Kunio Yoshida, Le Nguyen Hau (Eds.)

Proceedings

THE 2nd INTERNATIONAL CONFERENCE
ON PROJECT AND PROGRAM MANAGEMENT, VNP2M 2015

New Frontiers on Project and Program Management in Vietnam

Co-organizers:
HCMC University of Technology - HCMUT (VNU-HCM)
International Association of Project and Program Management (IAP2M)

HCM City, Vietnam, March 2015

CONSTRUCTION PUBLISHING HOUSE

ORGANISED BY

School of Industrial Management, HCMC University of Technology (VNU-HCM)

International Association of Project and Program Management (IAP2M)

***Chief Editors*: Kunio Yoshida, Le Nguyen Hau**

Editors: Dinh Thi Phuong

Assistants: Pham Quoc Trung, Nguyen Thi Duc Nguyen, Tran Thanh Phong

Publisher:

Construction Publishing House, 37 Le Dai Hanh street, Hai Ba Trung district, Hanoi, Vietnam

Tel: +084 4 9760216 Fax: +844 3821 5369 Email: phuongnxbxd@gmail.com.

Publishing License No: 84-2015/CXBIPH/02-03/XD date January 14th 2015.

ISBN: 978-604-82-1442-5

Publishing responsibility: Trinh Xuan Son

Prepress: Tran Kim Anh

Cover designer: Vu Binh Minh.

Printed in Vietnam 2015.

TABLE OF CONTENTS

THE RESONANT INFLUENCE OF SUPPLY CHAIN MANAGEMENT PRACTICES ON ORGANIZATIONAL PERFORMANCE

DUONG THI BINH AN[1], HUY TRUONG QUANG[1,*], MARIA DO SAMEIRO CARVALHO[2], PAULO SAMPAIO[2], ANA CRISTINA FERNANDES[2], ESTELA VILHENA[3,4]

[1]*Ho Chi Minh City University of Technology, Ho Chi Minh City, Vietnam*

[2]*Systems and Production Department, University of Minho, Braga, Portugal*

[3]*Sciences Department, School of Technology, Polytechnic Institute of Cávado and Ave (IPCA), Barcelos, Portugal*

[4]*Biostatistics and Health Metrics, EPIUnit - Institute of Public Health, University of Porto, Porto, Portugal*

**Corresponding author's E-mail: tqhuy@hcmut.edu.vn*

Abstract: A single supply chain management (SCM) practice will have a certain impact on organizational performance (OP). However, since it is placed in a system that many other practices are conducted simultaneously, the practice itself will interact with other ones and have a greater impact on OP. This mechanism is named the "resonant" influence. The technique of Structural equation modelling (SEM) was used to test the above mechanism with data collected from Vietnamese garment enterprises. The test results showed that the model without mutual interaction among SCM practices could explain 42.8%, 26.3% and 34% variance of operational performance, customer satisfaction and financial performance. While the one containing this interaction is capable to explain 69.5%, 33.1% and 57.3%, respectively.

Keywords: Supply chain management, Supply chain management practices, Organizational performance, mutual interaction, resonant influence.

I. INTRODUCTION

As competition moves from firms to supply chains, the term of Supply Chain Management (SCM) becomes increasingly popular. SCM aims at improving the sourcing for raw materials, the production and the distribution of products/services to customers (Frankel et al., 2014). Thus, the successful implementation of SCM practices provides opportunities to improve Organizational Performance (OP) along the supply chain (Wolf, 2014).

The impact of SCM practices on OP has received much attention in the literature. However, previous studies simply investigate direct or (and) indirect effects (Kaynak and Hartley, 2008), a "more comprehensive" influence still remains limited.

A single SCM practice will have a certain impact on OP. However, since it is placed in a system that many other practices are conducted simultaneously, the practice itself will interact

with other ones and have a greater impact on OP. Otherwise, a research model containing mutual interaction among SCM practices is able to explain OP much more than ones only exist direct effects. This mechanism named the "resonant" influence. It is worth noting that in the literature, this "resonant" influence has not been considered yet.

This study aims at examining resonant influence of SCM practices on OP with the data collected from the Vietnam garment industry. We also expect that the findings achieved from this research could contribute to the theory about relationship between SCM practices and OP.

The structure of this paper is organized as follows: in the next section, theoretical backgrounds and hypotheses are developed. Section 3 describes research methodology. Next, results are presented and discussed. Implications and further researches are mentioned at the end of this paper.

II. THEORETICAL BACKGROUND AND HYPOTHESES

In the literature, the adoption of SCM practices has been widely conducted. Yet, there is a large degree of overlap in the use of SCM practices and quality management practices. In other words, the taxonomy between them is unclear.

