

<http://ansinet.com/itj>

ITJ

ISSN 1812-5638

INFORMATION TECHNOLOGY JOURNAL

ANSI*net*

Asian Network for Scientific Information
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

Strategic Aims and Effectiveness of Traditional Companies Implementing E-Commerce: A Comparative Study

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Abstract: The aim of this study is to explore the factors affecting e-commerce in different sectors, compare the sectors and measure the relations of these factors with the effectiveness in company objectives regarding e-commerce. In the scope of the research, 75 firms from tourism, finance and textile sectors were selected as the sample and a survey has been conducted to define major differences between these sectors. Hypotheses have been defined and tested for 44 surveys received using t-tests and regression analysis in order to explore the factors influencing effectiveness of e-commerce in organizations. It was found that effectiveness is influenced positively by number of supplier activities performed online and top management support. Number of parties using e-commerce has a negative impact on effectiveness.

Key words: Strategic use of e-business, effectiveness of e-commerce, e-commerce, e-business, B2B, B2C, company objectives

INTRODUCTION

Online activities have been facilitating the living styles and working habits of many people and firms more and more every passing year and as the competition between the organizations increases, organizations become more and more willing to catch up with the new technology in order not to be left behind the competition.

The aim of this study is to explore the differences between usage, importance and effectiveness values of different sectors regarding e-commerce. Three sectors; finance, tourism and textile are selected as the sample sectors and several analysis have been conducted in order to get an overview about the subject and make comparisons between the sectors.

Internet is affecting everybody's life and living styles in the recent few years significantly, in a way that makes it possible for the companies to employ e-commerce to direct their business activities and to carry out electronic transactions (Chang *et al.*, 2006). Organizations are changing from a physical, supply-driven and disconnected structure to an intellectual, demand driven and interconnected type (Chang and Li, 2003). Many organizations conduct a detailed research before implementing such technology, whereas, others make investments based on the experience from the competition (Walden and Browne, 2006).

THEORETICAL BACKGROUND

Organizations prefer to use various strategies to increase their effectiveness. Some of these strategies are related to using information technology resources to increase their competitiveness. Resources support organizational success based on the management theory called as resource-based view of the firm (Zhuang and Lederer, 2006). Transforming a traditional company to a digital one necessitates new investments in different processes within the firm. Digital improvements in management of relations with suppliers, customers and other parties depend on financial resources of the organization.

In a widely used term, e-commerce can be defined as, the process of buying, selling, transferring or exchanging products, services and/or information via computer networks, including the internet and technologies such as Electronic Data Interchange (EDI), Electronic Funds Transfer (EFT), electronic mail (e-mail), internet activities such as web pages can be observed under the scope of e-commerce (Turban *et al.*, 2004; Mustaffa and Beaumont, 2004).

Organizations can be classified into three basic types based on their usage of e-commerce such as brick-and-mortar organizations, click-and-mortar organizations and virtual (pure-play) organizations (Turban *et al.*, 2004; Bendoly *et al.*, 2006).

B2B e-commerce is defined as performing business operations between an organization and its partners through the use of internet and online technologies (Teo and Ranganathan, 2004). Information technology has a significant and major role for facilitating the interaction between the customer organization and its suppliers, as electronic connection between the supply chain members, provided by e-commerce leads to an improved relationship among business partners (McIvor *et al.*, 2003).

The improvements in B2B e-commerce brings new advantages for the organizations in the management of supply chain networks and e-enable procurement, distribution, communications, sales and marketing and financial systems among business partners (Harrison and Waite, 2006). Among the effects of B2B e-commerce, the major benefit is the establishment of a new and more cost-effective supply chain network, which creates about 90% of all e-commerce by value and size (Nagurney *et al.*, 2005). Hence, most organizations consider B2B e-commerce as a necessity to improve their performance as well as profitability (Kaefer and Bendoly, 2004). B2B e-commerce enables companies to take their activities in a larger area (Wrigley and Currah, 2006) and provides supplier involvement in their new product development activities (McIvor *et al.*, 2003), which leads to an increase in productivity (Zank and Vokurka, 2003).

B2C e-commerce, also referred as e-tailing, can be defined as the online retail transactions between a company and individual shoppers (Turban *et al.*, 2004). According to Chun and Kim (2005) consumers preferring online transactions rather than the traditional methods increase, as the internet provides more information with less transaction costs. Factors that motivate the customers regarding online shopping can be listed as, broader selections, competitive pricing and greater access to information (Chen and Macredie, 2005).

