Management Review:
An International Journal

**Management Review: An International Journal
Volume 1, Number 1, December 30, 2006
ISSN: 1975-8480**

**Sang Hyung Ahn
Editor-In-Chief
Seoul National University**

Table of Contents

Technical Limitation Factors of Knowledge Management Systems and a New Approach

Jaehun Joo
Department of Electronic Commerce
Dongguk University
Gyeongju 780-714, South Korea
Email: givej@dongguk.ac.kr

Sang M. Lee
Department of Management
University of Nebraska-Lincoln
Lincoln, NE 68588-0491, USA
Email: slee1@unl.edu

ABSTRACT

The purpose of this study is to analyze the limitations of current KM (knowledge management) systems and to propose an approach for applying the Semantic Web to KM. We analyze the factors that affect KM system user dissatisfaction through a survey. We chose a sample of five firms that had used KM systems for more than one year. A total of 222 questionnaires were used for statistical analysis. Finally, we suggested methods applying the Semantic Web to KM as an alternative overcoming the limitations of the current KM systems.

Keywords: Knowledge Management, Semantic Web, Survey Study

INTRODUCTION

Many organizations design and use KM systems as specialized

information systems into which various technologies are integrated. KM systems help organizations increase their effectiveness and competitiveness. However, there are some limitations in maximizing the objectives of KM due to limited ability for semantic integration.

The purpose of this study is to discuss the limitations of current KM systems and to propose an approach for applying the Semantic Web to KM. First, we analyze the factors that affect KM system user dissatisfaction through a survey. Second, we suggest the Semantic Web as a new approach for KM.

RESEARCH DESIGN

Even though business value often originates from the KM system, it does not always improve organizational performance, as a lag or discrepancy exists between innovation and performance (Damanpour and Evan, 1984). This indicates possible barriers or limitation factors between the KM system and business values. In this paper, we classify barriers into two types: technological factors and social/cultural factors including people as described in Benbya et al. (2004).

Limitation Factors in System Quality

•Time/Space
•Inconvenience
•Knowledge Search
•Knowledge Integration

Limitation Factors in Knowledge Quality

•Incongruence/
 Incompleteness
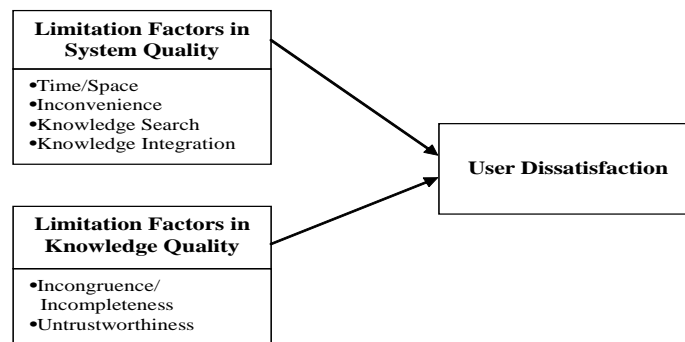•Untrustworthiness

User Dissatisfaction

Figure1. Research Model

In this paper, we focus on analyzing the technological limitations, rather than social and cultural limitations, of the KM system. We propose the research model shown in Figure 1 by considering the characteristics of the KM system and also by referring to DeLone and McLean's IS success model (Delone and McLean, 1992). We apply the reverse perspective of DeLone and McLean's IS success model (Delone and McLean, 1992). DeLone and McLean proposed system quality and information quality as important factors that affect user satisfaction and organizational performance.

Table 1 provides the definition of the limitation factors listed in Figure 1, and indicates the number of items used to measure each factor.

We derived six research questions from the research model. We were unable to find studies on the relationship between limitation factors in the KM system and user dissatisfaction. Therefore, we use research questions rather than hypotheses.

Q1: Do the limitations of system quality have a positive impact on user dissatisfaction with the KM system?

 Q1a: Does the limitation of time and space in the KM system have a positive impact on the dissatisfaction with the KM system?

 Q1b: Does the inconvenience of the KM system have a positive impact on user dissatisfaction with the KM system?

 Q1c: Does the limitation of knowledge search have a positive impact on user dissatisfaction with the KM system?

 Q1d: Does the limitation of knowledge integration have a positive impact on user dissatisfaction with the KM system?

Table 1. Definition of KM Systems Limitation Factors

Factors and Dissatisfaction		Definition	No. of Items
Limitation Factors of System Quality	Time and Space	Time and space limitation in the KM system use and limitation of access methods	3
	Inconvenience	Degree of inconvenience of the KM system use resulting from slow response and instability	3
	Knowledge Search	Limitations of keyword-based search as well as limited knowledge categorization	6
	Knowledge Integration	Limitations in integration of heterogeneous systems as knowledge resources and integration of the existing KM system with Web resources	3
Limitation Factors of Knowledge Quality	Incongruence and Incompleteness of Knowledge	Degree of incongruence or incompleteness of knowledge offered by the KM system	8
	Untrustworthiness of Knowledge	Degree of inaccuracy and untrustworthiness of knowledge offered by the KM system	6
User Dissatisfaction		Degree of overall dissatisfaction with KM system use	1

Q2: Do the limitations of knowledge quality have a positive impact on user dissatisfaction with the KM system?
Q2a: Do incongruence and incompleteness of knowledge

provided by the KM system have a positive impact on user dissatisfaction with KM system?

Q2b: Does untrustworthiness of knowledge provided by the KM system have a positive impact on user dissatisfaction with the KM system?

ANALYSIS

We interviewed four managers from two firms that have adopted and used KM systems for two or more years to pretest the survey questionnaire. The primary goal of the pretest was to check content validity and proper wording of the questionnaire. We revised a few question items for clarity and made some changes in the sequence of questions based on the pretest.

We investigated KM system solutions produced by Korean corporations. Two products 'A-wave' and 'K-wave' have been pervasively used in Korea. Thus, we selected these two products as typical KM system solutions for our questionnaire survey. We chose a sample of five firms that had used the products for more than one year. Representatives of KM teams in the five firms accepted our request for support in conducting our survey. Two hundred fifty six respondents from the five firms returned the questionnaire. However, 34 incomplete or invalid responses were discarded, because of their incompleteness or incredibility which means sequential same responses for more than seven questions. A total of 222 questionnaires were used for statistical analysis. We conducted an exploratory factor analysis and verified six factors as shown in Table 2. Cronbach's α was used to test internal consistency. The measures are acceptable as all α values exceed 0.69 (Nunnally, 1978).

Table 2. Results of Factor Analysis and Reliability Analysis

Limitation Factor[1]	Item[2]	FL[3]	α [4]
Time/Space Limitation	I should use the KM system only at limited time.	.760	.7265
	I should use the KM system only at limited locations.	.808	
	I have some limitations to access in the KM system through various access points such as mobile devices, PDA, and Internet.	.750	
Inconvenience	I think the KM system is unstable due to malfunctions or system errors.	.788	.7134
	I think the response time of the KM system is slow.	.663	
	I think it is not easy to use the KM system.	.631	
Knowledge Search Limitation	I think it is difficult to find knowledge that I need in the KM system.	.677	.8874
	I think the classification scheme for knowledge is not organized well in the KM system.	.629	
	I think the KM system provides irrelevant knowledge as search results.	.674	
	I think the KM system provides redundant or unnecessary knowledge as search results.	.716	
	I have some difficulties in finding knowledge suitable to my requirements from the KM system with only partial prior knowledge.	.717	
	I cannot find relevant knowledge when I use the keyword search method with synonyms.	.689	
Knowledge Integration Limitation	The KM system is not integrated with other information systems such as groupware and electronic document management systems.	.728	.6980
	I have some difficulties in aggregating and integrating knowledge from disparate information systems.	.599	
	I have some difficulties in integrating knowledge from internal systems with that of the Web.	.698	

9

Incongruence and Incompleteness of Knowledge	I think the KM system contains the knowledge irrelevant to my tasks.	.660	.8599
	I think knowledge provided by the KM system does not help me do my tasks.	.446	
	I think knowledge provided by the KM system cannot directly be applied to my job.	.485	
	I think knowledge provided by the KM system is redundant.	.607	
	I think knowledge provided by the KM system is neither comprehensive nor complete enough.	.589	
	I think knowledge provided by the KM system is too abstract.	.586	
	I think knowledge provided by the KM system is not comprehensive enough as much as it supports ad hoc decision making problems.	.421	
	I think knowledge provided by the KM system is valuable only to a certain group of employees.	.529	
Untrust Worthiness of Knowledge	I think knowledge provided by the KM system is inaccurate.	.547	.8481
	I think knowledge provided by the KM system is quite different from business practices.	.664	
	I think knowledge provided by the KM system is not verified through practical business activities.	.606	
	I cannot trust people who provide knowledge to the KM system.	.639	
	I think knowledge provided by the KM system is not verified as trustworthy.	.667	
	I think knowledge provided by the KM system is not reliable.	.782	

1) Method for factor extraction: principal component. Rotation method: Varimax with Kaiser normalization

2) All items of questionnaire are on a scale of 1 to 5, where 1 = don't agree at all, 2 = agree very little, 3 = somewhat agree, 4 = agree very much, and 5 = completely agree.

3) Factor Loading

4) Cronbach's Alpha

Multiple regression analysis is used to test research questions as shown in Table 3. User dissatisfaction is the dependent variable for research questions Q1 and Q2.

TABLE 3. Results of Regression Analysis

Dependent Variable	Independent Variables	Mean	SD	t-value	Sig.	TL[2]	Result
UD[1]	Time/Space Limitation	3.05	0.026	0.465	0.642	1.00	Non AFF[3]
	Inconvenience	2.31	0.139	2.444	0.015	1.00	AFF
	Search Limitation	2.61	0.248	4.371	0.000	1.00	AFF
	Integration Limitation	2.80	0.206	3.627	0.000	1.00	AFF
	Incongruence and Incompleteness	2.64	0.245	4.309	0.000	1.00	AFF
	Untrustworthiness	2.39	0.390	6.866	0.000	1.00	AFF

R^2 = 0.336, Adjusted R^2 = 0.316, F = 17.360, Significance: 0.000

1) User Dissatisfaction

2) Tolerance Limit

3) Affirmative

Table 3 shows the results of multiple regression analysis. The regression model is significant at the p   0.001 level. Six limitation factors of the model explained 31.6% of user dissatisfaction with the KM system. All research questions, except Q1a, have significant affirmative answers. The limitation factors for system quality, such as inconvenience, search and integration, positively affect user dissatisfaction with the KM system. The limitation factors of knowledge quality such as incongruence/incompleteness and untrustworthiness also increase user dissatisfaction at significant level 0.001.

THE SEMANTIC WEB AS A NEW APPROACH

The findings of the empirical analysis presented in the previous section suggest that the limitation factors of the KM system are related to system quality and knowledge quality. The limitation factors of system quality are mainly related to technology itself while the limitation factors of knowledge quality are related to people and culture (Benbya et al., 2004). We define the Semantic Web as an innovative technology playing a critical role in overcoming the limitations of system quality.

• Overcoming the Search Limitation: The Semantic Web enables us to overcome the barriers to knowledge retrieval in the current KM system. All resources in the Semantic Web are represented in RDF (Resource Description Framework) as metadata and this representation method makes it possible for users to query and get answers as if they are using database management systems. The Semantic Web also supports RDFS (RDF Schema) and ontology which enables semantic analysis on vocabularies contained in query and domains as well as syntactic analysis. Internal or external documents of organizations and Web resources can be represented as a resource in RDF. A resource of RDF, a knowledge object, can be searched with an independent knowledge unit as a user searches a document in document management systems. Furthermore, a specific part or sentence of a Web page or a part of a document may be represented as a knowledge object. This capability allows the Semantic Web-driven KM system to search for a knowledge object unit rather than a document unit.

• Overcoming the Integration Limitation: In the integration approach based on the Semantic Web, the software agents understand the meanings of the terms and automatically process

them by exploiting the RDF and ontologies. Since W3C adopted XML (eXtensible Markup Language) as the Web document standard, XML is widely used to ensure interoperability among heterogeneous systems. The Semantic Web, RDF, RDFS, and OWL (Web Ontology Language) follow XML-based syntax. In the Semantic Web, a software agent can access heterogeneous systems and provide knowledge and information suitable to users. The Semantic Web enables software agents to extract some parts of the related knowledge from different resources and to automatically aggregate them without the user's intervention

・Overcoming Inconvenience: When the Semantic Web is combined with ubiquitous computing (Chen and Finin, 2004), users can access KM systems anytime and anywhere conveniently. The Semantic Web-driven KM systems with the support of peer-to peer (P2P) technology (Davies et al., 2003) can improve personalized KM services. Therefore, the Semantic Web enables the current KM system to overcome limitations such as time/space and inconvenience through a combination of ubiquitous networks and P2P technology.

We identified the potential of the Semantic Web overcoming limitations of the current KM system. How do organizations adopt the Semantic Web to achieve an efficient and effective global KM by supporting KM systems? The challenge is to offer adoption strategies of the Semantic Web to organizations. We identify four types of organizations classified by their diffusion capability and control capability of technology push. Diffusion capability refers to an organization's ability to recognize capabilities of the Semantic Web, then adopt, assimilate and apply it quickly to improve KM performance. Control capability of technology push refers to an organization's ability to manage and coordinate the gap between technology push and demand pull, and to reflect

requirements of the business domain to technology in the stage of its development or earlier stage of its introduction. Four types of organizations are classified by the diffusion capability and the capability controlling technology push as follows:

Type I: Stationary Organizations, where both levels are low.
Type II: Aggressive First Movers, where diffusion capability is high, but control capability is low.
Type III: Alchemists, where control capability is high, but diffusion capability is low.
Type IV: Balanced Innovators, where both level are high.

According to Cohen and Levinthal (1990), absorptive capacity is the ability of a firm to recognize the value of new, external information, assimilate and apply it to commercial ends capabilities. This capacity is critical to innovative capabilities of organizations. We defined diffusion capability similarly to absorptive capacity. However, diffusion capability not only considers diffusion speed, but also technology developed within the organization as well as things acquired from external sources.