According to Talib et al. (2011), they can be classified based on "primary integration." While quality management practices mainly concentrate on the internal integration, e.g. purchasing, production, distribution, etc., SCM practices take into account internal processes of an organization and link them with the external operations of members in the entire supply chain (Fig. 1).

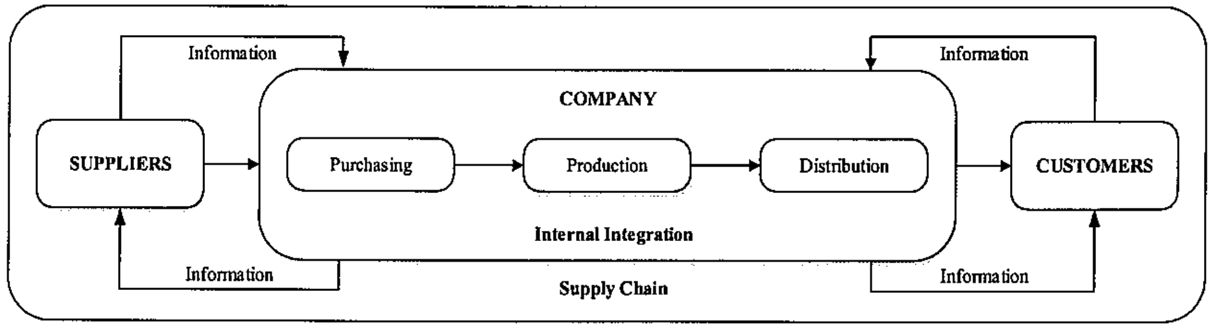


***Fig. 1.** Quality and Supply Chain Management*

Hence, by combining with extensive literature review, a set of relevant SCM practices has been identified, including top management support, human resource management, customer focus, supplier management reporting and analysis of quality data, product/service design and process management.

The influence of these SCM practices on OP was investigated in previous studies. Some authors proved that SCM practices have direct effect on OP (Keah - Choon et al., 1999; Koh et al., 2007; Li et al., 2006; Vanichchinchai and Igel, 2010) or even both direct and indirect (Kaynak and Hartley, 2008). However, if we simply investigates direct or (and) indirect impacts, the "resonant" influence of each and all practice(s) on OP will be not examined. It is the fact that a company usually applies simultaneously a set of practices instead of a single one in their organizational context. Thus, each implemented practice is not only to improve OP but also to increase efficiency of others. Consequently, each practice itself and a system including all practices will have greater influence on OP. In the effort of examining this "resonant" influence, a following model will be proposed:

