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THE INTERNATIONAL STUDENT AND POM: STATISTICS ANXIETY

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ABSTRACT

Do international students suffer from statistics anxiety in Production and Operations Management classes? To examine this, forty international students and one hundred-thirty-two domestic students were given the Statistics Anxiety Rating Scale (STARS) at the beginning of a Production and Operations Management (POM) class. The results were analyzed using the Mann-Whitney-Wilcoxon nonparametric test. The results somewhat mirrored a similar study of beginning statistics students. The international students differed significantly on three of the six factors revealed by STARS.

BACKGROUND

Statistics anxiety is defined as "the feelings of anxiety encountered when taking a statistics course or when doing statistical analyses; that is gathering, processing and interpreting data" (Cruise, 1985). Relatively few studies have concentrated entirely on POM. Students taking POM in an accelerated time frame recorded higher levels of statistics anxiety. This study found that students recorded significantly higher levels of statistics anxiety in night classes or summer classes than those students who took POM in the traditional MWF or TR format (Bell, 2003). International students were found to have significantly higher anxiety scores in POM than their domestic counterparts in two distinct studies (Bell, 1998; Bell, 2001). Statistics anxiety is negatively related to statistics achievement (Baloglu & Zelhart, 2003). Other studies have found that humor had an effect on anxiety levels (Berk & Nanda, 1998). Statistics anxiety adversely affects students' test performance, self-efficacy, and attitude toward subject matter. Removing time constraints on tests effectively lowered statistics anxiety levels (Onwuegbuzie, et. al., 1997). Younger females were found to flourish in single-sex classrooms (Campbell & Evans, 1997) and women experienced higher levels of statistics anxiety than men (Onwuegbuzie et. al., 1993). Students taught entirely via computers reported less statistics anxiety than those who opted for a traditional course (Bell & Weller, 2006). Mathematical background, namely a five-hour calculus course, significantly lowered statistics anxiety (Bell, 2003). Since international students have a better mathematics background than their domestic counterparts (Madison & Hart, 1990), will this mean lower statistics anxiety?

METHOD

In the spirit of Corey's "action research" of the 1950s, the Statistics Anxiety Rating Scale was administered to forty international students and one hundred-thirty-two domestic students enrolled in an introductory Production and Operations Management course. What is "action research"? Corey defines "action research" to be "deliberate, solution oriented investigation which is designed,

conducted, and implemented by teachers themselves in order to improve teaching in the classroom" (Corey, 1954). The data were recorded over a four-year time period. The instruments were administered at the beginning of the course. The classes were taught by the same instructor, using the same text. Due to the fact that STARS utilizes a five-point Likert scale that is unbalanced, the level of measurement is ordinal. Ordinary one-way ANOVA needs, at least, interval measurements. Hence, the nonparametric Mann-Whitney-Wilcoxon test was used to determine if the two groups differed. Otherwise, Excel was utilized for most calculations (Anderson, Sweeney, & Williams, 1996).

INSTRUMENT

The Statistics Anxiety Rating Scale (STARS) consists of two parts. The first part presents twenty-eight situations often associated with statistics anxiety. These items are scored on a Likert-type scale from one to five, with a "one" indicating no anxiety with that situation while a "five" indicates considerable anxiety. The second part consists of twenty-eight statements dealing with statistics, with responses recorded on a Likert-type scale from one (no anxiety) to five (considerable anxiety). Hence, the lower the score, the lower the anxiety level. Six factors are revealed in STARS: worth of statistics, interpretation anxiety, test and class anxiety, computation self-concept, fear of asking for help, and fear of statistics teachers (Cruise, 1985).

Factor 1 - Worth of Statistics - This factor deals with a student's perception of the value of a statistics course. A person scoring high on this factor sees little or no value in a statistics course. A student scoring high on this factor also feels that statistics does not "fit" their personality, thus indicating a negative attitude toward statistics (Cruise, 1985).

Factor 2 - Interpretation Anxiety - This factor is concerned with anxiety rising from interpreting statistical data. This could arise from deciding which statistical test to utilize or what to do with the null hypothesis (Cruise, 1985).

Factor 3 - Test and Class Anxiety - This factor deals with anxiety related to taking a statistics course or examination. The student that scores high on this factor experiences anxiety when enrolling in or taking a statistics course, solving statistical problems, or taking an actual statistic test (Cruise, 1985).

Factor 4 - Computation Self-concept - This factor reveals anxiety associated with actual mathematical computations, thus relating to classical mathematics anxiety. The student that scores high on this factor experiences anxiety because it involves mathematical calculations and the student feels inadequate when comprehending statistics (Cruise, 1985).

Factor 5 - Fear of Asking for Help - This factor reveals a fear of asking a fellow student or the professor for assistance with statistics problems (Cruise, 1985).

Factor 6 - Fear of Statistics Teachers - This factor deals with the perception of the statistics teacher. A person scoring high on this factor questions "the humanness of the teacher." This person views the statistics teacher as "lacking the ability to relate to the student as a human being" (Cruise, 1985).

DISCUSSION

Factor 1 – Worth of Statistics – The international students scored significantly lower, indicating less statistics anxiety than the domestic group (Z = -1.47, p = .0708) (Anderson, et. al., 1996). The means and corresponding percentiles are shown below:

Group	Mean	Percentile
International	37.075	65th
Domestic	39.508	72nd (Cruise, 1985)

Factor 2 – Interpretation Anxiety – There was a highly significant difference between the means of the international and domestic students with regard to this factor (Z = 4.38, p = .000006) (www.davidmlane.com/hyperstat/z_table.html). The means and percentiles are as follows:

Group	Mean	Percentile
International	30.475	76th
Domestic	26.129	60th (Cruise, 1985)

Factor 3 – Test and Class Anxiety – There was no significant difference with regard to this factor (Z = -.41, p = .3409) (Anderson, et. al., 1996). The means and percentiles of the two groups are shown below:

Group	Mean	Percentile
International	24.800	58th
Domestic	24.917	58th (Cruise, 1985)

Factor 4 – Computation self-concept – There is no significant difference between the two groups (Z = .95, p = .1711) (Anderson, et. al., 1996). The respective means and percentiles are shown below:

Group	Mean	Percentile
International	16.350	62nd
Domestic	15.182	57th (Cruise, 1985)

Factor 5 – Fear of asking for help – There was a significant difference between the means of the international group and the domestic group with regard to this factor (Z = 3.58, p = .000171) (www.davidmlane.com/hyperstat/z_table.html). The respective means and percentiles are shown below:

Group	Mean	Percentile
International	10.750	82nd
Domestic	8.167	58th (Cruise, 1985)

Factor 6 – Fear of Statistics Teacher – There were no significant differences with regard to this factor (Z = -.36, p = .3594) (Anderson, et. al., 1996). The respective means and percentiles are shown below:

Group	Mean	Percentile
International	11.772	59th
Domestic	14.318	76th (Cruise, 1985)

CONCLUSIONS

The international and domestic groups differ on three of the six factors identified by STARS. The differences between groups on Factor 5 – Fear of Asking for Help – and Factor 2 – Interpretation Anxiety - probably stem from communication problems. International students are communicating in, at best, their second language. The results of Factor 5 – Fear of Asking for Help – are country specific. Students from Central America and Japan, for instance, behave quite differently when they have a question. The difference noted in Factor 1 – Worth of Statistics – is interesting as the international group has significantly less anxiety with regard to this factor. It appears that the international students have a better grasp of the importance of statistics. It should be noted that a similar study with international students and business statistics found significant differences on two of the same factors, Factor 2 and Factor 5 (Bell, 2008).

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EXAMINING SHIFTS IN ONLINE PURCHASING BEHAVIOR: DECODING THE 'NET GENERATION'

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ABSTRACT

This study contributes to the understanding of online purchasing behavior of the net generation (Net-geners) and will help to envision new strategies for marketing to Net-geners. Previous research has focused on shifts in technology and overlooks the shift of consumer demographics as the net generation is the first generation to grow up surrounded by digital media and the Internet. As such, Net-geners consider Web-browsing and the Internet as a neutral and common technology. Also, given the size of the cohort, Net-geners are expected to grow as a powerful buying group, not only influencing other purchasers but also becoming themselves a prime consumer group.

This paper will examine the following research questions: (1) how do the factors revealed by previous research impact the online purchasing behavior of Net-geners and (2) what are the significant factors that attract Net-geners to online shopping now? The research model includes nine independent variables that are hypothesized to predict the intention of purchase derived from the online shopping context and Net-geners' characteristics: personalization, responsiveness, feedback, acceptance of complaints, information, product variety, shopping, return/exchange, and enjoyment. In studying these variables and answering these questions, this paper outlines the shift of factors affecting online consumer behavior and helps practitioners set new strategies. We believe that this paper will be of great interest to both academics and practitioners who study online shopping.

INTRODUCTION

Prior studies about e-commerce have gained a limited insight into turbulence of Internet technology because they overlooked the shift of customer behaviors. Thus, the current study focuses on revealing the difference of online behavior of newly emerged customer from existing consumers. New technology can be diversely interpreted and used by people who have perceived it differently. From the end of 1990 to early in 2000, research of consumer behavior in e-commerce was frequently conducted. For previous studies, target subjects were born before 1970. The online market was a new innovation for them so they were less familiar with online shopping.

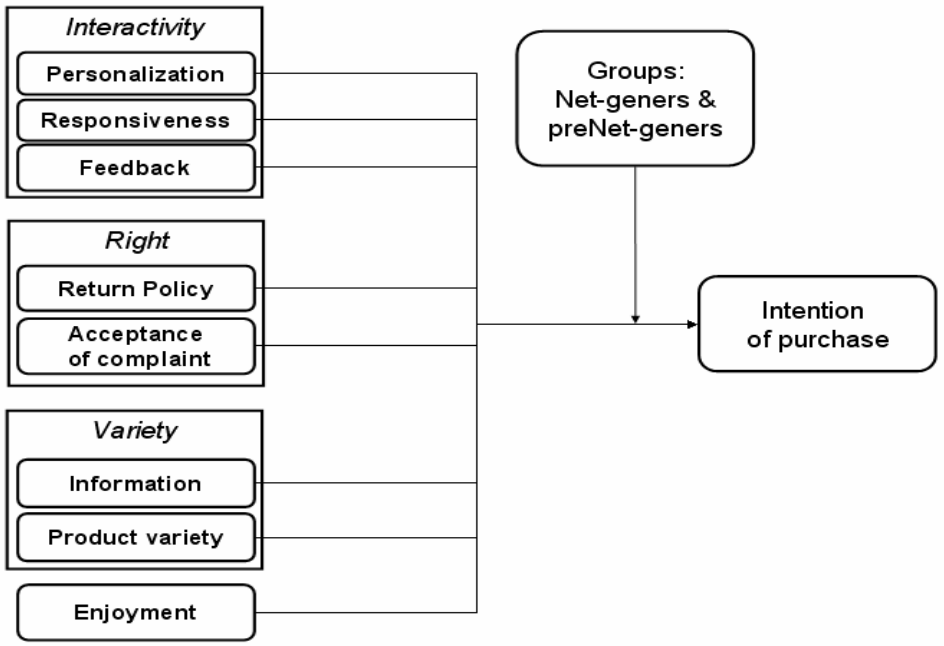
The Net-generation is made up of individuals (Net-geners) born between 1977 and 1997 (Tapscott 2006) and is the first generation to grow up surrounded by digital media and the Internet. Not only are Net-geners familiar with e-commerce and digital technology, but they are also more populous as the children of the baby-boomer generation. Due to their ability to control digital media and their numbers, they are destined to shake up current business practices and have a great effect

on the corporate world (Dale 2000). This will be felt especially by the current Internet sellers that use the technology and strategies developed for pre Net-geners. This paper will examine the following research questions: (1) how do the factors revealed by previous research impact the online purchasing behavior of Net-geners and (2) what are the significant factors that attract Net-geners to online shopping now?

Conceptual Model

We present our conceptual model in Figure 1. The following sections present our propositions and details our arguments in support this model.

Figure 1: Conceptual Model



Interactivity

Given the lack of space and time in Internet communication, e-commerce allows a company and its customers to interact continuously. This empowers the company to understand customers' needs and customers to express their desire. For Net-geners, online interaction is a part of life and online interaction is the most common inherently acquired habit. Interactivity in the context of online shopping is defined as the degree to which customers can communicate with sellers and control content of the interaction in order to solve curiosity and problems and has three dimensions: user control, responsiveness and feedback (McMillan and Hwang 2002, Yadav and Varadarajan 2005).