Technology push is an important force in diffusion of innovations. It results from ideas or capabilities that are developed in the absence of a customer's specific needs (Fichman, 1992; Munro and Noori, 1988). Technology push itself can trigger hardly organization change through technology innovation and it also faces various barriers or limitations. To realize the potential of the Semantic Web in KM with minimum barriers, it is necessary for organizations to possess the capability for coordinating or controlling technology development to reflect user groups' needs or requirements. One way to get such capability is to facilitate interactions and collaboration between technology development groups and user groups.

CONCLUSION

The results of the empirical analysis indicated that there indeed exist limitation factors in system quality and knowledge quality in the current KM systems. Inconvenience, search and integration are statistically significant limitation factors for system quality. On the other hand, incongruence and untrustworthiness of knowledge are significant limitation factors for knowledge quality.

The Semantic Web provides organizations adopting it with the potentials overcoming search limitation, integration limitation, and inconvenience. There are four types of organizations adopting the Semantic Web. Although the type IV of the balanced innovators is ideal, we recommend the type III of alchemists, where the capability controlling technology push is high, but the diffusion capability is low. This means that organizations need to posses the capability controlling technology push by reflecting their business requirements in the stage of its development as well as the absorptive capability.
 One major limitation of this study is that we must further test the effectiveness of our classification model. This is the topic of the authors' future research.

REFERENCES

Benbya, H., Passiante, G., and Belbaly, N.A. (2004), Corporate portal: A tool for knowledge management synchronization, *International Journal of Information Management*, 24 (3), 201-220.

Chen, H. and Finin, T. (2004), An ontology for context aware pervasive computing environments, *Knowledge Engineering*, 18(3): 197-207.

Cohen, W. M. and Levinthal, D.A. (1990), Absorptive capacity: A

new perspective on learning and innovation, *Administrative Science Quarterly*, 35(1): 128-152.

Damanpour, F. and Evan, W.M. (1984), Organizational innovation and performance: The problem of organizational lag, *Administrative Science Quarterly*, 29: 392-409.

Davies, N.J., Fensel, D. and Harmelen, F.V. (ed.) (2003), *Toward the Semantic Web: Ontology-Based Knowledge Management*, Hoboken, NJ: John Wiley & Sons.

Delone, W.H. and McLean, E.R. (1992), Information system success: The quest for the dependent variable, *Information Systems Research*, 3(1): 60-95.

Fichman, R.G. (1992), Information technology diffusion: A review of empirical research, *Proceedings of Thirteenth International Conference on Information Systems*, Dallas, 195-206.

Munro, H. and Noori, H. (1988), Measuring commitment to new manufacturing technology: Integrating technological push and marketing pull concepts, *IEEE Transactions on Engineering Management,* 35(2): 63-70.

Nunnally, J.C. (1978). *Psychometric Theory*, New York: McGraw-Hill.

Strategic Supply Chain for Global Customer Relationship in e-Business Management

Chang Won Lee
Jinju National University
Jinju 660-758, Korea
Email: cwlee@jinju.ac.kr

ABSTRACT

Supply chain and customer management for e-integration process has recently received a great deal of attention due to the strategic importance in business entities. A behavioral model is developed that considers several alternatives to expand existing e-business logistic management, or to construct new production-marketing collaboration. Survey study conducts for identifying characteristics of SCM and CRM. This study identifies 1) SERVQUAL dimensions with four outcome variables: purchasing intention, commitment, transition intention, and loyalty for CRM, and 2) five SCM performance measurement: cost, lead-time, feedback, inventory, and reliability performance. The results suggest that management can achieve strategic gains in CRM along with a significant competitiveness of SCM.

Keywords: Supply Chain Management, Customer Relationship Management, Survey Study, Business Performance

INTRODUCTION

High competition in e-business industry has emphasized the need for a linkage between SCM and CRM to facilitate information

flow of inbound level and outbound level. Both end-user (i.e., B2C) and industrial buyer-seller (i.e., B2B) relationships are very complex and complicated (Davis, 1993; Geoffrion and Powers 1995; Li, et al., 2006). Thus, a joint sharing of knowledge, cost savings, supplier relationship, and other strategic alliances are essential. It is important to find a good balance between good customer satisfaction and supply chain efficiency and effectiveness (Beamon, 1999; Cachon, 1999). Thus, the purpose of this paper is to identifying determinants affecting supply chain performance in terms of SCM-CRM linkage. Specifically, this study addresses an empirical study that 1) identifying determinants affecting supply chain performance, and 2) providing an insight for planning strategic supplier-customer linkages. This study performs to implement total planning process of an e-business industry pertinent to strategic SCM planning. Conceptualization and operationalization are established for three independent variables and five dependent variables for developing SCM performance measurement.

BACKGROUND

The need to better understanding supplier or customer behavior is to the interest of many managers focused on those two stakeholders who can deliver long-term profits to the organization. Traditionally, marketers of suppliers and customers have recognized to acquire either new or current competitor's partners. This has required massive advertisement and price-oriented promotions to suppliers, customers, logistics members, and distributors. For the best suppliers and customers, the paradigm of conversation has shifted from acquisition to retention in terms of supplier chain and customer relationship (Holmberg, 2000; Krajewski, et al., 2005; Lee, et al., 1997). This requires a different paradigm and a different and new approach.

The concept of supply chains, SCM has been defined as an integrated subject for information flow and materials flow among different facilities, supplies, customers, and logistics levels. (Forrester, 1961; Mason-Jones and Towill, 1997; Kwon and Suh 2004). Five business functions in SCM have been identified as sourcing, inbound logistics, operations, outbound logistics, and after-market services. The concept of after-market services in SCM is closely related to CRM (Gopal and Cahill, 1992; Shah and Ram, 2006).

Global customer relationship management is concerned with planning, implementing, and evaluating successful relationships between service providers and service recipients. A problem is that SCM and CRM mean different definition to different people. CRM has been defined in numerous ways (Gronroos, 1995; Morgan and Hunt, 1994; and Rigby et al, 2002).   For some perspectives, CRM means direct e-mail mails. For others, it is mass customization or developing products that meet individual customer's needs. For IT perspectives, it translates into complicated technical concept related to such as OLAP (online analytical processing) and CIC (customer interaction centers).

CRM is not only focusing on inbound-level customer relationship but also on outbound-level customer relationship in SCM.   This function focuses on service center location, service fleet, data mining, and knowledge management. Reichheld (1996) demonstrated the impetus for the interest in CRM and addressed dramatic increase in profits from small increases in customer retention rates. The essence of the information technology revolution and the web environment is the opportunity afforded organizations to select how they interact with their customers. The e-business allows organizations to build better relationships with customers than has been previously possible in the offline business.

By combining the abilities to respond directly to supplier or customer requests and to provide the supplier or customer with a highly interactive, customized experience, organizations have a greater ability today to establish, nurture, and sustain long-term supplier and customer management than ever before. These e-business capabilities complement human resources interactions provided through customer representatives and call centers. Likewise, organizations can select to exploit the low cost of e-business supplier or customer service to reduce their service costs and offer lower-quality service by allowing only electronic contact. The flexibility of e-business interactions allows organizations to select to whom they wish to offer services and at what quality level.

METHODOLOGY

A survey instrument is designed based on the constructs based on the research model. Respondents are asked to indicate the performance of their firm compared to that of their competitors, the level of interaction with suppliers, the extent to which they used the internal process for business process innovation, and the level of relationship with customers. Questions are designed using a seven point Likert scale. Questions about general classification and demographic information on the company are administrated. The survey instrument is pre-tested at meetings with managers/directors at certain numbers of companies. The questionnaire is modified to improve clarity. A series of meeting with experts is followed to measure the content validity and reliability of the instrument. Then, preliminary test is completed with the survey questionnaires.

The survey are sent to individuals identified from Korea Small and Medium Business Administration (Korean SMBA) list of executive officers, directors, presidents, or vise presidents. 660

questionnaires are distributed by email, fax, and visits. Two mailings, two follow-up calls, and a visit are resulted in 284 responses (47.3%). Among them, 192 are considered as valid.

In order to identify CRM characteristics, SERVQUAL model has been adopted. Service quality could be measured by the difference between expectations and perceptions of service quality (Parasuraman, 1985; Zeithaml et al., 1988). A similar approach has been undertaken into the SCM characterization in e-business industry. The survey model with Likert's five point scale is allowed to justifying supply chain environment based on extensive interviews and written surveys. The questionnaire was administered to 192 companies asking about supplier linkage, customer linkage, and internal process linkage an terms of inbound and outbound collaboration.

These 192 represents numbers of related companies those who are currently performing supply chain systems in their companies with e-business transactions. These individuals represented firms operated in a broad range of industries as follows: apparel (n=48, 25%), electronics (n=38, 19.5%), retail distribution (n=36, 18.5%), and wholesale distribution (n=70, 37%).

RESULTS

Developed is a SERVQUAL questionnaire, a multiple-item scale encompassing the five dimensions of service quality, namely tangibles, reliability, responsiveness, empathy, and assurance. Of particular interest were the findings of their other study that internal communication and coordination was a prerequisite for consistent communication to external customers (Parasuraman et al, 1991).

The SERVQUAL model can be transferable to an organization's internal environment based on extensive interviews and written surveys in e-business industry. The questionnaire was administered to 102 e-business customers. Dimensions of service quality with three different types of customer groups are justified using factor analysis. Table 1 shows five dimensions of SERVQUAL and three different customers groups with appropriate measurement. The results indicate all dimensions are significant to e-business customer types.

Table 1. SERVQUAL Dimensions and Different Types of Customers

Service Quality	Customer Group	Mean	SE	F value	P value
Tangibles	Potential	3.78	.34	7.804	.001
	Regular	3.30	.71		
	Premium	3.84	.52		
Reliability	Potential	3.69	.46	17.217	.000
	Regular	2.95	.71		
	Premium	3.76	.52		
Responsiveness	Potential	3.81	.35	26.663	.000
	Regular	2.83	.70		
	Premium	3.77	.51		
Empathy	Potential	3.75	.43	22.005	.000
	Regular	3.00	.72		
	Premium	3.83	.43		
Assurance	Potential	3.67	.51	27.473	.000
	Regular	2.76	.89		
	Premium	3.81	.43		

Table 2 presents SERVQUAL dimensions with four outcome variables with t and p values. In order to identifying CRM characteristics with respective to four outcome variable in e-business industry, five dimensions of SERVQUAL has been justified with purchasing intention, commitment, transition intention, and loyalty. Since no CRM characteristics have been

explored in terms of SERVQUAL aspect, the results provide a significant implication of finding CRM characteristics in e-business industry in Korea.

Table 2. CRM Characteristics with SERVQUAL Dimensions

CRM outcome variables	Service Quality	λ	SE	t	P <
Purchasing Intention	Tangibles	.096	.129	.430	.457
	Reliability	-.015	-.081	-.081	.936
	Responsiveness	.577	2.525	2.524	.012
	Assurance	.224	1.325	1.325	.185
	Empathy	-.098	-.610	-.610	.542
Commitment	Tangibles	.224	2.169	2.169	.030
	Reliability	-.022	-.150	-.150	.881
	Responsiveness	-.253	-1.385	-1.385	.166
	Assurance	.122	.904	.904	.366
	Empathy	.388	3.020	3.020	.003
Transition Intention	Tangibles	-.390	-3.755	-3.755	.000
	Reliability	.295	2.033	2.033	.042
	Responsiveness	-.603	-3.283	-3.283	.001
	Assurance	.042	.307	.307	.759
	Empathy	-.049	-.379	-.379	.705
Loyalty	Tangibles	-.250	-2.662	-2.662	.008
	Reliability	.227	1.736	1.736	.083
	Responsiveness	-.879	-5.309	-5.309	.000
	Assurance	.635	5.175	5.175	.000
	Empathy	.647	5.540	5.540	.000
χ^2	df	GFI	RMR	NFI	CFI
42.88	6	.915	.018	.945	.951

Table 3 shows the related results by factor analysis and reliability with appropriate measurement. Table 3 presents results of factor analysis for identifying SCM characteristics with its outcome variables in e-business industry.

Table 3. SCM Characteristics and Performances

Item	TRAN	LEAD	SPEE	FLEX	RELI
Total logistics cost	**.791**	.290	.233	.182	.205
Per logistics cost	**.776**	.108	.290	.341	.121
Sales/logistics cost	**.764**	.203	.235	.254	.267
Inbound cost	**.738**	.363	.291	.056	.249
Outbound cost	**.628**	.384	.174	.360	.267
Warehouse cost	**.590**	.441	.075	.243	.375
Delivery	.306	**.762**	.233	.252	.201
Supplemental delivery	.367	**.704**	.289	.221	.161
Order fulfillment	.241	**.648**	.365	.279	.288
Customer feedback	.233	.185	**.793**	.287	.176
Cycle time	.283	.258	**.716**	.173	.279
Salesman feedback	.286	.342	**.657**	.160	.339
Inventory ROR	.255	.227	.254	**.813**	.224
Product obsoleteness	.340	.269	.304	**.656**	.306
Inventory Maintenance	.306	.427	.180	**.593**	.310
Claim	.263	.249	.349	.312	**.717**
Damage amounts	.340	.248	.304	.267	**.713**
Product Return	.390	.250	.390	.306	**.607**
Eigenvalue	4.212	2.816	2.715	2.438	2.406
Variances	23.4	15.6	15.1	13.5	13.4
Cronbach α	.938	.878	.865	.885	.913

TRAN: Transportation Cost
LEAD: Lead-time
SPEE: Speed
FLEX: Flexibility
RELI: Reliability

Before identifying SCM performance (five performance measures),
Cronbach's alpha is used to assess the reliability of each scale. For
each of the item scales, factor analysis is used to reduce the total
number of items to a smaller number of underlying factors.
Principal components analysis is used to extract factors with

more than 1 of eigen values. Varimax rotation is use to facilitate interpretation of the factor matrix. Sampling adequacy measurement tests are examined to validate the use of factor analysis. Values of alpha over 0.7 indicate that all scales can be considered to be reliable.

