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The Impact of Cultural Distance on the Internationalization of Online Professional Communities: An Empirical Investigation of ISWorld

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Abstract

We report on an empirical investigation about how cultural distance affects the internationalization of an academic online community. Attracting more active participants from different countries is an important goal for many online professional communities. Based on the theories and findings in the innovation diffusion and internationalization literature, we propose that cultural distance has significant negative effects on the active usage of an online community across different countries, while economic conditions will moderate the impact of cultural distance. An empirical study based on the archival data from an academic online community supports the central hypotheses proposed above.

Key Words:

Online professional community, collaboration, internationalization, cultural distance

Introduction

Online communities are widely used across different professions to support collaborative social and work interactions and knowledge acquisition and exchange among people with common interests or shared backgrounds. In an online professional community, members can share ideas and experiences, ask questions, access industry information, and increase their professional exposure through social networking. Many online professional communities transcend geographical constraints and expand their usage worldwide. Such international expansion of online professional communities has become a trend of community development. Internationalization may create benefits to the community because membership diversity in an online professional community contributes substantially to the community's growth and development by absorbing novel ideas, transferring knowledge across boundaries, solving problems collaboratively, and cross-border expansion of the network basis of the community.

Collaborative projects are built based on continuous negotiation, communication, sense-making, and problem-solving. In a professional online community, all of these collaborative activities typically start with actions such as posting a question, contributing a relevant solution, and sharing useful information. Without this kind of active participation, collaboration in an online community could not even be initiated. Several studies have addressed issues related to the dynamics of virtual team collaboration (e.g. Kirkman and Mathieu 2005; Powell et al. 2004) and researched the antecedents of active participation in online communities (e.g. Bock et al. 2005; Wasko and Faraj 2005). However, most of these studies investigate the issues at an individual level or team level. On the other hand, the present paper offers an investigation based on the active participation at the national level. Our empirical results contribute to a better understanding of how online collaboration between professional actors from organizations in different countries can be effectively organized and managed.

In the internationalization and global diffusion literature, there are some fruitful theories and findings related to international expansion. Based on these theories, cultural distance and economic factors will impact the patterns of such international expansion significantly. Hence, we specifically propose that the cultural distance will affect the expansion of an online professional community across countries negatively, and economic factors such as GDP are positively related to such expansion. We examine the hypothesis proposed using archival data from an academic mailing list community (ISWorld).

The paper is organized as follows. In the next section, we provide a brief overview of online communities. Then, we describe our research setting — AISWorld Net and the ISWorld Mailing List. In the section of theoretical bases and hypotheses, the relevant literature on internationalization of online communities is reviewed and specific hypotheses are proposed. Based on the hypotheses proposed, the research design and the results of the data analysis will be presented. Finally, we discuss the major empirical findings and the implication of the findings, and we point out the limitations and future research directions at the end.

Some Basic Concepts About Online Community And Mailing List

There is no accepted definition of online or virtual community. Some common facets about online community are that it is about groups of people, dispersed over time and space, who converse, share knowledge, and build social contacts using computer mediated communication (Matzat 2004; Preece and Maloney-Krichmar 2003).

Online communities can benefit both organizations and individual members. For organizations, online communities could increase the social support of its members, enhance their customer loyalty, and facilitate information sharing within organizations. For individual members, an online community can help them build a social network and acquire valuable information to help carry out professional tasks.

Different types of synchronous and asynchronous technology are used in building various forms of online communities. Among others, synchronous technologies used include instant messaging, white boards, and text chats. Asynchronous technologies include bulletin boards systems, discussion forums, web-logs, mailing lists/listserv, and newsgroups. Particularly, mailing lists are widely used in many online communities to support basic functions such as announcements, information querying, and discussion.

The mailing list is one of earliest forms of online communities. Since 1975, scientific researchers have used e-mail based list servers to share information and knowledge (Schoberth et al. 2003). Some common features of mailing lists include broadcasting messages, supporting discussions, and creating archives. While some empirical studies (Preece and Maloney-Krichmar 2003) identify some technical features as advantages or disadvantages, how to evaluate certain features of mailing list in practice really depends on the designers' intentions and users' needs. For example, in some cases, the features of

sending announcements could benefit users by providing useful information and improve users' awareness toward some critical issues., In the other cases, however, the announcements function may seriously result in information overload and reduce the users' motivation to communicate with others actively.

