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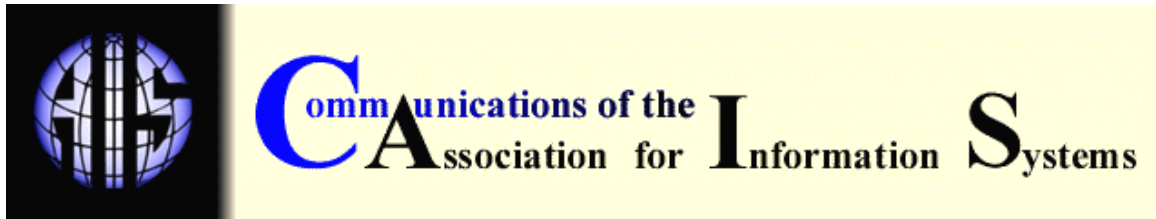
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## E-COMMERCE ADOPTION: PERCEPTIONS OF MANAGERS/OWNERS OF SMALL AND MEDIUM SIZED FIRMS IN CHILE

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### ABSTRACT

Although the adoption of e-commerce is widely studied in the industrialized world, only a small number of these studies focus on developing countries. An even smaller fraction of these studies focus on small and medium sized enterprises (SMEs), which account for a high percent of the economy generated in developing countries. In this study, managers/owners of SMEs in Chile identified variables that differentiate between adopters and non-adopters of e-commerce. The analysis suggests that Chilean managers/owners most receptive to adopting e-commerce possess the financial and technological resources to implement it, see e-commerce as increasing managerial productivity and supporting strategic decisions, feel external pressure to put e-commerce into operation, perceive e-commerce as compatible with preferred work practices and existing technology infrastructure, and perceive e-commerce as useful for their firms.

**Keywords:** electronic commerce adoption, SMEs, Chile, discriminant analysis.

### I. INTRODUCTION

E-commerce is defined as "business activities conducted using electronic data transmission via the Internet and the WWW" [Schneider and Perry, 2000]. E-commerce provides many benefits to both buyers and sellers. For example, Napier et al., [2001] suggested that sellers, by using e-commerce, could access specific geographically dispersed market segments. Likewise, buyers could access a wider variety of sellers. Other studies found that e-commerce reduces costs and improves product quality [Napier et al., 2001; Chaudhury and Kulboer, 2002; Saloner and Spence, 2002].

Among the studies focused on technology adoption, only a small number were devoted to the adoption and use of e-commerce in small and medium sized enterprises (SMEs) [e.g., Mirchandani and Motwani, 2001; Riemenschneider and McKinney, 2001-2002]. SMEs play an important role in the economies of both developing and developed countries. For example, in the United States, SMEs represent 99 percent of businesses, employ more than half of the work

force, and create two-thirds of new jobs [Small Business Administration, 2003]. However, few SMEs adopted e-commerce by the end of 2003. Small businesses establish Web sites primarily to advertise and promote their business, rather than to conduct e-commerce [The Gallup Organization, 2002]. These results are consistent with the "Second Annual Small Business Internet Survey" [<http://www.business-survival.com/reports/Verizonsurvey.html>]. This survey found that the number of small firms that established a Web site to advertise and promote their business increased 123 percent from 1999 to 2000, while small businesses that established a Web site primarily to sell products decreased 48 percent during the same period. It appears that while top managers and owners of SMEs recognize the importance of an Internet presence [Cyber Atlas, 2001; OPEN Small Business Network, 2002], only a small percentage of them use the Internet to sell.

International investors have seen Latin America as a target market to implement new businesses over the World Wide Web (WWW) [Pastore, 1999]. Specifically, Chile represents a good case study for Latin America because it offers many demographics that should make e-commerce a success. For example, over the last decade, Chile's economy was the most stable in Latin America. Consequently, it ranks as one of the most developed business and consumer climates in the region [Marino, 1999]. Another important demographic is that Chile is relatively advanced in terms of telecommunications infrastructure. For many emerging markets, telecommunications, or the lack of, is a significant obstacle preventing Internet and e-commerce adoption [Marino, 1999]. Chile, within the developing economies of the world, ranked third after Singapore and Hong Kong [The World Competitive Year Book, 2002; World Economic Forum, 2001]. This ranking is based on the ability of a particular economy to support/provide a stable business environment. Considering these facts and the expected increase of commerce between Chile and the US due to the US-Chile Free Trade Agreement [Chile-U.S. Free Trade Agreement, 2003], it is important to determine if managers/owners of SMEs in Chile are receptive to the adoption of e-commerce. For this study, we defined e-commerce as "the use of the Internet and the World Wide Web (WWW) to promote and sell products and services."

This study aims to identify and rank factors that differentiate adopters and non-adopters of e-commerce in Chilean SMEs. These findings can contribute to managers/owners' understanding of how those factors can influence e-commerce adoption. We hope to convey that changing managers' behaviors ultimately depends on changing their beliefs.

## **E-COMMERCE IN CHILE**

The National Science Foundation (NSF) authorized the Chilean Internet connection in the early 1990s. Based on an NSF grant, the Catholic University at Santiago was the first Chilean organization connected to the Internet in 1992 [Arriagada, 2001]. Currently, the percentage of online users represents more than 20 percent of the Chilean population [Santiago Chamber of Commerce, 2003]. According to the National Institute of Statistics [2002], approximately 22 percent of the SMEs in Chile have or will have Internet access by the end of 2002. Within this 22 percent, 60 percent are medium sized organizations, while the remaining 40 percent are small firms. A related study by the Chilean Ministry of Economic Development (March-May 2002) found that 74.5 percent of Chilean SMEs send and receive information from their customers electronically, 35.4 percent provide electronic product catalogues, and 18.4 percent of the organizations sell their products and services over the Internet.

The business-to-business (B2B) segment accounted for most of the e-commerce in Chile in 2002 [Santiago Chamber of Commerce, 2003]. Total sales reached US \$2,470 million representing a 75 percent increase from 2001. The business-to-consumer (B2C) segment, on the other hand, totaled only US \$40 million in 2002 [Santiago Chamber of Commerce, 2003] which represented a 30 percent increase from the previous year. Even though these percentages are high when compared with other developing countries in the region, e-commerce in Chile is not fully developed [Cubillos, 2001]. Mendoza and Alvarez de Toledo [1999] pointed out that although there is great potential for e-commerce in Chile, many individuals see building personal relations

and networking as more important than purchasing goods online. In their survey of 1,145 households, they found that only about 10 percent of the respondents ever made a purchase via the Internet.

Even though other studies examined the state of e-commerce in Chile [e.g. Mendoza and Alvarez de Toledo, 1999; Marino, 1999; Ceballos, 2001], the lack of research focusing on SMEs in Chile is still an issue. In addition, those studies or industry reports cited earlier did not directly survey top managers to determine their perceptions toward e-commerce adoption. This research intends to fill that gap.

In the following section, we review related research to develop the theoretical framework for this study (Section II). We then present the methodology employed in this study (Section III). A description of statistical methods and results follows in Section IV. We conclude with a discussion, the study's limitations, implications, and calls for future research.

## II. THEORETICAL BACKGROUND

The Information Systems (IS) community studies information technology adoption, using several approaches. For this study, we grouped existing research on technology adoption according to the type of technology addressed. Electronic Data Interchange (EDI), Group Support Systems (GSS), computer-aided software engineering (CASE), the Internet/WWW and corporate Web sites, and e-commerce are examples of technologies addressed in previous studies to determine the factors that influence their adoption. These studies identify factors that differentiate between adopters and non-adopters of e-commerce and provide a starting point in this study.