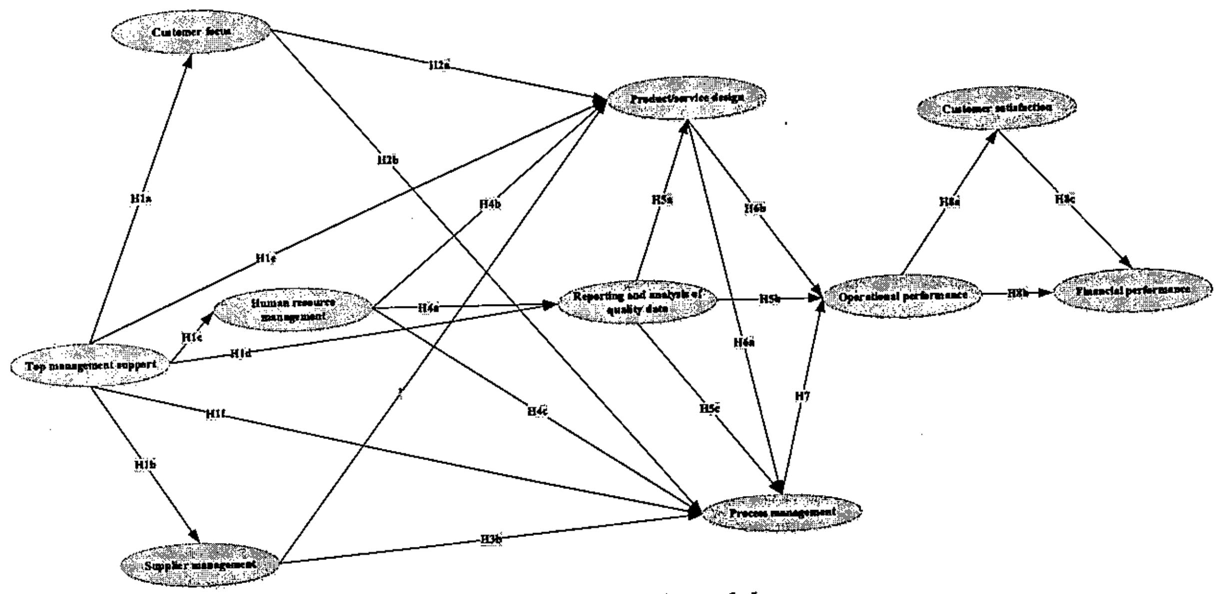


Fig.2. Research model

Fig.2 schematically depicts relationships between each pair of constructs. In this model, organizational performance is represented by three components: operational performance, customer satisfaction and financial performance. Hypotheses of the research model are proposed based on the relationships were proved in the previous studies (Table 1).

Table 1. The relationships among each pair of constructs in previous studies

Hypotheses	*Relationships*	*Authors*
H1a	TMS --> CF	(Kaynak, 2003)
H1b	TMS --> SM	(Kaynak and Hartley, 2008; Zu et al., 2008)
H1c	TMS --> HRM	(Kaynak and Hartley, 2008; Ou et al., 2010; Sila and Ebrahimpour, 2005; Singh, 2008; Tarí et al., 2007)
H1d	TMS --> QD	(Flynn et al., 1995; Kaynak, 2003; Lakhal et al., 2006; Sila and Ebrahimpour, 2005)
H1e	TMS --> PSD	(Kaynak, 2003; Kaynak and Hartley, 2008; Ou et al., 2010)
H1f	TMS --> PM	(Lakhal et al., 2006; Sila and Ebrahimpour, 2005)
H2a	CF --> PSD	(Ulwick and Teitelbaum, 2005)
H2b	CF --> PM	(Fening et al., 2008; Lakhal et al., 2006; Rahman and Bullock, 2005; Samson and Terziovski, 1999).
H3a	SM --> PSD	Yeung (2008), Hoegl and Wagner (2005)
H3b	SM --> PM	
H4a	HRM --> QD	Kaynak (2003), Sila and Ebrahimpour (2005), Tarí et al. (2007), Kaynak and Hartley (2008), (Zu (2009)) and Ou et al. (2010).
H4b	HRM --> PSD	
H4c	HRM --> PM	

Hypotheses	*Relationships*	*Authors*
H5a	QD --> PSD	Flynn et al. (1994), Kaynak (2003); Kaynak and Hartley (2008), Ou et al. (2010)
H5b	QD --> PM	
H5c	QD --> OP	
H6a	PSD --> PM	(Ahire and Dreyfus, 2000; Flynn et al., 1995)
H6b	PSD --> OP	(Tan, 2001), (Ahire and Dreyfus, 2000; Anderson et al., 1995)
H7	PM --> OP	(Ahire and Dreyfus, 2000; Forza and Filippini, 1998)
H8a	OP --> CS	Choi and Eboch (1998), Ahire and Dreyfus (2000), Kaynak (2003), Kaynak and Hartley (2008), Yeung (2008), Ou et al. (2010)
H8b	OP --> FP	
H8c	CS --> FP	

III. METHODOLOGY

This section includes three critical contents: (1) development of initial instrument, (2) large-scale data collection and (3) large-scale analysis.

Development of the initial instrument

Based on an extensive literature review, the scales of constructs were developed (table 2). A seven-point Likert scale was employed with a score of 1, indicating "strongly disagree", and 7, representing "strongly agree", to extract the different attitudes of respondents. Then, a structural interview and Q-sort were conducted with the participation of academicians and some managers who have many experiences in this area in order to revise the measuring scales before establishing the official questionnaire.

Large-scale data collection

A total of 2.147 out of 3.147 garment enterprises were selected. The link of the official questionnaire was sent to these 2147 firms via email addresses. A sum of 179 valid questionnaires was received.

Most of respondents are presidents, directors, vice directors, managers, etc. who had more than 5 years of working experience in the current company. Among them, 32.4% are retailers, 40.2% from manufacturing companies, 14.5% from distribution centers, fabric firms account 10.6% and the remaining are design-related companies. Approximately 26.8% of the firms had 10 or fewer employees, 35.8% of the firms employed between 10 and 49 workers, 19.6% of the firms had from 50 to 249 employees, and 17.8% of the firms had more than 250 employees.

Large-scale data analysis process

Firstly, Cronbach's Alpha coefficient was used for evaluating reliability of each construct (Antony et al., 2002). Then, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted to assess unidimensionality and validity of constructs, including: convergent validity, discriminant validity and criterion-related validity.

