

E-Commerce: Attitudes in the U.S. and Mexico

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ABSTRACT

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Studies have demonstrated that information technology (IT) has a positive impact on small businesses. Implementing IT is critical for small business owners given the potentially positive impact it can have on operations and firm performance. Electronic commerce is becoming more prominent, and small business owners are developing strategies to diffuse this technology in their firms. Their strategic planning should include an understanding of the organizational members' attitudes regarding this technology. While the diffusion of e-commerce technology has become more widespread within the U.S., little is known about the nature of this process and how it evolves elsewhere. Using U.S. and Mexican small businesses, this study searches for similarities and differences in attitudes toward e-commerce technology based on cultural factors. Differences were found that could be attributed to cultural factors. U.S. respondents believed e-commerce made their jobs more efficient, and they felt e-commerce enriched their jobs. While the Mexican respondents showed more anxiety about e-commerce, they were more involved in it. It is suggested that for successful implementation of e-commerce technology, cultural factors should be considered.

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Introduction

The use of information technology (IT) has become increasingly important for business owners worldwide. U.S. small businesses in the retail, service, and manufacturing sectors report that the use of IT yields positive results such as increased productivity and efficiency, as well as reduced cost (Cooper & Zmud, 1990; Julien, 1995, Schafter, 1995). The accelerated growth and affordability of personal computers has helped small firms enter the information technology arena. Initially, actual use of computers in small firms may have focused primarily on accounting applications, but the fast-paced global market requires quick and accurate communications. Research suggests that for businesses in Singapore, the use of IT provides access to global information and enables the firms to have an electronic presence worldwide (Tan & Teo, 1998). Vogel and Gricar (1997) report that IT in Slovenia is used to develop a global presence and to facilitate cooperation among businesses, academics, and the government.

While the deployment of IT initiatives has grown both in the U.S. and abroad, there is an underlying assumption that technology is neutral (Hasan & Ditsa, 1998), and the process of diffusing technology is relatively similar throughout the world. The “Review of the World Bank” (1994) suggests that technology development and diffusion in less developed countries is difficult and often times fail because of the inattention to history, tradition, and culture. Since variables such as economy, politics, education levels, and social mores may influence how diffusion occurs, these factors should also be considered. Emphasizing the need to look at each country’s proclivity to engage in technological innovations, Palvia, Palvia, and Zigli (1992) assert that the methods for diffusing technology are contingent upon that country’s culture, economic stability, and existing technology levels.

Given the many factors that influence the diffusion of technology, the role of culture is one of the most illusive (Hasan & Ditsa, 1998). Empirical studies that examine if and how culture influences the use and spread of technology in countries outside the U.S. are, however, limited (Tan, Watson, & Wei, 1995).

Culture

Culture encompasses values, beliefs, practices, and traditions that unify a group of people. Hofstede (1991) says that culture embodies the national shared values of people in a particular region. It has also been observed that culture is expressed through social relations, customs, and organizations (Clarke et al., 1981). These researchers suggest that IT is a means through which the values, beliefs, ideas, and cultural artifacts of a group can be expressed. Therefore, culture is expected to strongly influence one's attitudes toward IT.

As business owners throughout the world are introducing new technologies into their organizations, the many factors affecting diffusion should be given careful consideration in order to minimize difficulties and failures associated with diffusion. When assessing and comparing new technologies, business owners should contemplate how the technology has been designed and the individuals involved in the design process. Hill, Loch, Straub, and El-Sheshai (1998) report that since most technology is designed and produced in industrialized countries, there is a cultural bias toward both the designer's and producer's cultural systems. These cultural underpinnings have the ability to influence perceptions about the nature of the technology, its use, and the benefits that can be derived from it. Thus, cultural awareness of the designer and producer, as well as the diffusion target, is critical in order to increase the successful diffusion of new technology (Ein-Dor, et al., 1992; Kedia & Ghagat, 1988).

Attitudes, Behaviors, and Information Technology

As organizations are adopting various forms of IT, understanding the impact that attitudes and behaviors have on IT initiatives is important. The implementation of IT initiatives consists of several stages including initiation, adoption, adaptation, acceptance, routinization, and infusion (Cooper & Zmud, 1990; Kwon & Zmud, 1987). Each of these stages is affected by and has the potential to affect attitudes. Rogers (1983) notes that IT diffusion entails a temporal sequence whereby end users become knowledgeable about the innovation, form an attitude toward it, decide to adopt or reject, use the innovation, and seek reinforcement of the adoption made.