AISWorld Net and the ISWorld Mailing List

The primary research setting of the study is the ISWorld Mailing List in AISWorld Net. The ISWorld Mailing List is presumably the most important worldwide online communities for academics in the information systems area.

AISWorld Net

The ISWorld Mailing List is embedded in AISWorld Net, which is supported and funded by the Association for Information Systems, with resources currently provided by the University College Dublin and the Information Systems Research Center at the University of Houston. AISWorld Net is a well established website (<http://www.isworld.org/>), designed to

“provide information management scholars and practitioners with a single entry point to resources related to information systems technology and promote the development of an international information infrastructure that will dramatically improve the world's ability to use information systems for creating, disseminating, and applying knowledge (ISWorld Net)”.

As a multifunctional website, AISWorld Net organizes information into five categories — “Today on ISWorld”, “Research & Scholarship”, “Teaching”, “Professional Activities”, and “Country & Language Group Pages”. AISWorld Net also provides five hyperlinks on its homepage — JAIS, CAIS, eLists, eLibrary, and Directory. JAIS and CAIS are two IS journals sponsored by the Association for Information Systems. E-Library provides free access to conference proceedings and journal articles to members. Faculty Directory provides contacts of IS academics from all over the world. Finally, eList links directly to the ISWorld Mailing List. Through a simple registration process, IS academics can communicate with the entire international community through the list.

The ISWorld Mailing List

The mailing list is the major communication media among AISWorld Net users. Most users of ISWorld Net are IS researchers and educators. Through the various academic conferences and workshops, ISWorld Net users have plenty of opportunities to know each other in traditional face-to-face contexts. ISWorld is an online platform supporting collaborative work among the faculty in information systems academy. The ISWorld mailing list consists of about 2,500 members. The first message was posted on the ISWorld Mailing list on November 14, 1994. In the mailing list archive, users can retrieve all messages from 1994/11/14 to 1998/11/30, and 2002/04/01 to present. While most of the data ranging from 1994/11/14 to 1998/11/30 is available, the data is not continuous. Therefore in this study, we only collect the data ranging from 2002/04 to 2006/04. Since 1997 four categorized archives were offered based on the content of messages, which are research, teaching, job postings, and table of contents for journal publications.

While the mailing list is not moderated, the activities on the mailing list are well guided through a set of strict policies and conditions. Policies such as no advertising, no file attachment, no duplicated posting are designed to reduce spamming and information overload. In ISWorld users can post various queries related to research, teaching or academic administration. Other users are encouraged to send responses or answers to the information seeker directly and discouraged to broadcast their responses to the entire list. But when the original poster has collected enough responses to the request, it is considered good practice to broadcast a summary of them. Since its establishment, academic researchers and educators in the information systems area across various countries have used this mailing list to share knowledge and solve problem collaboratively. Through the mailing list, researchers acquire valuable directions and expertise for helping with their research projects and teaching issues, ranging from basic ideas, literature references, and measurement instruments to complicated research methods and analysis techniques. Sometimes such collaborative works even activate sustained collaborations offline. The managers of the mailing list will constantly review postings and categorize the valuable summaries and restore them in categorized archives. From 1997 to 2004/04, the ISWorld mailing list has produced 495 collaboratively created documents that summarize online discussions of particular research questions that were posted on the list. Similarly, 310 summary documents on teaching and curriculum question were also created and made available to the community in the ISWorld archive. .

Theoretical Basis and Research Hypotheses

There are two streams of literature addressing the patterns of international expansions - theories of internationalization (Kim 2003; Kogut and Singh 1988), and the theory of innovation diffusion (Rogers 1995). Both streams highlight the impacts of cultural and economic factors on the international expansion of managerial and technology innovations.

