoption, other countries are being left behind technologically [6].” Understanding the digital divide at the country level is important because it has a profound impact on how firms compete globally, how they relate to their customers and business partners, and how they formulate their strategies for online commerce [30].

Studies that aim to investigate the global digital divide primarily take a technological perspective. The studies usually focus on the national rate of access to fundamental information technologies such as the Internet, ICT, and digital wireless networks [4]. For instance, Quibria et al. [29] investigate ICT penetration among

Asian countries over the period 1999~2000. They find that income, education, and infrastructure are key determinants that explain the level of ICT penetration. Chinn and Fairlie [1] also study the penetration of both PC and Internet users in 161 developed and developing countries over the period 1999~2001. They find that the digital divide is mainly explained by differences in income, telecom infrastructure, and regulatory quality. For digital wireless networks, Kauffman and Techatassanasoontorn [21, 22] conduct several empirical studies to evaluate the digital divide in about 50 developed and developing countries over the period 1999~2002. They find that gaps in digital wireless penetration exist, but the digital divide narrows over time. Also, their results indicate that telecom infrastructure, technology standards, and competition level in the market play a significant role in determining the penetration rate.

Reviewing these previous studies, we understand that telecom infrastructure is widely used as a significant determinant of the global digital divide. As such infrastructure is a prerequisite for the active use of information technologies, many researchers have been motivated to incorporate telecom infrastructure in their studies in such form as the density of telephone lines or mobile phone penetration [4, 6]. Another reason that we pay attention to previous studies is that most of the global digital divide is explained by differences in economic wealth between developing and developed countries. As prior literature implies, economic wealth usually affects nationwide technology adoption decisions [11, 23]. Consistent with the evidence suggesting the existence of the digital divide, one would expect a positive relationship between economic wealth

and information technology penetration [5, 29]. In sum, technology infrastructure and economic wealth have been widely used as significant measurements of the digital divide at the global level. In this study, we utilize these factors as important constituents of our research model.

2.2 Culture Influence on Technology Diffusion

To resolve the issue of increasing a country's technological innovation level, a broad range of knowledge communities, such as academics, policy-makers, and practitioners, have long been interested in understanding the forces that drive national rates of technology diffusion [33]. The influencing factors of global technology diffusion have been differently identified with different theoretical perspectives. For instance, economists find that the level of national technology diffusion are closely associated with two macro-economic characteristics : industrial structure [27] and the national income level [42]. On the other hand, researchers from sociology, psychology, and marketing maintain that cultural values also influence the national rates of technology diffusion [34, 43].

From the social science perspective, culture is referred to as "a set of values, ideas, artifacts, and other meaningful symbols that help individuals communicate, interpret, and evaluate as members of society [9, p. 63]." Previous studies of consumer behavior propose that culture is a key factor that motivates people to make their decision upon new coming products and services [3, 28]. In particular, cross-national diffusion literature seeks to investigate the role of culture in technology diffusion in terms of products and

services with the research context of national culture. Takada and Jain's [36] study is one of the first kinds to examine culture's impact on the cross-national diffusion of products. The study suggests that the rate of diffusion is grater in countries characterized by high-context culture rather than low-context culture [14].¹⁾ After the study, several other studies also have examined cultural influence on global product diffusion [10, 24]. Although these studies don not provide consistent results regarding the relationship between national culture and product diffusion, the works collectively implies that National culture is a fundamental factor that distinguishes technology adoption rate of one country from that of other countries.²⁾

In this study, we use Hofstede's work [15-17] as the theoretical foundation to measure cultural dimension of a country. His dimensional framework of culture has been widely accepted in marketing and other business disciplines [26] and provided a sound basis for evaluating the influence of national culture on the diffusion rate of innovations. From a large scale of empirical study conducted in 1970's for over 50 countries, Hofstede [15] derives a categorization of national culture into four dimensions and find that these dimensions are unequally presented across countries. These dimensions of culture are power distance, individualism-collectivism, masculinity-fe-

mininity, and uncertainty avoidance (See the section 3 for details). Our research model described in the next section incorporates these cultural values as significant independent variables. Differences in these values might explain differences in the national rates of technology diffusion if some of the values are more likely than others to promote innovation. In this study, we seek to identify the relationship between cultural values and country-level behavior associated with technology diffusion, especially for online SNS.