User control can be interpreted as personalization in the online environment, in that "controlling" a web site is the setting of the websites variables to the customer's favor. Advanced

information technologies such as collaborative filtering, data mining, and click-stream analysis empower online shopping to provide customer-tailored offers. Prior studies related to web personalization are divided into two main streams. The first stream includes studies on the applications of personalization. These studies highlight new applications of personalization technology and their commercial potential (Ho and Tam 2005). The second stream focuses on technologies for tracking online customers, inferring customer preferences and purchasing behavior, and offering a set of personalized choices or presenting different interfaces (Murthi and Sarkar 2003, Kumar et al. 2004, Srikumar and Bharat 2004). Different interfaces include presenting products that customers have searched before and that are related to the product customers previously purchased. The current study focuses on the second stream. Shergill and Chen (2005) suggest that personalization is a key factor in online shopping mall design factors affecting online positive customer perceptions.

Net-geners want to take control of their working environment (Garrison 2000). Also, the emphasis of Net-geners is not placed on information acceptance but information control (Leung 2004). For the online customer, a tremendous amount of information and products have led to more utilitarian customers demanding more control. Providing personalized content enables customers to easily find what they need. This results in online customers enjoying high levels of control (Koufaris 2002). Given the utilitarian and information control nature of Net-geners, we expect them to prefer the online shopping mall that provides personalized contents.

However, for pre Net-geners, exposure of personal information has been considered a nuisance in online shopping. Thus, from the beginning of online shopping research, security has been highlighted as a solution to protect the loss of personal information (Keeney 1999, Lightner et al 2002; Jarvenpaa and Todd, 1997). In addition, given the nature of the control technology and uninhibited expression have in the online environment, Net-geners are likely to give more weight to personalization than to security (Alch 2000, Leung 2004). Thus we propose:

> Proposition 1. Offering personalization will be more strongly associated with intention to purchase for Net-geners than for pre Net-geners.

One of the most important traits of online shopping is bidirectional communication capability. In the brick and mortar shopping mall, consumers and sellers have limited time to communicate. Unlike offline customers, online consumers are allowed to communicate with sellers via a variety of ways such as e-mail and bulletin boards (Udo & Marquis 2001). Palmer (2002) defined responsiveness as "…the presence of feedback to users and the availability of response from the site managers." Shergill and Chen (2005) argue that the perceived willingness of responding to customer needs and problem solving, along with response speed, affected consumers' attitudes toward online shopping. Given the social, interactive and immediate nature of Net-geners (Oblinger and Oblinger 2005), responsiveness is an important function to attract Net-geners. For Net-geners, the right to know and to be equal is non-negotiable. Thus, unlike pre Net-geners, Net-geners do not hesitate to communicate to sellers and frequently contact sellers. Thus we propose:

> Proposition 2. Responsiveness of online sellers will be more strongly associated with intention to purchase for Net-geners than for pre Net-geners.

Information generated by real users enhances knowledge about a product and facilitates making better decisions (King, 2000). Online customer feedback has emerged as a viable mechanism that offers information from the perspective of consumers (Dellarocas 2003). Dellarocas suggests a feedback mechanism allows each period's buyer to report his/her satisfaction with the transaction to a central authority. Comegys et al (2006) argue that comments from a community about a product or set of products could change a consumer's preference and play a primary role during the purchase decision stage.

Net-geners like to communicate, argue, and debate with others online and in the online shopping environment they can instantly comment on any information they find with the click of mouse (Tapscott 1998). This inherent communication habit distinguishes them from pre Net-geners. Also, unlike pre Net-geners, Net-geners attach higher levels of importance to comments from others. Thus we propose:

> Proposition 3. Feedback will be more strongly associated with intention to purchase for Net-geners than for pre Net-geners.

Rights

Early evidence suggests that Net-geners hold their own rights dearly and have a strong belief in equal opportunity. Complaints from mismatching and under-performance of products frequently occur and thus, post purchase service has been a vital factor affecting online customer behavior (Comegys 2006). For example, post purchase satisfaction is an important factor in customer retention (Comegys 2006). Kim and Lee (2002) divide online purchasing behavior into four phases: information, agreement settlement and environment. After the agreement phase, which is done with payment, the settlement phase follows and includes delivery, return, and complaint acceptance as an after-sales service. A complex return policy can be a reason for the customer to abort online purchases (Cho 2004). With a strong belief in equal opportunity (Leung 2006), Net-geners are likely to pursue their rights after purchase. As an example, they would not accept a product that differs from what they expected; this active nature makes Net-geners much more likely to return purchases than pre Net-geners. Thus we propose:

> Proposition 4. Easy return policy will be more strongly associated with intention to purchase for Net-geners than for pre Net-geners.

Adapted to communicate with others around the world, Net-geners easily express their inner thoughts (Tapscott 1998, Leung 2004). Also, Net-geners are fast becoming a generation of critical thinkers because they have been trained to express themselves via Internet debate (Tapscott 2006). On the other hand, pre Net-geners are not accustomed to ‘complaining asynchronously.' Thus we propose:

> Proposition 5. High level of complaint acceptance will be more strongly associated with intention to purchase for Net-geners than for pre Net-geners.

Variety

The value of e-commerce to the customer includes the large amount of product information and product variety (Keeney 1999). Net-geners desire a wide selection because they already live with tremendous amount of options and they have an inherently sophisticated ability to make comparisons (Tapscott 2002). Net-geners possesses a high level of ability to collect and manage information because they frequently utilize the Internet as a tool for 'window shopping' and product comparison (Thamas and Laing 2003). In contrast, pre Net-geners have a relatively lower capability to utilize the excess of information available on the Internet. Thus we propose:

> Proposition 6. Information quality and abundant information about a product will be more strongly associated with intention to purchase for Net-geners than for pre Net-geners.

Customers select a product by comparing alternatives and reducing their set of alternatives (Comegys et al. 2006). A wide selection of products leads to better comparison shopping and eventually better purchases (Keeney 1999). Shergill and Chen (2005) suggest that a good selection of products positively affects online consumer's perceptions. Also, a variety of product offerings have positive effects on attitudes toward online shopping (Cho 2004). Li et al. (1999) argue that the economically-oriented person considers a wide selection of products as an important factor in online consumer participation. Net-geners expect a variety of options because they have been exposed to a tremendous amount of TV channel and Internet sources and are accustomed to surfing among a wide set of choices (Leung 2004). Also, pre Net-geners are less accustomed to surfing among a wide set of choices, and thus a wide set of choices could hinder their online shopping. Thus we propose:

> Proposition 7. A wide set of choices will be more strongly associated with intention to purchase for Net-geners than for pre Net-geners.

