

## Association for Information Systems AIS Electronic Library (AISeL)

---

PACIS 2001 Proceedings

Pacific Asia Conference on Information Systems  
(PACIS)

---

December 2001

# B2B Performance Evaluation Model

Hyogun Kym  
*Ewha Womans University*

Han-Hee Lee  
*Ewha Womans University*

Hui-Jin Kim  
*Ewha Womans University*

Christopher Lee  
*Ewha Womans University*

Follow this and additional works at: <http://aisel.aisnet.org/pacis2001>

---

### Recommended Citation

Kym, Hyogun; Lee, Han-Hee; Kim, Hui-Jin; and Lee, Christopher, "B2B Performance Evaluation Model" (2001). *PACIS 2001 Proceedings*. 42.  
<http://aisel.aisnet.org/pacis2001/42>

This material is brought to you by the Pacific Asia Conference on Information Systems (PACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in PACIS 2001 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# **B2B Performance Evaluation Model**

Hyo-Guen Kym

College of Business Administration

Ewha Womans University

11-1 Daehyun-Dong, Sodaemun-Gu

Seoul, Korea 120-750

TEL: 82-2-3277-3763

E-mail: kym@ewha.ac.kr

Han-Hee Lee, Hui-Jin Kim and Gah-Jin In

College of Business Administration

Ewha Womans University

11-1 Daehyun-Dong, Sodaemun-Gu

Seoul, Korea 120-750

TEL: 82-2-3277-4411

E-mail: hanhee@hotmail.com (Han-Hee Lee)

huijin@dreamwiz.com (Hui-Jin Kim)

gjin@dreamwiz.com (Gah-Jin In)

## **B2B Performance Evaluation Model**

### **Abstract**

Many business firms are planning, or practicing B2B, however, analysis on the performance of companies achieved by B2B has not been made sufficiently, and there isn't any evaluation method to determine whether B2B has been planned and practiced in an appropriate way. Therefore, we proposed B2B performance Evaluation Model , which is able to make in-depth evaluation of the company's performance caused by B2B and the overall factors that causes the performance in the planning, implementation and practicing process.

Evaluation Model is developed by the analysis of the current situation through interviews as well as the conceptual framework based on theoretical studies. We proposed 4 type B2B performance evaluation models: buyer-oriented B2B, seller-oriented B2B, e-Marketplace for Participants, and e-Marketplace for Intermediary. And each of them consist of three part of evaluation index; B2B initiation, B2B planning & implementation, and B2B performance evaluation. Validity of each evaluation factors was verified by surveying the six experts using the Delphi method, and the weights of each factors were proposed.

Keywords : B2B, EC, Performance Evaluation, IOS, Information Systems  
Planning

## 1. Introduction

Recently, business-to-business electronic commerce (B2B) has been growing rapidly. In this circumstance, many business firms has been planning, or practicing B2B. However, analysis on the performance of B2B has not been made sufficiently, and there isn't any evaluation method to determine whether B2B has been planned and practiced appropriately.

In the area of studying the performance of B2B, there are few studies conducted to evaluate the performance of B2B, while many studies on the performance of EDI and e-Marketplace have been conducted.

Prior studies define traditional performance evaluation as follows. Performance evaluation is an activity to eventually heighten the quality of products and the management activities by measuring, comparing the products based on the specific standard and procedure, and to estimate the degree of accomplishment of the planned goals(Rogers,1990; Smith, 1988). Traditional performance evaluation of business firms were done by financial, result-oriented, and short term indexes such as earnings, net profit, return on investment, earnings per share, and the comparison of the estimated performance and the actual performance. Meanwhile, in BSC(Balanced Scorecard) , the new way of performance evaluation suggests that a company's continuous advancement is fulfilled not by the fragmentary evaluation on the result, but by the evaluation of a series of process that causes the result.<sup>1</sup>And it is also recognized that performance evaluation is not only a means to control, but also an institutional device to implement the company's vision and strategy.<sup>2</sup>

In our study, we integrated such discussions about new means of performance evaluation, and develop a B2B performance evaluation model. In other words, the factors that cause the B2B performance should be evaluated, the quality of B2B planned by the company should be heightened through the process of performance evaluation, and the vision and strategy of the company should be implemented by practicing B2B. To make B2B performance evaluation possible to satisfy these functions, we developed the B2B Performance Evaluation Model, which is able to make in-depth evaluation of the company's performance caused

---

<sup>1</sup> Kaplan, R.S and Norton,D.P., "The balanced scorecard-measures that drive performance", *Havard Business Review*, January-February 1991, pp.71-9.

<sup>2</sup> Kaplan, R.S and Norton, D.P., "Using the balanced scorecard as a strategic management system", *Havard Business Review*, January-Februay 1996, pp.75-85.

by B2B and the overall factors that causes the performance in the following procedure.

Subsequently, the generated performance-affecting factors and performance factors were integrated in each stage, and grouped into several groups. Face validity of each evaluation factors were verified by surveying the six experts using the Delphi method, and the degree of importance of each item was decided by giving a weight to each item.

## 2 Literature Review

### 2.1 B2B (Business-to-Business electronic commerce)

It is necessary to recognize all the properties intrinsic to B2B comprehensively in order to measure comprehensive performance caused by B2B, and understand its affecting factors extensively.

B2B is defined as a means by which each company exchanges information and makes business transactions through the business-to-business information system based on their electronic infrastructure (Kalakota & Whinston, 1996). Therefore, B2B phenomenon is basically a phenomenon: (1) based on information technology; (2) based on the relationships of more than two organizations; and (3) for the sake of business. The properties of B2B are based on the three characteristics – information technological, organizational, and business property [Figure 1].

Due to its information technological property, B2B is introduced to organizations on the basis of the information technological planning methodology. However, what the introduction of B2B is largely different from the introduction of general information systems is that it begins with resolving to promote B2B with the business counterpart, not with making strategic plans for the information system independently. This process causes organizational problems created by the combination of two heterogeneous organizations.

B2B transforms the established process of a company to a new one. In addition, going far beyond the status as an operation system for the specific affairs of the company, it creates new business perspective as a sponsor for the specific business such as e-Marketplace. After all, no matter what is accomplished by B2B – achieving BPR, or even creating new business –, the kernel of the question is that B2B has a property of business.

## **2.2 B2B performance evaluation**

In the area of studying the performance of B2B, there are few studies conducted to evaluate the performance of B2B, while many studies on the performance of EDI and e-Marketplace have been conducted. The indexes of EDI and e-marketplce performance are shown in [Table1]. However, these studies have some limitations that are financial, result-oriented, and short-term indexes.