The theory of internationalization has been developed in the international business area to explain the temporal and geographical expansion of multinational firms. In the internationalization literature, cultural distance, derived from Hofstede's (1984, 2001) four dimensional framework of culture, is widely used as an important explanatory factor regarding a foreign firm's expansion into new host countries. The four dimensions of Hofstede's cultural framework can be defined and summarized as follows.

Table 1. Hofstede's Cultural Dimension (adapted from Hofstede, 2001)

Cultural Dimension	Description
Power distance index (PDI)	The extent to which the less powerful members of organizations and institutions (like the family) accept and expect that power is distributed unequally. The high power distance index refers to a society with high level of inequality.
Individualism (IDV)	The degree to which individuals are integrated into groups. The high individualism index refers to a society in which the ties between individuals are loose: everyone is expected to look after him/herself and his/her immediate family.
Masculinity (MAS)	The distribution of roles between the genders which is another fundamental issue for any society to which a range of solutions are found. The high masculinity index refers to a masculine society in which women are less assertive and competitive than men.
Uncertainty avoidance index (UAI)	The extent to which a culture programs its members to feel either uncomfortable or comfortable in unstructured situations. The high uncertainty avoidance index refers to a society in which people try to minimize the possibility of the unstructured situations by strict laws and rules.

The cultural distance concept is defined as the degree to which cultural values in one country are different from those in another country (Kogut and Singh 1988). According to these studies, cultural distance could serve as psychological barriers for individuals to get involved in the business activities in a foreign country (Johanson and Vahlne 1977, Sousa and Bradley 2006; Shenkar 2001). These studies argue that the technological or managerial innovations will enter a country later or slower when the country is culturally more different from the original country of the innovation (Gomez-Mejia and Palich 1997; Nordstrom and Vahlne 1992). In these studies, the expansion process from a focal country to other countries is negatively correlated with the cultural distance between the focal country and other countries. The theoretical arguments about the cultural effects based on the internationalization literature are consistent with those in the theory of diffusion of innovation (Rogers 1995). Maitland (1998) applied Hofstede's cultural dimensions (1984, 2001) in explaining how uncertainty avoidance, power distance, and gender equality will affect the diffusion of interactive networks. At a macro level, an aggregate construct like cultural distance is more straightforward and applicable than measures of separate dimensions of culture.

In the current study, the United States dominates AISWorld Net. Many of the information resources and platforms are located there as well and about 50% active users of the community are from various academic institutions in US. Therefore in this study, we choose United States as the focal nation to benchmark cultural distance. To indicate the degree of expansion of an online community, we use active usage of online community such as messages posted from a country and number of active users. Based on theories and empirical findings discussed above, we propose the following hypothesis.

Hypothesis 1: Cultural distance between a country and the US is negatively related to the active usage of ISWorld community in the country.

Besides the cultural effects, national economic standing is also a very important antecedent of technology adoption in a country or region (Rogers 1995). Studies in global diffusion of information technology argue that this economic factor has a significant effect on the level of technology usage (Beilock and Dimitrova 2003; Yenyurt and Townsend 2003). Beilock and Dimitrova (2003) show empirically that the economic conditions of a country will deeply impact the Internet usage rate (IUR) in the country. Moreover, the economic conditions will play an important role in shaping the level of academic development in a country, especially for scientific research and education in the information technology area. Based on

innovation diffusion theory and the empirical findings in Internet diffusion, using GDP to indicate the national economic factor, we propose that:

Hypothesis 2: GDP per capita of a country is positively related to active usage of ISWorld community in the country.

Research Methodology

Data Collection

We analyzed the all 8177 messages posted to the ISWorld mailing list over the 49 months from April 2002 to April 2006. Each message includes some information about the sender, date of posting, subject of the message, and the content of the message. We identified the nationality of the senders through searching the directory of ISWorld community. In total, we identified 1679 users from 54 countries from the usable 8143 email messages¹. 34 messages were discarded from analysis because they were considered spam or otherwise not related to the purpose of the list.

Software to Aid Content Analysis

The auto-coding function of ATLAS.ti 5.0 was used in the early stage of data coding. The auto-coding basically helped us to summarize the information such as the author's name and email address, and the posting date into an integrated spreadsheet. SPSS was used in counting the number of users and calculating the frequencies of users' names and email addresses.

