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Abstract

Under the prerequisite that virtual markets need a unit of analysis other than traditional markets, business model is set as the unit of analysis of this research. In this research, in order to help choose Internet business model that creates the most value, evaluation indexes for value-creation potential of Internet business models are developed. As research methods, deductive method and analytic hierarchy process (AHP) are used.

As the first stage of deduction process, the improved profits and the reduced costs, which factors are classified and quantitative and qualitative evaluation indexes of two dimensions are extracted by related studies. Then, evaluation indexes are corrected, complemented and verified through the expert interview, and analytic hierarchy is documented.

As the result, the improved profits dimension outweighed the reduced costs dimension, and each qualitative effect outweighed each quantitative effect. The overall consistency index showed to be 2%, which means that all the experts are determined to have rational consistency.

I. Introduction

As the recent development of digital technology has brought about the construction of an open-type digital network, that is Internet, an increasing number of people come to exchange a great quantity of information. Therefore, the problems involving the inverse proportion between the reachness and faithfulness of information become increasingly solved [19]. This solution in turn heightens the level of spreadibility and accessibility of information, which in turn can empower customers and promote the fundamental change of the business logic of firms [35]. By using Internet, consumers are enabled to choose the firm that is likely to offer the best quality of products and services, since they can acquire and exchange enormous information about products and services of all related firms quickly and freely.

On the other hand, the existing elements for predominance in competition - such as distribution channels and chain stores constructed through immense investment - became in name only owing to the alleviating of the inverse proportion between reachness and faithfulness of information. Furthermore, a fundamental change is appeared in the distribution channel selection for an efficient approach about suppliers and customers and in the interchange method between a firm's internal and external functions because transaction cost is decreased [17]. This fact means that the business models including a firm's operation method have been changed drastically by an emergence of the Internet.

Firms should select the most suitable business model in order to create more values in a digital economy environment. Specially, it is related with enhancing competitiveness of the existing core business and securing new business opportunities to select the most suitable business model in Internet business. The competitiveness of a firm is depending on selecting suitable Internet business models and strategies in the digital economy that is new economic environment.

However, most studies of the Internet business model have been suggested just taxonomy and some success factors or analyzed some cases. There were not the studies of a tool that can evaluate the value-creation potential of Internet business models systematically.

Therefore, this study aims to develop the evaluation indexes that can evaluate the potential of the value-creation of a business model for firms in the beginning

and help the firms select suitable business models.

II. Literature Review

1. The Definitions of Internet Business and the Business Model

The concept of Internet business is different from that of electronic commerce. Electronic commerce means that products, information or services are sold and bought on the Internet, whereas Internet business means that all processes of a value chain following by planning, development, manufacture, production, distribution and consumption of a product are connected with Internet.

The goal of Internet business is suggested on improving profits or creating values in most definitions about a business model. This study defines the business model as "structural form of the components of transactions that was designed in order to create values" by modifying the definition of Amit & Zott (2000) that structural form of the components of transactions that was designed in order to develop business opportunities.

2. The Classification of Internet Business Models

The main researches on Internet business model are as follows. Bambury (1998) divided Internet business models into the Internet unique business models and the traditional business models transplanted to the Internet. He insisted that a lot of traditional business models are applied compositely to the Internet.

Timmers (1998) found out the method to integrate information along a value chain by confirming the elements on a value chain and analyzing a interaction pattern of participants of a transaction. Through this, he classified business models into e-shop, e-procurement, e-auction, e-mall, third party marketplace, virtual community, value chain service provider, value chain integrator, collaboration platform, information brokerage, and trust services.

Rappa (2000) presented general business models such as brokerage, advertising, infomediary, merchant, manufacturer, affiliate, community, subscription, utility, and more concrete models according to business methods operated by each business model.

Yang (2000) classified business models into the type of advertisement, the type of retail shop, the type of channel, the type of cooperation, the type of franchise, and the type of joining according to main income sources.

2.1. The Value Creation of Internet Business Models

Bloniarz & Larsen (1997), Ghosh (1998), Jarvenpaa & Tiller (1999), Amit & Zott (2000), Bielski (2000), and Ethiraj et al. (2000) studied the factors that affect value creation of a business model.

Among them, the studies of Amit & Zott (2000) and Ethiraj et al. (2000) are similar to this study and provided some important factors. Amit & Zott (2000) observed the value-creation potential of business models of 59 Internet business firms in the United States and Europe.