3. Research Model and Hypotheses

After reviewing the literature surveyed in Section 2, we specify the variables in our research model. For the dependent variable, we use the Facebook penetration rate across countries as a proxy of the diffusion of online social network services. The variable comes from the idea that the global digital divide is most commonly characterized as the dispersion in IT penetration across countries [4]. It is based on the premise that if there were no digital divide then there would be no differences in IT penetration across countries.

For the independent variables (i.e., the determinants of global SNS diffusion), as shown in [Figure 1], we combine two research perspectives -technological and non-technological factors-to develop an integrative model to assess the global diffusion of SNSs. This study focuses on some determinants rarely evaluated in prior IS literature : non-technological factors. Prior literature suggests that the cultural influence can be an important driver of global media diffusion [2]. This is because SNS is characterized by various

- 1) Hall (1976, p. 39) proposes that "in high-context culture, people are deeply involved with each other, but in low-context culture, people are highly individualized, somewhat alienated, and fragmented, and there is relatively little involvement with others."
- 2) Similar to the argument, Hofstede (2001, p. 9) refers to culture as "the collective programming of the mind which distinguishes the numbers of one group or category of people from another."

[Figure 1] Research Model

aspects beyond means of communication. So, we expect that there could be differences from country to country. We also add another variable, language influence, which may also affect online SNS diffusion.

Finally, following what previous studies intended to do, we incorporate economic wealth in the research model to investigate the differences in the effects of influencing factors on global SNS diffusion between developed and developing countries. The criterion used to categorize the size of economic wealth is whether or not the sample country is a member of the OECD. In the following subsection, we discuss the hypotheses in our research model.

3.1 Technological Factors

To use an online SNS, the technological infrastructure should be established in advance. Specifically, in order for a particular IT-mediated service to be diffused, a certain level of IT infrastructure needs to be provided for the use of the service [4, 21].

Widespread use of basic network infrastruc-

ture such as the Internet is relevant to online social network diffusion because it can facilitate easy and stable access to online SNSs. Current online SNSs are provided through both wired and wireless platforms. Therefore, the Internet penetration rate and the smartphone subscription rate can be used as proxies of the level of technological infrastructure that directly and indirectly affects the diffusion rate of online SNSs [22]. Such arguments lead to the following hypotheses.

Hypothesis 1-1 : *The Internet penetration rate has a positive relationship with global online SNS diffusion.*

Hypothesis 1-2 : *The smartphone subscription rate has a positive relationship with global online SNS diffusion.*

3.2 Non-Technological Factors

The other research perspective pertaining to the current study is that the diffusion of online SNSs is expected to be affected by non-technological factors. Such a perspective is rooted in

the basic idea that an online SNS is not only characterized as a virtual communication platform using Internet technologies but also recognized as a social area that facilitates communication among people and organizations. The two-sided features of online SNSs imply that one needs to investigate the level of online SNS diffusion from multiple research perspectives, not being limited to technological aspects. In particular, for country-level analysis, researchers are recommended to apply cultural perspectives to identify the different shapes of social network service diffusion and investigate appropriate reasons for such phenomena. Thus, in this study, we develop hypotheses that conceptually explain the effects of cultural and linguistic factors on the rate of social media service diffusion across countries.

3.2.1 Language Influence

A unique feature of online SNSs is that they represent a medium that provides huge opportunities for people to communicate more globally. In the diffusion of global online SNSs, the language factor is very important because language barriers may exist when we want to communicate with people in other countries.

Kachru [18, 19] divides the use of English into three concentric circles : an inner circle, an outer circle, and an expanding circle. The inner circle is the traditional base of English and includes countries such as the UK and the US. In both the outer and expanding circles, English has an official and international influence on international communication. Even in today's digital era, as a global standard language, English allows Internet users to share their opinions across countries [2].

A number of online SNSs such as Facebook, MySpace, and Twitter operate their services on a language basis and not on a country basis for active communication within the same linguistic culture. Also, English is the default service in the representative sites (global sites) of each social media site. With this observation, we propose the following hypothesis.