The main factors that influencing B2C e-commerce in order to diminish transaction costs can be defined as, product digitizability, product complexity and sensitivity, product tangibility or industry structure characteristics such a market thinness or customer dispersion (Strebinger and Treiblmaier, 2006).

Web site is one of the most important factors in B2C e-commerce and in this context, usability and design attitudes such as download delay, navigation, content, interactivity, responsiveness (Zviran *et al.*, 2006), information quality, service quality, system use, playfulness and system design quality (Liao *et al.*, 2006; Rajagopalan and Deshmukh, 2005) can be considered as the crucial factors affecting user satisfaction.

B2B2C e-commerce can be explained as a combination of both the B2B and B2C e-commerce. This type of relationship can be observed when the customer is not able to give or does not prefer to order directly through the internet. Organization's distributors provide information about the products, give relevant advices and consultation as well as take orders (Chang and Li, 2003).

C2B e-commerce occurs between individuals who are selling goods and organizations searching for the best offer for the products they are in need of (Turban *et al.*, 2004). C2B e-commerce requires analyzing the buyers' necessities and associating them with the best suitable offer by the vendors. The aim of C2B in general, is to be able to get a special offer for a specific product by increasing the demand through collaborating the buyers who need the product. Internet has a major role for this coalition, as it is easier to form groups online (Chen *et al.*, 2006).

Consumer-to-Consumer (C2C) e-commerce can be defined as the system of e-commerce that serves as a facilitator in a transaction between individuals or small enterprises (Gonzalez, 2003). By means of C2C e-commerce, customers from different countries can interact with each other, so that the markets of developing countries are accessible worldwide, leading to a positively affected political, economic and social structure of the countries (Li and Lin, 2005).

Mobile Commerce can be described as any transaction with monetary value, either direct or indirect, that is conducted over a wireless telecommunication network (Ngai and Gunasekaran, 2007). Mobile commerce has several advantages such as mobility, net-access convenience, ubiquity, personalization, flexibility and dissemination (Wu and Wang, 2006).

E-commerce activities performed by non-business organizations such as academic institutions, non-profit organizations can be classified as non-business e-commerce activities (Turban *et al.*, 2004). Such activities are more concerned with developing existing transactions to increase efficiency then other previously explained workflows (Roy, 2005).

Main benefits of e-commerce to the organizations can be summarized as; global extension (Motiwalla, *et al.*, 2005; Sung, 2006; Apigian *et al.*, 2005), cost saving (Dinlersoz and Pereira, 2006; Quaddus and Achjari, 2005; Zhuang and Lederer, 2006), supply chain improvement (Soliman and Janz, 2004; Apigian *et al.*, 2005; Shin, 2005), customization (Chang and Li, 2003; Apigian *et al.*, 2005; Coltman *et al.*, 2001), market orientation and expansion (Motiwalla *et al.*, 2005; Dinlersoz and Pereira, 2006; Chang and Li, 2003), rapid time-to-market (Macgregor and Vrazalic, 2006; Zhuang and Lederer, 2006; Rabinovich and

Bailey, 2004), lower communication costs (Jih *et al.*, 2005; Apigian *et al.*, 2005), cheaper products and supplies (Lee and Kim, 2003; Apigian *et al.*, 2005), better customer relationship (Bremser and Chung, 2005; Jih *et al.*, 2005; Porra, 2000).

Obstacles of e-commerce are, lack of standards for quality, security and reliability (Meinert *et al.*, 2006; Wu and Chang, 2006; Wakefield and Whitten, 2006; Park and Kim, 2006; Roy, 2005), difficulties in the integration of legacy systems and e-commerce software (Strebinger and Treiblmaier, 2006; Lee and Kim, 2006; Shan and Hua, 2006; Kearns, 2005; Taylor *et al.*, 2004), inconvenience of internet accessibility (Kamel, 2006), customer's preference of touch and feel products (Efendioglu and Yip, 2004), cultural differences (Kamel, 2006; Tarafdar and Vaidya, 2006; Efendioglu and Yip, 2004), lack of top management commitment (Lee and Kim, 2006; Teo and Ranganathan, 2004).

MATERIALS AND METHODS

During the literature review period, a draft of the questionnaire has been prepared. Pilot questionnaire has been applied to a group of respondents and their opinions

about the questionnaire have been collected. After the revision of the survey, three sectors subject to comparison were selected among the companies performing some of their activities via internet. Finance, Tourism and Textile were chosen and the questionnaires were sent to the companies acting in these sectors.