### ELECTRONIC DATA INTERCHANGE

Iacovou et al. [1995] studied factors influencing the adoption of electronic data interchange (EDI). They considered seven organizations in different industries pursuing EDI initiatives. Among the factors included were perceived benefits, organizational readiness, and external pressure. To measure perceived benefits, they used awareness of direct and indirect benefits. Variables measuring organizational readiness were financial and technological resources. To measure external pressure, they considered competitive pressure and imposition by partners. They found that both perceived benefits and organizational readiness moderated adoption and that a strong relationship existed between external pressure and adoption of EDI.

In another study, Chwelos et al. [2001] considered a slightly modified set of factors as influencing the adoption of EDI. In this study, all three determinants were significant predictors of the intention to adopt EDI, with external pressure and readiness being more important than perceived benefits. In a similar line of inquiry, Kuan and Chau [2001] identified the factors influencing the adoption of EDI in small businesses using a technology, organization, and environment framework. The technology factor, as in Iacovo et al.'s [1995] study, incorporated perceived direct and indirect benefits of EDI. The organization factor consisted of perceived financial costs, perceived technical competence, and corresponded to organizational readiness in Iacovou et al.'s [1995] study. The environment factor included industry and perceived government pressure (in Iacovou et al.'s [1995] study this factor was labeled "external pressure"). As in the case of Chwelos et al. [2001], Kuan and Chau [2001] found that all three factors significantly influenced EDI adoption by small businesses, with organizational readiness and external pressure being most important.

### GROUP SUPPORT SYSTEMS

Chin and Gopal [1995] determined the relative importance of beliefs to adopt group support systems (GSS). They examined how relative advantage, ease of use, compatibility, and enjoyment influenced the intention to adopt GSS. Relative advantage and compatibility were factors taken from the study of Moore and Benbasat [1991] regarding the adoption of information

technology (IT) innovation. Perceived ease of use came directly from Davis' [1989] technology acceptance model (TAM) while enjoyment was adapted from Davis et al.'s [1992]. Chin and Gopal [1995] used different methods to measure the relative importance of these factors. Even though the relative importance of the factors did not converge across methods, the authors generally agreed on the significance of the factors. All factors tested were important determinants of GSS adoption.

### **COMPUTER-AIDED SOFTWARE ENGINEERING (CASE)**

Premkumar and Potter [1995] examined the impact of organizational and technology characteristics on the adoption of CASE technology. They considered top management support, product champion, and IS expertise as organizational factors. Among the variables included in the technology factor, they took into account relative advantage, cost, complexity, technical compatibility, and organizational compatibility. The discriminant analysis revealed that five variables were important discriminators between adopters and non-adopters of CASE technology – relative advantage, cost, product champion, top management support, and IS expertise.

### **THE INTERNET/WWW AND CORPORATE WEB SITES**

In an interesting study by Chang and Cheung [2001], the determinants of the intention to use the Internet/WWW were established. Instead of determining factors affecting adoption, they studied those affecting the intention to use the Internet/WWW. Among the factors considered were near and long-term consequences, complexity, affect, social factors, and facilitation conditions. Complexity and long-term consequences did not significantly influence the intention to adopt the Internet/WWW.

Beatty et al. [2001] also studied the factors influencing corporate Web site adoption. They found that the factors involved in the adoption process differed depending on the time of adoption. In their empirical study of 286 medium-to-large US firms, they found that early adopters placed significantly more emphasis than late adopters did on perceived benefits for having a Web site. The early adopters viewed using the Web as being compatible with their current organizational processes and their existing technological infrastructures. Firms that adopted corporate Web sites later appear to place less emphasis on benefits, and adopted them in spite of the lack of compatibility between the Web and their existing technology. This finding suggests that external pressure of peers, industry, or government may play a role in the adoption of information technology at least for later adopters.

Also in the area of web-site adoption, Riemenschneider et al. [2003] combined the theory of planned behavior [Ajzen, 1991] and the technology acceptance model (TAM) [Davis, 1989] into one model. This combined model was better at predicting the adoption of web sites by executives of SMEs. By incorporating perceived ease of use and perceived usefulness (the two direct causal antecedents of technology acceptance in the TAM), they were able to improve the fit of their theoretical model. Numerous studies tested the TAM [e.g. Adams et al. 1992; Hendrickson et al. 1993; Szajna, 1994; Igbaria et al., 1997; Subramanian, 1998; Hubona and Burton-Jones, 2003] and found TAM explained a significant amount of the variance in intentions to use a technology and/or actual use of the technology. For this reason, perceived ease of use and perceived usefulness were independent factors influencing e-commerce adoption in this current study.

### **ELECTRONIC COMMERCE**

Mirchandani and Motwani [2001] investigated factors that differentiate adopters from non-adopters of e-commerce in small businesses. The relevant factors included enthusiasm of top management, compatibility of e-commerce with the work of the company, relative advantage perceived from e-commerce, and knowledge of the company's employees about computers. The degree of dependence of the company on information, managerial time required to plan and

implement the e-commerce application, the nature of the company's competition, and the financial cost of implementing and operating the e-commerce application did not influence adoption. These results are quite different from those found by Ryan and Prybutock [2001] and Riemenschneider and McKinney [2001-2002]. Ryan and Prybutock found that the organizations that have previously installed user-centric technologies are more inclined to adopt new technologies. This suggests that implementation costs are important when deciding to adopt or not to adopt e-commerce. By using the theory of planned behavior [Ajzen, 1991], Riemenschneider and McKinney [2001-2002] found that cost is an important factor in the decision to adopt Web-based e-commerce.

Subramanian and Nosek [2001] provided a foundation to determine the factors that differentiate between adopters and non-adopters of e-commerce. These authors created an instrument to validate the perceptions of strategic value that an information system (IS) may provide. Through an empirical study of 73 firms, Subramanian and Nosek [2001] tested three factors that were thought to create strategic value in Information Systems: operational support, managerial productivity, and strategic decision aids. In each of these constructs, they used items found to have high convergent validity and reliability.

Grandon and Pearson [2003] validated these same constructs in an independent study. By using canonical correlation analysis, they found that the perceptions of strategic value of e-commerce were highly associated with factors that influenced the decision to adopt e-commerce by managers/owners of SMEs. Since perceptions influence behavior [Ajzen, 1991], it is believed that differences in perceptions lead to differences in behavior. Thus, considering the decision to adopt or not to adopt e-commerce as the target behavior, Subramanian and Nosek's [2001] factors were included in this study. Consequently, we can determine whether these factors (operational support, managerial productivity and strategic decision aids) can differentiate between e-commerce adopters and non-adopters.

For the purpose of our research, we grouped the factors found to be significant in influencing the adoption of different information technologies and considered them as potential factors that discriminate between adopters and non-adopters of e-commerce in SMEs in Chile. Table 1 summarizes the eight factors considered in this study and associates them with the factors included in previous research. A brief definition of each factor is also given.

### III. METHODOLOGY

#### SUBJECTS

Chile consists of 13 different regions. We targeted top managers of SMEs in the Bío-Bío region of Chile, which is located 328 miles south of Santiago, the capital. The Bío-Bío region is the second largest in terms of population and one of the three more important regions in the country. It is the second ranked region in terms of its contribution to the national economy [<http://www.octavaregion.com/v3/introduction.htm>].

In this study, we considered the number of employees as the principal criterion since other categorizations such as those involving revenue and/or total capital can frequently result in misleading classifications of organizations. The number of employees considered in a small or medium size business varies according to the agency providing the definition. We used the cutoff suggested by the U. S. Small Business Administration (less than 500 employees). The targeted managers were Chief Executive Officers (CEO), Chief Information Officers (CIO), Owners, or Functional Department Chiefs. In this study, we did not differentiate among these executives; instead we considered them all as "managers/owners."