***Hypothesis 2 :** The use of English as an official public language has a positive relationship with global online SNS diffusion.*

3.2.2 Culture Influence

We define culture by adapting Hofstede's view because his work still influences most of today's culture-related studies [15, 17]. Hofstede developed multi-dimensional views of culture through surveys of IBM employees between 1967 and 1973. Using these cultural dimensions, he quantified the cultural characteristics of nations based on five dimensions of culture including power distance, individualism, uncertainty avoidance, masculinity, and long-term orientation [17]. In this study, Hofstede's cultural indices play a key role in understanding how cultural characteristics influence the diffusion of online SNSs across our sample countries. However, the cultural index of long-term orientation was excluded from the analysis because of an inadequate number of sample observations. <Table 1> describes the concept of culture dimensions explained by [17].

Power Distance : As mentioned in the table, power distance is "the extent to which the less powerful members of institutions and organizations within a country expect and accept that

〈Table 1〉 Four Culture Dimensions and their Definitions

Dimensions of Culture Definition	Definition
Power Distance	The degree to which a society accepts equal power distribution : from 'relatively equal' to 'extremely unequal'
Individualism	The degree to which a country has a loose individual relationship or a cohesive group relationship : from 'individualist' to 'collectivist'
Masculinity	The degree to which a country is valued as "masculine", specifically, in terms of assertiveness, performance, success, and competition : from 'tough' to 'tender'
Uncertainty Avoidance	The degree to which a society withstands uncertainty. Also, it means which country prefers structured over unstructured situations : from 'relatively flexible' to 'extremely rigid'

power is distributed unequally [17 p. 98]." This index is about social equality and measures how much social inequalities are accepted by individuals within society [17].

A high power distance index (PDI) refers to a centralized culture associated with dependent decision-making on powerful others [7]. Van den Bulte and Stremersch [40] argued that in a high PDI culture, people have limited authority to make their decisions and are affected by the leader in a group. This means leaders are entitled to their preferences. Leaders can impress others by their visible status, and this represents their authority.

On the other hand, a low PDI means a decentralized culture associated with greater independent decision-making [7]. In a low PDI culture, people can have more independent decision-making skills and exert leadership qualities regarding each other. In this culture, inequality is an unfavorable condition, and people want to avoid this situation. Thus, in these cultures, leaders should attempt to appear less powerful [16].

Recently, online SNSs have been used as an efficient path for opinion leaders in many countries to express their own opinions. For example, US presidential candidate Barack Obama cam-

paigned for the 2009 presidential election partly through his Twitter account and expressed his willingness to participate in the next presidential election in 2012 via Twitter. In addition, many politicians in South Korea have communicated with their supporters through social media services such as Facebook and Twitter. This trend is not confined to politicians, celebrities, and journalists, who can be regarded as opinion leaders.

Therefore, we can expect that in a higher PDI culture, individuals tend to be easily affected by leader groups and people try to use social media to communicate with opinion leaders. Under such cultural circumstances, we expect that people are more open to interpersonal communication and the diffusion rate of online SNSs is likely to be higher [45].

Hypothesis 3-1 : *The level of power distance in the culture has a positive relationship with global online SNS diffusion.*

Individualism : Individualism refers to a cultural environment where people usually tend to put more importance on the interests of individuals rather than those of groups. On the other

hand, collectivism represents a culture where the interests of groups and organizations take precedence over those of individuals. These two extremes can be defined as the “we” society and the “me” society [7].

In individualistic cultures, people may tend to establish looser relationships among themselves and expect to take care of themselves [45]. Also, they tend to focus more on their own self-interests than on other people. Therefore, the social interactions among the members of such societies will not be strong [41].

On the other hand, collectivistic cultures feature strong bonds among members of society [41] and cohesive relationships [7]. Also, collectivists care for relationship building for efficient communication and developing trust among people [39]. This cohesive nature of collectivistic cultures should provide more opportunities for communication amongst their members [37]. That is, strong relationships are an important value for collectivists due to efficient communication [39]. So, we can expect that they are also associated with interpersonal relationships and with enhanced reliance on personal recommendation as an influence of individual behavior [45].