Several studies have examined the relationship between attitudes and new technologies. In an investigation of end-user attitudes, Currid (1992) and Rifkin (1991) indicate that managers hold positive attitudes toward computers. Rice and Aydin (1991) report that employee reaction to the diffusion of new technology varies based on organizational position. In their investigation of attitudes toward the introduction of robotic technology, Chao and Kozlowski (1986) report differences among skilled, semi-skilled, and line employees. While low-skilled employees perceived technology as a threat to job security, higher skilled employees viewed the technology as an opportunity to acquire additional knowledge and skills. Pena (1997) reports that during the late 1980s, assembly lines in the maquila industries were reorganized (automated), and a significant number of assembly line positions were eliminated. These actions are likely to impact one's attitude toward the introduction of new technologies. To minimize fear and anxiety, organizations should be willing to develop and support training in the new technologies.

Pivotal elements in the diffusion process include end-user perceptions, attitudes, and behavior. Nelson (1990) suggests that when incorporating IT in an organization, behavioral change is required of both the individual and the organization. In their investigation of the relationship

between behavior and the introduction of new technology, Black and Trippi (1990) suggest that managers may resist new technology implementation when the initiative is poorly planned. Fear associated with the technology may also lead to resistance. Sandkull (1980) suggests that end-user resistance may yield an incomplete implementation of the technology; may limit the benefit associated with introducing the technology; and end-users may attempt to regain control over work processes by limiting the effectiveness of the new technology.

Studies report that attitudes held toward computers will influence computer-related behavior. Igarria and Nachman (1990) suggest that anxiety inhibits computer usage, and involvement with computers has a positive affect on computer usage. Pare and Elam (1995) report that computer-related activities such as reading computer-oriented magazines help predict computer usage.

Individual and organizational behavior is culturally patterned. As such, culture and attitudes shape both of these behaviors (Steinwachs, 1999). In a study that explored the relationship between culture and personal computer adoption, culture was found to be important to the adoption and diffusion process (Bagchi & Cerveney, 2000). Harris and Davison (199) report that cultural background influences both computer anxiety and computer involvement. Steinwachs (1999) surmises that culture potentially impacts the information producer and content, the use of the information, as well as the information system itself.

Mexico and Information Technology

Within Latin America, Mexico has become an increasingly attractive area for the diffusion of new technology. Mahmood, Gomoets, and Gosler (1995) report that Mexico is among the twenty largest computer-using countries in the world, and the IT market in Mexico is second only to Brazil in Latin American countries (Tigre, 1991).

Projections indicate that Internet users in Latin American countries will approach 19.1 million by the end of 2003 (Smith, 1999). Focused efforts are underway to increase Internet access in Mexico. Telmex, Mexico's leading Internet service provider, has approximately 220,000 users, and it is experiencing rapid growth (Smith, 1999). In concerted efforts to fuel this growth, software companies are focusing on Mexico. In particular, Microsoft has been involved in developing the largest Spanish language Internet portal in Mexico (Millman, 1999). As e-commerce spreads throughout Latin America, e-commerce sales are projected to reach \$81.8 billion in Latin America excluding Mexico, and the sales in Mexico are expected to reach \$107 billion by 2004 (Meehan, 2000).

Given the positive and potentially lucrative business environment, business owners in Mexico are rethinking their business strategy and are increasingly adding new technologies such as e-commerce into their organizations. Owners in the service and manufacturing sectors recognize that the technology may improve their operations, business growth, and competitiveness (Nuncio, 1999).

These conditions have encouraged additional research on the diffusion of IT in Mexico. In one of the earliest investigations, Dean and LeMaster (1991) explore barriers when transferring technology from the U.S. to Eastern Europe and Mexico. They found that socio-cultural elements vary within these countries and may be responsible for difficulties in diffusing technology. Mont (1999) examines Internet usage and the behavioral patterns that emerge as a result of usage. In their study of technology diffusion in Mexico, Mahmood, Gemoets and Gosler (1995) report that cultural and contextual factors such as educational tradition, national economy, legal and political environment, corporate culture, as well as technological environment influence the ease of a diffusion event.

Since attitudes and behaviors are shaped by culture, and culture is believed to influence how diffusion occurs in an organization, this study investigates cross-cultural attitudes toward e-commerce technology and the nature of technology involvement. Small businesses that were located in the U.S. and in Mexico and who indicated that they were beginning to adopt e-commerce into their organizations are the focus of this study. Given the cultural differences between these countries, differences in degree of anxiety, extent of involvement, and attitudes toward e-commerce are expected.