## **2.3 Balanced Scorecard (BSC)**

BSC(Balanced Scorecard) is a method to measure performance of a company reflecting both quantitative and qualitative indexes without losing balance, and to evaluate both present and future value of the company. BSC is a new framework integrating measurement indexes derived from strategies, and is keeping balance between long term and short term objectives; financial and non-financial measurement indexes; lagging and leading indicators; and external and internal perspective on the performance. BSC allows managers to look at the business from four important perspective; Customer, Internal business process, Innovation & Learning and Financial perspective. BSC integrates financial measures, which state the result of the company's operations, and the operational measures, which provide a clear view of the causes of the results. In order to evaluate B2B performance, we reflect the contribution of BSC to overcome the limitations of traditional performance evaluation systems.<sup>3</sup>

## **2.4 The factors that influence B2B Performance**

We conducted interviews with B2B staffers and experts, and reviewed prior studies in order to extract the factors to influence B2B performance.

In the Interviews, questions about the present condition as well as the problems and the major points of B2B were asked. They pointed out the serious problems in actually promoting B2B as insufficiency of standardization, lack of cooperation in industry, poor information environment of small-to-medium-sized companies, legal / institutional inertia, payment / complement problems, lack of B2B mindset of CEO, and the practice of transaction without taxation

---

<sup>3</sup> Kaplan, R.S and Norton,D.P, "The balanced scorecard-measures that drive performance", Harvard Business Review, January-February 1991, pp.71-9. ; Kaplan, R.S and Norton, D.P., "Using the balanced scorecard as a strategic management system", Harvard Business Review, January-February 1996, pp.75-85.

documents to avoid disclosing tax sources.

Literature pertinent to the topic of IOS and the factors affecting a series of EDI performance were reviewed. The contents related to planning of B2B can be summarized as follows:

Although participants gathered together to implement B2B attempt to secure the common benefits through B2B, they have a fundamental property of an individual who pursues its own interest. Thus, it is difficult for them to cooperate and the possibility is high for them to take opportunistic action in the specific matters. Consequently, participants' disadvantage should not be emphasized in order to seek overall efficiency of B2B, and their suspicions about the opportunistic actions of others have to be dispelled by insuring trust among participants. In this way, cooperation of participants in promoting and continuously developing B2B will become possible (Williamson, 1985; Johnston & Vitale, 1988).

According to a series of studies related to EDI, the existence of clear objectives of EDI introduction and the existence of performance measuring criteria have influence on the company's performance which results from EDI introduction (Keen, 1988; O'Callaghn et al., 1992; Skagen, 1989; Abraham, 1991). Besides, long term development of B2B and the performance caused by it tend to be achieved when the participants are willing to take part in the project inspired by a persuasive demand, or incentives rather than a compulsive demand (Hartwick & H. Barki, 1994; Hart & Saunders, 1997).

In relation to the standards, decision making of business firms about B2B introduction and implementation becomes easier when there are management standards of data, which should be dealt with in the transaction procedure in industry, and when the standards of a company fit in with those of the business counterpart (Benjamin, 1990; Hwang, 1990).

In organizational context, business between organizations based on interorganization information system are connected one another infiltrating the boundary of each organization, but not a sequential connection of essential business components of each company. When the businesses between organizations combine themselves continuously, B2B can grow in a more developmental way (Russell & Vitale, 1988). The strategic sharing of essential information between the participating organizations is critical to gain competitive superiority over other companies through partnership (Konsynski & McFarlan, 1990), and the close relationship between the partners can be formed

by appropriate and regular exchange of information (Handerson, 1990; Konsynski & McFarlan, 1990). Sharing of information and knowledge ensures more efficient assignment and accomplishment of business between the partners, and increases the benefits of the partners (Jae Nam Lee & Young Gul Kim, 1999). However, one of the fundamental propensities of an organization is to recognize the risks of combining with heterogeneous organizations and to have a tendency to deny it. The organization should recognize that exchange of information is basically beneficial to itself in order to overcome this propensity and exchange information with heterogeneous organizations. Therefore, mutual exchange of information is possible in reality only when it is recognized to be profitable, as a win-win strategy (Williamson, 1985).

The higher the informatization capability of a company is, the more complete its understanding of information technology and the preparation for accommodating it in itself are than the companies otherwise (Byung Gon Kim, 1997).

After a decision to carry out B2B is made, a community for promoting B2B is formed and executes the strategic plans for B2B. Outputs of planning go through the implementation process and are embodied in each B2B community composing structure.

As a result of reviewing the study on SISP and Implementation, the factors that can affect B2B performance in this process are summarized and classified as follows. The first one is about whether B2B was well planned by basic ISP methodologies (Anthony, 1965; Zani, 1970; King, 1978, 1988; Bowman et al., 1983; Hederson & Sifonis, 1988); The second one is about whether the contents came out as a result of B2B planning are appropriate for the participants' circumstance factors (Pyburn, 1983; Lederer & Mendelow, 1990; Ramanujam & Venkatraman, 1987); The third one is about whether the result contents of planning produced by B2B methodology can be practically implemented in the organization (Earl, 1993); The fourth one is the factors affecting execution of plans, and is the domain of reorganization plan and recognition of the members of the organization (Zmud & Cox, 1979; Ginzberg, 1981). As demonstrated above, the factors that have influence upon B2B performance are acquired by the contents and the process of ISP of B2B themselves, and are the component affected by successful execution of B2B planning (Ginzberg, 1981; King, 1988; Earl, 1993).

It is pointed out that the provisions on reliability, data security, user privacy,



and system integrity should be prepared to cope with the opportunistic property of B2B participants (Johnston & Vitale, 1988). Additionally, what have been proposed as the factors leading to a successful planning of information system are: importance of the scale of a planning team; securing directors and information system personnel who are capable of planning (Vacca, 1983); planners' understanding of the business (Earl, 1983); sufficiently trained analysts (Boyton & Zmud, 1984); and technological power of a planning team (Zachman, 1982). [Table2] shows the results of literature review about the factors to influence B2B performance.

### **3. Research Methodology**

To examine the performance of B2B and to look for the factors that have an effect upon it, we developed a conceptual framework, where the intrinsic attribute of B2B was classified into information technological property, organizational property, and business property, and the procedure in which B2B is formed and connected with the performance of the company is divided into the three stages of initiation, planning & implementation, and operation

First of all, we reviewed the related literatures about IOS, SISP, and BSC and conducted the interview with B2B staffers and B2B experts about the obstacles to actually planning and promoting B2B. Subsequently, the generated performance-affecting factors and performance factors were integrated in each stage, and grouped into several groups. Face validity of each evaluation factors were verified by surveying the six experts using the Delphi method, and the degree of importance of each item was decided by giving a weight to each item.