In contrast, in loosely tied individualistic cultures, people are not as much integrated as they are in collectivistic cultures, thus reducing the flow of information in the communication channels [7]. One of the functions of online SNSs is gathering people and promoting communication between each other. As a result, we can expect that collectivistic cultures promote the diffusion of online SNSs because this cultural dimension emphasizes social relations and features active communication among people. This leads to the following hypothesis.

Hypothesis 3-2 : *The level of individualism in the culture has a negative relationship with global online SNS diffusion.*

Masculinity : Hofstede defines masculinity as the traditional and stereotypical gender roles of society [17]. Masculine cultures value competition, performance, self-achievement, and excelling to be the best [45]. High earnings and recognition can be motivators for high self-achievement in masculine cultures [7].

To get higher earnings and recognition in their society, people are more motivated to find the newest, most novel trends [7]. In this society, this is not just for having money but also for any social trends and positions. Being where and using what can define people’s social position and recognition. Therefore, people try not to fall behind and find their values and identities in their social position.

Online SNSs have become some of the most popular online destinations in recent years. According to the research firm HitWise, Facebook has scored the most visits on its home page since March 13, 2010 and surpassed Google in the US. This is a sign that the Web is becoming more sociable than searchable. From this, we can interpret that online SNSs have already become the hottest requirements of this age. We can expect that people in masculine cultures are eager to gain a higher social position by following this new trend. Therefore, these individuals try to gather information about online SNSs to catch up with the latest trends; it makes people interact with other members more effectively [41]. This argument leads to the following hypothesis.

Hypothesis 3-3 : *The masculinity of the culture has a positive relationship with global online SNS diffusion.*

Uncertainty Avoidance : Uncertainty avoidance is “the extent to which the members of a culture feel threatened by uncertain or unknown situations [17, p. 161].” Cultures with high uncertainty avoidance have a higher tolerance for anxiety toward uncertain or ambiguous situations [17, 38]. Therefore, members want to reduce their stress levels by rules and structures to make the situation predictable. On the other hand, cultures with low uncertainty avoidance possess an intolerance for and anxiety toward uncertain or ambiguous situations. They tend to take uncertainty and its inevitability and are more willing to take risks.

Many researchers have studied the relationship between uncertainty avoidance and innovation. In general, it has been known that high uncertainty avoidance is associated with resistance to innovation [17], whereas low uncertainty avoidance cultures are more willing to take unknown risks and tend to more readily bear uncertain situations [20].

The diffusion of online SNS is the process by which a product innovation is communicated and accepted by society’s members overtime [31]. Therefore, logically, we expect that a high-uncertainty avoidance culture has a lower rate of social media diffusion due to the tendency to avoid innovation than in low-uncertainty avoidance cultures. That is, the higher the uncertainty avoidance, the lower is the diffusion rate. Following this reasoning, we offer the following.

Hypothesis 3-4 : *The uncertainty avoidance of the culture has a negative relationship with global online SNS diffusion.*

4. Research Method and Analysis

4.1 Data Collection

We initially collected country-level secondary data across over 120 nations in Africa, the Asia Pacific, the Middle East, the Americas, South Asia, and Western Europe. Our key sources of data were the publications of the ITU, Socialbakers.com, and internetworldstat.com. From Wikipedia.com, we also obtained the language influence regarding the use of English and used a dummy variable where 0 referred to “English is not a primary language” and 1 referred to “English is a primary language.”

To maintain the accuracy and reliability of the data, we validated the values of our variables by cross-checking them with different sources that cited the same facts. The details of the variables are provided in <Table 2>.

<Table 2> Sources of Data

Variables	Source
Internet Penetration Rate	Internet worldstats.com (2010)
Smartphone Subscription Rate	Cisco Visual Networking Index (2010)
Hofstede Index	Geert-hofstede.com (2001)
Facebook penetration rate	Socialbakers.com (May 2010~April 2011)

As previously mentioned, we used the Face-

book penetration rate as a measure of the dependent variable, viz., the extent of online SNS diffusion. The data refer to the Facebook penetration rate of each country in the second week of April 2011 and were obtained from Socialbakers.com, which is the representative institution related to social media statistics.