Twenty five companies from each sector were selected randomly among the list of companies at similar sizes, applying similar online activities and the questionnaires were sent by e-mail to the representatives in each company. The sample size is conservative, as it is challenging to get a response from the companies. After 2 weeks, organizations without response were recalled by telephone and with periodical reminding, response rate was increased.

In the finance sector, 16 out of 25 companies responded without error. In textile sector, response rate was 15 out of 25. Finally, in tourism 13 out of 25 companies responded.

Hypothesis forming and analysis: Strategic aims of the organizations for implementing and using e-commerce activities were linked to the objectives of the organizations inside the questionnaire. Reliability analysis

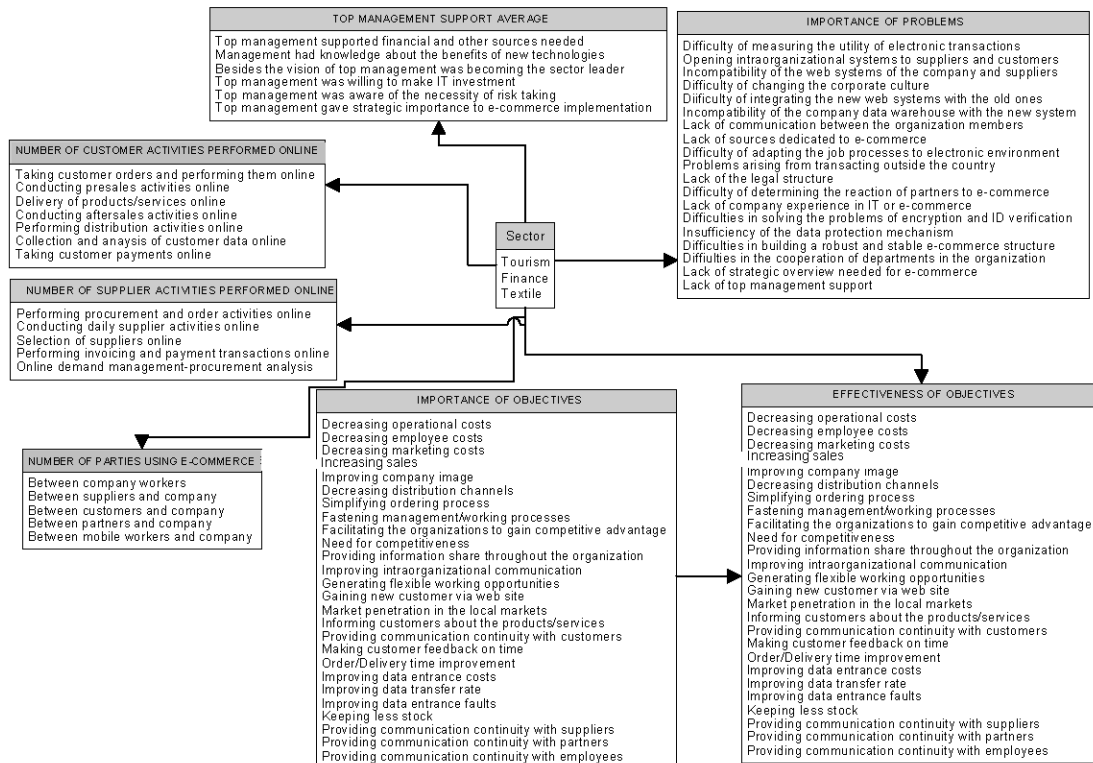


Fig. 1: The research model

was applied for the strategic aims that are connected to more than one objective. By calculating Cronbach's alpha, some of the objectives that are not consistent with the results of related strategic aims were removed. Further analyses were conducted using the remaining objectives. Since limit value for Cronbach's alpha is taken as 0.60; alpha values greater than 0.60 were included in the other tests.

In the first part of the analyses, number of online parties in each sector has been observed. In the second part, number and characteristics of online transactions are examined. In further observations, objectives of the companies for using e-commerce activities and the effectiveness rates of these objectives are analyzed. Each objective is evaluated in order to get an overview. In the next part of the survey, problems occurring during the adaptation of e-commerce activities and top management support are ranked by the respondents. Final hypotheses aim to analyze the effect of all sections to effectiveness rate. Independent variables are selected as; Number of parties using e-commerce, Number of customer activities performed online, Number of supplier activities performed online, Importance of objectives, Importance of problems and Top management support average.