Enjoyment

Shopping is not simply a process to acquire goods in modern life - it can also be used for enjoyment. The level of intrinsic enjoyment of the shopping experience affects consumer behavior (Blakney and Sekely 1994). Koufaris et al (2002) empirically demonstrate that shopping enjoyment is positively associated to the intention of return and past studies have indicated that shopping enjoyment can have significant effects on online consumer behavior (Jarvenpaa and Todd 1997, Koufaris 2002). Park and Lee (2005) found that, unlike pre Net-geners', Net-geners use online shopping not only to purchase but also for enjoyment. Thus we propose:

> Proposition 8. Enjoyment will be more strongly associated with intention to purchase for Net-geners than for pre Net-geners.

CONCLUSION

The goal of this paper is to explore the antecedents to the purchasing behavior of the Net generation. To our knowledge, this is the first conceptual model to compare Net-geners' online purchase behavior with pre Net-geners. Our model complements prior work by (1) providing an analysis of a newly emerging, populous, and powerful buying group and (2) articulating the differences in online purchasing behavior between Net-geners and pre Net-geners. In studying these variables, this model outlines the shift of factors affecting online consumer behavior and helps practitioners set new strategies. We believe that this model will be of great interest to both academics and practitioners who study online shopping.

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TECHNOLOGICAL FACTORS & BUSINESS FACULTY STRESS

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ABSTRACT

An exploratory study questioned the impact of 24/7 technology on faculty expectations related to the use of technology and work related stress. The purpose of this study, which was based on a literature review and earlier exploratory studies by the authors (2004), was to determine if technological factors (the "24/7" phenomenon) negatively increase the stress levels of business faculty. Data was collected by distributing the survey to college of business faculty at two Louisiana universities.

INTRODUCTION

College teaching was once considered a "low stress occupation" (Fisher, 1992). College faculty now have more demands on their time including teaching, advising, doing research and providing service to their discipline and university. Frederick Endres and Stanley Wearden (1996) studied full-time journalism and mass communications faculty. Ninety-seven percent reported that they experience work related stress and that this stress had a negative impact on their perceptions of themselves and their work. Walter Gmelch in his book Coping with Faculty Stress (1993) noted the negative impact that stress can have on faculty performance. One stress factor Dr. Gmelch identified was "time constraints". The constraint of time can be positively, negatively or not impacted by the adoption of technology and the expectation to continue to adopt new technology. This study was undertaken to determine business faculty perceptions of technology stress.

David Levy, a professor in the information school at the University of Washington, stated "What's going on now is insane, living a good life requires a kind of balance, a bit of quiet." He questions if we are able to use all of the information that we are constantly bombarded with from a vast array of electronic media. "Information environmentalism" is Dr. Levy's term, concerning the questions about our brain and body limitations, which are similar to the current environmental movement (Bittman, 2008). As technology is embedded into our everyday lives, how do we find balance and still get it all done? Where do we draw a line between always being available and needing down time? Being in academics the authors felt that we do have stress from ourselves, administrators, and student expectations that we be available anytime and from anywhere. To what extent is this stress new and how is it impacting our lives both at work and at home? These are the questions that this study is looking at answering.

LITERATURE REVIEW

This study hypothesized that age, years of experience, gender, and currently online teaching would be factors in how technology stress is perceived. The authors hypothesized that technology would cause more work related stress in older faculty, faculty with more years of teaching experience, female faculty, and faculty not currently teaching online. The following is a review of the relevant literature in this area.

"Technostress, a term labeled by Craig Brod (1984), also known as technophobia and computer anxiety, manifests itself in two distinct but related ways: the struggle to accept computer technology and over-identification with technology. According to Todd Duncan in an article review about his book Time Traps: Proven Strategies for Swamped Salespeople, technology time saver devices may actually be a "technology trap" that wastes time (Johnson 2006).

Faculty stress is defined by Elizabeth J. Thorsen (1996, pg. 471) as: "that which occurs when one perceives that the demands of the environment clearly exceed one's resources to handle them." Hemby (1998) found that gender was a significant predictor and concluded that women tend to have less computer experiences and approach new computer related activities with less confidence. Hemby also found that self-direction, socioeconomic status and age were additional factors in determining computer anxiety (stress). A national postsecondary faculty survey by the Higher Education Research Institute (HERI) in UCLA (Higher Education …, 1999) found that the "most frequently cited causes of stress in faculty life were time pressures, teaching load, committee work, lack of personal life, red tape and keeping up with information technology." Keeping up with information technology was reported as a stressor by more than two thirds of the respondents. Voakes, Beam, and Ogan (2003) found that "women faculty felt stress more acutely than men in the area of time constraints and professional identity" and that gender and the nature of the course load (application versus concepts) were significant factors influencing technology-related stress, whereas age and tenure track were only marginally significant.

Thorsen (1996) found that stress varied by rank and that women tended to be assistant or associate professors. Thorsen also found that associate professors had the greatest stress when compared to assistant or full professors. Gmelch (1993) and Thorsen (1996) found that the longer a faculty member had been teaching the less stress he/she experienced. Number of years teaching is often correlated with the rank of the professor, since rank has a years-in-teaching component to it at most institutions. In addition to rank and years in teaching, age would be a factor in technology stress. Friedberg's (2003) research on technology change and older workers found that older workers used computers less than younger workers. However, older workers using computers tended to put off retirement.

METHODOLOGY

The questionnaire was composed of several sections, including 10 scale items on the impact of technology's 24/7 demand on faculty time, questions about computer usage and demographics. After approval by our IRBs, the surveys were distributed via e-mail attachment to 67 faculty members at the lead author's school, including deans and department heads, and to 27 faculties at the second author's school, including the dean and department heads. Surveys were also distributed

in hard copy form to those faculties who requested that format. Data were collected in late February 2008. The focus of this paper is on the questions addressing the impact of technology's 24/7 demand on faculty time and computer usage.

RESULTS

A total of 35 surveys were returned by the end of February 2008, representing an overall response rate of 37.23%. Twenty-four surveys were returned from the lead author's school (35.82% response rate), and 11 surveys were returned from the second author's school (40.74% response rate).

Twenty-three respondents (71.9%, 23/32) indicated that they were tenured or on tenure-track, while the remainder were in non-tenure-track positions. The majority of respondents were Professors (14/34, 41.2%) or Assistant Professors (11/34, 32.4%). Respondents' ages ranged from 31-35 to over 65, with seven (20%) falling within the 46-50 age category and another seven (20%) being between 61 and 65 years old. Twenty out of 34 who answered the question (58.8%) reported having 16 or more years of teaching experience. Three-quarters of the respondents were male (24/32). Almost three-quarters of the faculty were married (26/35, 74.3%) and had earned Ph.D.s (25/34, 73.5%). Over a third of the respondents taught in the Management field (12/34, 35.3%), followed by Economics and Marketing (5 each, 14.7% each). Roughly a third of the respondents (12/35, 34.3%) reported that they teach online courses; of the 12, half teach more than 50% of the course online.