We also collected independent variables such as the Internet penetration rate, the smartphone adoption rate, and the Hofstede Index to evaluate social media diffusion. The Internet penetration rate was collected from the Internet Miniwatts Marketing Group that is provided in Internet worldstats.com. The site lists the per capita Internet penetration rate by continent and by country and represents the percentage of Internet users. Through the Cisco Visual Networking Index (VNI), Cisco Systems provide smartphone adoption rates by continent and for major countries as a percentage from 2009 to 2010. In this paper, for the accuracy of data, we used data in 2010. The Hofstede Index was collected from geert-hofstede.com, which was developed by Geert Hofstede in 1987 and revised in 2001. As he updated and included more observations in the 2001 version, we used this index with 78 countries.

Because of the limits of secondary data, most institutions did not introduce data in exactly the same year. For example, Internet worldstats.com introduced Internet penetration rate data in 2010 and social bakers.com in 2010~2011. As a result, the number of data points varied across data sources, but we tried to find the newest ones that were produced almost in the same year. Then, we conducted multiple regression analyses to identify the driving force of online SNS dif-

fusion. Additionally, we divided the sample data into two groups depending on OECD and non-OECD countries and assessed differences among each group of data. The summary statistics for these variables are reported in <Table 3>.

<Table 3> Descriptive Statistics of Key Variables

Variables	Measure	Mean	Std. Dev.
Dependent Variable			
	Facebook penetration rate	22.97	17.21
Independent Variables			
Technological Factors	Internet penetration rate	43.12	27.32
	Smartphone adoption rate	10.97	11.92
Non-technological Factors	Language	0.27	0.45
	HS-PDI	60.74	21.64
	HS-IND	42.87	23.40
	HS-MAS	50.71	18.42
	HS-UNC	64.95	22.81

Note) The samples of this study are 78 countries that include values of both technological and non-technological factors.

4.2 Analysis Results

Having established our research model to examine the relevant factors that affect social media diffusion, we estimated the regression models using data from 78 countries. We report the OLS regression results in <Table 4> and <Table 5>. <Table 5> shows the differences between OECD and non-OECD countries.

4.2.1 Regression Results by Technology and Non-technology factors

First, we conducted multiple regression analysis using the technological and non-technological factors (see <Table 4>).

<Table 4> Results of Regression Analysis
Regarding the Research Model

Variables		Coeff.	Std. Error
Technology Factors	Internet penetration rate	0.492***	0.064
	Smartphone adoption rate	0.257**	0.106
Non-technology Factors	English dummy	5.337*	2.953
	H_PDI	-0.018	0.072
	H_IND	-0.144*	0.073
	H_MAS	-0.068	0.062
	H_UNC	-0.010	0.057

Note) N = 78. The dependent variable is the Facebook penetration rate. $R^2 = 0.70$.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Based on the estimated coefficients in the model, four variables—the Internet penetration rate, smartphone adoption rate, the use of English, and Hofstede individualism index had significant influence. The coefficient of Internet penetration rate is positive and highly significant ($= 0.492$, $p < 0.01$). Thus, Hypothesis 1-1 is supported. This means that a unit increase in the Internet penetration rate increases the online SNS penetration rate by 49.2%. The coefficient of Smartphone penetration rate is positive and significant ($= 0.257$, $p < 0.05$), indicating that Hypothesis 1-2 is supported. This means that increase in number of Smartphone users among population increases the online SNS penetration rate by 25.7%. The use of English shows positive and significant coefficient ($= 5.675$, $p < 0.1$). The result supports Hypothesis 2 and indicates that countries using English as a primary language show about 5.6 times higher online SNS penetration rate than non-English-using countries. Finally, the coefficient of Hofstede's individualism index is negative and significant ($= -0.144$, $p < 0.1$), which supports Hypothesis 3-2. The unit increase in

individualism index decreases online SNS penetration rate by 14.4%.

The results indicate that the diffusion of social media is positively related to technological factors (the Internet penetration rate and the smartphone adoption rate) and non-technological factors (the English dummy). Also, individualism in Hofstede's index had a negative and significant influence.

Therefore, the four hypotheses (1-1, 1-2, 2, and 3-2) dealing with both technological and non-technological determinants of online SNS diffusion were well supported. In the case of technological factors, these findings were largely consistent with our predictions and prior work, notably, Kauffman and Techatassanasoontorn (2005) and Dewan (2005).