Hypotheses

Although increases in the use of computers and the introduction of e-commerce into more Mexican organizations may show a willingness to adopt electronic technologies, it is expected that the respondents in the Mexican firms would exhibit more anxiety toward e-commerce. Some of the anxiety may come from the “newness” of the technology in Mexico, and some may come from fear of being replaced by machinery. Thus, the first hypothesis (in alternative form) is:

H1: Mexican respondents will exhibit more anxiety toward e-commerce.

It is also expected that since the U.S. respondents have been exposed to more technological changes over a longer period of time than their Mexican counterparts, they would indicate a higher involvement with e-commerce technology. This supposition led to the second hypothesis:

H2: U.S. respondents will indicate a higher degree of involvement with e-commerce.

Generally, attitudes are described in term of three components: cognitive, emotional, and behavioral. Since the cognitive component represents knowledge about the object (e-commerce), and the emotional component reflects the individual’s likes or dislikes for the object, it was felt that the U.S. respondents would reflect stronger attitudes toward e-commerce because of more knowledge and experience with e-commerce. The behavioral component reflects the tendency to act

positively or negatively. Attitudes in this study, based upon Haddad's (1996) scale, were divided into four dimensions: (1) comfort level, (2) efficiency level, (3) positive influence, and (4) negative influence. Four hypotheses were developed:

H3: U. S. respondents will indicate a higher degree of comfort with e-commerce.

H4: U. S. respondents will perceive that e-commerce increases the efficiency of their jobs.

H5: U. S. respondents will feel more positive toward e-commerce.

H6: U. S. respondents will feel less negative toward e-commerce.

Understanding the impact of cultural differences on attitudes will help organizations develop strategies and training initiatives to ensure successful implementation of new technologies.

The Research Study

The number of firms introducing and using computer-related technology in their operations has been rapidly increasing in the past decade. Certainly U.S. firms have been early adopters of technological innovations including e-commerce. Mexican firms tend to emulate U.S. firms in many business areas. Mexico's geographical closeness to the U.S. might be one reason, but another salient reason might be the extremely large volume of trade between the two countries. Firms doing business with each other need to have similar lines of communication to develop long-term alliances. However, it is expected that the Mexican employees may not have received as much training or have as much experience as their U.S. counterparts.

Since technology is likely to impact a firm's ability to remain competitive, organizations are likely to adopt technology-related tools, and because of the scarcity of IT-trained personnel, they are likely to develop training programs that will provide their employees with specialized IT skills. As companies add new information technologies and before embarking on training programs, acquiring

information about their current employees' opinions and concerns about technology may be helpful in deciding on the types of employee training and types of communication required from management. Attitudes toward e-commerce, the degree of involvement in e-commerce, and the extent of anxiety about e-commerce were investigated using a sample of owners, managers, and employees of twenty firms located in the U.S. and Mexico.

Sample

The use of technology can be especially important to small businesses, and many small businesses are in the service sector. Thus, both the U.S. and Mexican firms in this study are small businesses in the service sector. The U.S. firms were randomly selected from a Chamber of Commerce directory of a city in the southwest, and a random sample of Mexican firms was selected from an American Chamber/Mexico Directory. Since it was decided that only firms that had already shown an interest in e-commerce would be included, a screening question concerning the firm's extent of involvement in e-commerce was used to ensure that each firm was in the early stage of developing e-commerce capabilities and usage. Of the twenty small businesses in the final sample, nine of the firms were in Mexico and eleven were located in the U.S.

A total of 572 respondents from the twenty firms completed a self-assessment instrument that measured their degree of anxiety or confusion about e-commerce, the extent of their involvement with e-commerce, and their attitudes toward e-commerce. Since nine of the firms were in Mexico, nine of the owners were Mexican and eleven were U.S. owners. Of the remaining 552 respondents, 99 were managers and 453 were employees of the firms. Table 1 shows the numerical breakdown of participants by position and country.

Table 1: Respondents' Position by Country

Position	Mexico	U.S.	Total
Owner	9	11	20
Manager	57	42	99
Employee	193	260	453
Total	259	313	572

Since this research focuses on looking for differences between Mexican and U.S. respondents' views of e-commerce, measures of other characteristics (e.g., respondents' age, educational level, and previous experience with e-commerce) that might account for any differences were collected. These variables were treated as covariates in the analysis of covariance (ANCOVA) tests. The age categories and education levels are presented in Tables 2 and 3. The U.S. respondents were younger than the Mexican respondents (almost 77 percent of the U.S. participants were under 35 while around 61 percent of the Mexican participants were under 35). The U.S. firms had a higher percentage of respondents with some college, a college degree or graduate work (77 percent versus 64 percent in Mexican firms).