Measures

The Active Usage of Online Community Service Functions

While some users are registered as a member of the mailing list, they merely use the mailing list to collect messages passively. In this study, we identify the active users as those who at least post one message in the mailing list. We use the number of users and number of messages posted from a country to indicate the active usage of the ISWorld community.

Cultural Distance

In our study, we choose the United States as the focal point of the online community (due to its dominance in terms of membership). Particularly, to calculate the culture distance, we apply the four dimensions of Hofstede's (1984, 2001) culture index — power distance, individualism, masculinity, and uncertainty avoidance. The culture distances between US and other nations are calculated using the following formula (Kogut and Singh 1988):

$$CD_j = \sum_{i=1}^4 \{(I_{ij} - I_{iu})^2 / V_i\} / 4, \quad \text{Where:}$$

CD_j= cultural distance from the USA to the jth country;
 I_{ij}=the index for the ith cultural dimension of the jth country;
 I_{iu}=the index for the ith cultural dimension of the USA; and
 V_j=the variance of the index of the ith dimension.

The formula represents an average of the normalized squared deviances on each of the four dimensions of cultural difference, in which the reference value is taken to be the cultural index of U.S. Using the above formula, the cultural distance between the 53 countries and the United States are calculated. Among them, Australia is closest to US culturally with cultural distance as 0.02, and Yugoslavia² is the farthest from US culturally with cultural distance as 4.69.

GDP Per Capita

In previous studies (e.g. Beilock and Dimitrova 2003; Yenyurt and Townsend 2003), per capita income (GNPP) or per capita gross domestic product (purchasing power party) — GDP (PPP) are used to indicate the economic conditions of a country. GDP per capita of each country is collected from the World Bank. Among the 53 countries investigated, Norway has the highest GDP per capita (\$42400) and Uganda the lowest (\$1700).

¹ For the posters who moved from one country to another country, we count the poster as two users in different countries.

² Here, we refer to the former Federal Republic of Yugoslavia (before 2003).

Data Analysis

Descriptive Statistics

The ISWorld mailing list has approximately 2500 registered users³. Among them, more than 800 users remain passive (lurkers) while 1679 were identified as active users (posters), from 54 countries with 8143 messages, who at least contributed one message. Of those, 834 posters with 3757 messages are from the US and 845 posters with 4386 messages are from other countries. The number of messages and posters shows that the US is obviously the center of the community. The descriptive statistics of the four indicators — number of messages, number of posters, GDP per capita, and cultural distance — are shown in the following table, in which U.S. is not included.

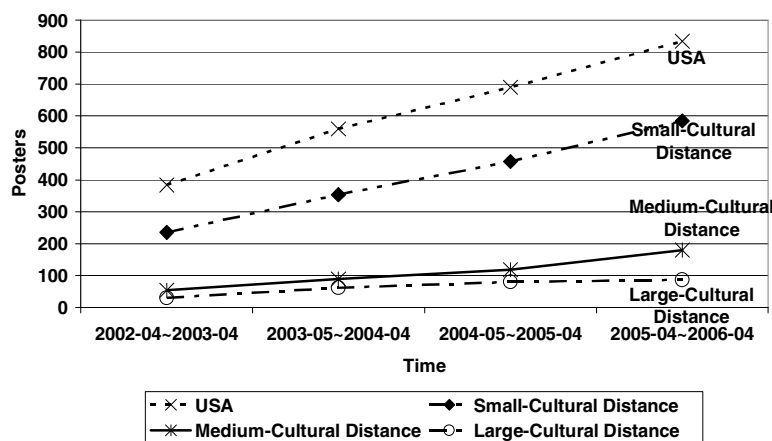
Table 2. Descriptive Statistics of Major Indicators

	Min	Max	Mean	Std. Dev.
Messages	1	627	80.36	128.51
Posters	1	125	15.49	24.80
CD (from USA)	0.02	4.69	2.34	1.27
GDP per capita (k\$)	1.70	42.40	19.24	11.55