They developed a value drive model that can evaluate the value-creation potential of Internet business model according to four dimensions of novelty, lock-in, complementarities, and efficiency. The Ethiraj et al.(2000) suggested scalability, complementary resources and ability, related specific assets, a knowledge sharing routine as success factors of Internet business model. The scalability means the ability that is able to extend a merit of a business model according to a value chain. Besides, it means using a unique complementarity of a business model in order to diversify markets, products and customers [30]. Cooperative firms develop a knowledge sharing routine in order to use a mutual ability efficiently. The knowledge sharing routine means a regular pattern of interaction between the firms transferring, recombining, and creating related specific assets [16].

III. Research Methodology

1. Analytic Hierarchy Process

The Analytic Hierarchy Process (AHP), which enables the user to determine the relative importance of criteria sets underlying their choice behaviors [5], is selected as the appropriate analysis tool. The AHP of Saaty (1977, 1980)-is theory and reality-an often used to solve strategic decision problems [3] [4] [5] [12] [28] [29] [32] [49] [53].

According to Saaty's original proposal, a complex system is decomposed into subsystems and represented in the hierarchical form. The element at the highest level is called the goal. The elements at each level are the criteria (factors) of the elements at the level below. The elements at the bottom level are called the alternatives. In this way, AHP organizes the basic rationality of the priority setting process by breaking down a multi-element complex system into its smaller constituent parts called components (or levels). The process can be divided into three phases, which are structuring a system, comparing pair-wise and synthesizing priorities.

The principle of comparative judgment is setting up a matrix to carry out the pair-wise comparisons of the relative importance of the elements in a component with respect to the criteria, elements in a dominating component at a higher level in the hierarchy. This matrix, denoted by A in our notation, is called the pair-wise comparison matrix. Let the pair-wise comparison matrix be

$$A = \begin{pmatrix} 1, & A_{1,2} & .A_{1,n} \\ A_{2,1} & 1\ldots & ..A_{2,n} \\ \cdots & \ldots & \cdots \\ A_{n,1} & \ldots & 1 \end{pmatrix} \quad (1)$$

where N is the number of elements in the component. The entry $A_{ij} > 0$ measures the relative importance of the impact on the criterion from element i against that from element j There are some obvious properties of A (1),

among which the consistency is the most important one. When matrix A satisfies the following equation, it is said to be consistent.

$$A_{ij} = A_{ik} A_{kj} \quad \text{for any } k. \tag{2}$$

It is straightforward to show that when A is consistent, the weight vector W, which gives the relative priorities of the elements, is identical to any one of the columns of A within a normalization factor. One can further show that W is the dominant eigenvector of the matrix, namely

$$A*W = N * W \tag{3}$$

Since the relative importance of the elements depends only on the relative amplitudes of the components of the vector W, we may normalize W by requiring

$$\sum_{I} W_i = 1 \tag{4}$$

Generally, a vector is said to be normalized if it satisfies the above equation.

In fact, the inadequate nature of the comparison process dictates that inconsistency cannot be completely eliminated. It has been argued that even when A is not consistent, the weight vector W is still determined by the dominant eigenvector of A, namely

$$A*W = \lambda_{max} W \tag{5}$$

where λ_{max} is the largest eigenvalue of the matrix A. It can be shown that $\lambda_{max} >= N$ for any positive reciprocal matrix. The equality is reached only when the matrix is consistent. To measure the consistency of the matrix A, we define the Consistency Index (C.I.) as follows:

$$C.I = \lambda_{max} - N / N-1 \tag{6}$$

In practice, we consider A is very consistent if the consistency index ratio C.R. = (C.I)/(R.I.) is less than 0.1(Random Index: R.I.), which is the average consistency index of a random reciprocal matrix of the same dimension. And also the consistency of A is acceptable if the ratio of C.I. is about 10% or less, we accept the estimate of W, Otherwise, we attempt to improve consistency [29] [38].

The general analyzing process of AHP is presented in Table 1.

----- Insert Table 1 about here -----

IV. Development of Evaluation Indexes

1. Generating the Evaluation Indexes for Value-Creation

The study found out the evaluation indexes for value-creation. Those were consisted of improved profits and reduced costs extracted by previous studies and interviews with experts and made the analytic hierarchy.