Table 2. Test results of measurement instrument

Constructs	Observed items	Factor loadings	Item – total correlation	Eigenvalue	Variance extracted	Cronbach's Alpha	Standardized Regression Weights	Composite reliability	Variance extracted
		Cronbach's Alpha and EFA with SPSS					CFA with AMOS		
Reporting and analysis of quality data	The collection of quality data.	0.879	0.731	2.387	79.562	0.871	0.81	0.872	0.695
	Display of quality data, control charts… at work stations.	0.893	0.757				0.838		
	Delivery feedback of quality data to employees.	0.904	0.775				0.852		
	Use of quality data in employees' tasks.	Deleted					Deleted		
	Availability of quality data.	Deleted					Deleted		
Product/service design	Use of modular design of component parts.	0.721	0.504	2.287	57.167	0.748	Deleted	0.722	0.565
	Use of standard components.	0.683	0.462				Deleted		
	The simplification of products.	Deleted					Deleted		
	Review of new product/service design.	0.825	0.634				0.783		
	Clarity of product/service specifications	0.787	0.576				0.719		
Process management	Use of statistical techniques.	0.803	0.647	2.721	68.014	0.843	0.706	0.844	0.575
	Use of automatic processes.	0.847	0.71				0.788		
	Use of fool-proof for process design.	Deleted					Deleted		
	Use of the preventive equipment maintenance.	0.803	0.649				0.76		
	Clarity of work or process instructions.	0.845	0.706				0.776		
Top management support	Offer of innovation and continuous improvement policies.	0.761	0.64	3.429	57.142	0.85	0.724	0.808	0.514
	Provision of necessary resources for processes.	0.8	0.686				0.733		
	Promotion of partners' involvement in firm's activities.	0.761	0.639				0.704		
	Participation of top management in supply chain improvement process.	0.749	0.625				0.705		
	Review of supply chain issues in top management meetings.	0.74	0.615				Deleted		
	Responsibility for organizational performance.	0.722	0.593				Deleted		
Human resource management	The relationship between human resource objectives and strategic.	0.782	0.669	3.548	59.135	0.862	0.731	0.862	0.511
	The role of environment on the development of all employees.	0.744	0.624				0.656		
	Promotion in the motivation of employees.	0.79	0.679				0.721		
	Involvement in determining training needs.	0.768	0.653				0.747		

Constructs	Observed items	Factor loadings	Item – total correlation	Eigenvalue	Variance extracted	Cronbach's Alpha	Standardized Regression Weights	Composite reliability	Variance extracted
		Cronbach's Alpha and EFA with SPSS					CFA with AMOS		
	Training program for employees timely.	0.804	0.697				0.722		
	Responsibility in employees' tasks.	0.721	0.6				0.703		
	The measurement methods of employee satisfaction.	Deleted					Deleted		
	The effectiveness of employee problem resolution program.	Deleted					Deleted		
Customer focus	Determination of customers' needs and wants.	0.802	0.623	2.461	61.517	0.791	0.753	0.751	0.502
	Use of information from customers in designing products and services.	0.771	0.583				0.68		
	Understanding of products or services by employees.	0.798	0.617				0.69		
	Commitment in satisfying customers.	0.766	0.578				Deleted		
	Relationship between company's goals and customers' expectations.	Deleted					Deleted		
Supplier management	Reliance on a few suppliers.	0.839	0.74	3.502	70.039	0.893	0.803	0.893	0.626
	Selection of suppliers based on quality.	0.822	0.717				0.768		
	Development of long-term relationship with suppliers.	0.826	0.723				0.763		
	Clear of the specifications provided to suppliers.	0.826	0.723				0.778		
	Assessment of suppliers' capabilities and performance.	0.871	0.784				0.842		
Operational performance	Reduction of management costs.	0.768	0.626	3.08	61.594	0.844	0.701	0.845	0.521
	Reduction of lead-time.	0.78	0.643				0.703		
	Reduction of order-time.	0.793	0.661				0.757		
	Reduction of rate of damaged materials.	0.827	0.705				0.765		
	Reduction of rate of late delivery.	0.754	0.612				0.68		
Customer satisfaction	Customer standards are always met by our plant.	0.937	0.755	1.755	87.728	0.854	0.916	0.863	0.759
	Customer evaluation of our performance has been improving.	0.937	0.755				0.824		
Financial performance	Sales growth.	0.801	0.62	2.439	60.985	0.786	0.733	0.751	0.502
	Market share.	0.753	0.559				Deleted		
	Return on investment.	0.772	0.582				0.669		
	Return on sale.	0.797	0.614				0.722		

The technique of SEM is applied to validate hypotheses. It is able to show direct and indirect effects of the SCM practices on OP. Furthermore, in order to test the "resonant" influence of mutual interaction among the SCM practices on OP, competitive models that only present the direct effect of SCM practices on various dimensions of OP and have no mutual interaction among SCM practices were built. These models will be compared with the SEM model. The models that have goodness of fit statistics and R^2 for OP explained by the SEM model. The models that have goodness of fit statistics and R² for OP explained by the SCM practices greater are better ones. In case, the better one is the SEM model, it means that the mutual interaction among SCM practices has a "resonant" impact on OP and vice versa.