CONCLUSIONS

E-business operations makes firms unprecedented opportunity in improving business performance. Few studies explored SCM collaboration and performance along with e-business contexts. This study addresses an empirical study of Korean corporations that identifying determinants affecting performance in supply chain and customer management, and providing an insight for planning strategic supplier-customer collaborations. SERVQUAL dimensions with four outcome variables are identified. Five dimensions of SERVQUAL has been justified. Five dependent variables are developed for SCM performance measurement. Discussed are conceptualization and operationalization of performance measures such as cost, lead-time, feedback, inventory, and reliability performance. This study refines more appropriate model for measuring supplier-customer performance.

REFERENCES

Beamon, M.B. (1999), Measuring Supply Chain Performance, *International Journal of Operations & Production Management*, 19(3): 275-292.

Cachon, G. (1999), Managing Supply Chain Demand Variability with Scheduled Ordering Policies, *Management Science*, 45: 843-856.

Davis, T. (1993), Effective Supply Chain Management, *Sloan*

Management Review, 34(4): 35-46.

Forester, J. (1961), *Industrial Dynamics*, Cambridge, MA: MIT Press.

Gopal, C. and G. Cahill (1992), *Logistics in Manufacturing*, Homewood, IL: Business One Irwin.

Geoffrion, A. and R. Powers (1995), Twenty Years of Strategic Distribution System Design: An Evolutionary Perspective, *Interfaces*, 25(5): 105-127.

Gronroos, C. (1995), Relationship Marketing: The Strategy Continuum, *Academy of Marketing Science*, 23(4): 252-254.

Holmberg, S. (2000), A Systems Perspective on Supply Chain Measurements, *International Journal of Physical Distribution and Logistics Management*, 30(10): 847–868.

Krajewski, L. J.R. Wei, and L.L. Tang (2005), Responding to Schedule Changes in Build-To-Order Supply Chains, *Journal of Operations Management*, 23(5): 452-469.

Kwon, I. W. and T. Suh (2004), Factors affecting the level of trust and commitment in supply chain relationships, *Journal of Supply Chain Management*, 40(2): 4-14.

Lee, H., P. Padnababhan, and S. Whang (1997), Information Distortion in a Supply Chain: The Bullwhip Effect, *Management Science*, 43: 546-558.

Li, S., B. Ragu-Nathan, T.S. Ragu-Nathan and S. S. Rao (2006), The Impact of Supply Chain Management Practices on Competitive Advantage and Organizational Performance, *OMEGA*, 34(2): 107-124

Mason-Jones, R. and D.R. Towill (1997), Information Enrichment Designing the Supply Chain for Competitive Advantage, *Supply Chain Management: An International Journal*, 2(4): 137–148.

Morgan, R.M. and S.D. Hunt (1994), The Commitment-Trust Theory of Relationship Marketing, Journal of Marketing, 58(3): 20.

Parasuraman, A (1995), "Measuring and monitoring service quality", in Glynn, W.J, Barnes, J.G (Eds), *Understanding Services Management*, John Wiley & Sons, New York, NY., .

Parasuraman, A., V.A. Zeithaml and L.L. Berry (1991), Refinement and Reassessment of the SERVQUAL Scale, *Journal of Retailing*, 67(4): 420-450.

Reichheld, F.F. (1996), Learning from Customer Defections, *Harvard Business Review*, 74(2): 56-70.

Rigby, D.K., F.F. Reicheld and P. Schefter (2002), Avoid the four perils of CRM. *Harvard Business Review*, 80(2): 1-8.

Shah, M. and M. Ram (2006), Supplier Diversity and Minority Business Enterprise Development: Case Study Experience of Three US Multinationals, *Supply Chain Management: An International Journal*, 11(1): 75-81.

Vidal, C. J. and M. Goetschalckx (2001), A Global Supply Chain Model with Transfer Pricing and Transportation Cost Allocation, European Journal of Operational Research, (129)1: 134-158.

Zeithaml, V.A., L.L. Berry, and A. Parasuraman (1988), Communication and Control Processes in the Delivery of Service Quality, Journal of Marketing, 52(2): 35-48.

A Conceptual DSS Framework for the Water Quality Control of the Nakdong River Basin: System Analysis and Design

Andrey Kim
Department of Industrial Management
Graduate School of Kumoh National Institute of Technology
Kumi 730-731, Korea

Wang Si
Department of Industrial Management
Graduate School of Kumoh National Institute of Technology
Kumi 730-731, Korea

Hoe-Kyun Shin
Department of Industrial Management
Kumoh National Institute of Technology
Kumi 730-731, Korea
hkshin@kumoh.ac.kr

ABSTRACT

The purpose of this paper is to present the conceptual DSS framework for the strategic planning and decision support. It considers water quality, quantity, and the ecological status of surface. As the basis of this conceptual model were used a list of management objectives, measures, and external scenarios. System diagrams for the catchments and the river network were adopted. They describe the properties, processes, and data influencing the water flow and substance load. The interaction of management objectives, external scenarios of climate, agro-

economic and demographic change, and selected measures to achieve the desired state of good water quantity and quality are investigated

Keywords: Decision Support Systems, Quality Control, System Analysis and Design

INTRODUCTION

The Nakdong River is the second largest river system in South Korea containing a large drainage basin and a long main channel. The flow of the Nakdong River is highly regulated by 4 multi-purpose dams in the major tributaries and an estuary barrage, which were constructed in the mouth of the river to ensure efficient use of water resources. Especially, the lower Nakdong River shows a river-reservoir hybrid type due to the stagnation of water flow during the dry period. Also hypertrophication was occurring within the Nakdong River over eutrophication because of the continuous inflow of raw nutrients from industries that have populated the middle part of the river (Joo et al. 1995). Since 1992, the low supply of water resources and the massive change in the aquatic community have caused cyanobacterial blooms every summer and the flourishing of diatoms during the dry winder period (Lee et al., 2005).

Numerous studies on the management and the status of the water quality in the Nakdong River have been undertaken. Water quality indicators such as oxygen content, heavy metal and persistent chemical concentrations as well as biotic indices have been monitored to track the effects of collapsing industry, sewage treatment improvements, and engineering measures.

Besides the monitoring aspects, geographical databases, simulation models, and experimental results have been collected so far. For the strategic planning we need various effective and efficient decision makings. Information systems make possible to support scientific decision making. One of them is decision support system. This paper suggests a conceptual DSS framework for the water quality control of the Nakdong River basin. The paper is focused on system analysis and design of DSS. The measure/scenario approach allows people to make scientific and rational decision making.

CHARACTERISTICS OF THE NAKDONG RIVER BASIN

The Nakdong River (Figure 1) is the longest river that reaches 521.1 km in its total length (river basin 23,817.3 km^2), from Bonghwa, Kyung-Buk province to the Nakdong estuary dam. The Nakdong River basin shows monsoon characteristics by frequent heavy rainfall from late June to early July every year. The mean annual precipitation is 1,272 mm at the lower Nakdong River. Over 60 percent of the annual rainfall is concentrated in summer (June-August and the remaining period, especially winder (December-January), is classified as the dry period. The mean annual water temperature is 12-16ºC. The mean annual cold water temperature is 2.5ºC in January and the mean annual hot water temperature is 29-30ºC in August (Kim et al. 2001)

In 1987, an estuary dam was constructed at the mouth of the Nakdong River to avoid salt-water intrusion. The lower part of the river became a river-reservoir hybrid due to these changes in hydrology (Joo et al. 1997; Kim et al. 1998). Because the cannel slope is very slight and the flow rate is slow, the retention time assumes similar aspects of a reservoir. Also, considering the present condition of pollution in the lower part of the river, the

pollution load of the Keumho River is 9.89 billion ton per day and is the principal depositor of pollution, occupying 39.2 percent of total pollution load in the lower Nakdong hydrosphere.

Figure 1. Nakdong River basin

Between 1996 and 2005, the government ran the comprehensive measures to improve water quality and got it being improved from 74 in 1996 to 80 in 2005. A new 10-year project with 32.7 trillion won allocated by the government has been launched in beginning this year. It aims to improve water quality in Han, Nakdong, Geum and Youngsan Rivers. 30 percent of the budget will go to the Nakdong River (Shin, 2006).

SYSTEM ANALYSIS AND DESIGN OF THE NAKDONG-DSS

Background

Decision-support system – computer-based information systems that combine models and data in an attempt to solve nonstructured problems with extensive user involvement through a friendly user interface (Turban et al. 2005). In addition, a DSS is built by an interactive process (often by end-users), supports one or more phases of decision-making, and it may include a knowledge component (van Delden, 2000). Originally developed to support business managers, DSS have attracted much interest in the field of environmental quality management (Guariso and Werthner, 1989).

Such DSS as low-flow management of the Nakdong River (Lee, 1999), risk-based management of surface water quality (McIntyre and Wheater, 2004), and restoration of flood- plains (BfG, 2004) or management of coastal zones (RIKS, 2003) have been developed for specific purposes. Recent developments integrate spatial information using Geographic Information System's (GIS) functionality with a variety of environmental models and databases. For instance, Newham et al. (2004) developed a framework for integrated hydrologic, sediment and nutrient export modeling for catchments scale management. Schlu¨ter et al. (2005) integrated a hydraulic network model with a habitat suitability index to assess the restoration of riparian forests in the Amurdarya delta. Economic valuation tools have been integrated into DSS to take ecosystem services and benefits into account for decision support (Klauer et al., 2001). The implementation of the EU Water Framework Directive initiated the development of several river basin management and decision support systems, e.g. MULINO (Mysiak et al., 2005). A Special Issue of Environmental Modelling and Software is in preparation and covers various

fields, concepts, and realizations of Environmental Decision Support Systems (Matthies et al., in press).

The major components required for decision support are shown in Figure 2. They were adopted from Matthies study in 2006.
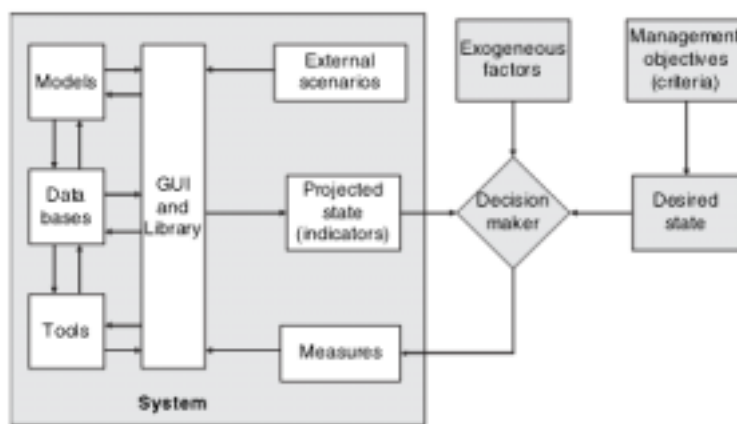

Figure 2 Decision support for environmental policy making

The DSS consists of various models, databases and assessment tools, which are integrated under a Graphical User Interface (GUI), often realized by using GIS functionality. Management objectives (criteria) describe the desired state, which should be achieved to meet legislative or other goals. The decision maker (user) communicates with the DSS and compares the projected state (indicators) with the desired state given by the management objective. Exogenous factors such as societal or political requirements might also influence decisions. Users select several measures to analyze how to achieve the objective. External scenarios such as climate, agro-economic and/or demographic changes are often provided as pre-processed information.

The measure/scenario-oriented approach has been chosen for the communication between a user and the DSS. This approach starts from a specific measure or a selected external scenario or both, calculates the influence on a related model-based indicator, and compares it with the corresponding management objectives.

Management objectives

Analyzing previously developed DSS systems for the water quality management (Matthies et al., 2006) and having oral interviews with a researcher involved in water quality research, the following objectives have been identified. These objectives are related to the water quantity and quality management

1. Good status of surface water should be achieved
    a. Good chemical status: a list of priority and specific chemicals has to be routinely monitored.
    b. Good ecological status including biological water quality: achievement of   a natural or near-natural state
2. Reduction of substance load to the South Sea
   Reductions in the emissions of nutrients, pesticides, heavy metals, and persistent, bio-accumulative and toxic substances are demanded.
3. Flood protection
   Provision for flooding risks, which tackles improvement the flood protection and lowering flood damage potential

External scenarios

The authors want to concentrate on three major external scenarios that can be developed:

1. Climate change – describing potential changes in the pattern of distribution of temperature, precipitation and other parameters in the Nakdong River catchments

2. Agro-economic change – impact of various legislative requirements, economic developments on agricultural production
3. Demographic change – projections of the demographic development

Other scenarios can be also developed.

Measures

Water quantity and quality is influenced by selected measures. Measures can consist of various options.