Messages and Posters over Time

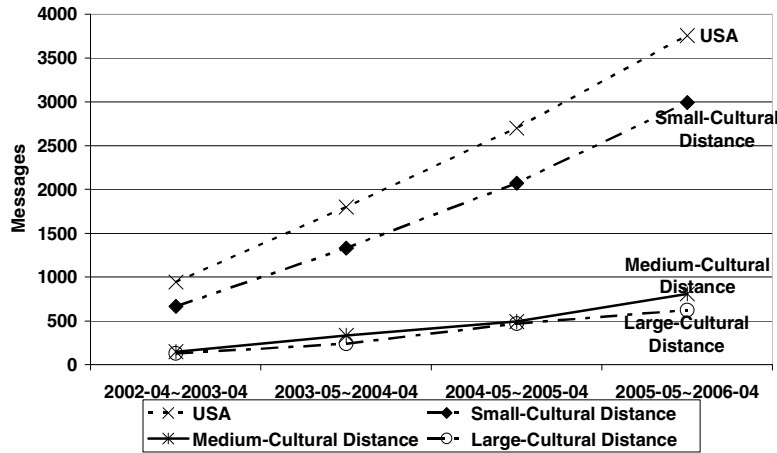
In order to visualize the impact of cultural distance on the expansion trend over the four-year period, we split the 53 countries into three groups based on the cultural distance from the U.S. The three groups are defined by level of cultural distance, with 18 countries exhibiting small differences, another 18 showing medium differences, and the remaining 17 large differences. Figures 1 and 2 illustrate the cumulative number of users and messages for the US and the three groups over time. From Figures 1 and 2, we can find that the closer a group culturally is to the US, the larger the amount of users and messages the group has. Moreover, although all three groups grow over time in terms of posters and messages, the group culturally closest to the US grows parallel with U.S., and obviously faster than the other two groups. The gap between culturally distant groups and culturally close group widens over time.

Figure 1. Cumulative Curve: Posters Over Time (Categorized by Cultural Distance)



³ Based on data provided on the ISWorld web site at <http://www.isworld.org/background/about.htm>

Figure 2. Cumulative Curve: Messages Over Time (categorized by cultural distance)



Similarly, we split the 53 countries into three groups based on GDP per capita. The three groups are high GDP group (18 countries), medium GDP group (18 countries), and low GDP group (17 countries). Figures 3 and 4 illustrate the number of users and messages of the three groups over time. The figures show that the high GDP group has the largest number of posters and messages, and grows fastest among the three groups. The gap between low GDP groups and high GDP group widens over time.

Figure 3. Cumulative Curve: Number of Posters Over Time (categorized by GDP)

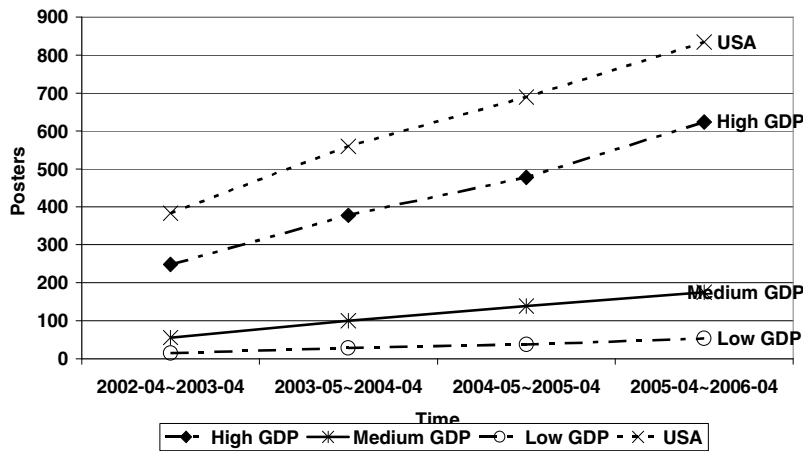
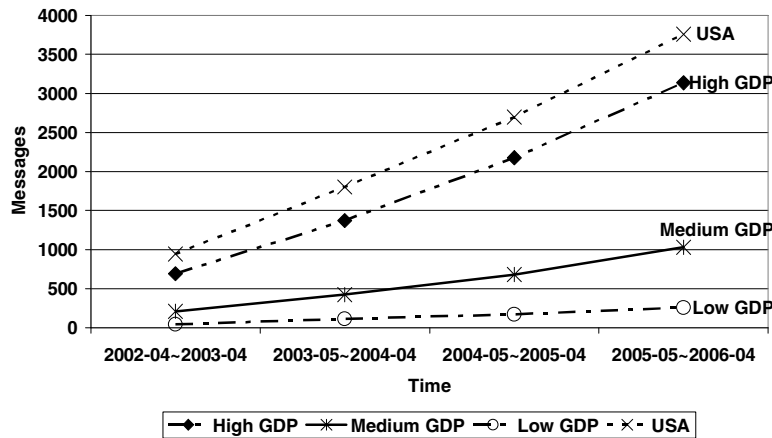