III. RESULTS AND DISCUSSION

Test results of the measurement instrument

The test results are summarized in the table 2. After removing unsatisfactory items of SCM's measuring scales and one item of OP's measuring scales, the measurement models are appropriate with the collected data (table 3).

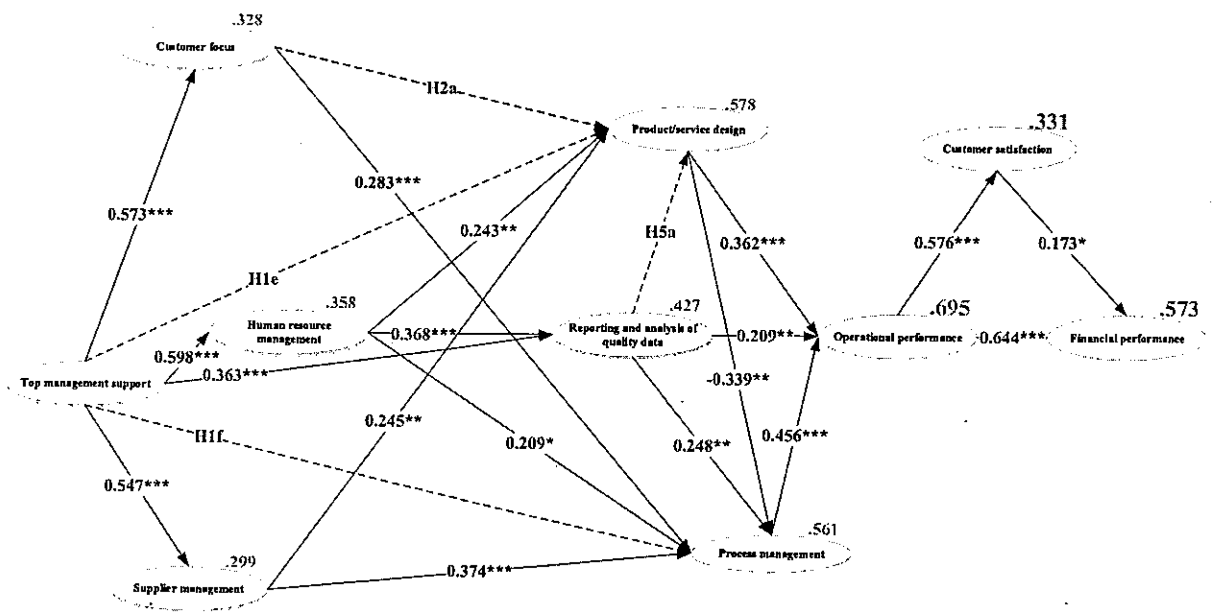
Table 3. Test results of research models

Goodness-of-fit statistics	Measurement model for SCM	Measurement model for OP	Structural model	Competitive model 1	Competitive model 2	Competitive model 3	Recommended values for satisfactory fit of a model to data
χ2/df	1.036	1.137	1.232	1.849	2.036	2.044	<3.0
RMSEA	0.014	0.028	0.036	.069	0.076	.077	<0.08
CAIC	762.442	173.651	1322.178				< Saturated model and independence model
CAIC for Saturated Model	2338.832	340.306	4349.732				
CAIC for Independent Model	2733.679	811.395	4035.262				
CFI	0.995	0.994	0.955	.853	.842	.830	>0.9