Table 1. Summary of Potential Discriminators Factors

| No. | Factor in the current study and definition  | Factors in previous studies   | Source   |
|-----|---|---|--|
| 1   | <b>Organizational Readiness</b><br>Availability of the financial and technological resources to adopt e-commerce (adapted from Iacovo et al., 1995)   | Organizational Compatibility<br>Technical Compatibility<br>Organizational Readiness<br>Organization<br>Compatibility with company<br>Facilitating conditions<br>Technological context<br>Cost<br>Cost | Beatty et al. [2001]<br>Beatty et al. [2001]<br>Iacovo et al. [1995]<br>Chwelos et al. [2001]<br>Kuan and Chau [2001]<br>Chang and Cheung [2001]<br>Ryan and Prybutock [2001]<br>Premkumar and Potter [1995]<br>Riemenschneider and McKinney [2001-2002] |
| 2   | <b>Compatibility</b><br>Consistency of e-commerce with the existing technology infrastructure, culture, values, and preferred work practices of the firm (based on Beatty et al., 2001)   | Compatibility with company<br>Compatibility with the company's work<br>Compatibility<br>Compatibility, top management support   | Beatty et al. [2001]<br>Mirchandani and Motwani [2001]<br>Chin and Gopal [1995]<br>Premkumar and Potter [1995]   |
| 3   | <b>External Pressure</b><br>Direct or indirect pressure exerted by competitors, social referents, other firms, the government, and the industry to adopt e-commerce (based on Iacovo et al., 1995)                                    | External Pressure<br>Environment<br>Social Factors<br>Environmental context<br>Normative beliefs  | Iacovo et al. [1995]<br>Kuan and Chau [2001]<br>Chang and Cheung [2001]<br>Ryan and Prybutock [2001]<br>Riemenschneider and McKinney [2001-2002]   |
| 4   | <b>Perceived Ease of Use</b><br>The degree to which an individual believes that using e-commerce would be free of effort (based on Davis, 1989)   | Perceived Ease of Use   | Davis [1989]<br>Chin and Gopal [1995]<br>Riemenschneider et al. [2003]   |
| 5   | <b>Perceived Usefulness</b><br>The degree to which a person believes that using e-commerce would enhance his or her job performance (based on Davis, 1989)  | Perceived Usefulness  | Davis [1989]<br>Riemenschneider et al. [2003]  |
| 6   | <b>Organizational Support</b><br>Managers' perception of an operational support value for e-commerce. It includes support to decision making and cooperative partnerships in the industry (adapted from Subramanian and Nosek, 2001)  | Organizational Support  | Subramanian and Nosek [2001]<br>Grandon and Pearson [2003]   |
| 7   | <b>Managerial Productivity</b><br>Managers' perception that e-commerce provides better access to information, helps in the management of time, improves communication among managers, etc. (adapted from Subramanian and Nosek, 2001) | Managerial Productivity   | Subramanian and Nosek [2001]<br>Grandon and Pearson [2003]   |
| 8   | <b>Strategic Decision Aids</b><br>Managers' perceptions that e-commerce supports strategic decisions (adapted from Subramanian and Nosek, 2001)   | Strategic Decision Aids   | Subramanian and Nosek [2001]<br>Grandon and Pearson [2003]   |

## DATA COLLECTION

In Spring 2002, using an enterprise guide for the Bío-Bío region of Chile [GEEP, 2001], we identified 210 small and medium size enterprises. In addition, through one author's personal contacts, 30 firms not listed in this enterprise guide were also identified. As a result, we mailed 240 surveys to top managers/owners of SMEs in the Bío-Bío region over a 3-week period.

In an effort to ensure that the surveys arrived at the targeted mail addresses, we attempted to contact each business via follow up telephone calls. We realized that not all the surveys arrived at the targeted firms due to changes in mailing addresses. Therefore, we re-sent 30 surveys to those organizations that did not receive the survey via the first mailing.

## INSTRUMENT DEVELOPMENT

Three top managers who were representative of our sampling frame participated in a pilot of the survey instrument. One of the authors observed these managers as they completed the survey. Feedback from the subjects resulted in minor changes to survey instructions and questions. The survey questionnaire (shown in Appendix I) included a brief definition of e-commerce (the use of the Internet and the World Wide Web (WWW) to promote and sell products and services) clarify the concept. Respondents completed a survey that had the following major sections:

- Seven demographic questions about the respondent's gender, age, education, years of work in present position and years of work within present firm.
- Two questions related to the number of employees and the industry in which the business operates.
- Four questions concerning the technology utilized in the organization: the number of PCs, the presence of Internet Server Provider, the presence of Web site and the utilization of e-commerce.
- Thirty eight questions measured the eight factors that we believed would differentiate between adopters and non-adopters of e-commerce (organizational readiness, compatibility, external pressure, perceived ease of use, perceived usefulness, organizational support, managerial productivity, and strategic decision aids).

A seven-point Likert scale (from strongly disagree to strongly agree) was used for the 38 questions relating to e-commerce adoption.

## IV. RESULTS

### DEMOGRAPHICS AND DESCRIPTIVE STATISTICS

Over a 12-week period, 88 surveys received. Five of these surveys did not meet the initial requirements of firm size. Thus, 83 companies provided usable data, which represents a 34 percent response rate. We attribute this high response rate to the telephone calls we made to ascertain top managers' willingness to participate in the study. The contact person in each company was crucial. He/she explained the nature of this research to top managers. While some managers were reluctant to take part in a study conducted through an American university, others were extremely enthusiastic to participate. Twenty-eight managers provided responses to open-ended questions about their perceptions of e-commerce adoption.

The results from the 83 firms indicate that the majority of their top managers (90 percent) are owners or CEOs of small and medium size businesses. These individuals are well educated, with over 68.67 percent holding a 4-year college degree or higher. The majority are male (94 percent) with an average age of 41 years. Approximately 15 percent of these firms already engaged in e-commerce. This number is consistent with the study done by the Chilean Ministry of Economic



Development (March – May 2002), which found that 18.4 percent of Chilean SMEs were currently engaged in e-commerce activities. Table 2 shows other demographics associated with the respondents of this study.

### STATISTICAL ANALYSIS

We conducted statistical analysis in two steps. In the first step, a preliminary discriminant analysis determined which factors differentiated between adopters and non-adopters of e-commerce and their respective order of importance. To obtain more insights into managers' perceptions about adoption of e-commerce, the second step used t-tests to identify items that differentiated between adopters and non-adopters within each factor.

Non-response is a potential source of bias in survey studies that needs to be addressed [Fowler, 1993]. As in the case of Kuan and Chau [2001], we compared early and late respondents to determine if there was a problem with non-response bias. Early respondents were those who had completed the questionnaire within the initial four-weeks while late respondents took longer.

Table 2. Demographics

|  |   |   |
|--|---|---|
| Gender:                                    | Male=94%  | Female=6%   |
| Age:                                       | Average= 40.67  | S.D.= 9.87  |
| Years of work in present position:         | Average= 9.55   | S.D.= 7.89  |
| Years of work with present firm:           | Average= 11.07  | S.D.= 9.35  |
| Education                                  | High School<br>2-year College<br>4-year College<br>Master Degree<br>Doctoral Degree   | 4.82%<br>26.51%<br>62.65%<br>4.82%<br>1.2%                      |
| Industry                                   | Manufacturing<br>Wholesale<br>Retail<br>Healthcare<br>Construction<br>Transportation<br>Other (forestry, fishing, services, and others) | 4.82%<br>20.48%<br>21.69%<br>4.82%<br>13.25%<br>1.20%<br>33.73% |
| E-commerce adoption by Industry            | Manufacturing<br>Wholesale<br>Retail<br>Healthcare<br>Construction<br>Transportation<br>Other (forestry, fishing, services, and others) | 0%<br>16%<br>8%<br>0%<br>0%<br>0%<br>76%                        |
| Hardware platform                          | Mainframe<br>Mini<br>PC<br>Mixture<br>Other   | 3.61%<br>1.2%<br>65.06%<br>25.30%<br>4.82%                      |
| Internet Service Provider already in place | Yes<br>No   | 87.95%<br>12.05%  |
| Firm web site                              | Yes<br>No   | 48.19%<br>51.81%  |
| Electronic commerce already in place       | Yes<br>No   | 15.66%<br>84.34%  |

Approximately 64 percent of the responses were early. The demographic data used for this purpose were number of employees, number of years managers/owners worked in the present company, number of years managers/owners worked in the present position, and age. No significant differences were found in terms of number of employees ( $t(81) = -1.616, p=.110$ ), number of years in the firm ( $t(74) = -.305, p=.762$ ), number of years in the position ( $t(76) = -.489, p=.626$ ), and age ( $t(67) = -.567, p=.573$ ). Thus, non-response biases, if any, should not be serious.