1. Reduction of pollution from urban areas:
- Reduction of impervious areas in urban-industrial areas to favor the infiltration of rainwater.
- Increasing fraction of separate sewer to prevent overflow water from treatment plants in case of storm weather.
- Increasing fraction of inhabitants connected to sewage treatment plant to reduce the input of raw sewage
- Upgrading of storage volume of sewer water systems to prevent overflows from treatment plants in the case of storm weather
- Enhancement of efficiency of treatment plants to reduce emissions

2. Modification of agriculture land allocation:
- Reforestation of arable land or grassland
- Renaturalization of drained agriculture land for retrieval of swampland
- Building of riparian buffer zones to prevent input of pollutants from agricultural land

3. Changes in agriculture practices:
- Application of soil protection methods like minimal tillage to prevent soil erosion

- Application of different distribution techniques to advance the efficiency of organic fertilizer
- Application of feeding methods to reduce the nutrient concentration in organic fertilizer
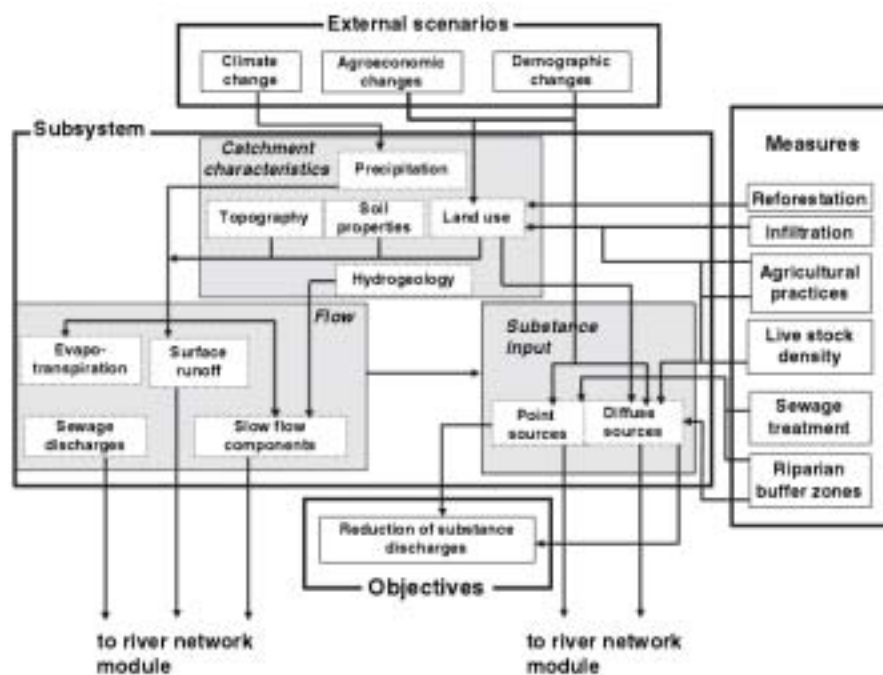- Application of eco-farming methods

Figure 3. System diagram of the catchment module with external scenarios, measures, and management objectives

4. Political and legislative requirements regarding waste water
- Direct discharge cut-off
- Gray water treatment and facilities

The following system diagram has been adopted from the

research of Elbe river basin (Matthies et al., 2006)
Both modules, the catchment and the river network module,
consist of a subsystem with three internal blocks and exogenous
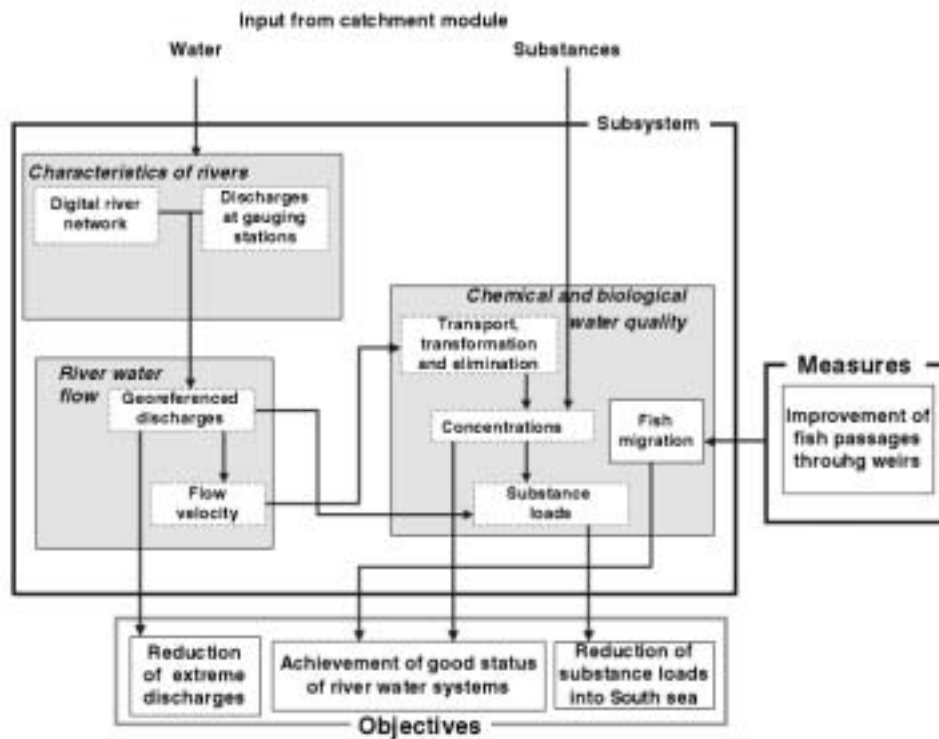driving forces (Figure 3 and Figure 4).

Figure 4. System diagram of the river network module with measures
and management objectives

SYSTEM DIAGRAM

Catchment module (figure 3)

Important catchment characteristics are the topography, soil

properties, precipitation, land-use, and hydrogeology. Various hydrological processes such as evapotranspiration, infiltration, and surface runoff determine the quantity of discharges. In addition, discharges from treated and untreated sewage water are considered. The third block describes the quality of discharges into the river network, which are driven by substance runoff from land (non-point sources of agrochemicals, i.e. nutrients) as well as from point sources (sewage treatment plants). Indicated at the bottom of Figure 3 are the management objectives, namely the reduction of substance input into surface water. Three sets of predefined scenarios (top of the diagram) can be investigated: climate change, demographic change and agro-economic change. They influence the land-use, water cycle, and substance impact on water systems. At the right hand side various measures are indicated, which the water manager can select to reduce nutrient or other substance discharge. Point as well as diffuse sources can be investigated. Typical measures are the regional change of agricultural practices to minimize nutrient input, reforestation, or construction of riparian buffer zones.

River network module (figure 4)

The river network receives the discharges from the catchment. A digital geo-referenced river network is attributed with the locations of the point sources. The long-term historical time series from gauging stations are statistically analyzed to derive mean and variability of the discharges. Moreover, with a rainfall-runoff model daily discharges can be calculated for future climate scenarios. Water quality is determined with a transport, elimination, and transformation model to deliver substance loads as well as concentration patterns along the river network. There are three management objectives in Figure 4, namely achievement of good status of river water systems, reduction of

extreme discharges (high water) and reduction of substance loads into the estuaries of the South Sea. Only one measure operating on the river network is indicated at the right hand side. The migration of fish to head waters for spawning is hindered or prevented by weirs, dams, and floodgates.

Model base

While selecting models, the following criteria are to be taken in account:
(1) Appropriate for the intended purposes of the Nakdong-DSS,
(2) Available for the Nakdong River catchment,
(3) Calculation of water flow and discharges from historical and projected time series,
(4) Estimation of substance loads from point and non-point sources,
(5) Consideration of nutrients, pesticides, persistent, bio-accumulative or toxic substances,
(6) Ability of combination with external scenarios and measures,
(7) Standard technical implementation without using proprietary software,
(8) Easy-to-use with acceptable run-time on a standard PC.

Data support

Data are collected from various data sources:
- Soil properties, hydrological and meteorological data from Federal Agencies
- Census data from Federal Statistical Office
- Wastewater treatment data and discharge consents from Federal and State Environmental Agencies
- Monitoring data from various source and, in particular, Kumoh National Institute of Technology

MEASURE/SCENARIO APPROACH

A user can communicate with the Nakdong-DSS using a measure/scenario-oriented approach. Measures and pre-processed scenarios are selected. Running the system, indicator values are compared with the management objectives. Figure 5 is one of many possible options. It has been derived from the system diagram of the catchment module and river network module. It shows an example of the interaction of the external scenario, management objective, and measure with the system. The following scenario is examined. There are demographic changes along the Nakdong River. Changes in the degree of urbanization entail the increase in fresh water usage and waste water production. It can be the reason for the soil and river pollution. All these changes will bring about the collapse of aesthetic quality, destruction of the aquatic ecosystem and decrease in usable water.

To restrain the negative influence of the demographic change user's pay policy and strong legislation are passed. This can cut off the direct discharge of waste water and make users pay for its treatment. Building additional waste water treatment plants can make the situation better. Also gray water treatment and usage of facilities should be encouraged. All these will lead to the decrease in fresh water demand and waste water discharge into the river. In its turn, pollution of water in the river can be decreased.

Both user's policy and strong legislation and simultaneously a scenario of demographic changes influence the concentration of BOD, COD, and bacteria, and the quantity of water in the river systems. The users can investigate how changes indicator part by manipulating scenario data and measure data.
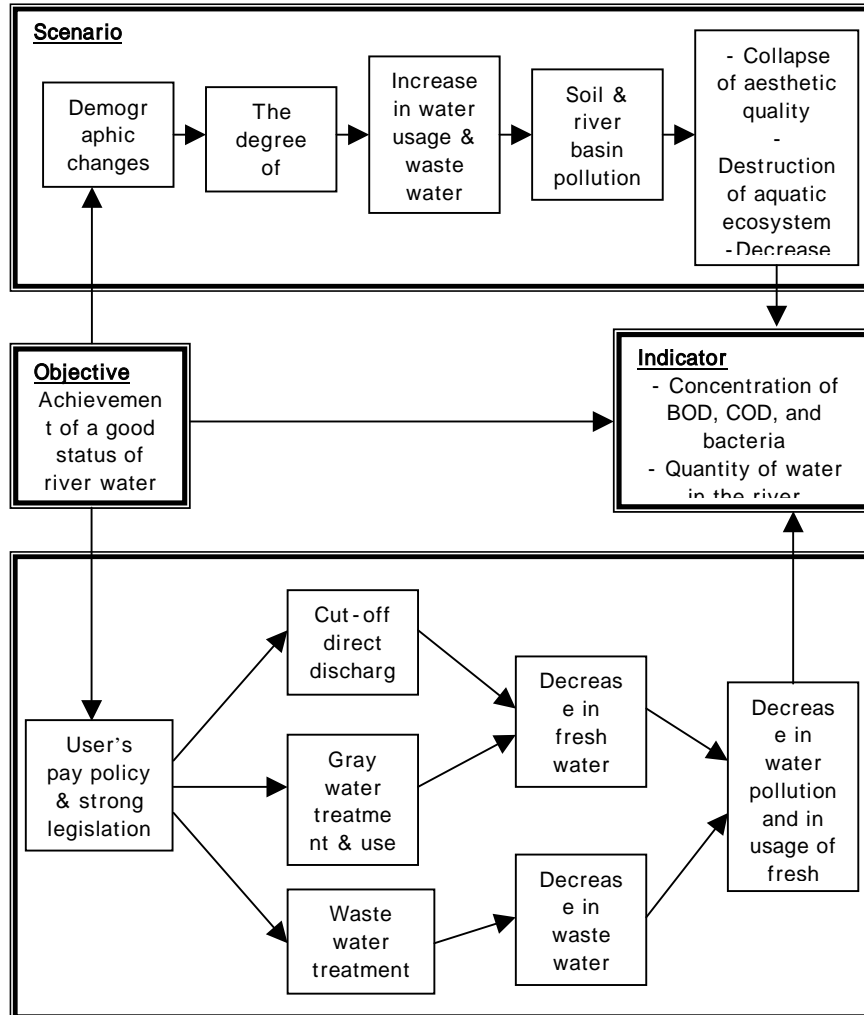
Figure 5. Interaction of management objective, external scenario, and selected measure to calculate an appropriate indicator for evaluation of the projected state

CONCLUSION, FUTURE RESEARCH AND LIMITATION

This paper proposes a conceptual DSS framework for the

strategic planning and decision support. This framework is just a theoretical approach to resolve the given problem. While in the implementation phase, the revision of the model might be necessary, when the empirical data is used.

The system analysis and design give the topic for the future research in selecting models and building a model base. User's input and feedback can play essential roles in selecting spatial and temporal scales of models. Another issue is gathering data from different sources and building effective data support with the relative and up-to-date data.

The limitation of the paper is minimal involvement of the potential users. More discussions should be done on every aspect of the proposed Nakdong-DSS, which can help to tackle the most important objectives, measures and scenarios, and increase acceptance of the system by potential end-users.

REFERENCES

BfG (2004) Projekt Elbe Okologie. Bundesanstalt fur Gewa¨sserkunde (German Federal Institute of Hydrology), Koblenz, Germany. http://elise.bafg. de, (accessed 2005.03.21)

van Delden, H (2000) A generic approach for the design of Decision Support Systems for river basin management. University of Twente and INFRAM, The Netherlands, (Project Report No. i312, Enschede)

Guariso, G., Werthner, H. (1989) Environmental Decision Support Systems. Horwood, Chichester.

Joo G.J. (1995) Ecological studies on the Nakdong River (1967-1994). Kumjung Press. Pusan. Korea.

Klauer, B., Meyer, B., Horsch, H., Messner, F., Grabaum, R. (2001) Decision support for land use changes e a combination of

methods for policy advising and planning. In: Kro¨nert, R., Steinhart, U., Volk, M. (Eds.), Landscape Balance and Landscape Assessment. Springer, Berlin: 281-297

Lee D.R. Kim H.S. (1999) Decision Support System for low-flow management of the Nakdong River. *Journal of The Korean Society of Civil Engineers,* 19(4), 455-465

Lee Y.J., Jung J.M., Shin P.S., Joo G.J. (2005) Daily variation of phytoplankton and water quality in the lower Nakdong River. *ALGAE*, 20 (1), 133-144

Matthies M., Berlekamp J., Lautenback S., Graf N., Reimer S., 2006. System analysis of water quality management for the Elbe river basin. *Environmental Modelling & Software* 21, 1309-1318

Matthies, M., Guppioni, C., Ostendorff, B. (Eds.). Environmental Decision Support Systems. Environmental Modelling and Software. Special Issue, (in press).

McIntyre, N.R., Wheater, H.S. (2004). A tool for risk-based management of surface water quality. *Environmental Modelling & Software* 19 (12), 1131-1140

Mysiak, J., Giupponi, C., Rosato, P. (2005) Towards the development of a decision support system for water resource management. *Environmental Modelling & Software* 20 (2), 203-214

Newham, L.T.H., Letcher, R.A., Jakeman, A.J., Kobayashi, T., 2004. A framework for integrated hydrologic, sediment and nutrient export modelling for catchment- scale management. *Environmental Modelling & Software*, 19, 1029-1038

RIKS, 2003. WADBOS. Research Institute for Knowledge Systems, Maastricht, The Netherlands. http://www.riks.nl/projects/WADBOSO, (accessed 2005.03.21)

Schluter, M., Savitsky, A.G., McKinney, D.C., Lieth, H. (2005) Optimizing long-term water allocation in the Amudarya River delta: a water manage- ment model for ecological impact

assessment. *Environmental Modelling & Software*, 20 (5), 529-545.