Table 2: Age of Respondent by Country

Age	Mexico	Percent	U.S.	Percent	Total
< 25	62	23.9	91	29.1	153
25 – 34	97	37.5	151	48.2	248
35 – 44	65	25.1	62	19.8	127
> 44	35	13.5	9	2.9	44
Total	259	100	313	100	572

Table 3: Education Level of Respondent by Country

Education	Mexico	Percent	U.S.	Percent	Total
High School	89	34.4	72	23.0	161
Some College	95	36.7	148	47.3	243
College Degree	70	27.0	88	28.1	158
Graduate work or degree	5	1.9	5	1.6	10
Total	259	100	313	100	572

The respondents' experience with e-commerce was directly related to age [$r = .588, p < 0.01$] and level of education [$r = .343, p < 0.01$]. The younger the respondent, the less experience, and the less education, the less experience. However, when only the U. S. respondents' education and experience were analyzed, there was a stronger relationship between education and experience ($r = .671, p < 0.01$), but it was weaker for age ($r = .485, p < .01$). Although the correlations were not as strong for the Mexican respondents in either category (for age, $r = .299$; for education, $r = .383$), the relationships were significant at the 0.01 level. In addition, the U.S. respondents had more experience than their Mexican counterparts, but not a significant difference at the 0.05 level. To obtain data for each of the dependent variables, each respondent completed a survey that contained several scales used to measure their attitudes, involvement, and anxiety toward e-commerce technology.

Measurement Instruments

Anxiety. The instrument used to measure technology anxiety was a variation of Igbaria's (1990) scale for measuring computer anxiety. The respondents were asked to agree or disagree with eight statements concerning their anxiety, apprehension, or confusion with e-commerce. The anchors on the five-point Likert-type scale were strongly disagree (value = 1) and strongly agree (value = 5), and a higher score indicated more anxiety. Refer to Appendix A for a list of the statements.

Involvement. To measure the degree of engagement in e-commerce respondents were asked to read seven statements and indicate the strength of their agreement or disagreement with them. (see Appendix B for those statements). Strong disagreement with a statement was represented by a value of 1, and strong agreement was represented with a numerical value of 5. Cronbach's alpha for this

scale was 0.80.

Attitudes. Haddad's (1996) scale for measuring attitudes toward new technology was modified to include e-commerce technology specifically. Haddad's 15-item Likert scale includes four dimensions (refer to Appendix C for the 15 statements): (1) Comfort (assesses one's personal feelings toward technology); (2) Efficiency (assesses feelings toward technology's impact on one's individual efficiency); (3) Positive Influence (assesses feelings toward technology's impact on jobs and firms); and (4) Negative Influence (assesses feelings toward negative impact of technology). For all 15 items, the scale ranged from 1 to 5. When respondents selected 1, they were indicating they strongly disagreed with the statement, and selection of a 5 indicated they strongly agreed with the statement. To reduce questionnaire bias, the statements were worded positively and negatively, and then they were reverse-coded for the analyses. Cronbach's alpha for the scale was 0.82.

Analyses

Analysis of covariance (ANCOVA) was used to examine whether Mexican respondents and U.S. respondents differ in the extent of anxiety concerning e-commerce technology and the degree of their involvement with e-commerce. Multivariate analysis of covariance (MANCOVA) was performed to assess whether the Mexican and U.S. respondents differ in their attitudes toward e-commerce technology.

Results

Analysis of Covariance

Anxiety. As Table 4 shows, the first hypothesis is supported. It was hypothesized that Mexican respondents would express a higher degree of anxiety than U.S. respondents. Education, organizational position, experience with e-commerce, gender, and age were treated as covariates. There was a difference in the degree of anxiety expressed by the Mexican and U.S. respondents ($F =$

8.90, $p < 0.01$; mean for Mexicans = 25.68, and mean = 24.08 for the U.S.). Overall the Mexican respondents showed more anxiety over e-commerce technology than their U.S. counterparts.