### Step 1: Preliminary Discriminant Analysis

Descriptive discriminant analysis [Stevens, 2002] showed major differences between adopters and non-adopters of e-commerce at the factor level. In this preliminary analysis, all items measuring the different factors were included. The dependent variable, adoption of e-commerce, was a dichotomous variable measured by adopters and non-adopters. A set of eight independent factors, based upon previous research in technology adoption, were included in this survey (see Table 1). Each independent factor represented the average of their respective items.

*Estimation of the Discriminant Model and Assessing Overall Fit.* Table 3 shows the group means, standard deviations, and the test for equality of the group means of the factors respectively. It can be seen from the test for the equality of group means (Table 3) that

- managerial productivity,
- decision aids,
- organizational readiness,
- compatibility, and
- external pressure

Table 3. Group Statistics

| Group Means for the Independent Variables                     |         |         |         |         |         |         |         |         |
|---|---------|---------|---------|---------|---------|---------|---------|---------|
|   | OS      | MP      | DA      | OR      | CC      | EP      | EU      | PU      |
| 0: Non-adopters   | 5.8116  | 5.6993  | 5.3652  | 4.9855  | 4.9130  | 4.1362  | 5.8464  | 5.2493  |
| 1: Adopters   | 6.0612  | 6.6071  | 6.0857  | 6.2143  | 5.6000  | 4.9286  | 5.9714  | 5.8143  |
| Standard Deviations Group Means for the Independent Variables |         |         |         |         |         |         |         |         |
|   | OS      | MP      | DA      | OR      | CC      | EP      | EU      | PU      |
| 0: Non-adopters   | 0.72905 | 1.07749 | 1.07482 | 1.28901 | 1.05690 | 1.12223 | 0.85071 | 1.14784 |
| 1: Adopters   | 0.67406 | 0.46734 | 0.74716 | 0.97496 | 1.05247 | 0.74671 | 1.21493 | 1.55061 |
| Test for the Equality of the Group Means                      |         |         |         |         |         |         |         |         |
|   | OS      | MP      | DA      | OR      | CC      | EP      | EU      | PU      |
| Wilks' lambda   | .983    | .895    | .934    | .877    | .943    | .927    | .997    | .970    |
| Univariate F ratio  | 1.397   | 9.500   | 5.703   | 11.356  | 4.924   | 6.372   | 0.216   | 2.490   |
| Significance level  | .241    | .003*** | .019**  | .001*** | .029**  | .014**  | .644    | .118    |

p\*\*\* <= .01; p\*\* <= .05; p\* <= .1

OS = Organizational Support      MP = Managerial Productivity      DA = Decision Aid  
 OR = Organizational Readiness      CC = Compatibility      EP = External Pressure  
 EU = Ease of Use      PU = Perceived Ease of Use

showed significant univariate differences between the two groups ( $p < .05$ ). In addition, the mean from the adopter group was larger than the mean from the non-adopter group for the five significant variables. This result indicated that the adopters had a stronger level of agreement regarding the perceived importance of the factors/items than the non-adopters. The standard deviation for the non-adopters was larger than the adopters indicating greater dispersion among

non-adopters than adopters. As Riemenschneider and McKinney [2001-2002] pointed out, this finding is intuitive, as one would expect more variance among respondents who had not yet adopted e-commerce than from respondents who already adopted this technology.

All of the independent factors were considered simultaneously in the discriminant analysis (enter method). Thus, the discriminant function included all of the independent factors, regardless of its discriminating power. The discriminant function was significant at .05 level and displayed a canonical correlation of 43 percent. Thus, a linear combination of the eight independent factors explains 18.8 percent of the variance in the dependent factors.

By using a cut-off value of 0.3 as suggested by Hair et al. [1998], six of eight factors showed significant values (Table 4). The rank of importance, given by the absolute value of the loading, was

- organizational readiness,
- managerial productivity,
- external pressure,
- decision aids,
- compatibility, and
- perceived usefulness.

Based on the predicted group membership, the classification matrix correctly classified all non-adopters while only 11 adopters were misclassified as non-adopters. The discriminant function was able to classify 86.75 percent (hit ratio) of the cases correctly assuming homogeneity of the covariance matrices. The hit ratio exceeds the proportional chance criterion of 71 percent demonstrating predictive accuracy of the discriminant function [Hair et al.,1998].

Table 4. Structure Matrix

| Factors                       | Function |
|-------------------------------|----------|
| Organizational Readiness (OR) | .776     |
| Managerial Productivity (MP)  | .710     |
| External Pressure (EP)        | .581     |
| Decision Aids (DA)            | .550     |
| Compatibility (CC)            | .511     |
| Perceived Usefulness (PU)     | .363     |
| Organizational Support (OS)   | .272     |
| Ease of Use (EU)              | .107     |

### Step 2: T-test of Mean Differences

The preliminary discriminant analysis described above sheds some light on the factors that differentiate adopters from non-adopters of e-commerce among managers/owners of SMEs in Chile. Further analysis identified which specific items within each factor made the difference. To conduct this analysis, we employed a t-test for each individual item. The t-test analysis helped us understand the specific managers' cognitions that influenced the adoption of e-commerce. In addition, by carrying out the analysis at the item level, we were able to put the results found in the preliminary discriminant analysis in a more meaningful context.

Table 5 shows the results of the independent sample t-tests across adopters and non-adopters of e-commerce. As in the case of the discriminant analysis, all items were included. Thus, Table 5 reflects all the survey questions in the instrument as explained in the Instrument Development section earlier.

Table 5. Independent Sample T-tests Across Adopters and Non-Adopters of E-commerce (significant items are marked in bold font)