Test results of hypotheses

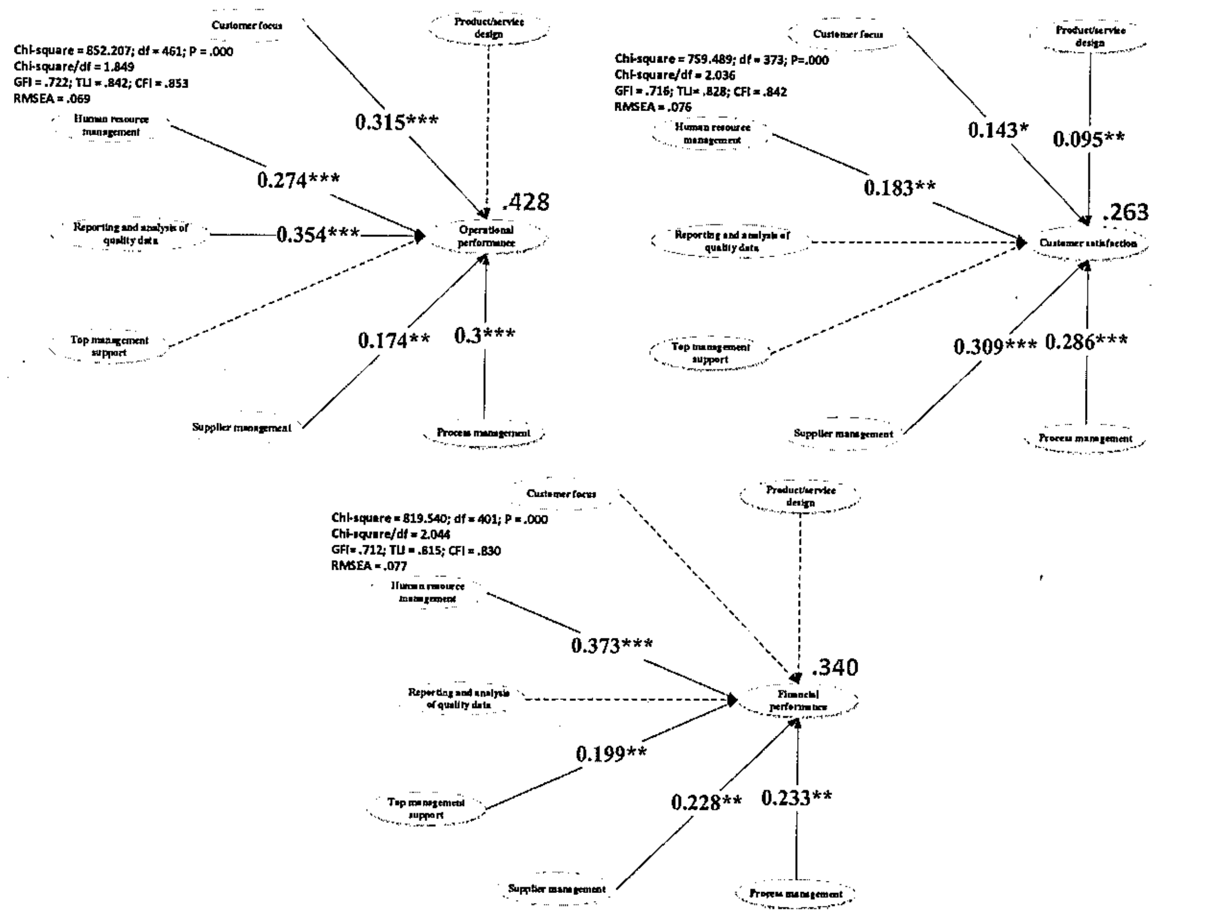
Test results of the structural model indicated that it is an appropriate fit with the collected data (table 3).

Fig. 3 describes the SEM results of relationships among SCM practices and OP. Parameters which are on the arrows are Standardized Regression Weights (β) and P-value. Test results indicate that all of paths in the model, with the exception of the paths pertaining to H1e, H1f, H2a, H5a and H6a, are supported by the collected data (β ranges from .173 to .644 at the significant level, $p<0.1$). Specially, the hypothesis of H6a related to the relationship between PSD and OP, although P-value<0.05, is a negative impact. Thus, the hypothesis of H6a is not supported by the data.



Notes: *p<0.1; **p<0.05; ***p<0.01

Fig. 3. Test results of SEM model



***Figs. 4(a)-4(b)-4(c).** Test results of competitive model – operational performance, customer satisfaction, financial performance*

The R^2 for operational performance, customer satisfaction and financial performance explained by the SCM practices is .695, .331, .573, respectively, indicating that the SCM practices can explain a large amount of variance in various dimensions of OP. It is worth noting that OP is not only impacted by the SCM practices, but also by other factors, such as: external environment, capital, technology, equipment, information flow, etc. Thus, enterprises which have limitations in resources for equipment investment and technological innovations could still improve OP remarkably by the implementation of these SCM practices. In other words, in the same conditions of finance, capital, technology, equipment, information, etc., firms which implement the SCM practices successfully will get higher OP.

The coefficients of β on the SEM model show direct impacts, there are no information about indirect effects among constructs. In other words, the total effects or the "real" effects have not been indicated yet. Table 4 presents the direct and indirect relationship between SCM practices and OP. The column of Standardized Total Effects is the sum of direct and indirect effects.