Table 4: Analysis of Covariance X Anxiety

Dependent Variable: Anxiety	Sum of Squares	df	Mean Square	F	Sig
Covariates (Combined)	3533.50	5	706.70	22.10	.00
. <i>Age</i>	.25	1	.25	.00	.93
. <i>Education</i>	142.09	1	142.09	4.44	.04
. <i>Experience</i>	262.69	1	262.69	8.22	.00
. <i>Position</i>	303.15	1	303.15	9.48	.00
. <i>Gender</i>	1026.16	1	1026.16	32.10	.00
Country	284.39	1	284.39	8.90	.00
Model	3896.16	6	649.36	20.31	.00
Residual	18063.91	565	31.97		

Involvement. On the other hand, the second hypothesis could not be supported. It was believed that the U.S. respondents would indicate higher involvement with e-commerce than the Mexican respondents. However, the results from the ANCOVA revealed the opposite (Table 5 shows the results). A difference in the respondents' belief about their involvement exists ($F = 12.51$, $p < 0.01$), but the Mexican respondents' mean was 22.2 while the U.S. respondents' mean was 21.70. Thus, the results of the analysis indicate that the Mexican respondents felt they were more involved than their U.S. counterparts.

Table 5: Analysis of Covariance -- Involvement

Dependent Variable: Technology Involvement	Sum of Squares	df	Mean Square	F	Sig
Covariates (Combined)	8837.89	5	1767.58	89.50	.00
. <i>Age</i>	19.44	1	19.44	.98	.32
. <i>Education</i>	684.30	1	684.30	34.65	.00
. <i>Experience</i>	2044.31	1	2044.31	103.52	.00
. <i>Position</i>	143.18	1	143.18	7.25	.00
. <i>Gender</i>	1503.16	1	1503.16	76.11	.00
Country	246.95	1	246.95	12.51	.00
Model	8874.02	6	1479.00	74.89	.00
Residual	11158.04	565	19.75		

Attitudes. Table 6 shows the results of a MANCOVA analysis where the dependent variables are the attitude dimensions: comfort level, efficiency level, positive influence, and negative influence. The independent variable is country. Two of the four hypotheses concerning attitudes were supported. It was hypothesized that the U.S. respondents would be more inclined to believe that e-commerce would help make doing their job more efficient (Hypothesis 4). Table 6 shows the results of the multivariate analysis of covariance which indicate that country in which the firm was located affected one's attitude toward efficiency ($F = 262.23$, $p < 0.01$). The mean for the U.S. respondents was 14.0, and the mean for the Mexican respondents was 10.69. Thus, the U.S. respondents were more likely to think that e-commerce would enable more efficiency in their jobs.

The fifth hypothesis stated that the U.S. respondents would view e-commerce in a more positive light than the Mexican respondents. This hypothesis was also supported ($F = 30.42$, $p < 0.01$). The mean for the U.S. respondents was 11.72, and for the Mexican respondents, it was 10.40. There was a difference in the means, and the U.S. respondents did have a more positive view of e-

commerce.

Table 6: MANCOVA Results X Attitudes

Source	Dependent Variable	Sum of Squares	Df	Mean Square	F	Sig.
Education	Comfort	68.92	1	68.92	13.69	.00
	Efficiency	211.07	1	211.07	43.14	.00
	Positive	161.19	1	161.19	29.08	.00
	Negative	58.43	1	58.43	17.75	.00
Position	Comfort	125.60	1	125.60	24.95	.00
	Efficiency	189.30	1	189.30	41.38	.00
	Positive	387.40	1	387.40	69.88	.00
	Negative	358.13	1	358.13	108.81	.00
Experience	Comfort	300.76	1	300.76	59.74	.00
	Efficiency	186.22	1	186.22	40.71	.00
	Positive	84.73	1	84.73	15.29	.00
	Negative	50.43	1	50.43	15.32	.00
Age	Comfort	.02	1	.02	.00	.95
	Efficiency	.02	1	.02	.01	.95
	Positive	6.94	1	6.94	1.25	.26
	Negative	7.24	1	7.24	2.20	.14
Gender	Comfort	145.02	1	145.02	28.81	.00
	Efficiency	68.27	1	68.27	14.92	.00
	Positive	21.45	1	21.45	3.87	.05
	Negative	21.51	1	21.51	6.53	.01
Country	Comfort	8.37	1	8.37	1.66	.20
	Efficiency	1199.65	1	1199.65	262.23	.00
	Positive	168.62	1	168.62	30.42	.00

	Negative	53.21	1	53.21	16.17	.00
Intercept	Comfort	666.04	1	666.04	132.31	.00
	Efficiency	834.55	1	834.55	182.43	.00
	Positive	1093.77	1	1093.77	197.29	.00
	Negative	395.72	1	395.72	120.23	.00
Corrected Model	Comfort	1647.76	6	274.63	54.55	.00
	Efficiency	3513.89	6	585.65	128.02	.00
	Positive	1837.12	6	306.19	55.23	.00
	Negative	1068.04	6	178.01	54.08	.00
Residual	Comfort	2844.23	565	5.03		
	Efficiency	2584.71	565	4.58		
	Positive	3132.31	565	5.54		
	Negative	1859.71	565	3.29		

It was expected that the U.S. respondents would indicate a higher comfort level regarding e-commerce than the Mexican respondents (Hypothesis 3). When all respondents were included in the MANCOVA, there was no difference in their attitude toward comfort ($F = 1.66$, $p = .20$). However, when only employees were selected ($n = 453$), a difference in attitude (comfort) was found ($F = 5.12$, $p = 0.024$). The means for the U.S. and Mexican respondents were 11.46 and 10.55, respectively, which indicates the U.S. employee respondents had a higher comfort level toward e-commerce. A MANCOVA of only the owners and managers ($n = 119$) resulted in no difference in the means.