| Item  | Description  | t                | df        | Sig. (2-tailed) | Mean Difference |
|---|--|------------------|-----------|-----------------|-----------------|
| Organizational Support (OS): Electronic commerce should help...                                   |  |                  |           |                 |                 |
| OS1   | Reduce costs of business operations  | -1.210           | 79        | .230            | -.4514          |
| <b>OS2</b>  | <b>Improve customer services</b>   | <b>-2.396**</b>  | <b>81</b> | <b>.019</b>     | <b>-.5238</b>   |
| OS3   | Improve distribution channels  | -1.792           | 81        | .077            | -.4845          |
| OS4   | Reap operational benefits  | -2.05            | 77        | .838            | -.0771          |
| OS5   | Provide effective support role to operations   | -1.160           | 81        | .249            | -.3623          |
| OS6   | Support linkages with suppliers  | -1.426           | 81        | .158            | -.3861          |
| OS7   | Increase ability to compete  | -1.232           | 81        | .221            | -.4141          |
| Managerial Productivity (MP): Electronic commerce should help...                                  |  |                  |           |                 |                 |
| <b>MP1</b>  | <b>Provide managers better access to information</b>                                     | <b>-2.343**</b>  | <b>81</b> | <b>.022</b>     | <b>-.6988</b>   |
| <b>MP2</b>  | <b>Provide managers access to methods and models in making functional area decisions</b> | <b>-2.563**</b>  | <b>81</b> | <b>.012</b>     | <b>-1.0228</b>  |
| <b>MP3</b>  | <b>Improve communication in the organization</b>   | <b>-2.094**</b>  | <b>81</b> | <b>.039</b>     | <b>-.7754</b>   |
| <b>MP4</b>  | <b>Improve productivity of managers</b>  | <b>-2.906***</b> | <b>81</b> | <b>.005</b>     | <b>-1.1346</b>  |
| Decision Aids (DA): Electronic commerce should help...  |  |                  |           |                 |                 |
| DA1   | Support strategic decisions of managers  | -1.654           | 81        | .102            | -.6066          |
| <b>DA2</b>  | <b>Make decisions for managers</b>   | <b>-2.839***</b> | <b>79</b> | <b>.006</b>     | <b>-1.0736</b>  |
| DA3   | Support cooperative partnerships in the industry   | -.601            | 80        | .549            | -.2521          |
| DA4   | Provide information for strategic decision   | -2.299           | 81        | .024            | -.7629          |
| Organizational Readiness (OR): Our organization has the...  |  |                  |           |                 |                 |
| <b>OR1</b>  | <b>Financial resources to adopt e-commerce</b>   | <b>-2.892***</b> | <b>81</b> | <b>.005</b>     | <b>-1.1418</b>  |
| <b>OR2</b>  | <b>Technological resources to adopt e-commerce</b>                                       | <b>-3.111***</b> | <b>81</b> | <b>.003</b>     | <b>-1.3157</b>  |
| Compatibility (CC): Our organization perceives that electronic commerce is consistent with our... |  |                  |           |                 |                 |
| C1  | Culture  | -.603            | 79        | .548            | -.2760          |
| C2  | Values   | -1.440           | 79        | .154            | -.6097          |
| <b>C3</b>   | <b>Preferred work practices</b>  | <b>-2.297**</b>  | <b>81</b> | <b>.024</b>     | <b>-.8872</b>   |
| <b>C4</b>   | <b>Existing technology infrastructure</b>  | <b>-2.862***</b> | <b>80</b> | <b>.005</b>     | <b>-.7920</b>   |
| <b>C6</b>   | <b>Top management is enthusiastic about the adoption of electronic commerce</b>          | <b>-2.939***</b> | <b>80</b> | <b>.004</b>     | <b>-1.3004</b>  |
| External Pressure (EP)  |  |                  |           |                 |                 |
| <b>EP1</b>  | <b>Competition is a factor in our decision to adopt electronic commerce</b>              | <b>-2.083**</b>  | <b>80</b> | <b>.040</b>     | <b>-.7416</b>   |
| <b>EP2</b>  | <b>Social factors are important in our decision to adopt electronic commerce</b>         | <b>-2.243**</b>  | <b>81</b> | <b>.028</b>     | <b>-.9337</b>   |
| EP3   | We depend on other firms that are already using electronic commerce                      | -1.849           | 81        | .068            | -.9710          |
| <b>EP4</b>  | <b>Our industry is pressuring us to adopt electronic commerce</b>                        | <b>-2.091**</b>  | <b>81</b> | <b>.040</b>     | <b>-1.1035</b>  |
| EP5   | Our organization is pressured by the government to adopt electronic commerce             | -.193            | 80        | .848            | -.0903          |
| Perceived Ease of Use (EU)  |  |                  |           |                 |                 |
| EU1   | Learning to operate electronic commerce would be easy for me                             | -.474            | 81        | .637            | -.1729          |
| EU2   | I would find electronic commerce to be flexible to interact with                         | -1.036           | 81        | .303            | -.3364          |

| Item                             | Description   | t               | df        | Sig. (2-tailed) | Mean Difference |
|----------------------------------|---|-----------------|-----------|-----------------|-----------------|
| EU3                              | My interaction with electronic commerce would be clear and understandable                   | -.343           | 81        | .732            | -.0839          |
| EU4                              | It would be easy for me to become skillful at using electronic commerce                     | .037            | 81        | .971            | .0135           |
| EU5                              | I would find electronic commerce easy to use  | -.124           | 81        | .901            | -.455           |
| <b>Perceived Usefulness (PU)</b> |   |                 |           |                 |                 |
| PU1                              | Using electronic commerce would enable my company to accomplish specific tasks more quickly | -.971           | 81        | .334            | -.3634          |
| PU2                              | Using electronic commerce would improve my job performance                                  | -1.390          | 81        | .168            | -.6128          |
| PU3                              | Using electronic commerce in my job would increase my productivity                          | -1.652          | 81        | .102            | -.6398          |
| PU4                              | <b>Using electronic commerce would enhance my effectiveness on the job</b>                  | <b>-2.009**</b> | <b>81</b> | <b>.048</b>     | <b>-.7981</b>   |
| PU5                              | <b>Using electronic commerce would make it easier to do my job</b>                          | <b>-2.576**</b> | <b>81</b> | <b>.012</b>     | <b>-.9710</b>   |
| PU6                              | I would find electronic commerce useful in my job   | -1.304          | 81        | .196            | -.4638          |

p\*\*\*<=.01; p\*\*<=.05; p\*<=.1

## V. DISCUSSION

### ORGANIZATIONAL SUPPORT

The discriminant analysis showed that organizational support does not discriminate between adopters and non-adopters. It seems that managers/owners of SMEs, both those who already adopted e-commerce and those who did not, are aware of the importance of this factor because their perceptions are similar about it. Further investigation on this factor indicated that only one item ("*e-commerce helps improve customer service*") is a significant discriminator. The mean value for the adopter group was significantly larger than the mean value from the non-adopter group on this item. This finding suggests that adopters agreed more strongly on this item when compared with non-adopters.

### MANAGERIAL PRODUCTIVITY

The results of the preliminary discriminant analysis indicated that managerial productivity is a significant factor that differentiates adopters from non-adopters. It was the second most important factor in the discriminant analysis. This finding indicates that adopters perceive that e-commerce provides better access to information, helps in the management of time, improves communication among managers, and other factors. The results from the t-test showed that all items in this factor discriminated between adopters and non-adopters of e-commerce. Thus, the t-tests corroborated the findings of the preliminary discriminant analysis. As one manager of an adopter firm pointed out:

*"E-commerce frees managers and employee time to perform other tasks and makes the company more productive as a whole."*

### STRATEGIC DECISION AIDS

As in the case of managerial productivity, decision aids was found to be a good discriminator between adopters and non-adopters at the factor level. At the item level, however, only one item out of four was significant. It seems that adopters perceive that e-commerce helps "making decisions for managers" while non-adopters do not share this perception. As in the case of the organizational support factor, the item analysis gave us more information about the managers'

beliefs. For example, it appears that adopters and non-adopters believe that e-commerce helps support strategic decisions of managers as well as developing and/or maintaining cooperative partnerships in the industry.

### ORGANIZATIONAL READINESS

Organizational readiness, as perceived by managers/owners of Chilean SMEs, emerged as the best discriminator between adopters and non-adopters of e-commerce at both the factor and the item level. SMEs technological and financial resources to engage in the adoption of information technology are typically limited. As both Iacovo et al. [1995] and Cragg and King [1993], “economic costs and lack of technical knowledge are two of the most important factors that hinder IT growth in small organizations” (p. 467). Other studies [e.g. Ryan and Prybutock, 2001; Chwelos et al. 2001; Kuan and Chau, 2001] support this finding as it applies to other information technologies. By using the theory of planned behavior, Riemenschneider and McKinney [2001-2002] found that cost is a significant element that differentiates adopters from non-adopters of web-based e-commerce. Results from the t-test analysis indicated that both items considered in this factor discriminated between adopters and non-adopters of e-commerce.