Shin H.I. (2006) 32 trillion won set aside to improve water quality. http://news.naver.com/news/read.php?mode=LSD&office_id=044&article_id=0000060814&section_id=108&menu_id=108, (accessed on 2006.10.13).

Turban, E., Aronson, J.E. (2005) Decision Support Systems and Intelligent Systems, Seventh ed. Prentice-Hall.

Expatriate Staffing Policy for Foreign Affiliates: The Moderating Effects of Host Country and International Experiences

Naoki Ando
Nagasaki Prefectural University
123 Kawashimo-cho, Sasebo-shi, Nagasaki, Japan
Email: nando@nagasakipu.ac.jp

Yong June Kim
Sungkyunkwan University
53, 3Ga, Myungryun-Dong, Jongro-Gu, Seoul, Korea
Email: kimyj@skku.edu

ABSTRACT

This study explores the question of under what conditions Japanese MNCs appoint parent country nationals to foreign affiliates. In addition to simple linear relationships, we examine moderating effects of the two kinds of experiences: international and host country experiences. Using data on 519 foreign affiliates of 26 Japanese MNCs, we found that the global integration imperative, the local market orientation, the country risk, and the unavailability of competent local managers affected expatriation decisions of Japanese MNCs. The results also revealed that these main effects were moderated by MNC's international and host country experiences.

Key words: expatriate staffing policy, international experience, host country experience, foreign affiliate, Japanese MNC

INTRODUCTION

Over the years, globalization has made multinational corporations (MNCs) face a complex and turbulent business environment.   In such an environment, the effective deployment of human resources across foreign affiliates can be considered one of the critical factors to gain competitive advantages.   This has led researchers to extensively investigate international staffing policies of MNCs, where they often point out that compared to US and European counterparts, Japanese MNCs tend to adopt ethnocentric staffing policy for foreign affiliates. In other words, Japanese MNCs prefer to staff foreign affiliates with parent country nationals (PCNs) (Beamish and Inkpen, 1998; Belderbos and Heijltjes, 2005; Tung, 1984).   This distinct feature of Japanese MNCs with regard to expatriate staffing policy may provide researchers with an interesting research setting. Therefore, this study attempts to explore an expatriate staffing policy of Japanese MNCs.   Although previous studies have emphasized a tendency of Japanese firms to extensively staff foreign affiliates with PCNs (Kopp, 1994; Tung, 1984), we adopt a contingency approach for expatriation decisions (Belderbos and Heijltjes, 2005; Delios and Björkman, 2000; Gong, 2003).   In addition, we will explore not only simple linear relationships between expatriate staffing policy and its determinants (e.g. Boyacigiller, 1990; Delios and Björkman, 2000; Harzing, 2001) but also moderating effects of the two kinds of experiences: international experience and host country experience.

In the following sections, we review existing literature on expatriation decisions, and then develop hypotheses with respect to the moderating effects of international and host country experiences on the relationships between expatriate staffing policy and its determinants.   The hypotheses are examined using

foreign affiliates of large Japanese manufacturers as a sample, and results of the empirical analysis are reported.   Finally, we summarize the implications of this study with its limitations.

LITERATURE REVIEW

Previous studies have explored the reasons why headquarters send PCNs to foreign affiliates based on the assumption that PCNs and host country nationals (HCNs) are two different types of human resources (Bonache, Brewster, and Suutari, 2001; Harzing, 2001; Tan and Mahoney, 2004).   In general, PCNs are assumed to have firm-specific capabilities such as the personal relationships with managers at headquarters, information channels, and the knowledge of operating processes (Festing, 1997; Tan and Mahoney, 2004).   In addition, through a socialization process held during the work period at a parent firm, they may come to better understand, assimilate, and internalize common values, beliefs, assumptions, and goals of their parent firm (Bonache et al., 2001; Delios and Björkman, 2000).   As a result, they try to maintain an MNC's economic interests and adhere to goals of an MNC as a whole (Cray, 1984; Eisenhardt, 1985; Kobrin, 1988; Ouchi, 1979; Tan and Mahoney, 2004).   In contrast, HCNs are assumed to possess better knowledge of local conditions.   Knowledge that is required for foreign operations seems to be classified into two categories: general knowledge and market-specific knowledge (Carlsson, Nordegren, and Sjöholm, 2005; Johanson and Vahlne, 1977).   General knowledge could be acquired from international operations in general and transferred from one country to another (Carlsson et al., 2005).   It pertains to marketing methods and common characteristics of certain types of customers and suppliers (Johanson and Vahlne, 1977). On the other hand, market-specific knowledge could be gained primarily through experience in a host country market (Carlsson

et al., 2005; Johanson and Vahlne, 1977).　It is concerned with characteristics of a specific host country market including business climate, culture, structure of the market system, and traits of individual customers (Johanson and Vahlne, 1977). Generally, HCNs are assumed to possess the latter—market-specific knowledge including cultural, economic, political, and legal aspects of a host country (Harzing, 2001; Kobrin, 1988). Therefore, for the purposes of improving the level of local responsiveness and the consequent competitiveness in host country markets, MNCs need to effectively use the talents of HCNs (Adler and Ghadar, 1990; Bonache et al., 2001).

Japanese firms have been reported to extensively rely on PCNs to manage foreign affiliates (Beamish and Inkpen, 1998; Kopp, 1994; Legewie, 2002; Tung, 1984).　However, a recent study showed the empirical result that was not consistent with conventional knowledge about expatriate staffing policy of Japanese firms. Investigating changes in the number of PCNs at Japanese foreign affiliates from 1960 to 1993, Beamish and Inkpen (1998) reported that the number of Japanese expatriates is declining.　In addition, recent empirical studies on expatriate staffing policy of Japanese firms indicate that they adopt a contingency approach for expatriate policy (Belderbos and Heijltjes, 2005; Delios and Björkman, 2000; Gong, 2003).　For example, Belderbos and Heijltjes (2005) reported that equity position of Japanese parents and relative size of foreign affiliates had the positive impact on an assignment of PCNs while local sales ratio and experience in host countries were negatively associated with the assignment of PCNs.　Similarly, Gong (2003) showed that Japanese MNCs used more PCNs for foreign affiliates when cultural distance between host and home countries was large.　He also found that the relationship between the cultural distance and the use of PCNs were moderated by the age of foreign affiliates.　In addition,

Jaussaud, Schaaper and Zhang (2001) reported that Japanese firms sent more PCNs to developing countries than industrialized countries since qualified local managers are usually less available in developing countries.   Similarly, comparing Japanese affiliates in US with those in China, Delios and Björkman (2000) found that the control function of PCNs were more prominent in China than in US.   They also showed that PCNs played a more significant knowledge-transfer role in technology- and marketing-intensive industries in China than in US.   Unlike conventional wisdom that Japanese firms use large numbers of PCNs, these studies indicate that their expatriate staffing policy may be much more complicated than we assumed.   The gap between conventional wisdom and actual Japanese expatriate policy may result from the fact that most previous studies on Japanese firms examined the simple linear relationships between several explanatory factors and the use of PCNs.   It seems that further studies are necessary to explore the complex nature of expatriate staffing policy of Japanese firms.

In the next section, hypotheses are developed about determinants of expatriation decisions of Japanese MNCs.   Determinants are proposed in terms of strategic imperatives of foreign affiliates and host country specific factors.   In addition to linear relationships, the moderating effects of international and host country experiences are suggested.

HYPOTHESES DEVELOPMENT

MNCs are generally confronted with two kinds of pressures: the global integration pressure to maximize efficiency of the entire global network and the local responsiveness pressure to sense and respond to local differences (Bartlett and Ghoshal, 1998).   The pressure for global integration would make MNCs place the first

priority on pursuing efficiency of global operations. The precedence of the global efficiency over an individual foreign affiliate's efficiency may bring about the economic incentive misalignment between headquarters and the affiliate (Tan and Mahoney, 2004). It is probable that managers at a foreign affiliate do not act to achieve goals of an MNC as a whole; they may seek the economic interests of the affiliate. However, MNCs could overcome the problem of economic incentive misalignment by staffing foreign affiliates with PCNs since they are usually known for better control over foreign affiliates, better coordination on foreign operations, and better alignment of economic incentives between the headquarters and foreign affiliates (Bonache et al., 2001; Boyacigiller, 1990; Cray, 1984; Delios and Björkman, 2000; Eisenhardt, 1985; Kobrin, 1988; Ouchi, 1979). Therefore, we expect that:

> Hypothesis 1a: *The likelihood that PCNs are appointed to foreign affiliates is greater when the global integration imperative is high.*

As foreign affiliates get mature, the problem of economic incentive misalignment between headquarters and foreign affiliates may be alleviated because HCNs gradually become socialized through working at the affiliates (Gong, 2003; Jaeger and Baliga, 1985). In addition, firm-specific capabilities required to integrate the global operations would be transferred from a parent firm to foreign affiliates over time (Belderbos and Heijltjes, 2005). HCNs will learn such capabilities, observing action of PCNs. Moreover, when MNCs have a broad experience in the global market, they may possess training programs to socialize HCNs who work for foreign affiliates. Also, internationally experienced MNCs may have a standardized procedure and system to integrate their global operations. Thus, the necessity for PCNs

may be reduced as MNCs accumulate host country and international experiences. These imply that decisions by headquarters to send PCNs to foreign affiliates may change in accordance with the degree of international and host country experiences. Therefore, it is hypothesized that:

> Hypothesis 1b: *Host country and international experiences moderate the relationship between the global integration imperative and an appointment of PCNs to foreign affiliates.*

MNCs will receive the pressure for local responsiveness when they attempt to penetrate host country markets (Bartlett and Ghoshal, 1998). When their orientation towards local markets increases, operations of foreign affiliates will become more specialized, since the affiliates need to respond to local differences and deal with transactions with local suppliers and buyers. To deal with idiosyncrasy of host country markets, a great deal of local knowledge is required on the part of a foreign affiliate. Headquarters would believe that HCNs generally possess knowledge of local contexts including cultural, economic, political, and legal aspects of a host country (Harzing, 2001; Kobrin, 1988; Tarique, Schuler, and Gong, 2006). This may discourage headquarters to send PCNs to foreign affiliates when their local market orientation is high. Therefore, we hypothesize:

> Hypothesis 2a: *The likelihood that PCNs are appointed to foreign affiliates is smaller when the local market orientation is high.*

Advantage of HCNs over PCNs in dealing with difficulties arising from the local market penetration may decrease over time. As foreign affiliates operate their business at local markets, host country-specific knowledge will be accumulated within organizations. Such accumulated knowledge may be transferred

from foreign affiliates to a parent firm (Belderbos and Heijltjes, 2005), which enables PCNs to better understand local conditions (Gong, 2003). This may increase the ability of PCNs to handle local differences and deal with local entities at host country markets (Gong, 2003). Also, accumulation of general knowledge through international experiences of MNCs may support the implementation by PCNs of the local market penetration. Using general knowledge acquired through their international experience, MNCs could establish a standardized procedure to respond to and adjust to local differences. That may decrease an MNC's dependence on HCNs. Thus, MNCs with more host country and international experiences may less rely on HCNs to manage foreign affiliates even when pursuing the penetration into local markets.

> Hypothesis 2b: *Host country and international experiences moderate the relationship between the local market orientation and an appointment of PCNs to foreign affiliates.*

Exogenous environmental factors would affect an MNC's expatriation decisions (Boyacigiller, 1990; Harzing, 2001); such external factors include country-level risks. PCNs may be in difficulty when they are confronted with uncertainty derived from the country risk. Facing with instability of a host country's environment, MNCs may demand the support by HCNs because they are regarded as experts at dealing with a host country environment. However, MNCs may try to overcome unpredictability arising from a volatile environment by exercising tight control over foreign affiliates (Anderson and Gatignon, 1986). Tight control may be rational because the likelihood of loss of income or assets might be substantial in a volatile host country environment (Harzing, 2001). When controlling tightly over foreign affiliates, the level of information flow will increase

between headquarters and the affiliates (Boyacigiller, 1990). The increased level of information flow between them is accompanied by the necessity of good communication. Efficient and effective communication between headquarters and foreign affiliates will be accomplished through the assignment of PCNs to foreign affiliates (Festing, 1997; Tan and Mahoney, 2004). These arguments lead to a set of competing hypotheses.

> Hypothesis 3a: *The likelihood that PCNs are appointed to foreign affiliates is smaller when country risk is high.*
> Hypothesis 3b: *The likelihood that PCNs are appointed to foreign affiliates is greater when country risk is high.*

An MNC's host country experience may moderate the relationship between the level of country risk and expatriation decisions. Through experience in a host country, PCNs would be accustomed to and understand a host country's unstable and volatile environment. They will gradually recognize how to cope with such macro level risk. Thus, accumulation of host country experience may reduce the necessity of the use of HCNs in host countries with volatile environments. In contrast, as host country experience is accumulated within MNCs, they may understand the nature of the host country risks and acquire the knowledge of how to manage foreign operations in such a volatile environment. As a result, they may come to carry out management of foreign affiliates without tight control through PCNs even in an unstable environment. Consequently, a rationale for tight control through the extensive use of PCNs may be diluted over time. Thus, it is hypothesized that:

> Hypothesis 3c: *Host country experience moderates the relationship between the degree of country risk and an appointment of PCNs to foreign affiliates.*

Edström and Galbraith (1977) argued that one of reasons why MNCs send PCNs to foreign affiliates is a lack of talented personnel in host countries.   Other researchers have also argued that MNCs use PCNs because they cannot find qualified local talent in host countries (Daniels and Radebaugh, 1998; Edström, 1994; Kobrin, 1988; Richards, 2001).   When headquarters perceive that local personnel are incapable of managing foreign affiliates, they would hesitate to leave management of the affiliates in the hands of HCNs.   Therefore, in cases where a pool of capable managers is poor within a host country, MNCs will appoint competent PCNs to foreign affiliates.