The sixth hypothesis stated that the Mexican respondents would have a more negative view of the impact of e-commerce than the U.S. respondents. A difference in the means was found ($F = 16.67, p < .01$), but it was in the opposite direction from the expected. The U.S. respondents indicated a more negative viewpoint (U.S. mean = 11.28; Mexico mean = 10.71). Once again, the sample was divided into two groups: (1) employees and (2) owners and managers. No difference in means was found between the two countries when only owners and managers were included, but the differences were clear among the employee respondents ($F = 27.44, p < 0.01$). The U.S. employees viewed e-commerce in a more negative light.

Discussion

This study examined pre-adoption attitudes toward e-commerce and the nature of technology involvement within American and Mexican small business organizations. The findings suggest that cultural value systems have the ability to influence the diffusion process. The differences in the American and Mexican cultural framework serve to create, as well as impact, understanding about the role of e-commerce technology in the workplace. The results provide support for three of the six hypotheses that were proposed (1, 4 and 5). It appears that cultural background does influence the degree of anxiety shown by the respondents toward e-commerce (H1). Even when the impact of education, experience, age, gender, and position was controlled, the country in which the respondent worked had an effect on how anxious the respondent was about e-commerce. The U.S. respondents were less anxious. Since other studies have indicated that anxiety impacts technology usage, knowledge of specifically what causes the anxiety to be higher in Mexico is needed. The relationship between experience and anxiety in both countries was similar ($r = -.264$ for U.S., and $r = -.262$ for Mexico).

The country in which the respondent worked impacted the attitude of how much the

respondent felt e-commerce contributed to the efficiency of one's job. The U.S. respondents indicated a stronger belief that e-commerce made their jobs more efficient. This result supported the third hypothesis. Once again, other factors that might influence the level of efficiency were controlled statistically (ANCOVA). Thus, there appears to be more uncertainty among the Mexican respondents as to how e-commerce may improve their job performance.

The fifth hypothesis indicated that the U.S. respondents would view the introduction of e-commerce in a more positive manner; that is, it would be beneficial to the firm and enrich jobs. This hypothesis was supported by the data. It is expected that the constant bombardment of advertisements advocating the benefits of electronic technologies might have influenced the U.S. respondents to view e-commerce more favorably.

One of the more interesting results of this study was the fact that there was no difference indicated in the comfort level with e-commerce between the respondents of the two countries (H3). This was true regardless of the covariates included. When the respondents were grouped into two categories: (1) owners and managers and (2) employees, there was no difference between the owners and the managers between countries, but there was a difference in the employees' comfort attitudes toward e-commerce. The U.S. employees showed a higher comfort level than the Mexican employees. Thus, when only employees were considered, hypothesis 3 was supported.

Perhaps the most puzzling result was the difference in the extent of involvement in e-commerce (H2). It was proposed that the U.S. respondents would indicate the most involvement, but instead, the Mexican respondents expressed higher involvement at all levels. The employees and the owners and managers indicated higher involvement than their U.S. counterparts. One interesting aspect was when age was treated as an independent variable and technology involvement as a dependent variable, the older groups (35-44 and 45 plus) were significantly different from both the

25-34 and the under 25 groups. The mean for the under 25 was 19.01, 21.40 for 25-34 group, but for the 35-44 and 45 plus, the means were 25.64 and 24.32 respectively. As noted earlier, the percentage of Mexican respondents who were 35 and over was 38.6 percent, while the percentage of U.S. respondents who were over 35 was 22.7 percent.

A likely explanation of these unanticipated results may stem from the Mexican practice of modeling American business practices. Gomez (1993) comments that there is a prevailing need to imitate all things American including consumption habits and, social, political, and economic ideas. With respect to technology, Mexico is not at the forefront of technological innovation and as such, there is the notion that systems and products that are developed in North America are superior in nature and must be adopted and emulated. Given these conditions, it seems reasonable that Mexican employees may want to emulate behaviors associated with employees of American firms and subsequently, they would have high involvement levels.