In the case of non-technological factors, the use of English as a primary language has a positive influence on the diffusion of online SNSs. This indicates that 'global communication' is an important factor being a key characteristic of SNSs.

Also, collectivistic culture was found to have a positive and significant effect on social media penetration compared to individualistic culture. The result indicates that the value of cohesive social bonding and relationship in collectivistic cultures impacts the diffusion of social media.

4.2.2 Regression Results by Economic Wealth (OECD vs. Non-OECD)

To evaluate whether social media penetration rates differed by the wealth of the country, we divided countries into two groups based on OECD ($N = 32$) and non-OECD ($N = 46$) countries.

Then, we performed regression analysis using the dataset. <Table 5> presents the results of re-

gression analysis. In the OECD sample, the coefficients for the smartphone adoption rate (= 0.246, $p < 0.1$) and the use of English (= 13.406, $p < 0.05$) were found to be positive and significant. Also, the coefficient for Hofstede's masculinity index (= -0.180, $p < 0.05$) was found to be negative and significant. On the other hand, in the non-OECD sample, the coefficients for the Internet penetration rate (= 0.588, $p < 0.01$) and Hofstede's masculinity (= 0.258, $p < 0.05$) turned out to be positive and significant.

As mentioned in previous literature, the results revealed technological infrastructure as being an important factor in the diffusion of social media services. The coefficient of the smartphone adoption rate was positive and significant in the OECD sample, and that of the Internet penetration rate was also positive and significant in the non-OECD sample. We can expect that as most OECD countries have developed high-technology infrastructures, the Internet penetration rate would not be significant in the OECD sample. On the other hand, since the non-OECD sample showed a relatively high gap in terms of the Internet penetration rate, the coefficient of

the Internet penetration rate turned out to be significant.

Also, the results for Hofstede's masculinity factor indicate that feminine culture in OECD countries and masculine culture in non-OECD countries attract more social media users; this can be considered when launching new social media sites. These results indicate that the data reflect emphasis on the quality of life in OECD countries and on success and high earnings in non-OECD countries.

5. Discussion

This study investigates online SNS diffusion by focusing on cultural and social aspects along with technological perspectives. Although this study reemphasizes the importance and readiness of IT infrastructure, non-technological factors such as language and culture also have become important determinants in the diffusion of online SNSs. Since online social media services enable global communication in an easy manner, the role of English as a global standard language has to be considered as a significant influence in

<Table 5> Regression Analysis by OECD and Non-OECD

Variables		OECD(N = 32)		Non-OECD(N = 46)	
		Coeff.	Std. Error	Coeff.	Std. Error
Technology Factors	Internet penetration rate	-0.016	0.184	0.588***	0.061
	Smartphone adoption rate	0.246*	0.133	0.108	0.147
Non-technology Factors	English dummy	13.406**	5.687	2.616	2.907
	H_PDI	-0.101	0.101	-0.019	0.084
	H_IND	-0.083	0.151	-0.134	0.084
	H_MAS	-0.180**	0.068	0.258**	0.109
	H_UNC	-0.153	0.108	0.058	0.059

Note) The dependent variable is the Facebook penetration rate. $R^2 = 0.63$ (OECD) and 0.80 (Non-OECD).

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

the diffusion of social media. In terms of the media's important features, the level of interpersonal bonding will lead to the proliferation of online SNSs across the country.

In an era of global business activity, understanding the diffusion of online SNSs has become increasingly important in the overseas expansion of the operations of such services. Nowadays, managers of social media companies encounter significant challenges to sustaining their competitive advantage in the global market. The use (or otherwise) of English as a mother language and cultural differences add a significant degree of complexity and perceived uncertainty to the international business environment, and have an important impact on all aspects of marketing activities.

For example, MySpace, a social networking service provider, terminated its business in South Korea after just ten months of operation, while the company still sustains its business competence in other countries located in Europe and North America. Also, Second Life closed its Seoul branch due to poor performance. Therefore, understanding various factors that affect social media diffusion in a specific country will help managers in the projection of demand by decreasing the perceived uncertainty of foreign cultural environments.