> Hypothesis 4a: *The likelihood that PCNs are appointed to foreign affiliates is greater when competent managers are unavailable in a host country.*

The relationship between unavailability of competent managers in a host country and the use of PCNs may be moderated by host country experience of MNCs.   MNCs with a broad host country experience may have the knowledge of how to identify and educate potential local managers.   In contrast, it will be difficult for MNCs with scant host country experience to find and develop qualified human resources.   Therefore, we propose that as MNCs accumulate host country experience, they may come to less rely on PCNs even in host counties that lack a pool of competent managers.

> Hypothesis 4b: *Host country experience moderates the relationship between the degree of unavailability of competent managers and an appointment of PCNs to foreign affiliates.*

METHOD

Sample and data collection

Hypotheses developed in the preceding section are concerned with expatriate staffing policy of Japanese MNCs. Of 100 largest Japanese firms in terms of total sales as of 2002, we selected only manufacturers because financial institutions, service firms, and wholesalers are reported to have a strong tendency to rely on PCNs (Beamish and Inkpen, 1998).   Forty-seven of 100 largest Japanese firms were financial institutions, service firms, or wholesalers.   The remainder, 53 firms, was manufacturers.   Of 53 large Japanese manufacturers, 9 firms whose ratio of foreign sales to total sales is less than 10 percent were also excluded. Because the Japanese law does not require these firms to report the accounting information regarding foreign operations, it is difficult to obtain necessary data of their foreign operations.   In addition to the 9 manufacturers, 18 manufacturers lacked critical data; these were also excluded.   Finally, our sample included foreign affiliates of 26 Japanese large manufacturers.   Industries of 26 manufacturers in our sample include food (1), chemical (2), glass (1), rubber product (1), construction (1), steel (3), metal (2), electric machinery (5), machinery (3), transportation machine (6), and other products (1).   Sample-bias was checked by conducting t-tests with regard to the number of employees, total sales, and a ratio of foreign sales to total sales.   With regard to the three variables, there were no significant differences between 26 manufacturers included in the final sample and excluded 27 manufacturers.   T-values were .269 for the number of employees, 1.638 for total sales, and .739 for the ratio of foreign sales.

Primary data for foreign affiliates were collected from Kaigai Shinshutsu Kigyo Soran 2002 (Yearbook of Japanese Investments

Overseas.   Hereafter, *Soran*), which offered data on foreign affiliates where a Japanese firm possesses 10 percent or more of ownership.   MNCs may maintain an equity position in a local unit for reasons other than proactively involving in the management of such units (Osborn and Baughn, 1990).   In such cases, MNCs are reported to frequently hold only minor equity positions (Paik and Sohn, 2004).   Thus, foreign affiliates in which a parent firm possesses less than 20 percent of equity ownership were excluded from our sample.   As a result, 519 foreign affiliates of 26 Japanese MNCs were included in the final sample.

Measures

Dependent variable.   A dependent variable, an assignment of PCNs to foreign affiliates, was operationalized in two ways: a ratio of Japanese to total employees at a foreign affiliate, and the nationality of foreign affiliate CEOs.   The nationality was coded as 1 when CEO was a Japanese national and otherwise 0.

Global integration imperative (GLOBL).   A dummy variable was used to represent the degree of a global integration imperative of foreign affiliates.   Primary purposes of each foreign affiliate assigned by parent firms were listed in *Soran*.   Foreign affiliates were regarded as having a high global integration imperative when their primary purpose was: to produce products/components exported to Japan; to produce products/components exported to third counties; to establish a global production network; to establish a global distribution network.   Foreign affiliates having a high global integration imperative were coded as 1 and otherwise 0.

Local market orientation (MARKT). Foreign affiliates that were

regarded as having the high local market orientation were also identified in *Soran*. Foreign affiliates whose primary purpose was the local market penetration were classified as having the high local market orientation. Foreign affiliates having the high local market orientation were coded as 1 and otherwise 0. Note that foreign affiliates may have the high global integration imperative and the high local market orientation simultaneously. In this study, we examine only main effects of the two variables.

Country risk (CRISK).   Political risk has been considered one of critical country-level risks confronted by MNCs (Boyacigiller, 1990; Kobrin, 1978; Thunnell, 1977). Data on political risk were collected from The World Competitive Yearbook 2001. The book offers ratings which present political stability. We multiplied the scores by -1 to represent political instability.

Unavailability of competent local managers (MANGR). Unavailability of competent local managers was measured by an average score of the two items from the World Competitive Yearbook 2001.   One is the availability of local senior managers, which represents the extent to which competent managers are available in local labor markets.   The other is the competence level of local managers, which represents the extent to which domestic managers are competent compared to international managers.   To measure the unavailability of competent local managers, we multiplied the average scores by -1.

Moderators and control variables. Age of foreign affiliates was used as a proxy for *Host country experience* (HOSTE).   To measure it, the log of years from establishment of a foreign affiliate was calculated.   *International experience* (INTLE) was operationalized by the number of foreign affiliates worldwide possessed by a parent firm.   The log of the number of foreign

affiliates was used to measure international experience of Japanese MNCs.   Equity ownership possessed by Japanese parent firms (OWNER) was incorporated as a control variable because majority-owned foreign affiliates may be more important to parent firms (Harzing, 2001).   Equity ownership of a Japanese parent was measured by the log of ownership stake.   In addition, cultural distance was controlled because it may increases uncertainty in managing organizations (Boyacigiller, 1990; Gong, 2003).   Cultural distance between host countries and Japan (CULTR) was measured by the often-used measurement developed by Kogut and Singh (1988), using data from Hofstede (1980, 1991).   Further, regional headquarters (RHEAD) are thought of being tightly tied with other foreign affiliates within a region.   Thus, they may be staffed with more PCNs.   For this reason, a dummy variable that represents regional headquarters was incorporated as a control variable.   Foreign affiliates that were established to function as regional headquarters were coded as 1, and otherwise 0.

RESULT

For a ratio of PCNs to total employees at a foreign affiliate, OLS regressions were conducted, while for the nationality of foreign affiliate CEOs, logistic regressions were conducted.   Correlation coefficients were calculated for variables used in this study (Table is omitted).   Because CRISK and MANGR were highly correlated ($r = -.77$, $p < .001$), we adopted two base models (see Tables 1 and 2).   For the other variables, we checked that all variance inflation factors were less than 2, indicating the absence of the severe multicollinearity problem.

Table 1. Results of OLS Regressions

Dependent variable: a ratio of PCNs to total employees

	Model 1		Model 2	
	b	S.E.	b	S.E.
Const.	.45***	.07	.39***	.10
GLOBL	-.10***	.02	-.10***	.02
MARKT	-.07***	.02	-.07***	.02
CRISK	-.01*	.00		
MANGR			-.02*	.01
HOSTE	.01	.01	.01	.01
INTLE	-.09***	.01	-.09***	.01
OWNER	.08**	.02	.09***	.02
CULTR	-.00	.01	.00	.01
RHEAD	.12***	.03	.12***	.03
F	20.75***		20.48***	
R square	.25		.25	
Adjusted R square	.24		.24	

***$p<$.001   **$p<$.01   *$p<$.05   †$p<$.10

Table 1 represents results of OLS regressions for a ratio of PCNs to total employees at a foreign affiliate.   From Table 1, MARKT and CRISK were significant and negative.   H2a was supported; it appears that the local market orientation has a negative impact on reliance on PCNs to manage foreign affiliates.   H3a was also supported, suggesting that higher country risk results in the fewer portion of PCNs at a foreign affiliate.   Although GLOBL and MANGR had a significant effect on expatriate staffing policy, the signs of the coefficients were opposite to our expectation. Unlike our prediction, the global integration imperative and the unavailability of competent local managers were negatively related to the use of PCNs for foreign affiliates.   Among

moderators and control variables, INTLE, OWNER, and RHEAD were statistically significant.   Internationally experienced Japanese MNCs seem to less rely on PCNs to manage foreign affiliates.   Also, the more ownership position a Japanese MNC has in a foreign affiliate, the more PCNs are used.   In addition, it appears that more PCNs are assigned to foreign affiliates when they serve as regional headquarters.

Table 2.   Results of Logistic Regressions

Dependent variable: the Nationality of CEOs at foreign affiliates

	Model 3		Model 4	
	b	S.E.	b	S.E.
Const.	5.10***	1.21	6.98***	1.57
GLOBL	-.07	.25	-.07	.25
MARKT	-.45†	.26	-.47†	.26
CRISK	.14*	.06		
MANGR			.43**	.15
HOSTE	.14	.21	.14	.21
INTLE	-.71**	.23	-.70**	.22
OWNER	3.22***	.39	3.18***	.38
CULTR	.16	.11	.10	.11
RHEAD	.32	.64	.33	.64
Correct ratio	81.7		81.3	
-2Log Likelihood	465.54		463.93	
Model Chi-square	109.78***		111.39***	
Pseudo-R square	.29		.29	

 ***p<.001   **p<.01   *p<.05   †p<.10

Table 2 represents results of logistic regressions for the

nationality of CEO at a foreign affiliate. From Table 2, MARKT was significant with an expected sign. Thus, H2 was supported for an appointment of CEOs, implying that local market orientation leads to the use of local nationals for a top position at a foreign affiliate. CRISK and MANGR were positively associated with the nationality of CEO. This supports H3b, suggesting that when country risk is high, PCNs are likely to be assigned as CEO at a foreign affiliate. H4a was also supported, indicating that Japanese MNCs are likely to compliment a lack of local managers with PCNs. Among moderators and control variables, INTLE and OWNER were statistically significant. Japanese MNCs having a large equity ownership at foreign affiliates are likely to assign PCNs as affiliate CEOs, while those with more international experience seem to less use PCNs for affiliate CEOs.

Table 3. Interaction effects on a ratio of PCNs to total employees

	Host country experience	International experience
GLOBL	n.s.	.07**
MARKT	n.s.	-.05†
CRISK	n.s.	-
MANGR	-.03*	-

*** $p<$.001   ** $p<$.01   * $p<$.05   † $p<$.10   n.s.: not significant

Tables 3 and 4 show the results of interaction terms. One interaction effect was tested at a time; we ran 20 regressions to test all interaction terms because we had two base models. We report only results of interaction terms due to space limitation. Even though the interaction terms with GLOBL and MARKT were tested for the two base models, we reported only one of the two results (i.e., a base model with CRISK) because we had

almost the same results for the two models. Results confirmed that international and host country experiences moderated the linear relationships between expatriate staffing policy and its determinants. Interpretation of the interaction terms will be discussed in the next section.

Table 4. Interaction effects on the nationality of foreign affiliate CEOs

	Host country experience	International experience
GLOBL	1.06*	1.13*
MARKT	n.s.	-.90†
CRISK	-.23**	-
MANGR	-.40†	-

*** $p<.001$ ** $p<.01$ * $p<.05$ † $p<.10$ n.s.: not significant

DISCUSSION AND CONCLUSION

The main effects of global integration imperative and local market orientation were negative, which seem to be moderated by host country and international experiences. Tables 3 and 4 reported three significant and positive interaction terms of the global integration imperative and two kinds of experiences. The results indicate that internationally experienced Japanese MNCs tend to appoint more PCNs to foreign affiliates when the affiliates have the high global integration imperative. The results also suggest that compared to less experienced counterparts, Japanese MNCs with more international and host country experiences tend to assign PCNs as CEO at a foreign affiliate when it has the high global integration imperative. Although we expected that more experienced Japanese MNCs use fewer PCNs when foreign affiliates have the high global integration imperative, we had an opposite result. Similarly, we had results opposite to our

expectation about interaction terms for local market orientation. Our results imply that internationally experienced Japanese MNCs tend to more rely on HCNs to implement the local market penetration.   Overall, results about moderating effects of host country and international experiences were all opposite to our expectation.   Although we attempted to explain reasons for moderating effects by assuming learning by both PCNs and HCNs, further theoretical development is required to uncover the question of why host country and international experiences moderate the impact of strategic imperatives on an expatriate staffing policy.

We had a set of competing results for the relationship between country risk and expatriation decisions.   For a ratio of PCNs to total employees at a foreign affiliate, H3a was supported, while H3b was supported for an appointment of CEO at a foreign affiliate.   Our results may depict one aspect of Japanese MNCs' behavior in a volatile environment; in an unpredictable and unstable environment, Japanese MNCs may tightly control foreign affiliates through assigning PCNs as CEO and simultaneously make the best use of local knowledge possessed by HCNs.   As for interaction terms, we found that the more host country experience Japanese MNCs accumulate, the less hesitant they are to assign HCNs as CEO even in an unpredictable environment.   However, in the initial stage, Japanese MNCs may emphasize the tight control through Japanese CEO in a volatile environment due to limited host country experience.   We also had contradicting results for H4a.   The result appeared in Table 2 indicates support for H4a for an appointment of CEO at a foreign affiliate, whereas for a ratio of PCNs, Table 1 reports a significant but negative coefficient.   This may be attributed to the existence of a moderator.   Results in Tables 3 and 4 support H4b; compared to those with scarce host country experience,

Japanese MNCs with substantial host country experience seem to less rely on PCNs to manage foreign affiliates even when host countries have a limited pool of competent HCNs.

This study examined determinants of expatriate staffing policy for foreign affiliates of Japanese MNCs. Our underlying position is that Japanese MNCs do not always rely on PCNs to manage foreign affiliates, whereas researchers often point out that their expatriate staffing policy is characterized as ethnocentric. Our results found that expatriation decisions of Japanese MNCs are contingent on several factors, which supports our underlying idea. Specifically, we found that the global integration imperative, the local market orientation, the country risk, and the unavailability of competent local managers reduce a ratio of PCNs to total employees at a foreign affiliate. We also found that the country risk and the unavailability of competent HCNs increase the probability that PCNs are assigned as a foreign affiliate CEO while the local market orientation decreases the probability. In addition to these linear relationships, we found that these main effects were moderated by international and host country experiences of Japanese MNCs. Our results of interaction terms implied complexity of their expatriation decisions. Experienced Japanese MNCs appear to make different decisions on expatriation from less experienced counterparts even when they are confronted with the same situations.