1.1. The Framework for the Development of Evaluation Indexes

To develop the evaluation indexes for value-creation potential of Internet business models, the study selected two factors such as improved profits and reduced costs that affect value-creation. Furthermore, the evaluation indexes were developed based on profit drives, expected profits, cost drives, and expected costs that were factors to measure improved profits and reduced costs. The profit drives and the cost drives were suggested as the

qualitative effect and the expected profits and expected costs as the quantitative effect.

----- Insert Figure 1 about here -----

1.2. The Analytic Hierarchy

The analytic hierarchy was presented in Figure 2. It was composed of the evaluation indexes that were extracted by previous studies and interviews with experts based on the framework for the development of evaluation indexes.

----- Insert Figure 2 about here -----

2. Defining the Evaluation Indexes

The evaluation indexes for value-creation potential of Internet business models were explained as follows.

2.1. Improved Profits

The indexes to evaluate improved profits were composed of a qualitative effect and a quantitative effect. The qualitative effect means the qualitative factor that raises total profit that a business model creates. There were complementarities, Lock-in, and novelty as indexes to evaluate the qualitative effect. The quantitative effect means expected total profit that a business model creates. There were things about potential customers and marginal incomes as indexes to measure the quantitative effect.

2.2. Reduced Costs

The indexes to evaluate reduced costs were composed of a qualitative effect and a quantitative effect. The qualitative effect means the qualitative factor that decreases total cost that a business model generates. There were transactional efficiency, marginal productivity, and reusability as indexes to evaluate the qualitative effect. The quantitative effect means expected total cost that a business model generates. There were labor cost, contents developing cost, operating cost, and marketing and selling cost as indexes to measure the quantitative effect.

3. Assigning the Importance of the Development of Evaluation Indexes and Analysis

To assign the importance of each evaluation index extracted by prior studies and interviews with experts, the related data were collected from the experts who had participated in the interview.

3.1. The Process of Survey

The questionnaire was made out based on the analytic hierarchy presented in the Figure 2. It was consisted of 52 items in five levels from goal in the highest level to final level. Two items in the same level were arranged to be able to compare. The relative importance between two items was measured on a nine-point scale.

The persons who participated in the survey were consisted of seven experts who had participated in the interview in the generating process of evaluation indexes. They were working-level officials who are in charge of developing Internet business model and consulting, and investing Internet business firms.

Two survey methods were used for the study. First, e-mails were sent to each of the experts. The e-mails included an explanation about the way to respond to the questionnaire. The completed questionnaires that the experts assigned the relative importance were sent to the researchers through e-mails.

Second, the researchers visited the experts and explained the way to respond to the questionnaires. Then they collected the questionnaires that the experts assigned the relative importance immediately. Team Expert Choice Ver. 9.5 was used for analysis. It is a software program supporting the analysis of AHP

3.2. The Results

The consistency index of the questionnaires collected from seven experts was analyzed. That of one questionnaire was exceeded the permitted limit. Then it was excluded and six questionnaires were analyzed. The results are as follows.

----- Insert Table 2 about here -----

Overall consistency index of six experts was 2%. The consistency index of each one was expert 1 (6%), expert 2 (5%), expert 3 (7%), expert 4 (9%), expert 5 (7%), and expert 6 (4%) respectively. All the experts had rational consistency because the consistency indexes of everyone were within 10% [38].

Through the result of synthesizing opinions of the experts who evaluated actual Internet business model in practical business, the study has the following conclusions.

First, the improved profits of a business model outweighed the reduced costs. It shows that how much the business model can create profits is a key point to select a business model before starting a business.

Second, the qualitative effect outweighed the quantitative effect in the improved profits and the reduced costs. It means that the qualitative effect was important than the quantitative effect to evaluate the value-creation potential of Internet business models.

Third, the order of importance was calculated that novelty is the first, complementarities, the second, and lock-in, the last among the qualitative indexes evaluating the improved profits. That is, it shows that the degree that a business model introduces a new way of transactions affects the improved profits highly, and then providing products and services in bundle and motivating customers to re-transact affect profits less.

Fourth, among the quantitative indexes evaluating the improved profits, the order of importance was calculated that marginal revenue is the first and potential customers, the second. It means that the marginal revenue affects qualitative profits highly.

