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Comparison of E-Commerce Practices between Large Enterprises and Small to Medium Enterprises

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ABSTRACT

E-commerce becomes an important element of the business strategy for both small and medium enterprises (SMEs) and large enterprises as online business and cyber market space continue to expand its size and volume. E-commerce has a particularly important implication for SMEs because it can help SMEs overcome many handicaps of the SMEs, such as the economies of scale, and compete against the large enterprises on the level ground. The two groups of business firms, large enterprises and SMEs, are often different in not only their sizes but also their business practices. This may also extend to how they use e-commerce in their business. This paper is to study whether there are differences in using e-commerce between large enterprises and SMEs, and what are the differences and why the differences are made. We compare the two groups of business firms in two aspects, format of implementation and their performance. Data used for the study is collected from a group of Korean firms.

Keywords: Electronic commerce, Business strategy, Small firms

1. INTRODUCTION

Electronic commerce (EC) has caused many changes in the economic structure, and now begins to develop a new paradigm for business process (Kalakota and Whinston, 1996). Business firms are taking part in online business activities because they cannot survive without participating in e-commerce. Thus, e-commerce is now an essential part of business strategy for survival and growth (Kettinger and Hackbarth, 1997; Levy et al., 1999; Poon, 2000) for both large enterprises and small to medium enterprises (SMEs).

The research on e-commerce so far has some limitations. First, it lacks empirical study conducted with field data collected from business firms. Most of the past studies also focused on the issues of adoption and diffusion of e-commerce (Cragg and King, 1993; Fink, 1998; Mehrtens et al., 2001). E-commerce nowadays, however, is considered a must rather than a matter of choice. Thus, we need to discuss the issue of how to use e-commerce more effectively. Second, past studies tend to overlook the effect of the size of the firm on the implementation and the performance of e-commerce. There are clear differences in the way of conducting business such as marketing and operations between large enterprises and SMEs (Thong et al., 1996), and these differences would be reflected in the way of utilizing e-commerce and need to be studied.

The differences between large enterprises and SMEs can be summarized as follows: First is the issue of the firm size. Usually, large enterprises take advantage of the economies of scale by producing a few items in large quantities while SMEs tend to rely on the differentiation ability by producing a variety of items in small quantities. E-commerce is known to neutralize the effect of the firm size on the competition, and thought to help SMEs overcome the disadvantage of the size in the market. Especially the market presence, that is, the power of reaching a large number of customers, may be accomplished very easily even by a very small firm by using e-commerce. One of the examples may be a home-shopping company which advertises and sells its products on cable TVs. We would like to find out whether the firm size is really overcome by e-commerce and has no impact on the business results in the world of e-commerce and internet age.

Second, SMEs are small in size with a relatively small sunk cost, and thought to be able to adapt to the change of the market situation quickly compared to large enterprises (Poon and Swatman, 1998). This agility gives SMEs an advantage to be able to innovate fast in the fast changing business environment of today's world. Therefore, e-commerce is again considered to help SMEs more than large enterprises.

Third, large enterprises have advantages in human resource and capital, and therefore can implement

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e-commerce in a more comprehensive manner. Also, the level of specialty is considered higher than SMEs that tend to hire generalists and use e-commerce for more general purposes.

As discussed above, large enterprises and SMEs are known to have differences in many aspects, but there has not been enough empirical study with field data to find out whether these differences extend to the e-commerce practices. This paper is to study whether there are differences in using e-commerce between large enterprises and SMEs, and what are the differences and why the differences are made. We compare the two groups of business firms by using the data collected from a group of Korean firms.

2. RESEARCH METHODOLOGY

2.1 Research Model and Hypotheses

The research model in Figure 1 shows the overall conceptual relationships of the variables affecting the implementation of e-commerce and its performance. While many of the previous studies only focused on the adoption issues (Cragg and King, 1993; Fink, 1998), our model is more comprehensive in that all the factors that affect adoption, implementation, and performance of e-commerce are included in the research model. Table 1 contains the explanations of the variables.

Figure 1. Research model for E-Commerce.

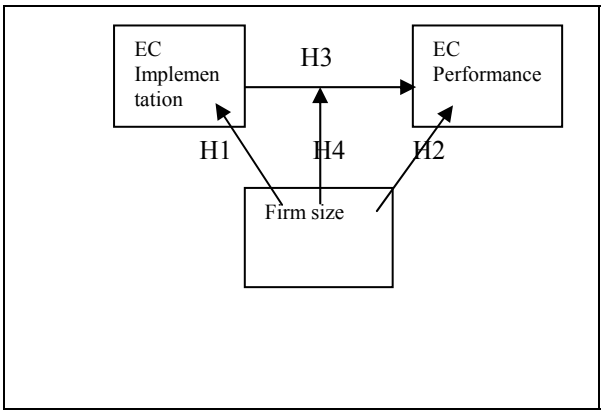

Table 1. Explanation of the variables.