Although we believe that our results make a contribution to the literature on expatriate staffing policy of MNCs, they are not without limitations. Our sample consists of foreign affiliates of only 26 Japanese large manufacturers. This research design reduces the generalizability of our findings. Another limitation is concerned with measurements. Due to unavailability of relevant data, we used dummy variables to represent the

strategic roles of foreign affiliates—the global integration imperative and the local market orientation.   In addition, we examined only main effects of these strategic roles of foreign affiliates on expatriation decisions.   Future research should examine the interaction effect of the global integration imperative and the local market orientation.   Moreover, our results are based on cross-sectional data.   This implies that although findings in this study suggest causal relationships, interpretation of these relationships is subject to limitations.   Finally, this study did not incorporate variables representing performance of foreign affiliates.   Thus, we failed to give the performance implications.   Future research should examine a relationship between expatriation decisions and a foreign affiliate performance.

ACKNOWLEDGEMENTS

REFERENCES

Adler, N. and Ghadar, F. (1990) 'Strategic human resource management: A global perspective', In: R. Pieper, *Human resource management: An international comparison*, Berlin: de Gruyter.

Anderson, E. and Gatignon, H. (1986) 'Modes of foreign entry: a transaction cost analysis and propositions', *Journal of International Business Studies*, 17(3): 1-26.

Bartlett, C.A. and Ghoshal, S. (1998) *Managing Across Borders* (2nd ed.), Massachusetts: Harvard Business School Press.

Bartlett, C.A. and Yoshihara, H. (1988) 'New challenges for Japanese multinationals', *Human Resource Management*,

27(1): 19-43.

Beamish, P.W. and Inkpen, A.C. (1998) 'Japanese firms and the decline of the Japanese expatriate', *Journal of World Business*, 33(1): 35-50.

Belderbos, R.A. and Heijltjes, M.G. (2005) 'The determinants of expatriate staffing by Japanese multinationals in Asia: Control, learning and vertical business groups', *Journal of International Business Studies*, 36(3): 341-354.

Bonache, J., Brewster, C. and Suutari, V. (2001) 'Expatriation: A developing research agenda', *Thunderbird International Business Review*, 43(1): 3-20.

Boyacigiller, N. (1990) 'The role of expatriates in the management of interdependence, complexity and risk in multinational corporations', *Journal of International Business Studies*, 21(3): 357-381.

Carlsson, J., Nordegren, A. and Sjöholm, F. (2005) 'International experience and the performance of Scandinavian firms in China', *International Business Review*, 14(1): 21-40.

Cray, D. (1984) 'Control and coordination in multinational corporations', *Journal of International Business Studies*, 15(2): 85-98.

Daniels, J.D. and Radebaugh, L.H. (1998) *International business environments and operations* (8th ed.), Reading, MA: Addison-Wesley.

Delios, A. and Björkman, I. (2000) 'Expatriate staffing in foreign subsidiaries of Japanese multinational corporations in the PRC and the United States', *International Journal of Human Resource Management*, 11(2): 278-293.

Edström, A. (1994) 'Alternative policies for international transfers of managers', *Management International Review*, 34(1): 71-82.

Edström, A. and Galbraith, J.R. (1977) 'Transfer of managers as a coordination and control strategy in multinational organizations', *Administrative Science Quarterly*, 22: 248-263.

Eisenhardt, K.M. (1985) 'Control: Organizational and economic approach', *Management Science*, 31(2): 134-149.

Festing, M. (1997) 'International human resource management strategies in multinational corporations: theoretical assumptions and empirical evidence from German firms', *Management International Review*, 37, special issue: 43-63.

Gong, Y. (2003) 'Subsidiary staffing in multinational enterprises: agency, resources, and performance', *Academy of Management Journal*, 46(6): 728-739.

Harzing, A.W. (2001) 'Who's in charge?   An empirical study of executive staffing practices in foreign subsidiaries', *Human Resource Management*, 40(2): 139-158.

Hofstede, G. (1980) *Culture's consequences: International differences in work-related values*, Beverly Hills, CA: Sage Publications.

Hofstede, G. (1991) *Cultures and organizations: Software of the mind*, New York: McGraw-Hill.

Jaeger, A.M. and Baliga, B.R. (1985) 'Control systems and strategic adaptation: lessons from the Japanese experience', *Strategic Management Journal*, 6(2): 115-134.

Jaussaud, J. Schaaper, J. and Zhang, Z. (2001) 'The control of international equity joint ventures: distribution of capital and expatriation policies', *Journal of the Asia Pacific Economy*, 6(2): 212-231.

Johanson, J. and Vahlne, J.E. (1977) 'The internationalization process of the firm—A model of knowledge development and increasing foreign market commitments', *Journal of International Business Studies*, 8(1): 23-32.

Kobrin, S.J. (1978) 'When does political instability result in increased investment risk?', *Columbia Journal of World Business*, 13: 113-122.

Kobrin, S.J. (1988) 'Expatriate reduction and strategic control in American multinational corporations', *Human Resource*

Management, 27(1): 63-75.

Kogut, B. and Singh, H. (1988) 'The effect of national culture on the choice of entry mode', *Journal of International Business Studies*, 19(3): 411-432.

Kopp, R. (1994) 'International human resource policies and practices in Japanese, European and United States multinationals', *Human Resource Management*, 33:581-599.

Legewie, J. (2002) 'Control and co-ordination of Japanese subsidiaries in China: problems of an expatriate-based management system', *International Journal of Human Resource Management*, 13(6): 901-919.

Osborn, R. and Baughn, C. (1990) 'Forms of interorganizational governance for multinational alliances', *Academy of Management Journal*, 33(3): 503-519.

Ouchi, W.G. (1979) 'A conceptual framework for the design of organizational control mechanisms', *Management Science*, 25(9): 833-848.

Paik, Y. and Sohn, J.D. (2004) 'Expatriate managers and MNC's ability to control international subsidiaries: the case of Japanese MNCs', *Journal of World Business*, 39: 61-71.

Richards, M. (2001) 'U.S. multinational staffing practices and implications for subsidiary performance in the U.K. and Thailand', *Thunderbird International Business Review*, 43(2): 225-242.

Tan, D. and Mahoney, J.T. (2004) 'Explaining the utilization of managerial expatriates from the perspectives of resource-based view, agency, and transaction-costs theories', *Advances in International Management*, 15: 179-205.

Tarique, I., Schuler, R. and Gong, Y. (2006) 'A model of multinational enterprise subsidiary staffing composition', *International Journal of Human Resource Management*, 17(2): 207-224.

Thunnell, L.H. (1977) *Political risks in international business*,

New York: Praeger Publishers.

Tung, R.L. (1984) 'Human resource planning in Japanese multinationals: a model for U.S. firms?', *Journal of International Business Studies*, 15(2): 139-149.

Socioeconomic and Health Resources Factors for Operations of a Health System

Jung A Park
Woosong University
Daejeon 300-718, Korea
Email: japark1040@korea.com

ABSTRACT

This paper is to assess the effect of health resources on state-level infant mortality and to assess the effect of socioeconomic characteristics on state-level infant mortality, i.e., to assess what change in the health status of a population can be identified as a function of socioeconomic characteristics and health resources. Some results are contrary to the common health strategy improving health status of a target population and suggest promoting individual level of health resources. This study suggest that changes in health resources or socioeconomic variables alone may not reduce the state level infant mortality, and both categories of health indicators do influence other health outcome as well as influence to each other.

Keywords: Health Resources, Health Performance, Health System Operations.

INTRODUCTION

The health status of a target population can be identified by many factors, like health resources, environmental conditions, and/or socioeconomic characteristics (Miller and Stokes, 1987; Wehler, et al., 2004). A population of defined scope, which may be a city, state, nation or other target areas can be conceptualized the target of a particular health system. The functioning of such systems and even their structural forms may be affected by

available resources in a given area (Bird and Bauman, 1995; Mays, et al., 2006). Therefore, it is necessary to examine the impact of a health system within a given structure. Such structure constrains the operation of the health system, and thus influences the health status of a population, while structure also has a direct impact on health status. Because of its pervasive influence, the structural setting of a location must be examined and controlled before the net impact of health indicators on health can be assessed (Fiscella and Franks, 2000). Thus, this study focuses on structural differences to the infant mortality and how those differences constrain the operation of the health system and eventually affect health status of a target population.

The objectives of this study are to assess the effect of health resources on state-level infant mortality and to assess the effect of socioeconomic characteristics on state-level infant mortality, i.e., to assess what change in the health status of a population can be expected as a function of socioeconomic characteristics and health resources. Hypothesis is that health resources variables account for more of the variance in state-level infant mortality than do socioeconomic variables. It is also hypothesized that an aggregated mode with socioeconomic variables and health resources variables has more predictive power to infant mortality rates than separated models have.

In the first section, an introduction deals with the rationale for doing a study on health status of a given target population. In section two, a literature review related to the current study is addressed. Then, in section three, a method section discusses study population, and study design, which covers study variables being interested and the method of statistical analysis. Section four shows a result of analysis for this study. A discussion section deals with implication to examine the relative importance of health resources and socioeconomic factors in predicting state-level infant mortality. In a final section, a conclusion gives some future directions and summary.

BACKGROUND

Generally accepted assumption is that increasing health resources will improve the health status of a target population due to the increased accessibility (Idler and S. Kasl, 1991). The US Department of Health and Human Services has established a framework for developing prevention programs aimed at making a difference in US health by the year 2000. Many programs financed by state governments have been developed to improve the access of the poor to health care (Duncan 2002; Singh and Yu, 1995).

Many government and private-sponsored programs, which are designed to improve the health status of a population, are based on the assumption of a close relationship between the health status of a target population and the amount of available health resources (Goldsmith, 1973). Based on this assumption, efforts for increasing the amount of health resources in every state throughout the nation is opted without any doubt about contributions of health resources to the outputs of those services. It is suggested that the impact of health programs on the health of a population is a complex and poorly understood issue, and that increasing access to health care may not be an effective way to improve health (Laaksonen, et al., 2005).

Therefore, some studies have revealed that the health status is not directly related to more health resources (Haveman, et al., 1994). Most of the decline in mortality is attributed to improvements in environmental conditions rather than to the expansion of health services (Fuchs, et al., 1995; McLeod, et al., 2003). Moreover, health interventions appear to have contributed a little to the decline in the age-sex adjusted death rates in the United States between 1900 and 1973. There is not a clearly established relationship that more health resources lead to better health status of population (Mackenbach, et al., 1994). In a number of recent studies socioeconomic characteristics and typical risk factors affecting health status show the different

predictive power between different target population (Lochmer, et al., 2001; Poilolainen and Eskola, 1988). Selective survival is well illustrated in the racial mortality and associated with environmental inequality while substantial disparity in infant mortality among different racial groups have been well observed. Changes in the social services and economic activities will be critical to controlling health issues and increasing the well-being of minority (Buck and Bull, 1986).

Whereas there has been interest in the lower predictive power of race as a health-affecting factor for mortality, researchers have failed to identify the extent to which other socioeconomic factors decline in their importance as predictors of mortality (Barbeau, et al., 2000; Diehr et al., 1979). A few studies have analyzed the determinants of health, focusing on the role of education (Leigh, 1983). Those studies show poverty and education can make large contributions toward improving the health status of the population, since life expectancy has been strongly related to income per capita (Hansluwka, 1985). Being covered by Medicaid is strongly related to access to health care. The most apparent explanation for this finding is that people in poverty and in the near-poor faces economic barriers to access because of the co-payments and deductibles that are typically part of private health insurance coverage (Branch, L. G. and A. Jette, 1985).

METHODS

The two most widely used health indicators are the infant mortality rate and life expectancy at birth. The importance of infant mortality as a significant indicator for assessing a heath status of a target population has been well recognized (Singh, 1995). Despite some limitations, mortality rates assume to be useful in comparative analysis at regional, national, and international level (Hansluwka, 1995). Infant mortality is considered the most sensitive index of the level of health existing in an area (Diehr, et al., 1975).

Each dummy variable has been derived by computing if a target population in a state   is more than that of nation's average, the state is given as 1, otherwise assigned as 0. During the elimination of multicolineality problem, male population, female population, white population, total number of physicians, smoking, and alcohol variables were excluded for subsequent analysis. And also, OBGYN, PEDIATI, GENFAM were excluded because of high VIF problems each other so that DOCTOR1 for total rate of physicians in OB/GYN, Pediatrician, general/family practitioners was included for this study.   Multiple regression analyses(OLS) using enter method to produce a full and   reduced regression models will be performed.

Table 1 Indicators of Health Resources as Independent Variables

Factors	Descriptions
NPHYSI	Total physicians in 1992
OB/GYN	Rate of Physicians in Obstetrics and Gynecology per 100,000 female population in 1993
PEDIATRI	Rate of physicians in per 100,000 population 17 years and younger
GENFAMI	Rate of physicians in general/family practice per 100.000 population in 1993
PNCHI	Per Capita Number Covered by health insurance in 1992
AVGBED	Average hospital beds per 100,000 population in 1992
FEESERV	Per capita expenditures for physician services in 1991
EXPENDI	Per capital state government expenditures for health programs in 1992
MEDICAID	Medicaid expenditures in 1992 (100,000,000 dollars)

Table 2 Indicators of Socioeconomics as Independent Variables

Factors	Descriptions
BLACK	Black population per 10,000 in 1992
BLACK1	Dummy variable of Black population
HISPANI	Hispanic population per 10,000 in 1992
HISPAN1	Dummy variable of Hispanic population)
ASIAN	Asian population per 10,000 in 1992
ASIAN1	Dummy variable of Asian population
INCOME	Median household income in 1992 (1,000 dollars)
EDUC	Public high school graduate rate in 1991
POVERTY	Poverty rate in 1992
SMOKE	Percent of adult who smoke in 1991
ALCOHOL	Adult per capita alcohol consumption in 1992 (gallon of absolute consumed per adult age 21 years and older)

Following are three equations   for the analysis:

$$IM_{Model\ 1} = f\ (BLACK1,\ HISPANIC1,\ ASIAN1,\ EDUC,\ INCOME,\ POVERTY,\ AVGBED,\ DOCTOR1,\ FEESERV,\ MEDICAID,\ EXPENDI,\ INSURE)$$

$$IM_{Model\ 2} = f\ (BLACK1,\ HISPANIC1,\ ASIAN1,\ EDUC,\ INCOME,\ POVERTY)$$

$$IM_{Model\ 3} = f\ (BLACK1,\ HISPANIC1,\ ASIAN1,\ AVGBED,\ DOCTOR1,\ FEESERV,\ MEDICAID,\ EXPENDI,\ INSURE)$$

RESULTS

Table 3 presented descriptive analysis and Table 4 shows values of multiple regression models of infant mortality. Of socioeconomic variables all but POVERTY have consistent directions of relationship with infant mortality rates in model 1. Both EDUC and INCOME are inversely related with infant mortality rates in both model 1 and model 2, whereas POVERTY is positively related with infant mortality in model 1, while in model 2 POVERTY has positive direction to infant mortality.