Marketers introducing online social media in masculine cultures (especially in non-OECD countries) should consider placing promotional emphasis on the associated symbolic status that their ownership may convey. The features and benefits that the social media may advertise also should be stressed through various kinds of technological features and their networks. On the other hand, in feminine cultures (especially in

OECD countries), marketers should emphasize how social media services make their life more meaningful. Linking the product to the issues of social responsiveness and people orientation should appeal to the nurturing side of feminine cultures.

Therefore, the introduction of online social media to the global market raises new issues for practitioners regarding the accurate interpretation of user research. Cultural differences in consumer responses from country to country do in fact exist, and are large enough to have a significant impact on the reliability of forecasts and other conclusions drawn from the research.

6. Conclusion

As a cross-country study, this paper used secondary data from 78 countries to investigate the diffusion of online social media services. Along with multiple regression analysis, we found that the diffusion of social media services is affected by non-technological as well as technological factors. Especially, from a consideration of culture, we found that collectivistic culture can be a strong driving force for the penetration of social media. Also, from regression analysis using both OECD and non-OECD samples, we uncovered that the diffusion of social media services depends on the economic wealth of a country. Being based on a broad range of countries, the study not only provides practical insights into critical factors that enable a social media firm's successful global expansion but also helps practitioners to plan their worldwide market strategies more effectively.

Considering that cultural dimensions have a significant effect on the penetration rates of on-

line social media, it is recommended that managers take into consideration cross-cultural differences between groups when designing marketing plans for social media introduction. Future studies should explore the effect of perceived cultural differences of the target markets during launch. Within this context, the moderating effects of socio-economic variables and the globalization extent of customers merit further investigation.

Investigating cross cultural aspects of SNS diffusion, this research contributes to both IS theory and practice. The study not only provides theoretical insights into understanding critical factors that enable successful international expansions of social media services but also helps practitioners to plan their market strategies more effectively in a global context.

Furthermore, studying SNS implies lots of opportunities for IS researchers because the impact of SNS on contemporary human society has recently become growing. Especially, from service science perspective, SNS is a typical example of service innovation of Internet communications in terms of communication service offerings, delivery, and interface. Thus, increased importance of SNS as communication platform stimulates academic demand for more scientifically understanding the service system of SNS.

However, as this study used secondary data, it retains inherent limitations that should be recognized. The lack of data prevents us from applying additional Internet penetration rates and smartphone adoption rates. In addition, there are time gaps of one or two months between the smartphone adoption rate and other variables.

In future research, we will consider other factors that impact on the diffusion of online social

media services. For example, content quality in online social media and technological power in respective countries might have an interesting influence on the diffusion of social media.

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◆ 저 자 소 개 ◆

손 인 수 (insoo114@korea.ac.kr)

현재 고려대학교 경영대학 대학원 박사과정 재학 중이다. 고려대학교 경제학사, University of Wisconsin-Madison 경영학 석사(MBA), Carnegie-Mellon University 경영정보학 석사(MISM)를 취득하였으며 LG-CNS 컨설팅 부문에서 근무하였다. 주요 관심 연구분야는 E-business, Service-oriented computing, Technology-based innovation, Business value of IT, Consumer behaviors under social network environment이다.

오 진 희 (jinheeoh@korea.ac.kr)

고려대학교 경영대학 대학원에서 MIS 석사학위를 취득하였으며 현재 삼일회계법인 산하 삼일 경영연구원 경영 컨설턴트로 근무하고 있다.

이 동 원 (mislee@korea.ac.kr)

현재 고려대학교 경영대학 교수로 재직 중이다. 서울대학교에서 경영학사 및 경영학 석사, University of Arizona에서 MIS 석사, University of Minnesota에서 경영학 박사를 취득하였다. 주요 관심 연구분야는 전자상거래 가격 전략, 온라인 소비자 행동 분석, 소셜미디어, 클라우드 컴퓨팅 등이다. Review of Economics and Statistics, Journal of AIS, Journal of MIS, International Journal of Electronic Commerce, Communications of the AIS, Information Systems Frontier, Electronic Markets, Journal of Global Information Technology Management, ACM Crossroads 등을 비롯한 다수의 국내외 학술지에 논문을 발표하였다.