Variables	Contents
Environmental variables	Firm size
Implementation variables	EC characteristics EC format EC strategy EC type
Performance variables	Utilization Satisfaction Usefulness

H1: Hypotheses on firm size and E-commerce implementation:
Firm size is an indicator of a firm's resource and capability. Management decision by a firm is often constrained by its resource and capability. Thus, firm size will affect a firm's decision on EC implementation in such areas as the characteristics, format, strategy and type of E-commerce. Four hypotheses are tested and the details are listed in Table 2.

H2: Hypotheses on firm size and E-commerce performance:
The E-commerce will produce different results for the firms depending on the firm's size when other conditions are equal because of the economies of scale. Regardless of firm's size, E-commerce requires a certain amount of investment, and it is thought that the return on investment will be greater for the large firms than for the small firms. The details of the hypotheses are listed in Table 2.

H3: Hypotheses on E-commerce implementation and E-commerce performance:
The impact of the EC implementation on the firm's performance is measured. A firm's business performance will reflect the results of E-commerce which the firm implements. While it is generally accepted that E-commerce affects the performance and provides many opportunities for business firms, we need to know the direction and magnitude of impact by E-commerce on the performance. Implementation decision includes determining the characteristics, format, strategy and type of E-commerce for the firm, and the firm's performance is measured by utilization, satisfaction and usefulness of the E-commerce assessed by the firm's management. The details of the hypotheses are listed in Table 2.

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H4: Hypotheses on the moderating effect of firm size:
A firm's performance is generally improved by the implementation of E-commerce. The magnitude of improvement, however, would be different by the firm size due to the difference in the cost structure, staff capability, knowledge level, and the area of usage of E-commerce. Thus, it is thought that the firm size will have a moderating effect on the relations between E-commerce implementation and performance. The details of the hypotheses are listed in Table 2.

Table 2. Hypotheses.

Variables	Hypothesis	Content
Firm size and EC implementation	H1-1	Firm size affects the characteristics of EC that a firm implements.
	H1-2	Firm size affects the format of EC that a firm implements.
	H1-3	Firm size affects the strategy of EC that a firm implements.

	H1-4	Firm size affects the type of EC that a firm implements.
Firm size and EC Performance	H2-1	Firm size affects EC utilization.
	H2-2	Firm size affects EC satisfaction.
	H2-3	Firm size affects EC usefulness.
EC implementation and EC performance	H3-1	EC characteristics has an impact on EC performance.
	H3-2	EC format has an impact on EC performance.
	H3-3	EC strategy has an impact on EC performance.
	H3-4	EC type has an impact on EC performance.
Moderating effect of Firm size	H4-1	The impact of EC characteristics on EC performance is affected by firm size.
	H4-2	The impact of EC format on EC performance is affected by firm size.
	H4-3	The impact of EC strategy on EC performance is affected by firm size.
	H4-4	The impact of EC type on EC performance is affected by firm size.

2.2 Data Collection and Analysis

We have circulated survey questionnaires to collect data from business firms in Korea. A total of 124 firms returned the questionnaires, and 99 of these were used for analysis after excluding those with missing data. The profile of the respondents are as follows (Table 3). Statistical tests such as cross tabulation, factor analysis, analysis of variance, and t-test are used to analyze the data and to find out the answers for the hypotheses presented in the above.

Table 3. Profile of respondent firms.

Type of industry	**Number of firms**	**Proportion**
Manufacturing	40	40.4%
Sales/Distribution	20	20.2%
IT/Technology	23	23.2%
Service	16	16.2%
Total	99	100%

3. ANALYSES AND RESULTS

The reliabilities are tested for the measured variables, and the results in Table 4 (cronbach $\alpha > 0.9$) show that all of them are well above the acceptance level. Also, factor analysis is conducted to confirm the validity of the performance variables. The 18 items in the questionnaire used to measure E-commerce performance were factor analyzed using principal component analysis with varimax rotation. We used eigenvalue of one and the factor loading of 0.5 as the selection criteria. This yielded three factors with 3 items for each factor, as shown in Table 5. The three factors are named as usefulness, satisfaction, and utilization.

Tables 6 through 9 show the results of the tests to find out the relationship among the variables and to determine the acceptance of the hypotheses presented in the above.

Table 4. Reliability test.

Variables	Number of items	Cronbach α
IS maturity	9	0.9096
EC utilization	6	0.9324
EC satisfaction	6	0.9236
EC usefulness	6	0.9550

Table 5. Results of the factor analysis for the performance variables.