Fifth, the order of importance was calculated that transactional efficiency is the first, reusability, the second, and marginal productivity, the last among the qualitative indexes evaluating the reduced costs. It shows that the degree that the transaction cost is decreased affects the improved profits highly. However, it affects profits less that the degree of the additional output as a result of adding one unit of variable factor and that of possibility of use services/information with other objectives.

Sixth, marketing/selling cost is the most important, and labor cost, the second, contents developing cost, the third, and operating cost, the least in qualitative indexes evaluating the reduced costs. That is, marketing/selling cost is produced highly, and then labor cost, contents developing cost, and operating cost are generated less.

V. Conclusions and Implications

The importance of an each index and a consistency level applying to AHP are as follows.

----- Insert Table 3 about here -----

Internet business firms must select suitable business models to create values. The competitiveness of firms is depending on selection and strategies of suitable Internet business models. However, most studies of the Internet business model have been suggested just taxonomy and some success factors or analyzed some cases. There were not studies of the evaluation index, which is able to evaluate the potential of the value-creation of Internet business models systematically.

Therefore, this study has contributions to practitioners as well as academics. As for a practical contribution, this study provides firms with evaluation indexes that can diagnose value creation potential of Internet business models and a relative importance between the evaluation indexes. As for academic contributions, this study presents a cornerstone of the study of evaluation criteria of the Internet business model.

However, the study was not able to consider on the difference of the indexes and the importance by industry. Therefore, it should be deliberated in future study.

References

[1] Abernathy and Utterback, Patterns of Industrial Innovation, *Technology Review*, June/July 1978.

[2] Amit and Schoemaker, Strategic Assets and Organizational Rent, *Strategic Management Journal*, Vol. 14, 1993, pp. 33-46.

[3] Arbel, A., Venturing into new technological markets, Math Modeling, Vol. 9. No. 3-5, 1987.

[4] Bahmani, N. & Blumberg, H., Consumer preference and reactive adaptation to a corporate solution of the over-the-counter medication dilemma - an AHP analysis, Math Modeling, Vol. 9. No. 3-5, 1987.

[5] Bahmani, N., Javalgi, G. & Blumberg, H., An application of the analytical hierarchy process for a consumer choice problem, Dev. Mktg Sci. IX., 1986.

[6] Balakrishnan et al., Manufacturing in the Digital Age: Exploiting Information Technologies for Product Realization, *Information Systems Frontier*, Vol. 1, 1999, pp. 25-50.

[7] Bambury, A Taxonomy of Internet Commerce, F*irstmonday*. Available: http://www.firstmonday.dk/issues/issue3_10/bambury/index.html., 1998.

[8] Barney, Firm Resources and Sustained Competitive Advantage, *Journal of Management*, Vol. 17, 1991.

[9] Bartlett and Ghoshal, *Managing Across Borders*, Harvard Business School Press, Boston, MA., 1989.

[10] Benjamin and Wigand, Electronic Markets and Virtual Value Chains on the Information Superhighway, *Sloan Management Review*, 42, 1995, pp. 62-72.

[11] Berryman et al., Electronic commerce: Three Emerging

Strategies, *The McKinsey Quarterly*, 1, 1998.

[12] Cheng, C.H., Yang, K.L. & Hwang, C.L., Evaluating attack helicopters by AHP based on linguistic variable weight, European Journal of Operational Research 1999, p. 116.

[13] Dierickx and Cool, Asset Stock Accumulation and Sustainability of Competitive Advantage: Comment, *Management Science*, Vol. 35, Issue, 12, 1989, pp. 1504-1512.

[14] Doz and Hamel, *Alliance Advantage*, Harvard Business School Press, Boston, MA, 1998.

[15] Dutta and Segev, Business Transformation on the Internet, *European Management Journal*, 17, 1999.

[16] Dyer and Singh, The Relational View: Cooperative Strategy and Sources of Interorganizational Competitive Advantage, *Academy of Management Review*, 23, 1998, pp. 660-679.

[17] Dyer, Effective Interfirm Collaboration: How Firms Minimize Transaction Costs and Maximize Transaction Value, *Strategic Management Journal*, 18, 1997, pp. 535-556.

[18] Ethiraj et al., *The impact of Internet and Electronic Technologies on Firms and Its Implications for Competitive Advantage*, Working Paper, Wharton School, University of Pennsylvania, 2000.

[19] Evans and Wurster, *Blown to Bits: How the New Economics of Information Transforms Strategy*, Harvard Business School Press, Boston, MA, 1999.