### **4. Development of the B2B Performance Evaluation Model**

To make a comprehensive and in-depth investigation into factors affecting the overall performance factors, we examined step by step the factors affecting the performance through the entire stages where B2B is introduced to a company and produces performance after passing operational procedure. we divided the components where each property of B2B has influence on the performance into three stages, as in [Figure 2]

The purpose of this process is to develop a more analytic evaluation tool by overcoming the defect of other previous studies on the performance of B2B, which failed to analyze the factors affecting the performance of B2B comprehensively only to mix up the components with various character in one

tool.

In the introduction of B2B, a period of consultation between the related organizations is required because it is also a sort of interorganization information system. We named this period the Initiation Stage for B2B. In this stage, the necessity or importance of business-to-business electronic transactions is commonly recognized and the overall preparatory activities for the transactions are performed, such as selection of business partners and composition of B2B community; determination of business domain; establishment of business culture; and selection of the goods to be dealt with.

Once the introduction of B2B is decided, it is introduced according to the information system planning methodology because B2B is a kind of IOS (Inter-organization System). This stage is named the Planning & Implementation stage for B2B in the idea that various components in the stage where the communities mutually agreed to promote B2B plan and implement the B2B strategies have influence on their performance. In this stage, the communities who mutually agreed to promote B2B review the components necessary for planning and implementing the B2B strategies.

Once the plan is actually implemented, the full-scale operation begins. The third stage is the Operation Stage, where implemented B2B immediately produces performance for the company and sends feedback to the subsequent planning process after passing continuous controlling process. In other words, this stage means that the performance of implemented B2B is measured continuously and the result is delivered as a feedback to the subsequent planning process.

The performance evaluation model developed by integrating the indexes based on the above discussions is showed in **[Figure3]**. The three-level performance evaluation model is classified by the type of B2B transactions and the position of participants. Therefore, we proposed 4 type evaluation models: dyadic B2B for buyer, dyadic B2B for seller, e-Marketplace for Participants, and e-Marketplace for Intermediary. And each of them consists of three part of evaluation index.

The first stage is B2B Initiation stage, where the factors to be considered when composing and promoting B2B community are to be measured in terms of strategic mindset of B2B, transaction standardization, inter-organizational culture, and informatization competence.

The second stage is B2B ISP & Implementation, where the items of evaluation,

which are important in the process of planning and implementing the B2B strategies, are to be measured in the strategy, people /organization, information technology, and implementation. Because the types of B2B to be applied are decided in this stage after going through the B2B planning stage, the factors for measuring performance in this stage could be classified by two types ; dyadic B2B for seller and buyer and e-Marketplace for intermediary

The third stage is Performance Evaluation of B2B. On the contrary to the existing informatization evaluation models that assess performance in the limited aspects of financial performance and the degree of system usage, the performance evaluation model considers both aspects of business value and the strategic utilization of IT, and measures the major items of evaluation in the financial, customers, process, and innovation perspective in this stage. And the factors for measuring performance in this stage could be classified by four types ; dyadic B2B for seller, dyadic B2B for buyer, e-Marketplace for intermediary and e-Marketplace for participants

## **5. The Weights in the B2B Performance Evaluation Model**

Three surveys using the Delphi method were conducted to the six experts composed of CEO of B2B companies, B2B practitioners and researchers to set the weight of each item of performance evaluation. The evaluation items, which were proposed by the researchers of this study and to which proposed basic scores were applied, were given to the experts initially. Then, they were asked to write down the weight of each item relative to one another, and state their opinion of each item. A weight was applied to one item in the primary classification compared with those of other items, and the weights of items in the secondary classification below each item of primary classification were decided compared with those of other secondary classification items. The expert opinions were communicated among all the experts, and the mean value of the weights were also delivered to them. [Table 3]–[Table9] are described the performance measuring indexes and the weight values of all the items acquired as a result of the three round Delphi survey.

In the first stage(B2B Initiation), 「inter-organizational culture」 appeared to be most important dimension(31.4/100). In B2B Initiation stage, the indexes in transaction standardization and inter-organizational culture are similarly weighted. It is because transaction itself can not be made without trust and more positive performance can be produced when participants recognize each

other as their partners.

In the second stage(ISP & Implementation), 「People/Organization」 were the most important dimensions(29.3/100). In the e-Marketplace for Intermediary part of the second stage, 「Level of supporting e-Marketplace as a trading community」 appeared to be the most important dimensions. It may be important for intermediary to know that the performance of e-Marketplace depends not only on its own efforts for operating the marketplace but also on the managing the relationships of their customers.

In the third stage(Performance Evaluation of dyadic B2B), 「Customer/Supplier」 and 「Process」 dimension turned out to be more important one. On the other side, Performance Evaluation indexes in e-Marketplace pointed that Financial Perspective is relatively important. This implies that the degree of importance in performance factors vary according to the type of B2B.

## 6. Conclusion

The conceptual performance evaluation model of B2B developed in this study has the following two characteristics: First, based on the analysis of the actual performance brought by B2B, this model can help evaluate performance insured to a company by B2B in multiple aspects, such as the financial performance, customer service, process innovation, and organizational reform. Second, this model can help evaluate the progress of the entire procedure of B2B introduction, planning, implementation, and operation, where a number of different companies carry out discussion, planning, and implementation together with others for B2B. The points that differentiate this one from other evaluation models are described in [Table 10].

There are two things to be considered when using this evaluation model.

First, in case B2B performance is measured in the individual company or B2B community, correlation among items is possible to occur if factor variables that should be recognized continuously in the aspect of administrative decision-making are added. But, these variables must be added because they were the indexes that have to be considered in the administrative decision-making.

Second, the weights of each variable determined by the Delphi survey are not the absolute weights of these indexes. So, they may be changed according to circumstantial variables related to B2B communities. Consequently, to apply the measured values selected in this study to the measurement of B2B performance of a real company, it is important to adjust the values to the ones suitable for the community which the

company is belong to. Similarly, the weights of the evaluation items also have to be developed related to the B2B model and the developmental stage of the community.

Our current efforts focus on extending this work to include an empirical test to validate the conceptual model in various B2B environments. Empirical results will provide the issues of B2B performance evaluation in 4 types of our models.