Table 4. Test results of relationship between SCM practices and OP

Relationships			Standardized Indirect Effects	Standardized Direct Effects	Standardized Total Effects	Relationships			Standardized Indirect Effects	Standardized Direct Effects	Standardized Total Effects
TMS	-->	OP	0.641	0	0.641	QD	-->	OP	0.15	0.209	0.359
TMS	-->	CS	0.369	0	0.369	QD	-->	CS	0.207	0	0.207
TMS	-->	FP	0.477	0	0.477	QD	-->	FP	0.267	0	0.267
HRM	-->	OP	0.278	0	0.278	PSD	-->	OP	-0.154	0.362	0.208
HRM	-->	CS	0.16	0	0.16	PSD	-->	CS	0.12	0	0.12
HRM	-->	FP	0.207	0	0.207	PSD	-->	FP	0.155	0	0.155
CF	-->	OP	0.159	0	0.159	PM	-->	OP	0	0.456	0.456
CF	-->	CS	0.092	0	0.092	PM	-->	CS	0.262	0	0.262
CF	-->	FP	0.119	0	0.119	PM	-->	FP	0.339	0	0.339
SM	-->	OP	0.221	0	0.221						
SM	-->	CS	0.127	0	0.127						
SM	-->	FP	0.165	0	0.165						

Fig. 4a, 4b and 4c schematically depict test results of the competitive models that have no mutual interaction among SCM practices. By comparing values of goodness of fit statistics among models, it can be said that the SEM model is well-fitting to the data than the competitive ones. Moreover, the coefficients of R^2 for operational performance, customer satisfaction and financial performance explained by the SCM practices in the competitive models are 0.428, 0.263 and 0.340, respectively that are less than in the SEM model (0.695, 0.331 and 0.573). Furthermore, by comparing the effect of each practices on various dimensions of OP in SEM model (table 4) and in competitive models (Figs. 4(a)-4(b)-4(c)), we can see that almost relationships in SEM model are greater than those in competitive ones. It means that mutual interaction among SCM practices increases the impact of these practices on OP. In other words, this interaction brings a "resonant" influence of SCM practices on OP.

In the purpose of improving OP, a major implication of this study is that managers should not simply choose one or some practices mentioned in this study to apply in their context. Rather, these practices should be applied simultaneously as an integrated system. In this system, they will interact with each other and bring a "resonant" influence on OP. However, the implementation of all practices immediately is quite difficult. We suggest that the SCM practices should be applied a step by step and the structural model proposed in this study is capable to be used as "a guideline" for this implementation. According to the structural model, the implementation of the SCM practices should start with top management support that all paths in the model are derived. Then, the process can continue with the other SCM support practices, e.g. human resource management that is able to create a high quality human resource, Customer focus that is to determine customers' demands or supplier management to select good suppliers, etc., until all practices are applied.

V. CONCLUSION

This research extends the picture of relationship among SCM practices. In this comprehensive picture, mutual interaction of SCM practices was examined. Consequently, the "resonant", indirect and direct influences of these practices on OP were identified. To improve OP, therefore, these practices should be implemented simultaneously as an integrated system rather than independent ones and the structural model used in this study could play as a "guideline" to orient for the implementation of SCM practices.

Conversely, this study still has some limitations that need to further explore. As mentioned above, beside SCM practices, there are many factors having impacts on OP that are not considered in this study, e.g. capital, technology, equipment, information flow, risk, outsourcing, etc. Moreover, it would be more comprehensive if extending the sample scope in other industries and many countries. These things imply the directions for further research.

REFERENCES

Ahire, S.L., Dreyfus, P., 2000. The impact of design management and process management on quality: an empirical investigation. Journal of Operations Management 18, 549-575.

Anderson, J.C., Rungtusanatham, M., Schroeder, R.G., Devaraj, S., 1995. A Path Analytic Model of a Theory of Quality Management Underlying the Deming Management Method: Preliminary Empirical Findings*. Decision Sciences 26, 637-658.

Antony, J., Leung, K., Knowles, G., Gosh, S., 2002. Critical success factors of TQM implementation in Hong Kong industries. International Journal of Quality & Reliability Management 19, 551-566.

Choi, T.Y., Eboch, K., 1998. The TQM Paradox: Relations among TQM practices, plant performance, and customer satisfaction. Journal of Operations Management 17, 59-75.

Fening, F.A., Pesakovic, G., Amaria, P., 2008. Relationship between quality management practices and the performance of small and medium size enterprises (SMEs) in Ghana. International Journal of Quality & Reliability Management 25, 694-708.