The results suggest that adopters possess the financial and technological resources to implement e-commerce in their firms. Non-adopters seem to lack these resources. The following are comments made by non-adopters about the lack of technological and financial resources in their firms:

- |                              |   |
|------------------------------|---|
| Car retailer                 | <i>“The major disadvantage of incorporating e-commerce in our organization is the high implementation cost. This includes equipment and systems costs as well as costs associated with changing the way of doing business that employees perceive. Some employees may have difficulties in adapting to these changes since to do businesses using the Internet will require doing things faster.”</i> |
| Health care                  | <i>“Incorporating e-commerce does not guarantee success and the technological effort, at least for us, is very high.”</i>   |
| Manufacturing<br>(furniture) | <i>“There are not sufficient financial resources to allocate to train employees in the use of e-commerce in my company.”</i>  |

### COMPATIBILITY

Compatibility of the firm with e-commerce is a strong discriminating factor between adopters and non-adopters of e-commerce in SMEs. This result corroborates the findings of prior compatibility research [Premkumar and Potter, 1995; Chin and Gopal, 1995; Beatty et al., 2001; Mirchandani and Motwani, 2001]. In a previous study by the authors [Grandon and Pearson, 2003], compatibility emerged as an independent factor that influences e-commerce adoption. In this current study, compatibility played an important role in discriminating between adopters and non-adopters of e-commerce. At the item level, compatibility between e-commerce and preferred work practices and e-commerce and existing technology infrastructure turned out to be very influential items. As in the case of Mirchandani and Motwani [2001], top management enthusiasm about adoption of e-commerce turned out to be an important item that differentiates between adopters and non-adopters. Those managers who already adopted e-commerce perceived it compatible with their preferred work practices and technology infrastructure, and felt enthusiastic toward e-commerce. Organizational culture and values were items mentioned by both adopters and non-adopters as important factors when deciding to adopt e-commerce. As a result and as the t-test demonstrated, culture and values were not a discriminant between adopters and non-adopters. As one non-adopter from a healthcare firm put it:

*“One of the major impediments of incorporating e-commerce in our firm is the organizational culture. People are accustomed to using traditional methods that sometimes retard the incorporation of technology or changes in processes.”*

### **EXTERNAL PRESSURE**

External pressure to adopt e-commerce - measured by the direct or indirect forces exerted by competitors, social referents, other firms, the government, or industry - is a factor that discriminates between adopters and non-adopters according to the preliminary discriminant analysis. Our results corroborated studies [Iacovo et al. 1995; Kuan and Chau, 2001; Chang and Cheung, 2001; Ryan and Prybutock, 2001; Reimenschneider and McKinney, 2001-2002] that found external pressure to differentiate between adopters and non-adopters of other information technologies. For example, Grover and Goslar [1993] found that external pressure, labeled as environmental factor, explains differences between adopters and non-adopters of telecommunication technologies. We found that competition, social factors, and industry were important factors in the decision to adopt e-commerce.

### **PERCEIVED EASE OF USE**

Perceived ease of use turned out to be non-significant within both the discriminant analysis and the item t-tests. These results suggest that perceived ease of use does not explain any difference between the levels of the dependent variable (adopters/non-adopters). The item level analysis showed that none of the items discriminate between adopters and non-adopters of e-commerce. In other words, both adopters and non-adopters have similar perceptions about the ease of use of e-commerce.

### **PERCEIVED USEFULNESS**

Even though the loading was close to the cut-off level, perceived usefulness turned out to be a significant factor that differentiates between adopters and non-adopters of e-commerce. The low loading of this factor may be explained by the fact that only two items, out of six, were significant in explaining differences at the item level. The adopter group believes that the use of e-commerce “enhances manager’s effectiveness on the job” and “makes their job easier” while non-adopters do not share the same beliefs.

## **VI. CONCLUSIONS**

By using discriminant analysis at the factor level and t-tests at the item level, it was possible to identify factors and individual items that differentiate between adopters and non-adopters of e-commerce in SMEs in Chile. Organizational readiness, managerial productivity, external pressure, decision aids, compatibility, and perceived usefulness were factors found to discriminate, in that order, between adopters and non-adopters of e-commerce. Closer investigation of the significant items that make up the respective factors gave us a better understanding of the perceptions and beliefs of SME managers/owners in Chile.

### **LIMITATIONS**

It is important to point out that the sample for this study was limited to the Bío-Bío region of Chile. Even though the Bío-Bío region is the second largest region in the country, a nation-wide survey would be more representative of the entire population of SMEs in Chile. In addition, the relatively small sample size and the unbalanced number of observations between adopters and non-adopters of e-commerce are potential limitations in this study. However, since the objective of this research was to determine managers’ perceptions toward e-commerce adoption rather than to determine a discriminant function between adopters and non-adopters, these limitations become less of an issue.

## IMPLICATIONS FOR PRACTICE

Our results contain several significant implications for practice.

First, the difference between organizational readiness among the adopters and non-adopters of e-commerce allows us to speculate that implementation costs and the availability of the technological infrastructure continue to be an issue in SMEs in Chile. Managers/owners that intend to adopt e-commerce need to make certain they obtain the needed resources prior to the implementation of e-commerce.

Second, changing managers' behaviors ultimately depends on changing their beliefs. Even though perceived usefulness was a significant discriminator between adopters and non-adopters, its loading was the lowest among the factors (.363) tested and very close to the cut-off value of .3. This result suggests that, to promote e-commerce adoption in Chilean SMEs, it is important for managers/owners to develop a better understanding of the benefits that can be achieved through the adoption of e-commerce. As Iacovo et al. [1995] pointed out, diffusion of IT "is delayed because the managers of small organizations fail to perceive the benefits that the technology has to offer to their business operations" (p. 480). Thus, if governmental agencies want to encourage / support e-commerce adoption, these agencies must communicate the benefits and usefulness of e-commerce to managers/owners of SMEs.

Third, based on the factors that were found in this paper to differentiate between adopters and non-adopters of e-commerce in Chile, managers/owners should better understand the specific factors that may influence e-commerce adoption. By suggesting specific actions, this paper conveys the idea that changing managers/owners behaviors ultimately depends on changing their beliefs.

Fourth, since Chile shares many issues that are characteristic of countries in the region, the results of this study can help other developing countries in Latin America to increase their understanding of the factors that differentiate adopters from non-adopters of e-commerce in SMEs.

Finally, with the Free Trade Agreement between Chile and the USA [Chile-U.S. Free Trade Agreement, 2003], an increased trade of products and services between both countries should develop in the years to come. This increased commerce can benefit from the incorporation of e-commerce.

## IMPLICATIONS FOR RESEARCH

First, from the results generated from this discriminant and t-test analyses, it is important to identify other variables that might increase the power of the discriminant function. The predictive power of the overall model indicates that 18.8 percent of the variance in the independent variables is by the discriminant function. Thus, further studies are necessary to ascertain other factors that influence managers/owners of SMEs in their decisions regarding e-commerce adoption. From the open-ended questions answered by SMEs managers, we noticed that factors such as trust and friendliness would impede the implementation of e-commerce. For example,

*"Lack of trust in electronic systems especially when dealing with credit cards is a big impediment of using e-commerce."* A non-adopter from a wholesale-retailer company

In the same context,

*"There have been many cases of hackers stealing credit card information for their own benefits."* Non-adopter

*"By using ecommerce we don't directly know our clients (direct contact), which is seen as impersonal service and sales management."* Non-adopter



"By using e-commerce, the sale process is seen as more impersonal since when we sell all our products we often try to develop a friendly relationship with our clients. We look to friendship ties with our customers to promote our products since we sell expensive products (trucks and buses)." Non-adopter in a transportation firm

"The following are some variables that impede the investment of time in a study and the implementation of e-commerce in my company: the operational 'urgencies', competition, the 'day-to-day', the lack of knowledge about successful experiences in e-commerce adoption." Non-adopter in an insurance company

Thus, future research should incorporate these factors as potential discriminators between adopters and non-adopters of e-commerce.