[Table1] The indexes of EDI & e-Marketplace performance

| Researcher                       | EDI Performance  |
|----------------------------------|--|
| M. A. Emmelhainz (1990)          | Cost Reduction, Improvement in efficiency of internal process, Improvement in customer satisfaction, Enhancement of cooperative relationship between trading partners  |
| B. Dearing (1990)                | <ul style="list-style-type: none"> <li>• Direct Benefit: data are sent electronically from one application to the next and do not rely on either business making other changes in business practice</li> <li>• Indirect Direct Benefit: leveraging EDI to enable the technology to change the way business is done</li> <li>• Long-term Strategic Performance; Market share expansion, strategic use of information</li> </ul> |
| J. W. Kim, M. S Park (1996)      | Improvement in inventory management<br>Reduction in order-process time<br>Improvement in task-efficiency<br>Reduction in operating cost<br>Sales Revenue Growth<br>Market share expansion<br>Improvement in trust between trading partners<br>Increase in accuracy of data<br>Improvement in on-time delivery  |
| Clemons et al. (1986)            | Reduction in lead time<br>Reduction in number of purchase process<br>Reduction in inventory cost<br>Improvement in task-efficiency   |
| Sokol (1989)                     | Improvement in customer satisfaction,<br>Improvement in data processing<br>The ability to predict customers demand & to plan<br>Reduction in transaction cost  |
| Researcher                       | B2B Performance through e-Marketplace  |
| Scully & Woods (1999)            | Reduction in transaction cost & search cost<br>Improvement in transparency of trading information<br>Improvement in efficiency of price-setting  |
| Waston, Padden & Latimore (2000) | <ul style="list-style-type: none"> <li>• Buyer: Reduction in search cost, Improvement in transparency of trading information</li> <li>• Seller: Removal of traditional intermediary, Direct access to customers, Transparency of price setting</li> </ul>  |
| Waston, Padden & Latimore(2000)  | Increase of cash flow, Reduction in transaction cost, Easy to compare trading partners, Supply Chain Management  |

[Table2]

The results of literature review about the factors to influence B2B performance.

|                               |  |
|-------------------------------|--|
| <b>Business Factors</b>       | <ul style="list-style-type: none"> <li>• Existence of clear objectives and motivations to start B2B (Keen 1988 , O'Callaghn et al 1992, Skagen 1989, Abraham 1991)</li> <li>• The amount of resources that has been put into B2B</li> <li>• The standards for product classification (Lee ,1999)</li> <li>• The standardized trading rules, procedures (Sculley, Woods 2000)</li> <li>• The standards of trading documents (Kim 1997, Ramamurthy 1995)</li> <li>• The standardized data code (Benjamin 1990, Hwang 1991), • Existence of ISP (Kym, 1995)</li> <li>• Existence of long-term and short-term action plans (McLean &amp; Soden 1977, Premkumar &amp; King 1991)</li> <li>• Property of critical success factors of B2B (King, 1978)</li> <li>• Level of Integration of specific B2B plans with strategic goals (Leaderer &amp; Mendelow, 1989)</li> <li>• Existence of specific B2B-Implementation plans (Lederer &amp; Sethi, 1988)</li> <li>• Ability to solve exceptional problems by trading partners (McLean &amp; Soden, 1977)</li> <li>• Sufficiency of education and training associated to B2B (Kim 1997, Hwang 1991, Lacovou 1995, Crook &amp; Kumar 1998), • Understanding internal user's needs</li> <li>• Participant company manager's understanding the trading process of e-Marketplace (Earl, 1983)</li> <li>• Level of supporting e-Marketplace as a trading community (Scully &amp; Woods, 2000)</li> </ul> |
| <b>Organizational Factors</b> | <ul style="list-style-type: none"> <li>• Trust (Anderson &amp; Narus 1990, Gulti 1995, Morgan &amp; Hunt 1994, Moorman et al 1993 )</li> <li>• The CEO's willingness, • Electronic payment system, • Coordination (Lee, 1999)</li> <li>• The willingness to share information and know-how between trading partners (Handerson 1990, Konsynski &amp; McFarlan 1990)</li> <li>• Degree of preparing security problems (Banerjee &amp; Golhar 1994, Hansen &amp; Hill 1989)</li> <li>• Level of retaining network management systems</li> <li>• Standardization of product catalogues (Scully &amp; Woods, 2000)</li> <li>• Security for trading systems and data (Lee, 1999)</li> <li>• Improvement in CEO'S B2B support, • Improvement in spirit of informatization</li> <li>• Employee job satisfaction index, • Improvement in trust between trade partners by B2B</li> <li>• e- Marketplace (Mishra 1995, Hart &amp; Saunders 1997, Y.G. Kim 1999)</li> </ul>   |
| <b>Technical Factors</b>      | <ul style="list-style-type: none"> <li>• Perceived win-win effects of information sharing (J.N. Lee &amp; Y.G. Kim 1999)</li> <li>• Degree of making a decision depending on objective data &amp; information (Lee, 1999)</li> <li>• Degree of documenting the details of trading (Lee, 1999)</li> <li>• Personnel's ability to utilize IT (B.G. Kim, 1997)</li> <li>• The expertise of IT team, • The company's level of IS infrastructure retention</li> <li>• Involvement of internal users in development of IS for B2B (Boyton &amp; Mud 1984, Kay et al 1980, Grover 1990, Hwang, 1991)</li> <li>• Level of retaining application necessary for B2B &amp; hardware necessary for B2B</li> <li>• Number of employees specialized in B2B (Zachman, 1982)</li> <li>• Level of Integration of B2B e-commerce system with legacy system (Kim 1997, Lacovou et al 1995, Hwang 1991, Crook &amp; King 1998)</li> </ul>  |

[Table3] Stage1-B2B Initiation

| Category   | 2 Indexes   |
|--|---|
| B2B Mind (23.5)  | Existence of clear objectives and motivations to start B2B e-commerce (9.7), The CEO's willingness (8.2), The amount of resources that has been put into B2B e-commerce (5.6)   |
| Transaction standardization ;Existence of transaction standards (29.7) | The standards for product classification (8.4) , The standardized trading rules, procedures (7.7), The standards of trading documents (7.2), The standardized data code (6.4)   |
| Inter-organizational culture (31.4)                                    | Trust (6.0), Coordination (5.5), The willingness to share information and know-how between trading partners (5.9), Perceived win-win effects of information sharing (5.6), Degree of making a decision depending on objective information (4.4), Degree of documenting the details of trading (3.9) |
| Informatization Competence (15.5)                                      | Personnel's ability to utilize IT (3.4), The expertise of IT team (3.7), The company's level of IS infrastructure retention (4.6), The partner's level of IS infrastructure retention (3.8)   |
| <b>Total 100.00</b>  |   |

[Table4] Step2. B2B SISP & Implementation (dyadic B2B for buyer & seller)

| 2 Category                  | 2 Index   |
|-----------------------------|---|
| Strategy (23.1)             | Existence of ISP for B2B (6.5), Existence of long-term and short-term action plans (5.4), Property of critical success factors of B2B e-commerce (5.8), Level of Integration of specific B2B plans with strategic goals (5.4)   |
| People/ Organization (29.3) | Number of employees in charge of B2B-ISP Implementation (5.3), B2B-ISP Implementation team's level of understanding B2B tasks and IT (5.7), Top management support (7.8), Internal position of a chief B2B-ISP manager (5.3), Involvement of internal users in development of IS for B2B (5.2)  |
| IT (23.8)                   | Level of retaining application necessary for B2B e-commerce (4.4), Level of retaining hardware necessary for B2B e-commerce (3.9), Number of employees specialized in B2B e-commerce (3.6), Degree of standardizing documents for trading (4.1), Level of Integration of B2B system with legacy system (4.6), Degree of preparing security problems (3.2) |
| Implementation (23.8)       | Existence of specific B2B-Implementation plans; (5.6), Ability to solve exceptional problems by trading partners (4.6), Understanding internal user's needs (5.8), Sufficiency of education and training associated to B2B e-commerce, Quality of that education and training (3.8), Existence of legal and political support for B2B (4.0)               |
| <b>Total: 100.00</b>        |   |