[20] Figueiredo, Finding Sustainable Profitability in Electronic Commerce, *Sloan Management Review*, Summer 2000, pp. 41-52.

[21] Ghosh, Making Business Sense of the Internet, *Harvard Business Review*, March-April 1998, pp. 127-135.

[22] Green, Throw Out Your Old Business Model, *Business Week*, 3621, March 1999, pp. EB22-EB23.

[23] Hagel and Armstrong, *Net Gain: Expanding Markets through Virtual Communities*, Harvard Business School Press, Boston, MA, 1997.

[24] Hamel, Competition for Competence and Inter-partner Learning within International Strategic Alliances, *Strategic Management Journal*, Vol. 12, Winter Special Issue, 1991, pp. 83-104.

[25] Harrigan, *Strategic flexibility*, Lexington, MA: Lexington Books, 1985.

[26] Hill and Hellriegel, Critical Contingencies in Joint Venture Management: Some Lessons from Managers, *Organization Science*, Vol. 5, 1994, pp. 594-607.

[27] Jarvenpaa and Tiller, Integrating Market, Technology and Policy Opportunities in e-Business Strategy, *Journal of Strategic Information Systems*, Vol. 8, 1999, pp. 235-249.

[28] Jung, H.W. & Choi, B. J., Optimization models for quality and cost of modular software systems, European Journal of Operational Research 1999, p. 112.

[29] Lee, M., Pham, H. & Zhang, X., A methodology for priority setting with application to software development process, European Journal of Operational Research 1999, p. 118.

[30] Milgrom and Roberts, The Economics of Modern Manufacturing: Technology, Strategy, and Organization, *American Economics Review*, Vol, 80, No. 3, 1990, pp. 511-28.

[31] Oliver, Sustainable Competitive Advantage: Combining Institutional and Resource-based Views, *Strategic Management Journal*, Vol. 18, No. 9, 1997, pp. 697-713.

[32] Ossadnik, W. & Lange, O., AHP-based evaluation of AHP-Software, European Journal of Operational Research, 1999, p. 118.

[33] Peteraf, The Cornerstones of Competitive Advantage: A Resource-based View, *Strategic Management Journal*, Vol. 14, 1993, pp. 179-191.

[34] Porter, *Competitive Advantage: Creating and Sustaining Superior Performance*, Free Press, New York, NY., 1985.

[35] Prahalad and Ramaswamy, Co-opting Customer Competence, *Harvard Business Review*, Vol. 78, 2000.

[36] Rappa, Business models on the web. Available: http://www.ecommerce.ncsu.edu/business_models.html, August 2000.

[37] Rayport, The Truth about Internet Business Models, *Strategy+Business*, Third Quarter Vol. 16, 1999, pp. 1-3.

[38] Saaty and Vargas, *The Logic of Priorities*, Kluwer-Nijhoff Publishing, London, 1982.

[39] Saaty, *Decision Making for Leaders: The Analytic Hierarchy Process for Decisions in a Complex World*, RWS Publications, Pittsburgh, PA., 1986.

[40] Saaty, How to Make a Decision: The Analytic Hierarchy Process, European Journal of Operational Research, 48, 1990, pp. 9-26.

[41] Saaty, T. L. & Vargas, L.G., The Logic of Priorities, Kluwer-Nijhoff Publishing, London, 1982.

[42] Sampler, Redefining Industry Structure for the Information Age, *Strategic Management Journal*, Vol. 19, 1998, pp. 343-355.

[43] Sandberg, Strategic Management's Potential Contributions to a Theory of Entrepreneurship, *Entrepreneurship Theory and Practice*, Vol. 16, No. 3, 1992, pp. 73-90.

[44] Saxenian, *Regional Advantage*, Cambridge, MA: Harvard University Press, 1994.

[45] Shan et al., Interfirm Cooperation and Startup Innovation in the Biotechnology Industry, Strategic Management Journal, 15, 1994, pp. 387-394.

[46] Shapiro and Varian, *Information Rules: A Strategic Guide to the Network Economy*, Harvard Business School Press, Boston, MA, 1999.

[47] Teece, Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy, *Research Policy*, Vol. 15, No. 6, 1986, pp. 285-305.

[48] Timmers, Business Models for Electronic Markets, *Electronic Markets*, Vol. 8, 1998, pp. 3-8.