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## REFERENCES

Editor's Note: The following reference list contains hyperlinks to World Wide Web pages. Readers who have the ability to access the Web directly from their word processor or are reading the paper on the Web, can gain direct access to these linked references. Readers are warned, however, that

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- Adams, D. A., R. R. Nelson, and P. A. Todd (June/1992) "Perceived usefulness, ease of use, and usage of information technology: a replication", *MIS Quarterly*, pp. 227-247
- Ajzen, I. (1991) "The theory of planned behavior", *Organizational Behavior and Human Decision Processes*, (50), pp. 179-211
- Arriagada A. (2001) "The war that delayed the development of the Internet in Chile", *Puntonet*, pp. 14-15
- Beatty, R. C., J. P. Shim, and M. C. Jones (2001) "Factors influencing corporate web site adoption: a time-based assessment", *Information & Management*, (38), pp. 337-354
- Ceballos (2001) "E. Economy report: Digital economy in Chile" <http://www.seminar.com.tw/Economy%20Reports/d5.htm> (Accessed April 2002)
- Chang M. K. and W. Cheung (2001) "Determinants of the intention to use Internet/WWW at work: a confirmatory study", *Information & Management*, (39), pp. 1-14
- Chaudhury, A. and J. P. Kulboer (2002) *E-Business and E-commerce Infrastructure*, Boston, MA: McGraw-Hill
- Chilean Ministry of Economic Development (March-May 2002) "Access and use of information technology in Chilean firms", [http://www.paisdigital.org/docs/f70\\_.pdf](http://www.paisdigital.org/docs/f70_.pdf) (Accessed October 2003)
- Chile-U.S. Free Trade Agreement (2003). <http://www.chileusafra.com> (Accessed April 2003)
- Chin, W. W. and A. Gopal (May/August 1995) "Adoption intention in GSS: relative importance of beliefs", *DATA BASE*, (26) 2-3, pp. 42-64
- Chwelos, P., I. Benbasat, and A. Dexter (2001) "Research report: empirical test of an EDI adoption model", *Information Systems Research*, (12)3, pp. 304-321
- Cragg, P. and M. King (March 1993) "Small-firm computing: motivators and inhibitors", *MIS Quarterly*, (17)1, pp. 47-60
- Cubillos, C. (2001) "The Internet of tomorrow", *Puntonet*, pp. 22-25

- Cyber Atlas (November 2001) "Small businesses use net for customers service communications", [http://cyberatlas.internet.com/markets/smallbiz/article/0,10098\\_921821,00.html](http://cyberatlas.internet.com/markets/smallbiz/article/0,10098_921821,00.html) (Accessed May 2002)
- Davis, F. D. (September 1989) "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, pp. 319-340
- Davis, F. D., R. P. Bagozzi, and P. R. Warshaw (1992) "Extrinsic and intrinsic motivation to use computers in the workplace", *Journal of Applied Social Psychology*, (22), pp. 1111-1132
- Fowler, F. J. (1993) *Survey Research Methods*. 2<sup>nd</sup> Edition. Thousand Oaks, Sage.
- GEEP. (2001) "Guide of enterprises, executives, and products of the Bío-Bío region"
- Grandon, E. and J. M. Pearson (2003) "Perceived strategic value and adoption of electronic commerce: An empirical study of small and medium sized businesses", *Proceedings of the Hawaii International Conference on System Sciences (HICSS36)*, Hawaii, pp. 1-10.
- Grover, V. and M. D. Goslar (Summer 1993) "The initiation, adoption, and implementation of telecommunications technologies in US", *Journal of Management Information Systems*, (10)1, pp. 141-164
- Hair, J. F., Anderson, R. E., Tatham, R. L., and W.C. Black (1998) *Multivariate Data Analysis*. New Jersey: Prentice Hall, pp. 239-276
- Hendrickson, A. R., P. D. Massey, and T. P. Cronan (June 1993) "On the test-retest reliability of perceived usefulness and perceived ease of use scales", *MIS Quarterly*, pp. 227-230
- Hubona, G. S. and A. Burton-Jones (2003) "Modeling the user acceptance of e-mail", *Proceedings of the Hawaii International Conference on System Sciences (HICSS36)*, Hawaii, pp. 1-10
- Iacovou, A. L., I. Benbasat, and A. Dexter (December 1995) "Electronic data interchange and small organizations: adoption and impact of technology", *MIS Quarterly*, pp. 465-485
- Igbaria, M., Zinatelli, N., Cragg, P., and A. Cavaye (September 1997) "Personal computing acceptance factors in small firms: A structural equation model," *MIS Quarterly*, pp. 279-302
- Kuan, K. and P. Chau (2001) "A perception-based model of EDI adoption in small businesses using technology-organization-environment framework", *Information & Management*, (38), pp. 507-521.
- Marino, L. (1999) "The state of electronic commerce in Chile", Larrain Vial S.A. Chile Research.
- Mendoza, M. R. and J. A. Alvarez de Toledo (1999) "Demographics and behavior of the Chilean Internet population", *JCMC*, (3)1 <http://www.ascusc.org/jcmc/vol3/issue1/mendoza.html> (Accessed April 2003)
- Mirchandani, A. A. and J. Motwani (Spring 2001) "Understanding small business electronic commerce adoption: an empirical analysis", *Journal of Computer Information Systems*, pp. 70-73
- Moore, G. C. and I. Benbasat (1991) "Development of an instrument to measure the perceptions of adopting an information technology innovation", *Information Systems Research*, (2)3, pp. 192-222
- Napier, H. A., Judd, P. J., Rivers, O. N., and S.W. Wagner (2001) *Creating a Winning E-business*. Boston, MA: Course Technology, pp. 11-12
- National Institute of Statistics. (2002) "Primera encuesta semestral de las micro empresas y tercera de las pequeñas y medianas. Instituto Nacional de Estadísticas (INE)". <http://www.ine.cl> (Accessed February 2003)
- OPEN Small Business Network 2002 Monitor. [http://www.americanexpress.com/homepage/smallbusiness.shtml?mtpers\\_home=smbustab](http://www.americanexpress.com/homepage/smallbusiness.shtml?mtpers_home=smbustab) (Accessed December 2002)
- Pastore, M. (1999) "E-commerce gaining interest in Latin America" <http://www.internetnews.com/bus-news/article.php/225951> (Accessed November 2002)
- Premkumar, G. and M. Potter (1995) "Adoption of computer aided software engineering (CASE) technology: an innovation adoption perspective", *DATA BASE* (26)2-3, pp. 105-123
- Riemenschneider, C. K. and V. R. McKinney (Winter 2001-2002) "Assessing belief differences in small business adopters and non-adopters of web-based E-commerce", *Journal of Computer Information Systems*, pp. 101-107