Figure 4. Cumulative Curve: Messages Over Time (categorized by GDP)



Correlation Analysis

A correlation analysis was conducted involving both cultural distance and the four dimensions of cultural indices. (table 3). The correlation analysis shows that both cultural distance and GDP are significantly correlated with the number of messages and posters of a country, and that among the four dimensions of cultural indices, power distance (PDI) is significantly negatively correlated with both messages posted and number of posters from a country. Individualism (IDV) is significantly positively correlated with both messages posted and number of posters from a country. But masculinity (MAS) and uncertainty avoidance (UAI) are not significantly correlated with the active usage of the community. Cultural distance is significantly correlated with all of the dimensions of Hofstede’s cultural framework except the uncertainty avoidance. Moreover, the messages and posters are highly correlated ($r=0.957$), so that the two indicators are exchangeable in the study.

Table 3. Correlations

	Messages	Posters	Four Dimensions of Culture Indices				CD	GDP pc
			PDI	UAI	IDV	MAS		
Messages.	1							
Posters	.957**	1						
PDI	-.501**	-.500**	1					
UAI	-.164	-.254	.145	1				
IDV	.601**	.624**	-.670**	-.126	1			
MAS	.146	.058	.073	.062	.023	1		
CD	-.560**	-.596**	.614**	.221	-.844**	-.323*	1	
GDP pc	.489**	.502**	-.602**	-.145	.601**	-.119	-.445**	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

N=53

Hypothesis Testing

The dependent variables — messages and posters — in the study are count data bounded below by zero. They are obviously skewed. Figure 5 and 6 show the Q-Q plot of the two variables.

Figure5 Q-Q Plot of MESSAGES

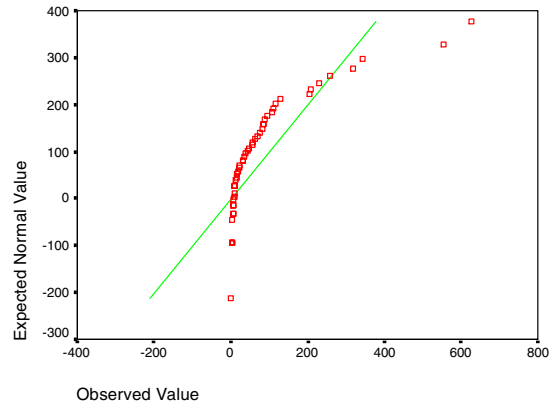
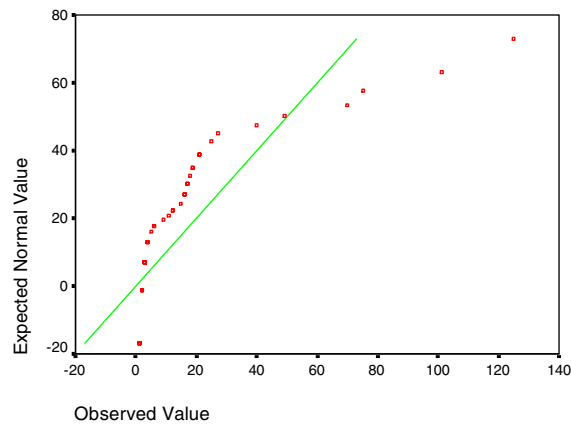