Hypotheses of this study are summarized in the research model showed in Fig. 1.

RESULTS AND DISCUSSION

Online connected parties

Hypothesis 1: Parties involved in online transactions vary depending on the sector.

First hypothesis has been tested with ANOVA. Significance level is found as 0.563 and H_0 is accepted. There is no significant difference between the sectors in the parties involved in online transactions. After ANOVA is conducted, a similar test, Kruskal-Wallis has also been applied in order to test if the results are compatible. The results were compatible.

Online activities performed by the organizations

Hypothesis 2a: Type of online transactions for customers, performed in the organizations varies depending on the sector.

Hypothesis has been tested with ANOVA. Significance level is found as 0.708 and H_0 is accepted. There is no significant difference between the sectors in the online transactions for customers. Kruskal-Wallis has also been conducted to see whether the results are compatible. Results were similar.

Hypothesis 2b: Type of online transactions for suppliers, performed in the organizations varies depending on the sector.

Hypothesis has been tested with ANOVA. Significance level is found as 0.011 and H_0 is rejected. There is significant difference between the sectors in the online transactions for suppliers. After ANOVA is conducted, a similar test, Kruskal-Wallis has also been applied in order to test if the results are compatible. The results were compatible.

Objectives of online activities: Another important analysis is conducted for the company objectives for implementing e-commerce. Respondents ranked the importance of each objective on the list according to the view of their organization.

When the tourism sector is analyzed, 16 objectives out of 26 were marked as very important. Objectives with the highest means are, gaining new customers via web site, informing customers about the products/services and making customer feedback on time. Factors with least mean values are, decreasing employee costs, generating flexible working opportunities and improving data entrance faults.

In the finance sector, 16 objectives out of 26 objectives are selected as very important. The most important factors are observed as, facilitating the organizations to gain competitive advantage, decreasing operational costs and increasing sales. Objectives with the least mean values are, decreasing marketing costs, keeping less stock and providing communication continuity with suppliers.

As the Textile sector is observed, 23 objectives out of 26 are selected as very important. The highest mean values belong to the factors, increasing sales, improving intraorganizational communication and order/delivery time improvement. Objectives with the least mean values are, Gaining new customer via web site and Market penetration in the local markets.

Effectiveness of objectives: Objectives that are ranked according to their importance are also evaluated according to their effectiveness in the next part of the questionnaire. Effectiveness was measured with a five point scale for 20%, 40, 60, 80 and 100 effectiveness.

In the tourism sector, effectiveness means of 11 objectives are above 3.50 meaning 70% effectiveness out of 26 objectives. Objectives with the highest mean values are, decreasing operational costs and improving data entrance costs.

Means of the effectiveness rates in finance sector are higher than the other sectors, as means of 22 objectives are above 3.50 out of 26 objectives. Highest effectiveness rates belong to facilitating the organizations to gain competitive advantage, gaining new customer via web site and providing communication continuity with employees.

In the textile sector, effectiveness rates are lower than the other sectors. Only 7 objectives have mean values above 3.50. Objectives with the highest effectiveness rates are Simplifying ordering process, Improving intraorganizational communication, Providing communication continuity with customers and Providing communication continuity with employees.

Importance of problems occurring in online activities:

Problems that can arise during online transactions are listed and the importance levels assigned to those problems have been selected by the respondents from a five point scale.

In tourism sector, lack of top management support, difficulty of integrating the new web systems with the old ones and lack of strategic overview needed for e-commerce are selected as the most important problems.

Difficulties in solving the problems of encryption and ID verification and Insufficiency of the data protection mechanism are the most important problems in Finance sector.

In the textile sector, difficulty of changing the corporate culture, lack of communication between the organization members, lack of sources dedicated to e-commerce and lack of top management support are found to be the most important problems.

Top management support: Final part of the questionnaire was composed of evaluations regarding top management support. Respondents ranked their agreement levels on the attention level of top management.

When the mean values of three sectors are compared, highest mean values are observed in the finance sector. As most of the activities performed within the organization are conducted online, top management is highly supportive in this sector. Mean values observed in the textile sector is less than the others and management support of Tourism is in the medium extent.

Relationship between the importance and the effectiveness of objectives:

In order to examine the relationship between the importance and effectiveness of the company objectives for implementing e-commerce, paired samples t-test has been applied.