[49] Vachnadze, R.G. & Markozashvili, N.I., Some applications of the AHP, Math Modeling, Vol. 9. No. 3-5, 1987.

[50] Venkatraman and Henderson, Real Strategies for Virtual Organizing, *Sloan Management Review*, Vol. 40, Fall 1998, pp. 33-48.

[51] Wernerfelt, A Resource-based View of the Firm, Strategic Management Journal, Vol. 5, 1984, pp. 171-180.

[52] Wilder, E-Business: What's the Model?, *PlanetIT.com*. Available: http://www.planetIT.com/docs/PIT19990808S0007, July 1999.

[53] Wind, Y. & Saaty, T. L., Marketing applications of the analytic hierarchy process, Mgmt Sci., 1980.

[54] Yang, Y. S., The Business Models of Electronic Commerce and the Trends of Electronic Commerce in the United States, Samsung Economic Research Institute, 2000.

[55] Zott et al., Strategies for Value Creation in e-Commerce: Best Practice in Europe, *European Management Journal*, Vol. 18, No. 5, 2000, pp. 463-475.

Appendices

Table 1. The Analyzing Process of AHP

Step 1.	Problems should be defined exactly and then requirements of problems are clarified.
Step 2.	A Hierarchical structure is consisted of from goal of problems, evaluation criteria, to comparison of alternatives considering all elements related to the problems.
Step 3.	A relative importance about all evaluation criteria is marked and a comparative matrix is made out after executing pairwise comparison between evaluation criteria.
Step 4.	The consistency level(C.R.) is calculated to check matrix consistency after finding out the relative estimate weights (W) of all evaluation criteria. If C.R. exceeds 10%, the results of pairwise comparison should be reexamined.
Step 5.	The process of step 3 and step are repeated toward all evaluation criteria included the hierarchical structure made in step 2.
Step 6.	The relative estimates of alternatives calculated by each evaluation criterion are added by each alternative. It is that relative weight between the alternatives that considered all evaluation criteria generally.
Step 7.	The alternative that got most a lot of scores is selected after comparing an evaluation score of each alternative that calculated in step 6.
Step 8.	If C.R. of all evaluation results exceeds 10%, You must examine whether a mistake was with configuration of hierarchical structure of problems in the beginning or consistency lack on comparative judgment.
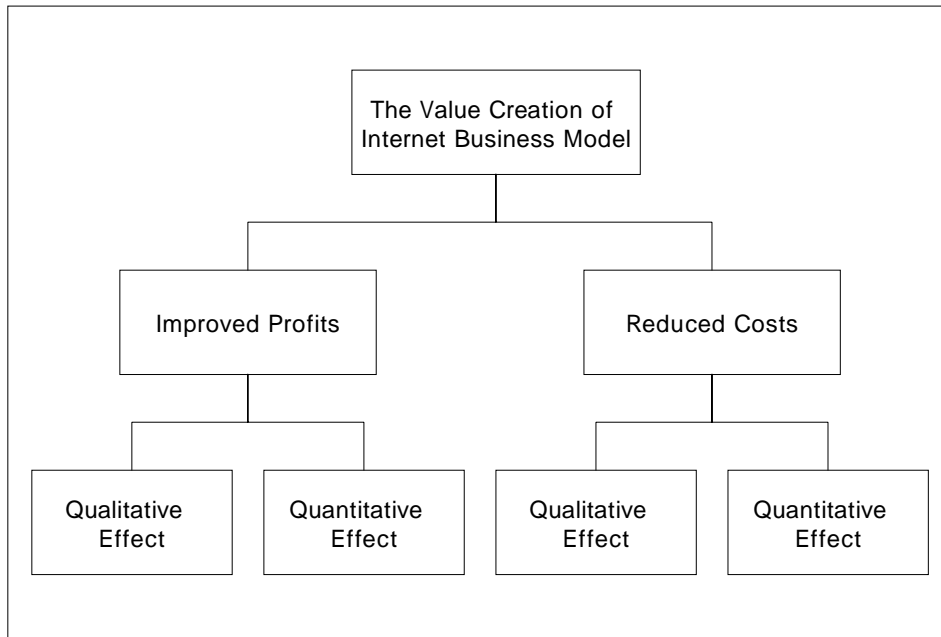
Figure 1. The Framework of Development of Evaluation Indexes