Eighteen out of the 35 respondents (51.4%) indicated they used computers between two and five hours during a work day. Sixteen of the 35 (45.7%) reported using computers less than two hours on non-work days. Faculties were asked to provide numbers that reflected the percent of computer usage that related to their work. The 32 teachers who responded reported percentages ranging from 33% to 95%, with a mean of 71.81% and a standard deviation of 17.587%. The modal response was 90% while the median was 75%. The last question before the 10 scale item questions dealt with accessibility to students versus five years ago. Twenty-nine (87.9%) out of the 33 faculty who answered the question said technology had made them more accessible to students compared to five years ago, while the remaining four professors said accessibility had not changed (i.e., "as accessible").

Ten scale items were developed and a Likert-type rating scale was used for each of the ten questions. Respondents were allowed to indicate "Not applicable" if they felt a question did not apply to their situation. Based on median responses, faculties tended to agree with "Students expect immediate response to their communications" while being ambivalent to the remaining nine statements. The greatest variation in responses, based on the two modes, was found for "Being accessible on the weekends is expected by my students." The last question that dealt with technology 24/7 impact involved "check all that apply" responses to interacting with students via technology at home. A summary of responses to the question of student interaction via technology at home is provided in Table 1.

Table 1
Interacting with students through technology at home has …

Statement	#Checked
made my job more enjoyable	15
not changed my job	15
allowed more flexibility to deal with personal issues	14
not interfered with my family time	12
interfered with my family time	08
made my job less enjoyable	04

Further analyses were conducted using chi square analysis and nonparametric statistics where appropriate, using most of the demographic variables. There were significant cell size problems with most of the cross-tabulations. First, we look at significant results regarding the computer usage questions. Then we look at significant results from Mann-Whitney U and Kruskal-Wallis tests on the 10 scale items.

Professors at the second author's school tended to use computers more (six hours plus) during non-work days (2 = 6.952, df = 3, p = .073), and felt that technology had made them as accessible to their students compared with five years ago (2 = 4.306, df = 1, p = .073). Professors at this school also tended to check that interacting with students via technology at home made their jobs more enjoyable (2 = 2.828, df = 1, p = .095). Professors with six to 15 years of teaching experience indicated that interacting with students via technology at home made their jobs more enjoyable (2 = 6.958, df = 3, p = .073) and gave them more flexibility to deal with personal issues (2 = 13.886, df = 3, p = .003). Business faculty who teach online classes tended to check that interacting with students via technology at home made their jobs less enjoyable (2 = 3.323, df = 1, p = .068; though Fisher's exact test p = .106). Those who don't teach online classes tended to check "has not interfered with my family time" (2 = 5.459, df = 1, p = .021).

Three marginally significant results were found by school. Two-tailed tests of significance were used, since we had no directional hypotheses. The second author's school faculty disagreed with the statement, "I feel pressure to use e-mail to correspond with my students," while the lead author's colleagues were more ambivalent (Means: 1.82 vs. 2.79, Z = - 1.941, p = .052). The lead author's colleagues tended to disagree with these statements, while the second author's colleagues were more ambivalent: "I often purchase my own hardware and technology for use at school" (2.14 vs. 3.20, Z = - 1.868, p = .062), and "I often purchase my own software for use at school," (2.14 vs. 3.20, Z = - 1.897, p = .058). One significant difference was identified by gender. A one-tailed test was used, since we expected women to encounter more tech 24/7 stress. Men tended to disagree with the following statement, while women tended toward ambivalence or agreement: "I feel pressure to use e-mail to correspond with my students" (2.04 vs. 3.50, Z = - 2.70, p = .008). Finally, one significant and one marginally significant difference were found for online teachers vs. non-online teachers. A one-tailed test was used, since we expected online teachers to encounter

more tech 24/7 stress. Those who do not teach classes online tended to disagree with these statements: "I often purchase my own hardware and technology for use at school" (2.10 vs. 3.08, Z = - 1.951, p = .051), and "I often purchase my own software for use at school," (2.05 vs. 3.17, Z = - 2.341, p = .019).

Instructors tended to agree with the statement, "I feel pressure to use e-mail to correspond with my students," while Assistant Professors and Professors tended to disagree (2 = 10.114, df = 3, p = .018). Professors with six to 10 years of experience tended to agree with the statement, "I am frustrated by the lack of technology at my university," while those with 16 or more years of experience tended to disagree (3.80 vs. 2.26, 2 = 8.505, df = 3, p = .037). Those with less than 16 years of experience tended to agree with this statement, "I am frustrated by the lack of technology at my university," while those with 16+ years tended to disagree (3.60 to 4.00 vs. 2.44, 2 = 10.578, df = 3, p = .014). Younger professors (31-40) tended to agree with this statement, "I am frustrated by the lack of technology at my university," while those between the ages of 51 and 60 tended to disagree (3.88 vs. 2.30, 2 = 7.346, df = 3, p = .062). Professors who are 50 or younger tended to agree with the statement, "I am frustrated by the lack of technology at my university," while those between the ages of 51 and 60 tended to disagree (3.8 to 3.88 vs. 2.4, 2 = 9.334, df = 3, p = .025).

DISCUSSION

With respect to our tentative hypothesis about age and stress, it appears that we need to rethink it, as we didn't find much evidence of tech stress among the older faculties. They were not as concerned about the lack of technology available at their schools as were younger professors. Turning to years of teaching experience and stress, it would appear that our tentative hypothesis is also wrong. More stress, in terms of "frustration," was felt by professors with fewer years of teaching experience. Only one indication of possible stress was found with regard to gender. This time, the hypothesis of more stress on women seemed to have some validity, though of course we have a limited sample size and only one significant finding to contemplate. One marginally significant finding was somewhat higher stress among faculty who teach online, as it related to making their work less enjoyable because they interacted with their students from home. Online teachers were more ambivalent about having to pay for their own hardware and software. While we don't have irrefutable evidence, it appears that we need to rethink our tentative hypothesis that non-online teachers would have more stress.