Hypothesis 3: There is no difference between the importance level and effectiveness level of the objective.

Paired samples t-test has been applied for all of the objectives and in most of the cases. There is a difference between the importance assigned to an objective and its effectiveness level. Effectiveness of the objectives does not change proportionally with the importance level of that objective.

Linear regression results: In order to clarify the relationship of the variables with the effectiveness rate, linear regression is applied. In the first step, mean value of effectiveness for each organization is calculated. Then, the distribution of the sample has been compared with normal distribution using Kolmogorov-Smirnov test, as the distribution of the dependent variable should be normal in order to apply regression. It is found that, the distribution of the effectiveness mean values is similar to the normal distribution. Thus, mean values are used in the regression analyses.

In the regression analysis, effectiveness has been taken as the dependent variable; whereas, number of parties using e-commerce, number of customer activities performed online, number of supplier activities performed online, importance of objectives, importance of problems and top management support average are taken as the independent variables.

After the analysis has been done, ANOVA table is controlled in order to test the meaningfulness of the model. R^2 of the model has been calculated as 0.540; which means that the independent variables explain the dependent variable with a ratio of 54%.

In order to test the multi-collinearity, Variance Inflation Factor (VIF) has been observed in the coefficients table. VIF values of the independent variables are less than 10, it can be accepted that, there is no significant multi-collinearity. Independent variables do not affect each other.

Third test has been applied for examining autocorrelation. Results of Durbin-Watson test has been observed in order to prove that, there is no correlation between the residuals. Value obtained at the result of the test is 2.889.

Thus, as the model passed three tests, it can be admitted as meaningful. Coefficient values obtained at the end of the analysis can be examined below.

Model that is formed at the end is as:

$$Y = 0.255 - 0.041 X_1 - 0.006 X_2 + 0.13 X_3 - 0.59 X_4 + 0.147 X_5 + 0.479 X_6$$

Where:

- Y = Effectiveness rate of the objectives
- X_1 = No. of parties using e-commerce

- X₂ = No. of customer activities performed online
- X₃ = No. of supplier activities performed online
- X₄ = Importance of objectives
- X₅ = Importance of problems
- X₆ = Top management support average

After the model is formed, variables that have significance values greater than 0.05 are removed, as their contribution to the model can be ignored. X₂, X₄ and X₅ are removed according to their significance levels.

Final model is summarized as:

$$Y = -0.041 X_1 + 0.313 X_3 + 0.479 X_6$$

The model can be explained as, if the online activities for suppliers increase 1 point, effectiveness of the objectives increases 0.313 points. If top management support increases 1 point, effectiveness of the objectives increases 0.479 points. As the number of parties connected online increases 1 point, effectiveness decreases 0.041 points.

CONCLUSION AND FUTURE RESEARCH

The aim of this research was to examine different sectors regarding their frequency of usage, preferences, importance assigned to activities, effectiveness rates, problems faced and top management support. Results obtained are compared in order to realize the differences between the sectors and to develop a model for describing the factors influencing effectiveness of e-commerce.

According to the analyses conducted in the study, there is no significant difference between the parties connected online between the tourism, finance and textile. There are no significant distinctions between the online activities for customers, but there exist differences between the online activities for suppliers.

As the effectiveness rates of the sectors are compared, number of objectives that have high mean values of effectiveness rates is more than the other two sectors in the finance sector. Similarly, when the importance of problems in the e-commerce and top management sections are analyzed, in the finance sector, more factors are analyzed as important and top management support rate seems more than the other sectors.

As the importance of each objective was compared with the effectiveness of the same objective, it is observed that there is no direct relation between the importance and effectiveness rate of the objectives.

Finally all factors are tested together with a regression analysis, in order to find out which factors affect effectiveness. Effectiveness is affected positively by Number of supplier activities performed online and Top management support average. Number of parties using e-commerce influences effectiveness negatively.

Findings of this study can form a basis for future research, as a model of effectiveness has been created by analyzing the relations between number of online parties, online activity performance, importance of e-commerce objectives, types of problems, top management support rate and effectiveness. Besides these, a comparison of sectors has been made according to these variables.

Main limitation of the study was the response rate of the organizations. As it is difficult to gather data from organizations in different sectors, number of sectors has been selected as three. If the number of sectors can be increased or the same research has been done with different sectors, the scope of the study can be enlarged and more specific results can be obtained in the future.

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