The final hypothesis (H6) that was not supported was the attitude toward negative effects of e-commerce. When all of the respondents were combined, there was a difference in their attitudes, but the U.S. respondents were more negative in their attitude. When the respondents were grouped based on organizational position, there was no difference between U.S. and Mexican owners and managers, but the difference held for employees only. The Mexican employees had a less negative view of e-commerce than the U.S. employees. This result can probably be attributed to the fact that employees in U.S. firms have had more extensive exposure to technology such as e-commerce. It is highly likely that given their exposure, they have witnessed a wide array of effects associated with the technology and as such, they probably have generated more thoughts and opinions about the technology.

The findings of the study indicate that culture influences attitudes toward and involvement with technology such as e-commerce. Given the potentially advantageous effects associated with diffusing e-commerce technology into a small business, it seems that careful consideration should be given to a firm's technology strategy and existing policy. Prudent thought should also include a

cultural assessment in order to select and diffuse a form of technology that is on one accord with the prevailing cultural values.

References

- Black, W. & Trippi, R. (1990). Management attitudes toward IT in the UK. *Journal of Systems Management, 41*, 21-25.
- Bagchi, K., & Cerveney, R. (2000). Impact of national level indicators on PC adoption, *Proceedings of the 8th International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems, San Francisco, CA*, 570-574.
- Chao, G. & Kozlowski, S. (1986). Employee perceptions on the implementation of robotic manufacturing technology. *Journal of Applied Psychology, 71(1)*, 70-76.
- Clarke, J., Hall, S., Jefferson, T., & Roberts, B. (1981). Subcultures, cultures and class, in T. Bennett, G. Martin, C. Mercer, & J. Wallacott (eds.) *Culture, Ideology and Social Process*, Batsford, London, 53-79.
- Cooper, R. & Zmud, R. (1990). Information technology implementation research: a technology diffusion approach. *Management Science, 36(2)*, 123-139.
- Currid, C. (1992). User satisfaction keeps IS from becoming the evil empire. *InfoWorld, 14(8)*, 56.
- Dean, C. & LeMaster, J. (1991). Present barriers to technology transfer: U.S. to Eastern Europe versus U.S. to Mexico, *The International Executive, 33*, 35-42.
- Ein-Dor, P., Segev, E., & Orgad, M. (1992). The effect of national culture on IS: Implications for international information systems, *Journal of Global Information Management, 1*, 33-44.
- Gomez, J. (1993). Mexican Corporate Culture. *Business Mexico, 8-9*.
- Haddad, C. (1996). Employee attitudes toward new technology in a unionized manufacturing plant. *Journal of End User Computing, 6(4)*, 15-25.
- Harris, R. & Davison, R. (1999). Anxiety and involvement: Cultural dimensions of attitudes toward computers in developing societies, *Journal of Global Information Management, 7*, 26-38.
- Hasan, G. & Ditsa, G. (1998). The impact of culture on the adoption of IT: An interpretive study, *Journal of Global Information Management, 7*, 5-15.
- Hill, C., Loch, K., Straub, D., & El-Sheshai, K. (1998). A qualitative assessment of Arab culture and information technology transfer, *Journal of Global Information Management, 6*, 29-38.

- Hofstede, G. (1991). *Cultures and Organisations: Software of the Mind*. London, McGraw-Hill.
- Igbaria, M. (1990). End-user computing effectiveness: A structural equation model, *Omega: International Journal of Management Science*, 18(6), 637-652.
- Igbaria, M., & Nachman, S. (1990). Correlates of end user satisfaction with end user computing: An exploratory study, *Information and Management*, 19, 73-82.
- Julien, P. (1995). New technologies and technological information in small business. *Journal of Business Venturing*, 10, 459-475.
- Kedia, B., & Bhagat, R. (1988). Cultural constraints on transfer of technology across nations: Implications for research in international and comparative management, *Academy of Management Review*, 13, 559-571.
- Kwon, T. & Zmud, R. (1987). Unifying the fragmented models of information systems implementation. In R. Boland and R. Hircheim (eds.), *Critical Issues in Information Systems Research*, John Wiley & Sons Ltd.
- Mahmood, M., Gemoets, L., & Gosler, M. (1995). Information technology transfer and diffusion to Mexico: A preliminary analysis, *Journal of Global Information Management*, 3, 5-15.
- Meehan, M. (2000). Forrester: E-commerce to explode in Asia, Europe, South America, *Computerworld*, 14.
- Millman, J. (1999). Microsoft joins Telemex to build Internet portal for Hispanics, *Wall Street Journal*, October 19, A18.
- Mont, C. (1999). The social uses of Internet in Mexico: A case study, *Telematics and Informatics*, 16, 91-98.
- Nelson, D. (1990). Individual adjustment to information driven technologies: A critical review, *MIS Quarterly*, 14, 78-98.
- Nuncio, A. (1999). Technology solutions, *Business Mexico*, 8, 54-55.
- Pare, G. & Elam, J. (1995). Discretionary use of personal computers by knowledge workers: Testing of a social psychology theoretical model, *Behaviour and Information Technology*, 14, 215-228.