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NEWLY EMERGING ORGANIZATIONAL AND COORDINATION FORMS

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ABSTRACT

The organization theory and behavior literature tends to depict organizations as integrated, systemically organized and relatively solid structures. In reality rigid hierarchies have been changing into flat and modular structures over the last twenty years or so. Traditional organizational boundaries are blurring and dissolving, creating symbiotic and interconnected enterprises with a network structure and create new ways to coordinate and manage. Through the gradual dissolution of temporal, spatial and structural constraints, information and communication technologies (ICT) and the resulting infrastructures are revolutionizing organization, management, marketplaces, enterprises and inter-organizational relationships. The appropriate and creative deployment of ICT make these changes possible. These developments are transforming organizations in a pervasive, ubiquitous and to a previously inconceivable und unprecedented degree. This contribution identifies six novel forms of organization and describes each.

The organization theory and behavior literature tends to depict organizations as integrated, systemically organized and relatively solid structures. In reality rigid hierarchies have been changing into flat and modular structures over the last twenty years or so. Traditional organizational boundaries are blurring and dissolving, creating symbiotic and interconnected enterprises with a network structure. Through the gradual dissolution of temporal, spatial and structural constraints, information and communication technologies (ICT) and the resulting infrastructures are revolutionizing marketplaces, enterprises and inter-organizational relationships. The appropriate and creative deployment of ICT make these changes possible. These developments are transforming organizations in a pervasive, ubiquitous and to a previously inconceivable und unprecedented degree.

Information and communication systems unite human resources (qualification, motivation), organizational (assembly and process organization) and technical (hardware, software) components in organizations. The combination of these components determines the structure of information and communication systems and influences their efficacy in view of organizational task accomplishment.

Many organizational activities today go beyond traditional structures and boundaries. We can observe numerous novel forms of organizing, cooperation and strategic alliances among organizations that blur the conventional boundaries of organizations and firms. Where are the boundaries of a local organization today? Organizations develop tighter and tighter, often just-in-time linkages among each other. This is clearly observable on the buy-side of a focal organization where such linkages may extend three to four tiers downstream the supply chain. These

efforts are enabled by various forms of electronic supply chain management (eSCM) using numerous ICT. On the sell-side (upstream) of that focal organization we may observe similarly tight linkages between that focal organization and its customers or, in the case of government, its constituents or citizens; sometimes also two to three tiers down on the customer side (customer's customer's customer). Such sell-side efforts are enabled by electronic customer relationship management (eCRM) technology integrating the focal organization and its customers. In addition, we can observe numerous forms of cooperation and strategic alliances among organizations that blur the conventional boundaries. Moreover and most importantly, these developments transform organizations to an extent that is pervasive, ubiquitous and was previously inconceivable. Most of these developments are made possible with newer information and communication technology (ICT).

The ICT requirements of an organization have to be seen within the larger context of the organization's tasks (Wigand, 2007), the market-based interconnections and linkages among organizations, as well as resulting enterprise structures. Transaction cost theory (see Coase, 1937; Williamson, 1975, 1985) demonstrates that organizational or coordination forms are dependent on the characteristics of each task and exchange relationship. The fundamental unit of analysis here is the single transaction itself, defined as the transfer of property rights. These representative characteristics influence in the final analysis the information and communication problems to be mastered together with the tasks to be accomplished through the division of labor. It follows then that that form of coordination is chosen which minimizes the information and communication problems within the performance exchange among organizations and resulting transaction costs.

Following this line of thinking, four types (domains) of exchange relationships can be identified: Information and communication systems (1) in the hierarchical form of task accomplishment (hierarchy), (2) for the market form of coordination (market), (3) for group-oriented task accomplishment (clan), and (4) for inter-organizational information processing and electronic data exchange (strategic networks). This typology is derived from writings of several scholars, including Ciborra (1994), Jarillo (1988), Picot and Reichwald (1991), Wigand (2007), and others.

From these deliberations it becomes clear that the planning of information and communication systems has to be suitable for the differing task types and coordination forms (Wigand, 2007). It has to consider internal and organization-overlapping coordination and cooperation and needs to ensure appropriate organizational, personnel and technical configurations.

Given these developments, several entirely novel forms of coordination have emerged:

Modularization:

Modularization is the restructuring of organization and management based on integrated, customer-oriented processes in relatively small, manageable units (modules). These are characterized by a decentralized decision-making competence and results-oriented responsibility (conceptually almost small firms within the firm) while the coordination among the modules is increasingly achieved through non-hierarchical forms of coordination.

Virtual organizations:

Virtual organizations may be viewed as further development of hybrid coordination forms inn the spectrum between market and hierarchy. They constitute division of labor-linkages among

organizations. The fundamental idea of symbiosis is of vital importance for their existence. They bring along unique characteristics and design principles such as modularity, flexibility, time and spatial distribution, virtual largeness in spite of actual smallness, centralization in spite of actual decentralization, generalization in spite of actual specialization, and others.

Peer-to-Peer Networking:

Peer-to-peer networking enables two or more personal computer (PC) owners to pool their resources (disk drives, CD-ROM drives, printers) together. These resources are then transformed into shared, collective resources accessible from every PC participating in that network. File sharing can thus occur directly rather than having to store and then retrieve a given file on a separate server. Instead, each user's PC within the peer-to-peer network becomes both a server and a client. This novel form of organizing has revolutionized, e.g., the music industry (Napster, Gnutella) and must be seen as an entirely new form of cooperation and coordination. Moreover, it also is a new distribution channel from a sharing or marketing perspective. From this perspective peer-to-peer networking may be as important to the Internet's future as the web browser was to its past.

Telecooperation:

The generic term telecooperation denotes the entire spectrum of media-supported and distributed cooperation and work processes in the production of goods and services based on the division of labor. ICT enable various forms of telecooperation such as telework, telemanagement, as well as teleservices, i.e. the carrying out of tasks without having to overcome traditional constraints of location and distance. Since telecooperation lends itself only to information-related tasks, the resulting output is always information.

Mass customization/Personalization:

In general, mass customization may be defined as a delivery process through which mass-market goods and services are individualized to satisfy a very specific customer need at an affordable price. This is not true customization or personalization, but comes very close to this and may be perceived by the customer, user or citizen as true customization. Moreover, mass customization is the ability to customize products literally in quantities as small as one while producing them at mass-production speeds and costs. The ultimate outcome is simultaneous manufacturing or producing. These developments are based on the public's growing desire for product personalization and it seems to serve as the ultimate combination of "custom-made" and "mass production." In many ways, mass customization is all about customer choice and this approach has become an organizational form in that "mass customization" has become an organization, business and customer-interaction principle for the 21st century. Newer ICT, however, make not only these developments possible, but they give the customer the impression that the product or service was produced just for that customer, even though the entire effort was mass produced via computer. Many companies today are increasingly using the Internet to give customers the impression of personal service. Such customization and personalization may take on communication-like features such as carrying on a dialogue, interaction, etc. over a longer period of time.