- Riemenschneider, C. K., D. A. Harrison, and P. P. Mykytyn (2003) "Understanding it adoption decisions in small business: integrating current theories", *Information & Management*, (40), pp. 269-285
- Ryan, S. D. and V. R. Prybutock (Summer 2001) "Factors affecting the adoption of knowledge management technologies: a discriminative approach", *Journal of Computer Information Systems*, (41)4, pp. 31-37
- Saloner, G. and A. M. Spence (2002) *Creating and Capturing Value, Perspectives and Cases on Electronic Commerce*, New York: Wiley, pp. 30-39
- Santiago Chamber of Commerce (2003) "Comercio electrónico en Chile llegó a US\$ 2.500 millones en 2002", *Revista Comercio*, 8875 <http://www.ccs.cl/html> (Accessed February 2003)
- Schneider, G. P. and J. T. Perry (2000) *Electronic Commerce*. Cambridge, MA: Course Technology, pp. 388
- Second Annual Small Business Internet Survey. <http://www.business-survival.com/reports/Verizonsurvey.html>. (Accessed November 2002).
- Small Business Administration (2003). The state of small businesses, a report of the president 1999-2000. Together with the Office of Advocacy's Annual Report on Small Business and Competition. [http://www.sba.gov/advo/stats/stateofsb99\\_00.pdf](http://www.sba.gov/advo/stats/stateofsb99_00.pdf) (Accessed February 2003)
- Stevens, J. P. (2002) *Applied Multivariate Statistics for the Social Sciences*. New Jersey: Lawrence Erlbaum Associates Publishers, pp. 286-297
- Subramanian, G. H. (1998) "A replication of perceived usefulness and perceived ease of use measurement", *Decision Science*, (25)5-6, pp. 863-874
- Subramanian, G. H. and J. T. Nosek (Spring 2001) "An empirical study of the measurement and instrument validation of perceived strategy value of information systems" *Journal of Computer Information Systems*, pp. 64-69
- Szajna, B. (September 1994) "Software evaluation and choice: predictive validation of the technology acceptance instrument", *MIS Quarterly*, pp. 319-324
- The Gallup Organization (2002). <http://www.gallup.com> (Accessed August 2002).
- The World Competitiveness Yearbook. Chile in the IMD World Competitiveness Yearbook 2002. International Institute for Management Development. (2002). [http://www.chileusafta.com/save\\_images/res\\_pdf3cf3db2a75742056\\_30068.pdf](http://www.chileusafta.com/save_images/res_pdf3cf3db2a75742056_30068.pdf). (Accessed March, 2003)
- World Economic Forum. Chile in the Global Competitiveness Report 2001. [http://www.chileinfo.com/fta/save\\_images/res\\_pdf3cf3db2a75742056\\_30068.pdf](http://www.chileinfo.com/fta/save_images/res_pdf3cf3db2a75742056_30068.pdf). (Accessed March 2003)

**APPENDIX I. QUESTIONNAIRE**Instrucciones

Esta encuesta es parte de nuestro estudio acerca de la percepción del valor estratégico y adopción de comercio electrónico en empresas de la Región del Bío-Bío, Chile. Comercio electrónico se refiere al uso de redes, especialmente la Internet y la WWW para promover y vender productos y/o servicios.

*Sección 1: Información acerca de usted*

|  |  |  |  |
|--|--|--|--|
| Sexo   | <input type="checkbox"/> Masculino                 | <input type="checkbox"/> Femenino            |  |
| Edad   | ___  |  |  |
| Educación                                      | <input type="checkbox"/> Enseñanza Media           | <input type="checkbox"/> Técnico-Profesional | <input type="checkbox"/> Universitario           |
|  | <input type="checkbox"/> Master/MBA                | <input type="checkbox"/> Doctorado           | <input type="checkbox"/> Otro _____              |
| Posición en la empresa                         | <input type="checkbox"/> Técnico                   | <input type="checkbox"/> Administrativo      | <input type="checkbox"/> Supervisor              |
|  | <input type="checkbox"/> Ejecutivo                 | <input type="checkbox"/> Gerente             | <input type="checkbox"/> Otro _____              |
| Área funcional a la que pertenece              | <input type="checkbox"/> Contabilidad/<br>Finanzas | <input type="checkbox"/> Recursos Humanos    | <input type="checkbox"/> Sistemas de Información |
|  | <input type="checkbox"/> Marketing                 | <input type="checkbox"/> Producción          | <input type="checkbox"/> Compras                 |
|  | <input type="checkbox"/> Ventas                    | <input type="checkbox"/> Otro _____          |  |
| Años trabajando en su actual puesto de trabajo | ___  |  |  |
| Años trabajando en la firma                    | ___  |  |  |

*Sección 2: Información acerca de la firma*

|  |   |  |  |
|--|---|--|--|
| Número total de empleados  | ___                                       |  |  |
| Número total de empleados en el departamento de informática                    | ___                                       |  |  |
| Porcentaje del presupuesto de la firma asignado al departamento de informática | ___                                       |  |  |
| Industria en la cual su firma opera  | <input type="checkbox"/> Manufactura      | <input type="checkbox"/> Forestal            | <input type="checkbox"/> Pesca               |
|  | <input type="checkbox"/> Finanzas         | <input type="checkbox"/> Ventas al por Mayor | <input type="checkbox"/> Ventas al por Menor |
|  | <input type="checkbox"/> Área de la Salud | <input type="checkbox"/> Construcción        | <input type="checkbox"/> Transporte          |
|  | <input type="checkbox"/> Gobierno         | <input type="checkbox"/> Otro _____          |  |



**Sección 5:** Las siguientes preguntas son acerca de la adopción de comercio electrónico. Por favor, indique que tan de acuerdo usted está usando la misma escala anterior.

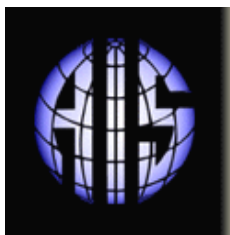
|    |   | Desacuerdo |   |   |   |   |   | Acuerdo |
|----|---|------------|---|---|---|---|---|---------|
| 1  | Nuestra organización tiene los recursos financieros para adoptar comercio electrónico                               | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 2  | Nuestra organización tiene los recursos tecnológicos para adoptar comercio electrónico                              | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 3  | Nuestra organización percibe que el comercio electrónico es consistente con nuestra cultura                         | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 4  | Nuestra organización percibe que el comercio electrónico es consistente con nuestra valores                         | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 5  | Nuestra organización percibe que el comercio electrónico es consistente con nuestra prácticas de trabajo preferidas | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 6  | Comercio electrónico debería ser consistente con nuestra infraestructura tecnológica                                | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 7  | El gerente general esta entusiasmado con la idea de adoptar comercio electrónico en nuestra empresa                 | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 8  | Competitividad es un factor importante en nuestra decisión de adoptar comercio electrónico                          | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 9  | Factores sociales son importantes en nuestra decisión de adoptar comercio electrónico                               | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 10 | Nosotros dependemos de otras firmas que ya están usando comercio electrónico  | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 11 | Nuestra industria nos está presionando para adoptar comercio electrónico  | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 12 | Nuestra organización está presionada por el gobierno para adoptar comercio electrónico                              | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 13 | Aprender a operar comercio electrónico sería fácil para mi  | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 14 | Encontraría el comercio electrónico flexible para interactuar   | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 15 | Mi interacción con comercio electrónico debería ser clara y entendible  | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 16 | Sería fácil para mi adquirir la habilidad para usar comercio electrónico  | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 17 | Yo encontraría comercio electrónico fácil de usar   | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 18 | El uso de comercio electrónico ayudaría a mi empresa a cumplir tareas específicas mas rápidamente                   | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 19 | El uso de comercio electrónico me ayudaría a mejorar mi rendimiento en el trabajo                                   | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 20 | El uso de comercio electrónico en mi empresa me ayudaría a aumentar mi productividad                                | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 21 | El uso de comercio electrónico en mi empresa me ayudaría a aumentar la efectividad en mi trabajo                    | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 22 | El uso de comercio electrónico haría el trabajo mas fácil   | 1          | 2 | 3 | 4 | 5 | 6 | 7       |
| 23 | Comercio electrónico sería útil en mi trabajo   | 1          | 2 | 3 | 4 | 5 | 6 | 7       |

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