Improved Profits	Qualitative Effect	Complementarities	Complementarity Between Products/Services
			Complementarity Between Technologies
			Complementarity Between Online and Offline
			Providing Indirect Complementary Goods
		Lock-in	The Degree of Customization of Products/Services/Information
			Providing Loyalty Programs
			Potential Network Effect
			Intellectual Properties
			Providing Trust Services
		Novelty	Capturing Potential Needs of Customers
			Developing New Markets
			New Elements/Introduction Ways
	Quantitative Effect	Potential Customers	The Number of Potential Customers
			The Intensity of Potential Customers' Needs
			The Frequency of Potential Customers' Needs
		Marginal Revenue	
Reduced Costs	Qualitative Effect	Transactional Efficiency	Reorganization of Supply Chain
			The Scope of Selection of Products for Customers
			The Information Balance Between Buyers and Sellers
			The Convenience of Transaction Process
			The Degree of Economy of Scale
		Marginal Productivity	Securing Cost of Resources
			Processing Cost of Resources
			Distributing Cost of Resources
		Reusability	Contents
			Forms
	Quantitative Effect		Labor Cost
			Contents Developing Cost
			Operating Cost
			Marketing/Selling Cost

Figure 2. The Analysis Hierarchy

Table 2. The Importance of Evaluation Indexes

Level 1	Level 2	Level 3	Level 4
Improved Profits **0.808**	Qualitative Effect **0.617**	Complementarities **0.177**	Complementarity Between Products/Services **0.030**
			Complementarity Between Technologies **0.032**
			Complementarity Between Online and Offline **0.105**
			Providing Indirect Complementary Goods **0.010**
		Lock-in **0.101**	The Degree of Customization of Products/Services/Information **0.032**
			Providing Loyalty Program **0.017**
			Potential Network Effect **0.013**
			Intellectual Properties **0.013**
			Providing Trust Services **0.025**
		Novelty **0.339**	Capturing Potential Needs of Customers **0.115**
			Developing New Markets **0.124**
			New Elements/Introduction Ways **0.100**
	Quantitative Effect **0.191**	Potential Customers **0.085**	The Number of Potential Customers **0.036**
			The Intensity of Potential Customers' Needs **0.012**
			The Frequency of Potential Customers' Needs **0.036**
		Marginal Revenue **0.106**	
Reduced Costs **0.192**	Qualitative Effect **0.139**	Transactional Efficiency **0.099**	Reorganization of Supply Chain **0.013**
			The Scope of Selection on Products of Customers **0.020**
			The Information Balance Between Buyers and Sellers **0.028**
			The Convenience of Transaction Process **0.030**
			The Degree of Economy of Scale **0.008**
		Marginal Productivity **0.019**	Securing Cost of Resources **0.012**
			Processing Cost of Resources **0.005**
			Distributing Cost of Resources **0.002**
		Reusability **0.021**	Contents **0.018**
			Forms **0.003**
	Quantitative Effect **0.053**	Labor Cost **0.009**	
		Contents Development Cost **0.009**	
		Operating Cost **0.007**	
		Marketing/Selling Cost **0.029**	

Table 3. The Consistency Index and the Importance of Evaluation Indexes

OVERALL CONSISTENCY INDEX = 2%	
Developing New Markets	0.124
Capturing Potential Needs of Customers	0.115
Marginal Revenue	0.106
Complementarity Between Online and Offline	0.105
New Elements/Introduction Ways	0.100
The Number of Potential Customers	0.036
The Frequency of Potential Customers' Needs	0.036
Complementarity Between Technologies	0.032
The Degree of Customization of Products/Services/Information	0.032
Complementarity Between Products/ Services	0.030
The Convenience of Transaction Process	0.030
Marketing/Selling Cost	0.029
The Information Balance Between Buyers and Sellers	0.028
Providing Trust Services	0.025
The Scope of Selection of Products for Customers	0.020
Contents	0.018
Providing Loyalty Programs	0.017
Potential Network Effect	0.013
Intellectual Properties	0.013
Reorganization of Supply Chain	0.013
The Intensity of Potential Customers' Needs	0.012
Securing Cost of Resources	0.012
Providing Indirect Complementary Goods	0.010
Contents Developing Cost	0.009
Labor Cost	0.009
The Degree of Economy of Scale	0.008
Operating Cost	0.007
Processing Cost of Resources	0.005
Forms	0.003
Distributing Cost of Resources	0.002