[Table5] Stage2.1 B2B SISP & Implementation (e-Marketplace for Intermediary)

| Category                    | 2 Index   |
|-----------------------------|---|
| Strategy (25.0)             | Existence of e-Marketplace business strategies (6.4), Existence of long-term and short-term plans (6.0), Property of critical success factors of e-Marketplace (6.1), Level of Integration of ISP with e-Marketplace's strategic goals (6.5)  |
| People/ Organization (27.7) | e-Marketplace management team's understanding trading features of e-Marketplace (5.7), Participant company's top management support (8.0), Participant company manager's understanding the trading process of e-Marketplace (6.7), Level of supporting e-Marketplace as a trading community (7.3) |
| IT (24.2)                   | Level of retaining network management systems (5.0), Standardization of product catalogues (7.7), Standardization of product catalogues (7.7), Electronic payment system (5.8), Security for trading systems and data (5.7)   |
| Implement-ation (23.07)     | Existence of specific e-Marketplace managing plans; (6.0), Ability to analyze risks and solve problems (4.97), Reflecting customer's needs in B2B-ISP (7.6), Existence of legal & political support for B2B (4.5)   |
| <b>Total: 100.00</b>        |   |



[Table 6] Step 3.1 B2B Performance Evaluation (dyadic B2B for seller)

| Category                      | Sub-category                   | 2 Indices   |
|-------------------------------|--------------------------------|---|
| Financial Perspective (21.9)  | Revenue (15.5)                 | Increase in number of trading trial by B2B e-commerce (%) (5.7), Increase in number of trade completed by B2B e-commerce (%) (5.1), Sales revenue growth by B2B e-commerce (4.7)                                  |
|                               | Cost (6.4)                     | Reduction in sales cost by B2B e-commerce (6.4)   |
| Customer Perspective (27.5)   | Market Share (5.8)             | Market share expansion by B2B e-commerce (5.8)  |
|                               | New Customer Acquisition (8.5) | Increase in number of new customers by B2B e-commerce (5.0), Reduction in marketing cost by B2B e-commerce (3.6)  |
|                               | Customer Retention (6)         | Retention of existing customer relationships, partnering for the long term (6.0)  |
|                               | Customer Satisfaction (7.2)    | Customer satisfaction index (4.0), Number of complaints (3.2)   |
| Process Perspective (29.7)    | Effectiveness (15.2)           | Transparency of trading information (3.8), Error rate (3.1), Timeliness (3.0), Consistency (2.6), The ability to predict customers demand & The ability to plan (2.8)   |
|                               | Efficiency (14.6)              | Reduction in lead time (5.8), Reduction in number of sales process (4.9), Speed on decision-making (3.8)  |
| Innovation Perspective (20.8) | Intra organizational (11.4)    | Improvement in CEO'S B2B support (2.5), Improvement in spirit of informatization (2.2), Employee job satisfaction index (2.5), Building B2B Performance evaluation systems (2.3), Sales employee's skill up (1.9) |
|                               | Inter organizational (9.5)     | Improvement in trust between trade partners by B2B e-commerce (3.6), Improvement in relationships between trading partners (3.0), Improvement in new joint ventures and alliances (2.8)                           |
| Total: 100.00                 |                                |   |

[Table 7] Step3.2 Performance Evaluation (dyadic B2B for buyer)

| Category                      | Sub-category                | 2 Indexes   |
|-------------------------------|-----------------------------|---|
| Financial Perspective (21.3)  | Cost (21.3)                 | Reduction in transaction cost by B2B e-commerce (8.3), Reduction in inventory cost by B2B e-commerce (6.1), Reduction in purchase cost by B2B e-commerce (6.7)                            |
| Supplier Perspective (30.1)   | Supplier Retention(7.6)     | Retention of existing supplier relationships, partnering for the long term (7.6)  |
|                               | Supplier Acquisition (13.5) | Increase in number of new suppliers by B2B e-commerce (7.6), Reduction in search cost by B2B e-commerce (5.9)   |
|                               | Supplier Satisfaction(9.0)  | Transaction satisfaction (4.6), Number of supplier complaints (4.4)   |
| Process Perspective (29.3)    | Effectiveness (14.6)        | Transparency of trading information (4.3), Error rate (3.3), Timeliness (4.2), Consistency (2.8)  |
|                               | Efficiency (14.7)           | Reduction in lead time (5.8), Reduction in number of purchase process (4.9), Speed on decision-making (4.0)   |
| Innovation Perspective (19.3) | Intra-organization (10.6)   | Improvement in CEO'S B2B support (3.0), Improvement in spirit of informatization (2.5), Improvement in employee job satisfaction (2.0), Building B2B performance evaluation systems (1.7) |
|                               | Inter-organization (8.7)    | Improvement in trust between trade partners by B2B e-commerce (3.3), Improvement in new joint ventures and alliances (2.7), Improvement in relationships between trading partners (2.8)   |
| Total: 100.00                 |                             |   |

[Table 8] Stage 3.3 Performance Evaluation (e-Marketplace for Intermediary)

| Category                      | Sub-category                | 2 Index   |
|-------------------------------|-----------------------------|---|
| Financial Perspective (18.3)  | Revenue (18.3)              | Increase in number of trading trial by B2B e-commerce (%) (5.9), Increase in number of trade completed by B2B e-commerce (%) (5.6), Trading commission revenue growth by B2B e-commerce (%) (6.8)                         |
| Customer Perspective (23.4)   | Market share (9.3)          | e-Marketplace membership (5.3), Leveraging of existing brand image (4.1),   |
|                               | Customer Retention (6.0)    | Retention of existing customer relationships, partnering for the long term (6.0)  |
|                               | Customer Satisfaction (8.1) | Customer satisfaction index (4.6), Number of complaints (3.5)   |
| Process Perspective (22.2)    | Effectiveness (11.9)        | Transparency of trading information (3.6), Error rate (3.0), Timeliness (2.8), Consistency (2.5)  |
|                               | Efficiency (10.3)           | Reduction in transaction process (4.9), Reduction in order-processing time (5.4)  |
| Innovation Perspective (17.9) |                             | Improvement in trust between trade partners through B2B e-Marketplace (6.1), Improvement in new joint ventures and alliances through B2B e-Marketplace (5.3), Improvement in relationships between trading partners (6.5) |
| Contents Perspective (18.2)   | Contents (18.2)             | The specialized contents of B2B web site (6.7), The diversity of contents of B2B web site (6.1), Continuous update of B2B web site (5.3)  |
| Total: 100.00                 |                             |   |