Question items	Factors		
	Factor 1 utilization	Factor 2 satisfaction	Factor 3 usefulness
Hours used	**.874**	.208	.244
How often	**.805**	.220	.355
How much	**.738**	.263	.383
Satisfaction	.119	**.794**	.321
Work support	.212	**.848**	.285
Ease of use	.334	**.845**	.146
Advantage	.362	.334	**.807**
Business results	.333	.246	**.861**
Improving	.345	.302	**.811**

3.1 Firm size and E-commerce Implementation

The hypotheses about the effect of the firm size on the firm's decision on E-commerce implementation are tested by cross-tabulation analysis. The results are presented in Table 6. Four dimensions of the firm's implementation decisions are analyzed: the characteristics, format, strategy, and type of E-commerce.

Firm size does not affect any of the E-commerce implementation decisions. For characteristics, all firms tend to use E-commerce for value system, that is, to enhance transaction values. Also, firm size does not affect the format of E-commerce significantly. Firms, however, appear to have different formats for their E-commerce, that is, large firms have more structured E-commerce format, and small firms have less structured format. In terms of strategy, firms do not adopt different strategy by its size. Lastly, firm size does not affect the firm's decision on E-commerce type selection. Both large and small firms adopt Business-to-Consumer (B2C) more often.

Table 6. Impact of firm size on EC implementation.
(Insert Table 6 here, available upon request)

3.2 Firm size and E-commerce Performance

We tested the relations between firm size and the firm's E-commerce performance measured in utilization, satisfaction and usefulness. The t-test results in Table 7 show that firm size does not significantly affect any of the performance measures. Thus, firms or its staff and employees do not feel the difference in E-commerce performance based on the firm size. In other words, the staff of small firms at least feel the same degree of satisfaction and usefulness about E-commerce, and utilize it as much as those of large firms.

Table 7. Impact of firm size on EC performance (t-test).

Performance variable	Firm size	Means	results
EC Utilization	Small	13.4769	t = 0.416
	Large	13.0606	p = 0.678
EC Satisfaction	Small	12.7273	t = -1.542
	Large	13.6061	p = 0.126
EC Usefulness	Small	12.2769	t = -1.014
	Large	13.0909	p = 0.313

3.3 E-commerce implementation and performance

We tested the relations between the four E-commerce implementation variables discussed above (characteristics, format, strategy, and type) and the EC performance experienced by the firm measured in utilization, satisfaction and usefulness. The results of t-tests and analysis of variance (ANOVA) are presented in Table 8.

Some of the implementation variables have significant impact on the firm's E-commerce performance. Two implementation variables of E-commerce characteristics and format, significantly affect all three performance measures at the significance level of α=0.05. E-commerce type has significant impact only on the utilization out of three performance measures. E-commerce strategy does not affect the performance at all. That is, firms do not show any difference in performance based on the strategy they adopted for E-commerce.

Table 8. Impact of EC implementation on EC performance
(Insert Table 8 here, available upon request)

3.4 Moderating effect of firm size

We conducted ANOVA tests to see whether there is a moderating effect of firm size on the relations between E-commerce implementation and performance. The results are presented in Table 9. To sum up, the moderating effect of firm size was found to be significant for only a few cases.

For small firms, firm size has influenced only the satisfaction measure of the performance when E-commerce format and strategy are concerned. For large firms, firm size has more influence on the relations between the E-commerce implementation and performance. Firms show large difference in E-commerce performance depending on what they decide on the implementation issues of characteristics, format, strategy, and type. These factors in fact define the shape of the E-commerce system of a firm, and the results imply that the impact of the E-commerce system design is relatively more important for large firms than for small firms.

Table 9. Moderating effect of firm size on the relations between EC implementation and EC performance (ANOVA).
(Insert Table 9 here, available upon request)

4. CONCLUSION

We have found that the impact of firm size is not significant for most cases of E-commerce implementation decisions and performance. Firm size has moderating effect on the certain cases of E-commerce implementation and performance. E-commerce are said to help small-and-medium enterprises (SMEs) compete against large firms on a more level ground by moving the competition from the physical market place to cyber market space, and thus reducing the marketing and distribution cost. From the results, it seems that small firms, at least, use E-commerce as extensively as large firms, and enjoy the same degree of satisfaction and usefulness. Thus, we can say that E-commerce helps small firms enhance their operations up to the level of large firms, if not to overcome the firm size disadvantage completely.

This study has been conducted with a relatively small sample size, especially, of large firms. We need to continue to collect data from more firms, and then the study will produce more reliable and meaningful results.

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