Table 3. Descriptive analysis for each variables of study

Variable	Mean	Std Dev	Minimum	Maximum
ALCOHOL	2.62	0.56	1.63	4.71
ASIAN1	0.20	0.40	0.00	1.00
BLACK1	0.36	0.48	0.00	1.00
EDUC	74.42	7.60	54.26	89.55
FEESERV	557.48	108.06	337.00	806.00
HISPAN1	0.16	0.37	0.00	1.00
INCOME	30.72	5.17	20.30	42.17
INFANMOR	8.41	1.42	5.40	11.60
MEDICAID	18.03	24.95	1.14	152.81
NPHYSI	12.70	15.98	0.18	84.56
POVERTY	13.91	4.04	7.60	24.50
PCSGEHP	91.71	43.53	41.42	291.12

The relative magnitude of regression coefficient in each independent variable in each model indicates relative effect of that independent variable on variance in infant mortality rates. The negative effect of EDUC on infant mortality rates is greater in model 2 than model 1, as well as it also is statistically significant difference in both model 1 and 2. Relative net effect of INCOME variable on infant mortality rates between model 1 and 2 is negligible, whereas POVERTY effect on infant mortality rates is greater in model 1 than in model 2. Among health resources

indicators, AVGBED for average bed in population and PCSGEHP for state government expenditures for health program have all positive direction to the infant mortality rates in model 1 and model 3.

These two health resources variables have statistically significant relationship with infant mortality rates in model 1 and model 3. while PNCHI for per capita peoples covered by health insurance has positive direction in model 1, it has negative direction in model 3. DOCTOR1, FEESERV, and MEDICAID variables are negatively related with infant mortality rates in model 1 and model 3. DOCTOR1 and FEESERV have statistically significant relationship with infant mortality rates in both model 1 and model 3. Meanwhile, the relationship between MEDICAID and infant mortality rates is statistically significant in model 1, but not in model 3.

The relative degree of regression coefficient in each health resources variable between model 1 and model 3 indicates relative effect of that health resources variable on variance in infant mortality rates. Positive effect of AVGBED on infant mortality rates is greater in model 3 than in model 1, whereas positive PCSGEHP effect on dependent variable is greater in model 1 than model 3. Negative effects of DOCTOR1 and FEESERV variables on infant mortality rates is greater in model 3 than in model 1, whereas MEDICAID effect on dependent variable is greater in model 1 than model 3.

DISCUSSION

Primary concern of this study is to examine the relative importance of health resources and socioeconomic characteristics in predicting state-level infant mortality. Previously showed evidences in role of socioeconomic condition to improve the health status of a target population are not consistent with this study. Rather, an aggregated model as a whole do make a significant contribution to accounting for the variance of infant mortality

rates over and above the variance accounted for by socioeconomic characteristics or by health resources only. That is, the contribution of an aggregated model predicting the health status of a target population as a whole is rather big in comparison to the roles of socioeconomic characteristics or health resources model respectively.

Table 4. The Effects of Health Indicators with Three Dummy Variables of ASIAN1, HISPAN1, and BLACK1 (Dependent Variable: Infant Mortality)

Variable	Model 1		Model 2		Model 3	
	B	T	B	T	B	T
(Constant)	10.745	2.248	13.606	3.349	13.773	4.903
BLACK1	1.524	3.475***	1.473	3.625***	1.700	4.560***
HISPAN1	.026	.044	-.388	-.739	-.289	-.466
ASIAN1	-.655	-1.450	-.517	-1.029	-1.032	-2.150***
EDUC	-.004	-.119	-.029	-1.009		
INCOME	-.108	-1.982**	-.105	-2.017**		
POVERTY	033	.446	-.007	-.086		
AVGBED	.0136	3.182***			.015	3.254***
DOCTOR1	-.014	-1.805*			-.023	-2.834***
FEESERV	-.003	-1.764*			-.004	-2.523**
MEDICAID	-.016	-2.051***			-.012	-1.418
EXPENDI	.011	2.803***			.007	2.020**
INSURE	.005	.136			-.045	-1.366
Multiple R	.84047		.73398		.78434	
R Square	.70638		.53873		.61519	
Adj R Square	.61116		.47437		.52861	
Standard Error	.88754		1.03191		.97722	
F	7.4178		8.37018		7.10529	
Sig. F	.0000		.00000		.00000	

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

The direction of the relationship between each variable and infant mortality is a criterion in describing association among variables. The negative relationship between INCOME and infant mortality rates means that more income do play important role in reducing infant mortality rates in all states.   The degree of regression coefficient on DOCTOR1 indicates that the role of doctors of OB/GYN, Pediatrics, and family practitioners do play important role in reducing infant mortality rates in all states.   The negative association of MEDICAID to infant mortality rates reflect that higher Medicaid allow people more to access to health services, resulting in improving health status of population.

Since the study about causal relationship of the physicians to infant mortality rates was expected, this association obviously explained by using data about OB/GYN, Pediatricians, and family practitioners instead of total number of physicians in population. The positive relationships of AVGBED and PCSGEHP to infant mortality do not indicate detrimental impact of the health resources indicators to health status of the target population. Rather, health status may be impacted by how hospital beds and governmental expenditures for health programs will be utilized, instead of how much amounts of expenditure of health program by state governments will finance or how many numbers of current beds in hospitals will provide.

In this study, PNCHI does not make any direct significance of contribution to reducing infant mortality rates, while health insurance is positively related with infant mortality rates in model 1 and negatively in model 3. The negative association of FEESERV to infant mortality rates   may reflect that higher fee for services makes better quality in services, resulting in better health status of the population, or reducing the infant mortality rates.

In model 3, MEDICAID is not statistically significant with infant mortality rates, while ASIAN1, a dummy variable of Asian population, is statistically significant. In model 2, INCOME variable is significantly related to infant mortality, along with

BLACK1, a dummy variable of Black population, significant with infant mortality rates. Notably, in model 1, an aggregated model, BLACK1, INCOME, and MEDICAID are significant with infant mortality rates. It may reflect that utilization of MEDICAID is not significant by ASIAN1, but significant by BLACK1. MEDICAID in model 1 is significant but PNCHI, per capita covered by health insurance, is not significant. It may support that some hospitals selectively retain privately insured people for high risk health care deliveries. White people without Medicaid coverage, most of them were determined to have private coverage. But refer less well-insured people to sub-specialty regional centers, to avoid financial losses.

CONCLUSION

This study indicates that state-level infant mortality can be reduced by controlling state level socioeconomic characteristics and health resources correlates of infant mortality. Some results are contrary to the common health strategy improving health status of a target population and are, maybe, suggesting to promote individual level of health resources.
In sum, our study suggest that changes in health resources or socioeconomic variables alone may not reduce the state level infant mortality, and both categories of health indicators do influence other health outcome as well as influence to each other. That is, this is to say that health resources and socioeconomic characteristics should be simultaneously considered as interventions of health outcomes for reducing infant mortality.

REFERENCE

Barbeau, E. M., N. Krieger and M. J. Soobader (2000) 'Working Class Matters: Socioeconomic Disadvantage, Race/Ethnicity, Gender, and Smoking in NHIS 2000' American Journal of Public Health, 94(2): 269 - 278.
Bird, S. T. and K. E. Bauman (1995) 'The Relationship between Structural and Health Services Variables and State-Level

Mortality in the United States,' *American Journal of Public Health*, 85(1): 26-29.

Branch, L. G. and A. Jette (1984), 'Personal Health Practices and Mortality among the Elderly,' *American Journal of Public Health*, 74(10): 1126-1129.

Buck C. and S. Bull (1986), 'Preventable Causes of Death versus Infant Mortality As an Indicators of the Quality of Health Services,' *International Journal of Health Services*, 16(4): 553-562.

Diehr, P. K., W. C. Richardson, S. M. Shortell, ,and J. P. LoGerfo, (1979), 'Increased Access to Medical Care: The Impact on Health,' *Medical Care*, 17(10): 989-999.

Duncan, G.J., M. C. Daly, P. McDonough and D. R. Williams (2002) 'Optimal Indicators of Socioeconomic Status for Health Research' *American Journal of Public Health*, 92(7): 1151 - 1157

Fiscella, K. and P. Franks (2000) 'Individual income, income inequality, health and mortality: What are the relationship?' *Health Services Research*, 35:307-318.

Fuchs, C. S., M. J. Stampfer, G. A. Colditz, E. L. Giovannucci, J. E. Manson, I. Kawachi, D. J. Huinter, S. Hankinson, C. H. Hennekens, B. Rosner, F. Speizer, and W. C. Willett (1995), 'Alcohol Consumption and Mortality Among Women,' *The New England Journal of Medicine*, 332(19): 1245-1250.

Goldsmith, S. B. (1973) 'A Reevaluation of Health Status Indicators,' *Health Services Report*, 88(10): 937-941.

Hansluwka, H. E. (1985), 'Measuring the Health of Populations, Indicators and Interpretations,' *Social Science & Medicine*, 20(12): 1207-1224.

Haveman, R., B. Wolfe, B. Kreider, and M. Stone (1994) 'Market Work, Wages, and Men's Health,' *Journal of Health Economics*, 13: 163-182.

Idler, E. L. and S. Kasl (1991) 'Health Perceptions and Survival: Do Global Evaluations of Health Status Really Predict Mortality?,' Journal of Gerontology: *Social Sciences*, 46(2): S55-65.

Laaksonen, M., O. Rahkonen, P. Martikainen and E.Lahelma

(2005) 'Socioeconomic Position and Self-Rated Health: The Contribution of Childhood Socioeconomic Circumstances, Adult Socioeconomic Status, and Material Resources', *American Journal of Public Health*, 95(8):1403 - 1409.

Leigh, J. Paul (1983), 'Direct and Indirect Effects of Education on Health,' *Social Science & Medicine*, 17(4): 227-234.

Lochmer, K., E. Pamuk, D. Makuc, B. Kenney and I. Kawachi (2001) 'State-level income inequality and individual mortality risk: a prospective multilevel study', *American Journal of Public Health*, 91:385-391.

Mackenbach J. P., J. V. D. Bos, I. M. A. Joung, H. V. D. Mheen, and K. Stronks (1994), 'The Determinants of Excellent Health: Different from the Determinants of Ill-Health?,' *International Journal of Epidemiology*, 23(6): 1273-1281.

Mays, G. P., M.C. McHugh, K. Shim, N. Perry, D. Lenaway, P.K. Halverson and R. Moonesinghe (2006), 'Institutional and Economic Determinants of Public Health System Performance' *American Journal of Public Health*, 96(3): 523 - 531.

McLeod, C. B., J. N. Lavis, C. A. Mustard and G. L. Stoddart (2003) 'Income Inequality, Household Income, and Health Status in Canada: A Prospective Cohort Study', *American Journal of Public Health*, 93(8): 1287 – 1293.

Michael K. Miller and C. Shannon Stokes, (1987) 'Health Status, Health Resources, and Consolidated Structural Parameters: Implications for Public Health Care Policy,' *Journal of Health & Social Behavior*, 19: 263-279.

Poilolainen K. and J. Eskola (1988), 'Health Services Resource and their Relation to Mortality from Causes Amenable to Health Care Intervention: A Cross-National Study,' *International Journal of Epidemiology*, 17(1): 86-89.

Singh G. K. and S. M. Yu (1995) 'Infant Mortality in the United States: Trends, Differentials, and Projections, 1950 through 2010,' *American Journal of Public Health*, 85(7): 957-964.

Wehler, C., L. F. Weinreb, N. Huntington, R. Scott, D. Hosmer, K. Fletcher, R. Goldberg, and C. Gundersen (2004) 'Risk and Protective Factors for Adult and Child Hunger Among

Low-Income Housed and Homeless Female-Headed Families' *American Journal of Public Health*, 94(1): 109 - 115.

Management Review: An International Journal

Editorial Policy

Management Review: An International Journal (MRIJ) publishes intellectual findings to academies and practitioners in profit and non-profit organizations as well as local and global institutions on all aspects of managerial issues. MRIJ promotes the findings of sharing knowledge, exchanging experience and creating new ideas between academes and practitioners. MRIJ encourages all manuscripts of multi-disciplinary and cross-functional approaches with theoretical and empirical, technical and non-technical, and cases studies related to managerial issues in certain individual organizations, societies, countries.

Manuscript Submission

Your manuscript should be original contents that are not copyrighted, published, accepted for publication by any other journal, or being reviewed to any other journal while being reviewed by the Journal. Your manuscripts should be formatted with Century 12 points, double-spaced, left-aligned, 2.5 inches of top, 1.5 left and right, and 2 bottom margins on international standard (letter) size. The manuscript size may be between seven and fifteen pages. Manuscripts should follow generally accepted manuscripts printing guidelines. All manuscripts should be electronically submitted to the managing editor at kinforms@korea.com.

Management Review:
An International Journal