Interactivity:

In the present context, the concept of interactivity is closely related to mass customization and personalization. It implies an immediacy of response, often non-sequential access to information, some degree of adaptability based on the user's or customer's need, and it implies two-way communication. Examples include the activation of chat bots or the actual use of a live customer service representative when shopping or seeking help at a website. Being able to create such interactivity on demand comes close to traditional human-to-human communication, although it may not necessarily be face-to-face.

CONCLUSIONS AND IMPLICATIONS FOR MANAGEMENT

Recent developments in ICT contribute to overcoming numerous barriers and traditional boundaries of time and space. They enable, permit, simplify and promote the numerous limitations to management, coordination and the dispersion of location. Often the value chain can be disintegrated and be reconceptualized utilizing new ICT as well as the above mentioned new organizational forms. This makes possible, e.g., the transition from "real" to a "virtual" organization. Virtual organizations then are enabled by and themselves may embrace newer ICT and utilize them in restructuring organizations into more responsive, faster acting, boundaryless and around-the-clock entities. These new organizational and coordination forms when coupled with newer ICT lend themselves well to encourage freedom of action and decision-making as well as entrepreneurial creativity and innovation.

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CAUSES OF CONFLICTS OF LOCAL INFORMATION TECHNOLOGY MANAGER IN MULTINATIONAL COMPANY

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ABSTRACT

The local IT managers in foreign subsidiary of multinational operation are unique in the sense that they face dual conflicts: one is between local IT manager and headquarters caused by cultural difference existing between headquarters and subsidiaries, and the other is between the IT manager and local workforces. The objectives of the study are to identify factors causing the dual conflicts that the local IT manager of multinational enterprise must manage, and to analyze how the factors work in the conflicts resolution management in IT usage of workforces in local subsidiary.

Based on literature review, we identified the effects of local IT manager participation, media, cultural difference, and firms' strategy on the dual conflicts. We employed a case study method because we attempt to explore meaningful insights on a phenomenon which is at an early stage (Hovav and Schuff, 2005).

The study on Company X was carried out in the subsidiary of a United Kingdom based multinational corporation in South Korea. We employed qualitative data gathering methods such as participant observation and unstructured interviews over the years 2006-2007.

From the interview and observation, we found that participation of local IT manager is strongly affected by headquarters' strategy. Under the standardized strategy, active participation of local IT manager would increase the conflict with headquarter whereas it decreases the conflicts with local end users. Cultural difference increases the conflict with headquarter and affect the level of adoption of the strategy. However, media richness has restrictive effect on decreasing conflict with headquarter and cultural difference.

INTRODUCTION

As the globalization of company's activities is growing, the work process has not been confined to specific localities and the projects have employed the multinational, interdisciplinary, and multiorganizational partnerships to overcome inefficiencies due to the dispersion (Horwitz, Bravington, and Silvis, 2006; Chinowsky and Rojas, 2003). In this context, information and

communication technology (ICT) has been extensively adopted in organizations and the number of virtual workers and e-workers has been increasing rapidly (Thomas, 1999; Sivunen and Valo, 2006).

IT manager is increasingly important as IT has been extensively adopted at all different levels of business function and has become essential to an organization (Banker and Kauffman, 2004). A company's workforces of an organization get supports from their IT manager or staff, as most workers lack of knowledge of IT artifacts or systems. In most cases, they are end users of information systems and in particular of applications used for specific purposes (e.g., Microsoft Office).

Local IT managers confront diverse requirements from their workforces. However, the IT managers in foreign branches of a multinational operation are unique in the sense that they face dual conflicts: one is between the local IT manager and headquarters that results from cultural differences existing between headquarters and the subsidiaries, and the other is between the IT manager and the local workforces. Due to lack of knowledge on IT artifacts or systems, end users in foreign branch are hard to claim their problem to headquarters directly. Thus, IT managers are often asked to intervene between the two parties as mediator.

The primary objectives of this study are to identify factors causing the dual conflicts that the local IT manager of a multinational enterprise must manage, and to analyze how the factors work in the conflicts resolution management of the dual conflicts in the IT usage of workforces in a local branch. To achieve these goals, constructive conflict theory and media richness theory will be discussed because these theories present important insight into the role of managers and media in resolving conflict. On the basis of empirical data obtained by in-depth interviews, observation, and content analyses of an IT manager's work process, the goal is to present practical implication on the role of IT manager in foreign branch operations of multinational operations.

LITERATURE REVIEW

Process Approaches

Several theoretical approaches for the process of system development are applied to find factors leading to success. Process approaches (Robey, Farrow, and Franz, 1989; Schmidt and Kochan, 1972) emphasizes different dimensions of the problem resolution process to attain the goal. The problem solving approach (Smith, 1998) focus is that the acting should be led by object to achieve goals, whereas conflict theory emphasizes feedback to monitor and correct behaviors of employees. A constructive conflict approach (Robey and Farrow, 1982) puts its focus on the conflict process and factors affecting the process to achieve goal, mainly successful administration of management information systems.

Media Richness Theory

Media richness indicates the capacity of information processing to support multiple channels regardless of reference frame and to allow coordinating inter- and intraorganizational communication (Banker, Bardhan, and Asdemir, 2006). So the effectiveness and efficiency of

communication technology are directly affected by the richness of media (Shepherd and Martz, 2006). The media richness theory provides useful implication related to task complexity.

Cultural Difference

Local IT managers in foreign branches are required to work with IT staffs or technicians at headquarters thus come to experience the cultural differences. The conflict in IT management can be more serious when multinational enterprises treat their subsidiaries as independent affiliates and the activities of a subsidiary do not affect on the activities of other subsidiaries (Leidner and Kayworth, 2006). In this case, little interdependence exists between various functions across the multinational enterprises, and the connection between subunits is weak (Porter, 1986; Taylor, Beechler, and Napier, 1996).

Firm's strategy

The activity of the local IT manager in a foreign subsidiary is affected by headquarters' strategy (Theodosiou and Leonidou, 2002). Under standardized a strategy, the role of an IT manager is marginal since all important decisions are determined by headquarters (Theodosiou and Leonidou, 2002; Levitt, 1983; Douglas and Craig, 1986). The local IT manager simply implements the decisions and marginal authority is allowed. On the other hand, the local IT manager is given resources and the authority to implement independent IT strategies satisfying local requirements (Porter, 1986; Taylor, Beechler, and Napier, 1996).