[Table 9] Stage3.4 Performance Evaluation (e-Marketplace for participants)

| Category                      | Sub-category                   | 2 Indexes   |
|-------------------------------|--------------------------------|---|
| Financial Perspective (30.6)  | Revenue (16.0)                 | Increase in number of trading trial through the e -Marketplace (%) (5.3), Increase in number of trade through the e-Marketplace (%) (4.3), Sales revenue growth through the e-Marketplace (%) (6.4) |
|                               | Cost (14.6)                    | Reduction in transaction cost through the e-Marketplace (4.8), Reduction in inventory cost through the e-Marketplace (5.0), Reduction in purchase cost through the e-Marketplace (4.8)              |
| Customer Perspective (28.6)   | Market share(7.9)              | Leveraging of existing brand image (4.8), Improvement in market share through the e-Marketplace (3.1)   |
|                               | New Customer Acquisition (9.9) | Reduction in marketing cost through the e-Marketplace (4.5), Increase in number of new customers through the e-Marketplace (5.4)  |
|                               | Customer Retention (4.0)       | Retention of existing customer relationships, partnering for the long term (4.0)  |
|                               | Customer Satisfaction (6.8)    | Customer satisfaction index (4.0), Number of complaints (2.8)   |
| Process Perspective (22.7)    | Effectiveness (12.5)           | Transparency of trading information (3.5), Error rate (2.8), Timeliness (2.3), Consistency (2.5), The ability to predict customers demand &to plan (1.4)  |
|                               | Efficiency (10.2)              | Reduction in lead time (4.8), Reduction in number of sales process (5.4)  |
| Innovation Perspective (18.1) | Intra -organizational (7.7)    | Improvement in CEO'S B2B support (2.9), Improvement in spirit of informatization (2.0), Employee job satisfaction index (1.4), Building B2B Performance evaluation systems (1.4)                    |
|                               | Inter organizational (10.4)    | Improvement in trust between trade partners through the e-Marketplace (5.6), Improvement in new joint ventures and alliances (4.8)  |
| Total: 100.00                 |                                |   |

[Table 10] Analysis of existing Evaluation Models

| [Analysis of Evaluation Models] |   | Initiation |     |     |     | ISP & Implementation |     |     |     | Performance Evaluation |     |     |     |     |
|---------------------------------|---|------------|-----|-----|-----|----------------------|-----|-----|-----|------------------------|-----|-----|-----|-----|
|                                 |   | [1]        |     |     |     | [2]                  |     |     |     | [3]                    |     |     |     |     |
|                                 |   | 1.1        | 1.2 | 1.3 | 1.4 | 2.1                  | 2.2 | 2.3 | 2.4 | 3.1                    | 3.2 | 3.3 | 3.4 | 3.5 |
| IS/Informatization              | A |            |     |     | ⊙   |                      |     | ⊙   |     | ⊙                      |     | ⊙   |     |     |
|                                 | B |            |     |     |     |                      |     | ⊙   | ⊙   |                        | ⊙   | ⊙   | ⊙   |     |
|                                 | C |            |     |     | ⊙   | ⊙                    | ⊙   | ⊙   | ⊙   | ⊙                      | ⊙   |     |     |     |
|                                 | D |            |     |     | ⊙   | ⊙                    |     | ⊙   | ⊙   | ⊙                      |     | ⊙   | ⊙   |     |
| IS Planning                     | E |            |     |     |     | ⊙                    | ⊙   | ⊙   |     |                        |     |     |     |     |
| WEBSITE                         | F |            |     |     | ⊙   |                      |     | ⊙   |     |                        | ⊙   |     |     | ⊙   |
|                                 | G |            |     |     |     |                      |     |     |     |                        | ⊙   |     |     | ⊙   |
|                                 | H |            |     |     | ⊙   |                      |     | ⊙   |     |                        | ⊙   | ⊙   |     | ⊙   |
|                                 | I |            |     |     |     |                      |     |     |     |                        | ⊙   | ⊙   |     | ⊙   |
|                                 | J |            |     |     |     |                      |     |     |     |                        |     |     |     | ⊙   |
|                                 | K |            |     |     |     |                      |     |     |     |                        | ⊙   | ⊙   | ⊙   | ⊙   |
|                                 | L |            |     |     |     |                      |     |     |     |                        | ⊙   | ⊙   |     | ⊙   |
|                                 | M |            |     |     |     |                      |     |     |     |                        |     |     |     | ⊙   |
|                                 | N |            |     |     |     |                      |     |     |     |                        | ⊙   | ⊙   |     | ⊙   |
| Internet Business               | O |            |     | ⊙   |     | ⊙                    |     | ⊙   |     | ⊙                      | ⊙   |     |     |     |

1.1 B2B mind, 1.2 Transaction standardization, 1.3 Inter-organizational culture, 1.4 Informatization competence

2.1 Strategy, 2.2 People/Organization, 2.3 IT, 2.4 Implementation

3.1 Financial Perspective, 3.2 Customer Perspective,

3.3 Process Perspective, 3.4 Innovation Perspective, 3.5 Contents Perspective

A Evaluation framework of Ernst & Young, B IS Success Model

C IS Infrastructure assessment model of SERI in Korea

D EIII(EIII: Evaluation Indexes of Industrial Informatization )

E IS Planning performance measurement (King, 1988)

F Evaluation Model of Ecom, Japan

G Website Evaluation Process Model (Webjectives Research)

H WA(Web Assessment) Model(Selz & Schubert)

I Website's Criteria Matrix(David Siegel)

J Korea Internet Contest(K.I.C '99)

K '99 KMA, Internet Commerce Award

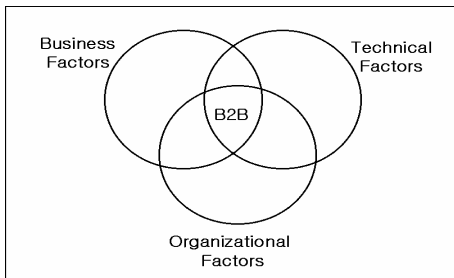
L Cyber Shopping Mall Interface Assessment Model (National Computerization Agency)