- Palvia, P., Palvia, S., & Zigli, R. (1992). Global information technology environment: Key MIS issues in advanced and less developed nations, in Palvia, S. & Palvia, P. & Zigli, R. (eds), *The Global Issues of Information Technology Management*.
- Pena, D. G. (1997). *The Terror of the Machine: Technology, Work, Gender and Ecology on the U.S.-- Mexico Border*. CMAS Books, Austin, Texas.
- Review of World Bank* (1994). Lending for industrial technology: Lessons from six countries, 70.
- Rice, R. & Aydin, C. (1991). Attitudes toward new organizational technology: Network proximity as a mechanism for social information processing. *Administrative Science Quarterly*, 36, 219-244.
- Rifkin, G. (1991). What the PC means to me. *Computerworld*, 25(31), 54.
- Rogers, E. (1983). *The Diffusion of Innovations*. Free Press, New York.
- Sandkull, B. (1980). Practice of industry-mismanagement of people. *Human Systems Management*, 1(2), 159-167.
- Schafer, S. (1995). How information technology is leveling the playing field. *Inc. Technology*, 4, 92-96.
- Smith, J. (1999). Latin America is online for Internet sales explosion, *Los Angeles Times*, July, 26, 1.
- Steinwachs, K. (1999). Information and culture- The impact of national culture on information processes, *Journal of Information Science*, 24, 193-204.
- Tan, M. & Teo, T. (1998). Factors influencing the adoption of the Internet, *International Journal of Electronic Commerce*, 2, 5-18.
- Tan, M., Watson, R., & Wei, K. (1995). National culture and group support systems: Filtering communication to dampen power differentials, *European Journal of Information Systems*, 4, 82-92.
- Tigre, P. (1991). *The Mexican Professional Electronics Industry and Technology*. A report prepared for UNIDO.
- Vogel, D. & Gricar, J. (1998). Using electronic commerce to focus a country: The case of Slovenia, *International Journal of Electronic Commerce*, 2, 19-31.

APPENDIX A

Anxiety Statements

No.	Statement
1	I am not at all confident that I can learn e-commerce skills.
2	I am unsure of my ability to learn a computer programming language.
3	I will not be able to keep up with important technological advances.
4	I feel apprehensive about using e-commerce technology.
5	I have avoided computers because they are unfamiliar to me.
6	I hesitate to use a computer for fear of making mistakes that I cannot correct.
7	I have difficulty understanding most technological matters.
8	Computer terminology sounds like confusing jargon to me.

APPENDIX B

Involvement Statements

No.	Statement
1	I regularly read magazines and newspaper articles about e-commerce.
2	I am confident about understanding most of what I read or hear about e-commerce.
3	I believe it is necessary to keep my knowledge about e-commerce up to date.
4	I believe e-commerce is important in today's world.
5	I would like to use e-commerce technology for more of my regular tasks.
6	I would watch a TV program about new developments in e-commerce technology.
7	I often take a close look at PCs, peripherals and software in shops and/or catalogs.

APPENDIX C

Attitude Dimensions and Statements

Dimension	Statement
Comfort	The new e-commerce technology gives me job security.
	I enjoy working with the new e-commerce technology.
	The new e-commerce technology is a threat to my job security.
	I want to go back to my job the way it was before e-commerce was brought in.
Efficiency	The new e-commerce technology will make my job easier.
	The new e-commerce technology will improve the way work is done.
	The new e-commerce technology results in the closer monitoring of my work quality.
	The new e-commerce technology has improved the way work is done.
Positive Influence	The new e-commerce technology will make the job more interesting.
	The new e-commerce technology will make the job more challenging.
	The new e-commerce technology has improved the quality of our products.
	The new e-commerce technology was needed.
Negative Influence	The new e-commerce will result in closer monitoring of my work.
	I feel more stress on the job since the new e-commerce technology arrived.
	The new e-commerce will make the job more boring.

Modification of Haddad's scales (1996).