RESEARCH MODEL

We develop the conflict model to identify factors causing conflicts in IT management. We argue that active participation of local IT managers increases conflict with headquarters and, on the other hand, decreases conflict with local workforces. The participation of a local IT manager is expected to be affected by communication media and the strategy of headquarters. The local IT manager has dual conflicts with headquarters and with the local workforces in IT management. Conflict with headquarters would be increased by high cultural difference, poor media communication, high participation, and adaptation strategy.

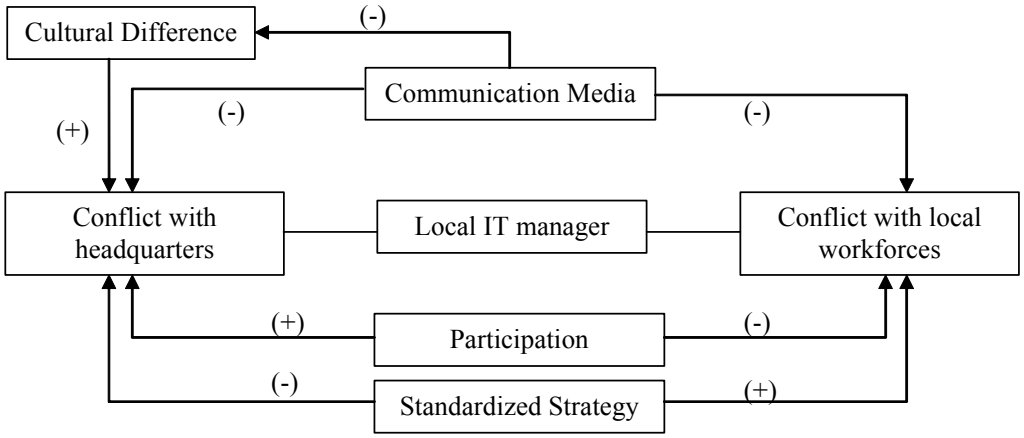

Figure 1 Research Model

Table 1 Expected effect of factors on conflicts		
	Conflict with headquarters	Conflict with local
High participation	High	Low
Rich media communication	Low	Low
High cultural difference	High	N/A
Standardized strategy	Low	High

CASE ANALYSIS

Research Setting

We carefully selected the parameters for our case studies. The study on Company X was carried out in the South Korea subsidiary of a United Kingdom based multinational corporation in South Korea. The case study is very extensive given that it is conducted in a non-Western country context (Shoib and Nandhakumar, 2003).

We employed qualitative data gathering methods such as participant observation and unstructured interviews over a period of time. The study at Company X involved one of the authors as a participant observer. During two years (2006-2007), the author visited main office in South Korea occasionally to observe and interview the IT manager. The focus has been placed on the role of the IT manager and the interaction with headquarters related to IT management.

Case Description and Analysis

The Company X involves inspection and classification of ships to assure quality and reliability of design, construction, and operation of ships. The company is headquarted in the UK, with main offices around the world. Regarding the Asia region, Company X has main offices on Hong Kong, Japan, China, South Korea, Singapore, Malaysia, and India. The main office in each country administers site offices that are located on a shipbuilding yard and support inspectors' works.

The branch of South Korean branch has four levels in terms of management. The highest manager is the country manager who supervises the country main office and administers area managers. The local IT manager is supervised under the direction of the area manager who administers in-charges in site office.

The responsibilities of local IT are to support inspectors' IT usage and guarantee IT infrastructure such as network bandwidth so inspectors have no problem in using IT artifacts or systems. Specifically, the main tasks of local IT are to manage network performance and applications, secure bandwidth of the network and Internet, backup files, install programs on computers, repair hardware and software, and support usage of applications. Since the Company X adopts a standardized strategy in IT management, most critical resources are centered in the headquarters in UK and the local IT manager has marginal authority in IT management.

In a local office, the most frequently preferred media for communication is email due to its convenience in usage and function to keep evidence by recording all transactions as history. The phone is preferred because of its synchronous characteristics. Thus phone is most used when in an emergency and real time communication is required. Video conferencing is the third preferred communication media.

Cultural difference is found to impede effective communication and IT management. South Korea can be classified into high-contexture culture whereas most western countries are belongs to low-contexture culture. People in high-contexture culture emphasize background or context in which a conversation occurs. When the local IT manager reports a problem or explains a situation, such cultural difference in mode of communication disturbs effective communication and makes it hard for two parties understood each other. The effect of cultural difference also can be verified from the fact that the level of adoption of the Help Desk call system is different among nations.

Conflicts occur between headquarters and the local IT manager, and between the manager and local end users continually. The local IT manager conflicts with headquarters when he has a) a late response on a request, b) unreasonable remedies on reported problem due to lack of understanding of the local situation, c) change or alteration on local server or equipment without consultation with the local IT manager, and d) request of assistance on things launched and progressed before the local IT manager is aware. The local IT manager also has conflicts with local end users when a) they think the response is too late, b) they ignore the suggestions and assistance of the IT manager, c) they install unauthorized programs and raise trouble, and d) they have wrong information on the source of problem.

Findings

From the interview and observation, we found that standardized strategy shrinks participation of the local IT manager in the problem solving process and increases conflicts with local end users. The participation of the local IT manager is strongly affected by headquarters' strategy. Under the standardized strategy, active participation of the local IT manager would increase the conflict with headquarters whereas it decreases the conflicts with local end users. Cultural difference increases the conflict with headquarters and affects the level of adoption of a proposed strategy. However, media richness has a restrictive effect by decreasing both conflict with headquarters and cultural differences.

CONCLUSION

From the case study, we found that participation of the local IT manager is strongly affected by headquarters' strategy. Under the standardized strategy, active participation of the local IT manager would increase the conflict with headquarters whereas it decreases the conflicts with local end users. Cultural difference increases the conflict with headquarters and affects the level of adoption of a proposed strategy. However, media richness has restrictive effect on decreasing conflict with headquarters and cultural difference.

The major limitations of this study stems from the sample. We only adapt one case and it is very limited in providing in-depth understanding on a phenomenon. The findings cannot be applied into other companies or be generalized because each company has a unique environment affecting its conflicts. Also the findings do not provide comprehensive view on research topic because of a limited study.