Figure 6 Q-Q Plot of POSTERS



To reduce skewness, we performed a log-transformation for messages and posters. After the transformation, the normality of the two log-transformed variables becomes much better, as illustrated by figures 7 and 8 that show the Q-Q plot of log-message and log-poster

Figure 7 Q-Q Plot of Log Message

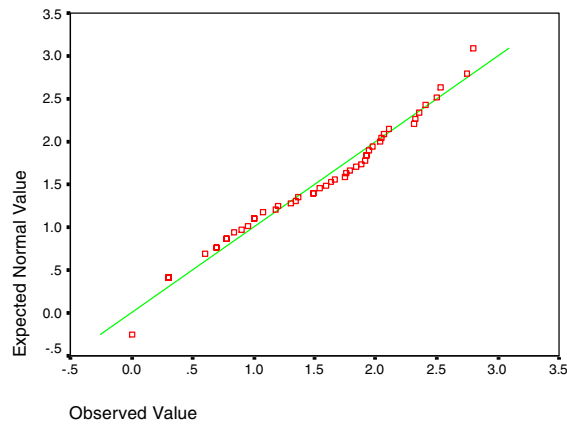
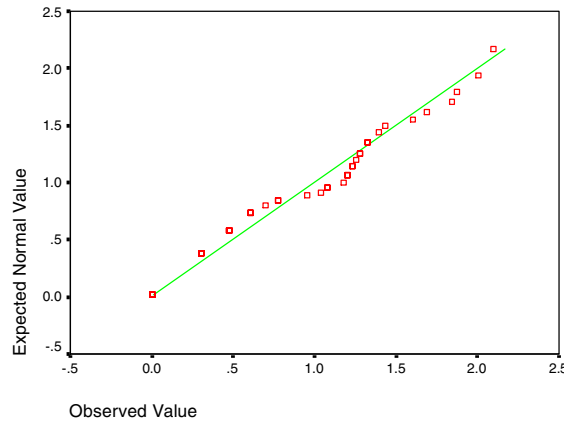


Figure 8 Q-Q Plot of Log Posters



In the following linear regression, we use the two transformed variables — log-message and log-poster — as dependent variables. In our hierarchical regression model, in the first step we put cultural distance as the independent variable, and in the second step we put the both GDP and cultural distance as independent variables. In the hypothesis testing, we do not put the four cultural dimensions in regression model. Theoretically, cultural distance is derived from the four cultural dimensions, so that the two measurements are exchangeable to some extents. Statistically, the high correlations between the two measures will result in collinearity. Table 4 shows the results of the two regression tests. The results show that cultural distance is significantly negatively related to the number of messages posted and posters of a country. GDP per capita is significantly positively related to the number of messages posted and posters of country. The results support our two hypotheses stating that both cultural and economic factors play significant roles in the expansion of an online community.

Table 4. Hierarchical Linear Regression

	Model 1		Model 2	
	Log-Poster	Log-Messages	Log-Poster	Log-Messages
Cultural Distance	-.577**	-.500**		
Cultural Distance			-.316**	-.268*
GDP per capita			.588**	.524**
R ²	.333**	.250**	.611**	.471**
ΔR ²			.278**	.221**

** Regression is significant at the 0.01 level (2-tailed).

* Regression is significant at the 0.05 level (2-tailed).

N=53

Discussion and Conclusions

The present study explored how cultural and economic factors impact the international expansion of an online professional community. We analyzed the four-year archival data of an academic online community centered in U.S. We used active usage of the online community in a country to indicate the degree of expansion of the online community in the country and investigated the different effects of culture and economic factors on the international expansion. We found that in this academic online community, cultural distances have strong negative effect on the active usage of the online community, and GDP per capita has strong positive effect on the active usage of the online community. Moreover, we found that among the four dimensions of Hofstede’s cultural framework, two dimensions are significantly correlated with active usage in this online community. Power distance is negatively related to the active usage of the online community and individualism is positively related to the active usage. A descriptive investigation also shows that both cultural distance and the differences of GDP per capita could impact the growth of the online community in different countries. Particularly, the gap in terms of active usage of the ISWorld community between low GDP countries and high GDP countries widens over time (Figure 3 and 4). The gap between the culturally distant countries and culturally close countries widens over time (Figure 1 and 2).