M KIUSE Report-I WARS Model

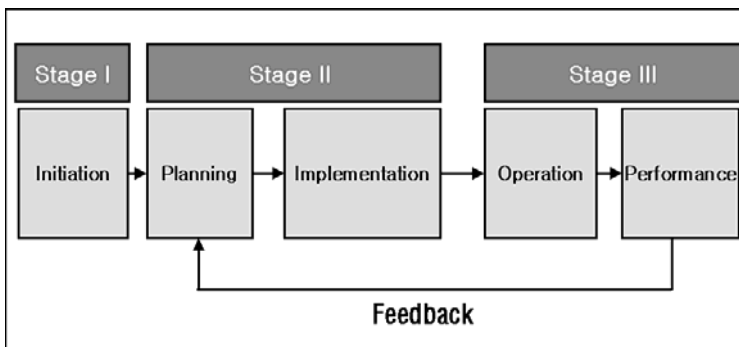
N The Evaluation of customer's interface (HCI Lab,Yonsei)

O E-Valuator Model

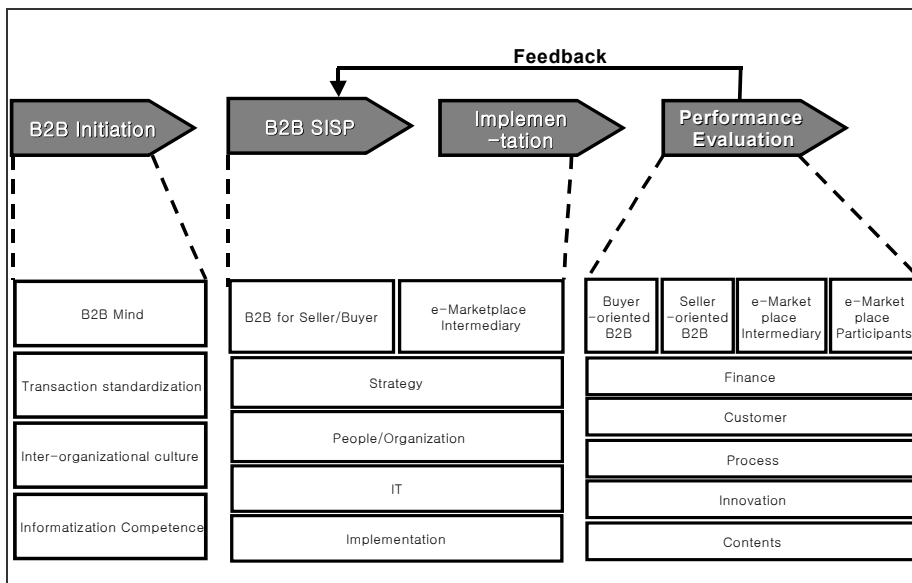
[Figure 1]



[Figure 2]



[Figure 3] B2B Performance Evaluation Model



## [Reference]

1. Abraham, "Managerial Fads and Fashions: The Diffusion and Rejection of Innovations," *Academy of Management Review*, Vol.16, 1991.
2. Anderson, J. C. and J. A. Narus, "A Model of Distributor Firm and Manufacturer Firm Working Partnerships," *Journal of Marketing*, pp. 54, 42-58, 1990.
3. Ahn, Il Tae and Jung, Boo Yun, "A Study on success factors analysis according to the business type" *KISDI*, 2000.
4. Bae, Myung Jin, "The effects of user participation and user influence on the performance of the information systems" *Yonsei University*, 1999.
5. Bae, Kyung Yul and Hong, Sung Chan, "21 Century IT Revolution", *KPI Publishing Co.*, 1996.
6. Benjamin et al, "Electronic Data Interchange : How Much Competitive Advantage ?", *Long Range Planning*, Vol.23., No.1, 1990.
8. Boyton, A. C., & Zmud, R. W., "An Assesment of Critical Success Factors," *Sloan Management Review*, 1984.
9. Carter, J. R. et al., "Education and Training for Successful EDI Implementation," *Journal of Purchasing and Materials Management*, Summer, 1987.
10. Delone, W. & E. McLean, "Information Systems Success", *Information Systems Research*, 3(1), 1992.
11. Do, Jae Kon, "An Empirical study on MIS evaluation centering on the correlation between the perceived importance and Isperformance" *Hankuk University of Foreign Studies*, 1993.
12. Earl, M. J., "Experiences in Strategic Information Systems Planning," *MIS Quarterly*, Vol.17, No.1, March, 1993.
13. Electronic Commerce Research and Development Assocoatiion of Korea, "The trend of B2B e-Commerce in the first half of 2000", 2000. 5.
14. Eom, Keun, "A Study on the motives and performances of the implementation on EDI system in Korea trade companies" *Kookmin University*, 1995.
15. Etimes, "Evaluation of Internet Business Firm" 2000. 9. 21.
16. Genasan, S., "Determinants of Long-term Orientation in Buyer-Seller Relationship," *Journal of Marketing*, 58, 1994.
17. Grover, V., M. J. Cheon and J.T.C. Teng, "The Effects of Service Quality and Partnership on the Outsourcing of Informations Systems Functions," *Journal of Management Information System*, 1996, 12, 4.
18. Gulti, R., "Does Familiarity Breed Trust? The Implications of Repeated Ties for Contractual Choice in Alliances," *Academy of Management Journal*, 1995.
19. Johnston, H.R. & M.R. Vitale. Creating competitive advantage with inter-organizational information systems. *MIS Quaterly*, June 1988.
20. Jo, Sung Kwan, "A study on determinants and outcome of electronic data interchange : an innovation diffusion perspective" *Korea University*, 1997.
21. Jung, Ie Sang, "A study on organizational and information system characteristic influencing information systems planning's performance" *The journal of MIS research*. Vol.10 No.2, 2000.
22. Jung, In Keun, Park, Joon Chul and Kim, Byung Il, "Factors affecting organizational performance through the mediating role of EDI usage level", 2000.

