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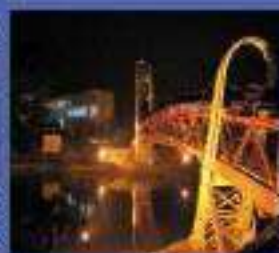
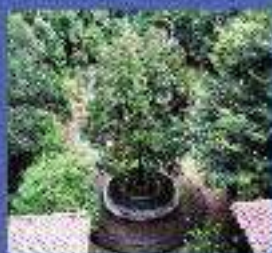
The 11th International Conference
on QiR (Quality in Research)

QiR

Organized by:



Faculty of Engineering
University of Indonesia



3 - 6 August 2009,
Faculty of Engineering
University of Indonesia
<http://qir.eng.ui.ac.id>

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WELCOME FROM THE RECTOR OF UNIVERSITY OF INDONESIA



I am honoured to have the opportunity to officially welcome you to the 11th International Conference on QiR (Quality in Research) 2009. The conference provides an excellent forum for engineering professionals, business executives, industry practitioners, and academicians to exchange ideas and to share their experience, knowledge and expertise with each other. I believe the participants will also learn about the latest trends in the development of new tools, knowledge and skills in various engineering design and technology.

As we agree that engineering products or projects bring together resources, skills, technology and ideas to achieve business objectives and deliver business benefits and it comes in all shapes and sizes from the simple and straightforward to the large and unmentionably complex, thus we need an application of knowledge, skills, tools, and techniques necessary to develop and successfully execute the products or projects plan so it will meet or exceed our customer and stakeholder needs and expectations.

The ultimate concern of engineering product or project is three-fold: the product/project meeting its targets and purposes, the product/project on schedule, and the product/project cost within budget. As the Indonesian economy is growing, local enterprises are obliged to upgrade their skills in innovation and product design. There are also increasingly aware of the importance of professionalism in various engineering areas for industries needs and many professionals are keen to upgrade their capability.

Having said that, I hope this conference can be a kick-off for strengthened our action and partnerships on creating a platform for us; national and international thinkers, academics, government officials, business executives and practitioners, to present and discuss the pivotal role of engineers in the achievement of excellence organizations.

I am sure you will find the 11th International Conference on QiR (Quality in Research) 2009 both informative and stimulating. I would like to thank the Faculty of Engineering, University of Indonesia for organizing this meaningful and timely event, and the supporting organizations for their participation and contributions. With this, I wish you all a fruitful conference. Thank you.

Prof. Dr. der. Soz. Gumilar Rusliwa Somantri
Rector of University of Indonesia
University of Indonesia



WELCOME FROM DEAN OF ENGINEERING
UNIVERSITY OF INDONESIA

On behalf of the Faculty of Engineering, University of Indonesia, it is my greatest pleasure to extend our warmest welcome to all of you to the 11th International Conference on QiR (Quality in Research) 2009. As we know that this conference is conducted to cover a wide range of engineering design and technology issues. I hope these four days of the conference will be spent in interesting discussion and exchange of ideas. I also hope this conference would be able to provide a state-of-the-art information and knowledge in the challenging world of engineering design and technology. The growing success of our institutions and expertise should urge us to develop our competitive capabilities, especially as we face certain challenges which would be overcome with more hard work and working together hand by hand. We will work together to develop a common path and collaboration opportunities for future action and research on multi disciplinary engineering areas.

I am delighted that you have accepted our invitation to this conference in such large numbers as indicated that we will have many international keynote speakers' lectures and papers from various countries to be presented and discussed during these two days conference. We will explore various engineering techniques and tools in various industries that can be used to build better stakeholder performance and relationships, to enable us to create wealth through innovation, to promote productivity through technology, and to foster our collaboration.

I would like to thank you to our sponsors, supported bodies and various contributors for their generous support of this conference. I would also like to thank our distinguished speakers for agreeing to share their insights with us. To our friends from overseas and other provinces of Indonesia, I would also like to extend a warm welcome to you and wish you an enjoyable stay in Jakarta. Last but not least, I would invite you to join me in thanking the committed staff that made this conference happen and to make it a success.

I wish you a very pleasant stay here in Jakarta and a successful and productive discussion at the conference. Thank you.

Prof. Dr. Bambang Sugiarto
Dean of Engineering University of Indonesia

WELCOME FROM THE QIR 2009 ORGANIZING COMMITTEE

On behalf of the Organizing Committee, it is my greatest pleasure to extend our warmest welcome to all of you to the 11th International Conference on QIR (Quality in Research) 2009.



I am sure that you will all find this conference stimulating and rewarding. As we are aware of, the impact of globalization has resulted in a very competitive business environment that makes the fulfillment of customer/clients' ever-sophisticated project or product or service needs most challenging. Without any doubt, a good engineering design and technology is powerful in helping our industries to enhance their productivity and competitiveness. Thus, it is our aim and hope that the conference would be able to provide an international forum for exchange knowledge and research expertise as well as to create prospective collaboration and networking on various fields of engineering and architecture.