The findings of our study have significant implications to the literature of online professional communities, and the growth and expansion of online, cross-cultural and cross-border collaboration. The ISWorld mailing list is a typical online professional community in which members have shared domain knowledge and similar professional backgrounds. The strong impact of cultural distance on the international expansion of ISWorld mailing list could shed light on the other online professional communities. The increasingly widening gap between countries that are culturally more distant from the U.S.- and those that are closer also suggest that the research issues about internationalization of online professional communities deserve more attention. To overcome the barriers of cultural distance, we have several suggestions for the development of ISWorld in particular and online professional communities in general. First, one possibility to make the culturally different countries speak out more is to share more of the sponsorships of the online communities with these countries. Co-sponsorship with diverse national cultures will reduce the perceived cultural distance in an online community. Second, since the leaders and moderators play important roles in shaping the growth and development of online communities (Berge and Collins 2001; Butler 2003), some key people from those culturally different countries could be invited to serve as moderators to constantly bring forth some valuable queries or discussions from their national perspectives. Finally, those culturally different countries could be invited to host some of the international conferences and other events more often. The resulting additional face-to-face encounters could increase mutual understanding and reduce the cultural barriers.

We did not draw strong conclusions about the effects of the other two cultural dimensions because the effects of the individual dimensions likely are moderated by the dominant culture of an online community. In our study, American culture is the dominant culture, which exhibits low power distance and high individualism. We conjecture that if the focal country of an online community were to have totally reversed cultural indices, such as high power distance and low individualism, the roles of individual cultural dimensions on international expansion of the online community would be remarkably different.

Our study is limited in several important ways. First, in our predictive model of the internationalization of online professional communities, we only employed cultural and economic factors. We did not involve some relevant factors such as language, and perceived competence due to the sparseness of quantifiable indicators at the national level. Obviously, among other factors, language plays an important role in the internationalization of an online community. An additional analysis (table 5) about the effect of language, by simply categorizing the 53 countries into English vs. non-English speaking countries, shows that the average messages (361.8) posted and average active users (62.2) from each native English speaking country are much higher than those (52.9 messages and 10 active users) from each non-English speaking country. This results (table 5) suggest that the language popularity in a country could limit the actually usage of an online community in the country. Second, the small sample size (53 countries in our data setting) does not allow us to include macro-level control variables such as academic development, number of academicians in information systems, and Networked Readiness Index (NRI). We assume that the high correlations between these factors and GDP per capita may result in collinearity and compromise the hypothesis testing. Third, the constraints of our archival data limit our empirical investigation. The missing archives at the beginning stage of the ISWorld mailing list make it impossible for us to use the entry time to a country as the indicator of internationalization. Some academic researchers could use the opportunity of sabbaticals to serve as visiting scholars for a short period of time in other countries. It is difficult to track such cases. The mild inaccuracy in the measures of user's nationality could result in some bias in our tests. Finally, in the data analysis, we applied log transformation on the dependent variables to improve the normality of the data, and then conducted linear regression to test the hypothesis. However, a Poisson regression model might be better for the count data of this study (Greene 2003).

Table 5. English Speaking vs. Non-English Countries

	Number of Countries	Total Messages	Average Messages	Total Active Users	Average Active Users
Native English Speaking Countries	6	1901	361.8	373	62.2
Non-English Speaking Countries	47	2485	52.9	472	10.0

Note: The six native English speaking countries are Canada, United Kingdom, Ireland, Australia, New Zealand, and South Africa.

Future research can extend this study in several different directions. First, they could involve multiple online communities centered on different national cultures to investigate the interaction effects between the focal culture and each cultural dimension. Second, more relevant antecedents and control variables at the macro level could be considered in the predictive model of internationalization of online community. Third, more appropriate data analysis method such as Poisson regression or panel data analysis could be used to improve the rigorousness of hypothesis testing.

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