23. Jung, In Young, "An empirical study on the implementation and performance of the electronic data interchange(EDI) in Korean trade firms" *Chungnam National University*, 1998.
24. Han, Gye Seop and Jung, Jin Woo, "An achievement analysis on information technology adoption : in case of comparison two pharmaceutical companies", 1997.
25. Han, Kyung Il, "The effects of the task and the characteristics of information system on the information system performanace" *Yonsei University*, 1999.
26. Hart, P.&C. Saunders, "Power and Trust : Critical factors in the adoption and user of electronic data interchange" *Organization Science*, 8(1), 1997.
27. Henderson, J. C., "Plugging into Strategic Partnerships: The Critical IS connection," *Sloan Management Review*, 30, 3, 1990.
28. Hyun, Yong Seok, "An Study on performance determinants and performances of management information systems", *Sogang University*, 1988.
29. *CALS/EC Journal*, Vol. 1- Vol. 12, 1999-2000.
30. Kang, So Ra, "An Empirical test of R.Nolan's growth model for firm's information systems function" *Ewha Womans University*, 1994.
31. Kay et al., "Strategic Planning of Information Systems at Corporate level," *Information Management*, Vol.3, No.5, 1980.
32. Kim, Byung Kon, "A Study on factors influencing EDI implementation" *Kyungpook National University*, 1997.
33. Kim, Hyo Keun, Seo, Ji Hyun and Seo Hyun Joo, "An empirical reserach on how IT environment resources affect IT performance and substainable competitive advantages" *The journal of MIS research*. Vol.10 No.1, 2000.
34. Kim, Jae Wook and Park, Myung Sup, "The adaption of EDI logistics information system and logistics performance", 1996.
35. Kim, Ji Seung, "An Empirical Research on the Effect of Website Contents Characteristics on its Performance" *Ewha Womans University*, 2000.
36. Kim, Joon Seok, "The effects of IT centralization and organizational structure on the performance of information systems" *The journal of MIS research*. Vol.9 No.4, 1999.
37. Kim, Yu Jeong and Jo, Sung Kwan, "A study on determinants and outcome of electronic data interchange : an innovation diffusion perspective", Vol.32 No.2, 1998.
38. King, W., "How effective is your Information Systems Planning?", *Long Range Planning*, , Vol.21, No 5., 1988.
39. Konsynski, B. R. and F. W. McFarlan, "Information Partnerships- Shared Data, Shared Scale", *Havard Business Review*, 68, 5., 1990.
40. Leaderer, A. L. & Mendelow, A. L., "Coordination of Information Systems Planning with Business Plans," *Journal of Management Information System*, Vol.6, No.2, Fall., 1989.
41. Leaderer, A. L. & Mendelow, A. L., "Information Resource Planning: Overcoming Difficluties in Identifing Top Management's Objectives," *MIS Quarterly*, Vol.11, No3, September., 1987.
42. Lee, Byung Kon, "A study on influence of change management in ISP process on IS performance" *Sogang University*, 2000.
43. Lee, Chul Seung et al, "A driving strategy for informationization" *KISDI*, 1997.
44. Lee, Han Hee, "An Exploratory study searching for the success factor of SISP(strategic information systems planning)" *Ewha Womans University*, 1995.

45. Lee, Ho Keun, "A study on success strategy of information systems in domestic industry through the case analysis" *National Computerization Agency*, 1999.
46. Lee, Hyun Hee, "A Study on the adaption of EDI logistics information system and logistics performance" *Korea University*, 1996.
47. Lee, Hyun Sik, "A Study on the international strategic management performances of Korean EDI adopting enterprises" *Hankuk University of Foreign Studies*, 1997.
48. Lee, Hyun Sik, "A Study on the international strategic management performances of Korean EDI adopting enterprises" *Hankuk University of Foreign Studies*, 1997.
49. Lee, Jae Ku et al, "The Principles of E-commerce", 1999.
50. Lee, Jae Nam et al, "Testing a causal model of outsourcing success : structural equation modeling approach", 1999
51. Lee, Jong Koo, "A Study on the effects of user attitude, user education & training on the successful information systems implementation" *Kyungpook National University*, 1997.
52. Lee, Kun Chang, "New Management Information Systems", *Mooyuk Kyungyoungsa*, 1999.
53. Lee, Soo Dong, Kim, Joo Young and Son, Chan Ho, "Identifying factors for a successful EDI implementation and solutions to problems during EDI application", 1999.
54. Malone, T.W., J. Yates & R.I. Benjamin, Electronic markets and electronic hierarchies. *Communications of the ACM*, 30(6), 1987.
55. McLean, E. R. & Soden, J. V., "Strategic Planning for MIS", 1977.
56. MOCIE, "Analysing of the recent B2B e-Commerce trends", 2000.
57. Mogan, R. M. and S.D.Hunt, "The Commitment Trust Theory of Relationship Marketing," *Journal of Marketing*, 58, July., 1994.
58. Moon, Hui Chul, Jang, SI Young and Sung, Tae Kyung, "A literature review on determinants and performances of EDI adoption and implementation", 1996.
59. Moorman, C., R. Deshpande and G. Zaltman., "Factors Affecting Trust in Market Research Relationships," *Journal of Marketing*, 57, January, pp.81-101., 1993.
60. Na, Mi Ja, "A study on tool for evaluation of knowledge contribution rate of organizational members" *Ewha Womans University*, 1999.
61. No, Hyung Jin and Hong, Sung Chan, "The Case-studies of CALS", *KPI Publishing Co.*, 1997.
62. No, Young, "A study on factors influencing the usage level and performance of EDI" *Hankuk University of Foreign Studies*, 2000.
63. O'Callaghn et al., "Adoption Correlates and Share Effects of Electronic Data Interchange Systems in Marketing Channels," *Journal of Marketing*, 1992
64. Oh, Ji Yun, "The Impact of IS planning characteristics and organization support characterisits on IS planning effectiveness" *Ewha Womans University*, 1995.
65. Park, Chul Min, "The effect of communication between system analysis and users on the performance of information system" *Yonsei University*, 2000.
66. Park, Myung Bum, "An Empirical study on relationship between planned organizational change and successful information system" *Hankuk University of Foreign Studies*, 1994.
67. Pyo, Ji Hyun, "The evaluation on the effect of communication and shared knowledege between IS and Line orrganizations to IS performance" *Ewha*

- Womans University*, 1998.
68. Raghunathan, B., and Raghunathan, T. S., "Relationship of the Rank of Information Systems Executive of Organizational Role and Planning Dimmensions of Information Systems," *Journal of Management Information System*, Vol.6, No1., 1989.
  69. Riggins, F.J., C.H. Kriebel & T. Mukhopadhyay, The growth of inter-organizational systems in the presence of network externalities. *Management Science*, 40(8), 1994.
  70. Schwartz, M.H., *MIS Planning.Datamation* , September., 1970.
  71. Seo, Ji Hyun, "An empirical research on how IT environment resource affect IT performance and sustained competitive advantage " *Ewha Womans University*, 1998.
  72. Song, Young Il, " A Study on the relationships between information characteristics and organizational structure variables influencing management information systems performance" *Sogang University*, 1996.
  73. Sullivan, C. H. Jr., " Systems Planning in the Information Age," *Sloan Management Review*, winter, 1985.
  74. Vacca, J. R., "BSP:How is It Working," *Computerworld*, march., 1983.
  75. Venkatraman, N. and Ramanujam, V., " Planning Systems Success: A Conceptualization and An Operational Model," *Management Science*, Vol.33, No.6., 1987.
  76. Yang, Eun Hui, "An Empirical study on factors influencing EDI performance" *Korea University*, 1997.
  77. Zmud & Cox, "The Information Process : A Change Approach," *MIS Quarterly*, Vol.3, No.2, June. 1979.