Flynn, B.B., Schroeder, R.G., Sakakibara, S., 1994. A framework for quality management research and an associated measurement instrument. Journal of Operations Management 11, 339-366.

Flynn, B.B., Schroeder, R.G., Sakakibara, S., 1995. The Impact of Quality Management Practices on Performance and Competitive Advantage. Decision Sciences 26, 659-691.

Forza, C., Filippini, R., 1998. TQM impact on quality conformance and customer satisfaction: A causal model. International Journal of Production Economics 55, 1-20.

Frankel, R., Keller, S.B., Keller, B.C., Gibson, B.J., Hanna, J.B., Defee, C.C., Chen, H., Tate, W., Sanders, N.R., 2014. Definitive Guides for Supply Chain Management Professionals (Collection). Pearson Education

Hoegl, M., Wagner, S.M., 2005. Buyer-Supplier Collaboration in Product Development Projects. Journal of Management 31, 530-548.

Kaynak, H., 2003. The relationship between total quality management practices and their effects on firm performance. Journal of Operations Management 21, 405-435.

Kaynak, H., Hartley, J.L., 2008. A replication and extension of quality management into the supply chain. Journal of Operations Management 26, 468-489.

Keah - Choon, T., Vijay, R.K., Robert, B.H., Soumen, G., 1999. Supply chain management: an empirical study of its impact on performance. International Journal of Operations & Production Management 19, 1034-1052.

Koh, S.C.L., Mehmet, D., Erkan, B., Ekrem, T., Selim, Z., 2007. The impact of supply chain management practices on performance of SMEs. Industrial Management & Data Systems 107, 103-124.

Lakhal, L., Pasin, F., Limam, M., 2006. Quality management practices and their impact on performance. International Journal of Quality & Reliability Management 23, 625-646.

Li, S., Ragu-Nathan, B., Ragu-Nathan, T.S., Subba Rao, S., 2006. The impact of supply chain management practices on competitive advantage and organizational performance. Omega 34, 107-124.

Ou, C.S., Liu, F.C., Hung, Y.C., Yen, D.C., 2010. A structural model of supply chain management on firm performance. International Journal of Operations & Production Management 30, 526-545

Rahman, S.-u., Bullock, P., 2005. Soft TQM, hard TQM, and organisational performance relationships: an empirical investigation. Omega 33, 73-83.

Samson, D., Terziovski, M., 1999. The relationship between total quality management practices and operational performance. Journal of Operations Management 17, 393-409.

Sila, I., Ebrahimpour, M., 2005. Critical linkages among TQM factors and business results. International Journal of Operations & Production Management 25, 1123-1155.

Singh, P.J., 2008. Empirical assessment of ISO 9000 related management practices and performance relationships. International Journal of Production Economics 113, 40-59.

Talib, F., Rahman, Z., Qureshi, M.N., 2011. A study of total quality management and supply chain management practices. International Journal of Productivity and Performance Management 60, 268-288.

DISCUSSION OF INDICATORS FOR ASSOCIATING PROJECTS WITH PROGRAMS

HIRONORI TAKUMA[1,*], MASAYUKI HIYAMA[2]
[1]*Department of Project Management, Chiba Institute of Technology, 2-17-1 Tsudanuma Narashino Chiba, 275-0016, JAPAN*
[2]*Project Promotion Department, FIXER Inc., Yokogawa Building 4-4-44 Shibaura Minato-ku Tokyo, 108-0023, Japan*
**Email: takuma.hironori@it-chiba.ac.jp*

Abstract: This paper discusses indicators for associating projects with programs related to program architecture design. We define practical indicators in this case study for the purpose of designing the association of outcomes, action plans, resources, strategies, risks, etc., in between projects and programs. Finally, we discuss a prototype web tool that could be used in the future to design the program architecture using these indicators.

Keywords: Value indicator, Project program association, Architecture management, Value assessment management, 3S models

I. INTRODUCTION

The impact and the outcome of a program are generated from project-implemented tangible and intangible goods (which are called “system” in this paper). The “indicators” and “targets” of expected values must be indicated to a program manager so that he or she can appropriately control the values acquired from the projects.

In the Project & Program Management for Enterprise Innovation (P2M), the activities that constitute a program are defined as the “standard project model.” This model is further defined by the following three models (3S Models) (by Ohara, 2003):

1. Scheme model

Sets the system requests (e.g., quality, cost, and delivery date (QCD)) for designing and implementing program values.

2. System model

Implements the system for satisfying the requests set by the scheme model.

3. Service model

Operates the system implemented by the system model, collects its outcome, evaluates the program, and creates knowledge.