With its continuous presence in the last 11 years, QIR has become an icon of Faculty of Engineering University of Indonesia in serving the objectives to provide engineering excellence for both national and international needs. The QIR 2009 consists of 2 special issues and 4 symposia covering almost all aspect in engineering, design and architecture. I am delighted to inform you that we have such large numbers of participants today as indicated that we will have 7 keynote speakers' presentation and more than 240 papers from various countries to be presented and discussed during these two days conference. We are fortunate to have a lot of good quality of papers that belongs to:

70 papers on Radio Frequency Identification (RFID) as a Bridge between Computing and Telecommunication
36 papers on Green Infrastructure for Sustainable Development and Tropical Eco-Urbanism.
56 papers on Industrial Engineering Approach for Productivity Improvement
56 papers on Advanced Materials and Processing
30 papers on Energy Conservation through Efficiency in Design and Manufacturing

I would like to thank you to various contributors, speakers and participants for your generous support of this conference. It is my pleasant duty to thank all the members of Organizing Committee and the International Board of Reviewers for their advices and help. We are grateful to all the Sponsors, Supporters and Exhibitors for their spontaneous response and encouragement by way of committing funds and extending help in kind.

I would like to sincerely thank the Dean of Engineering, for fully supporting the Committee and providing all supports to make this conference happen and to make it a success.

I wish you a very pleasant stay here in Jakarta and finally, let me wish all of you a meaningful and fruitful conference. Thank you and hope to see you again in QIR 2011.

Dr. Bondan T. Sofyan
Organizing Chairperson of QIR 2009

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The Influence of Collaboration to the Supply Chain Performance (A Survey on Modern Retails at DKI Jakarta and Bandung City)

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ABSTRACT

The competition paradigm in modern retail has recently been changed, from the former, intercorporate competition into inter supply chain network. The improvement of Retail Supply Chain Performance seem to be the main demand to win high competition. Some questions of the study include : first, how does The Collaboration happen ? Second, how does The Supply Chain Performance happen ? And third, how far is the influence of Information Collaboration, Decision Synchronization Collaboration, Incentive Alignment Collaboration, and Organization Collaboration to The Modern Retailer Supply Chain Performance either partial or simultaneous. The study was conducted as descriptive and verification method in which the causality was used as a type of investigation. This study was under taken in Hypermarket, Supermarket, and Minimarket. Number of sample are 207, while the empirical way of testing to examine hypotheses, the author used Structural Equation Modeling (SEM) processed by Lisrel 8.30 software for windows NT. Research findings indicate that; (1) There are some positive and significant influence between Information Collaboration to The Modern Retailer Supply Chain Performance; (2) There are some positive and significant influence between Decision Synchronization Collaboration to The Modern Retailer Supply Chain Performance; (3) There are some positive and significant influence between Incentive Alignment Collaboration to The Modern Retailer Supply Chain Performance; (4) There are some positive and significant influence between Organization Collaboration to The Modern Retailer Supply Chain Performance; (5) There are some simultaneously positive and significant influence between Information Collaboration, Decision Synchronization Collaboration, Incentive Alignment Collaboration, and Organization Collaboration to The Modern Retailer Supply Chain Performance. Based on the findings above the author concludes that Collaboration in Supply Chain between Modern Retailers and Key Suppliers are significantly able to enhance The Modern Retailer Supply Chain Performance.

Keywords : *Information Collaboration, Decision Synchronization Collaboration, Incentive Alignment Collaboration, Organization Collaboration, Supply Chain Performance.*

1. INTRODUCTION

Supply chain collaboration has become a new imperative strategy for companies to create competitive advantage [12]; [25]. A closer relationship enables the

participating companies to achieve cost reductions and revenue enhancements as well as flexibility in dealing with supply and demand uncertainties [5]; [18]. Hewlett-Packard (HP), for instance, initiated collaboration with one of its major resellers [7]. These collaborative efforts, which focused on co-managed inventory by considering different levels of demand uncertainty, enabled both parties to improve fill rate, increase inventory turnover, and enhance sales. Similarly, Wal-Mart collaborated in demand planning and replenishment with its major suppliers to increase inventory turns, reduce inventory costs, reduce storage and handling costs, and improve retail sales [21]. Supply chain collaboration requires a reasonable amount of effort from all participating members to ensure the attainment of potential benefits [3]; [9]. The chain members also search for better practices and ideas through benchmarking their current collaborative practices to other collaborative supply chains. To achieve higher supply chain efficiencies, the various members of the supply chain are presumed to share information and trust one another. According to Supply Chain Management (SCM) theory, the level of collaboration depends on the nature of relationships (e.g., the frequency of the contact, the level of trust, etc.) and the application of advanced information technologies such as collaborative forecasting [11]; [19]. Improving relationships among the members of the supply chain in turn leads to cost reductions and higher levels of customer service [26].

The growth of modern retail in DKI Jakarta and Bandung is higher than the other cities in Indonesia. This certainly will cause the level of competition inter modern retailer become more and more tight. Thus the retail supply chain performance seems to be the most important demand to win the strict competition. The increase of retail supply chain performance would expectedly reached through collaboration with suppliers in form of information Collaboration, Decision Synchronization Collaboration, Incentive Alignment Collaboration, and Organization Collaboration. Some questions of the study include : first, how does The Collaboration happen ? Second, how does The Supply Chain Performance happen ? And third, how far is the influence of Information Collaboration, Decision Synchronization Collaboration, Incentive Alignment Collaboration, and Organization Collaboration to The Modern Retailer Supply Chain Performance either partial or simultaneous.

2. LITERATURE REVIEW

Collaboration between supply chain partners has been covered extensively in the strategic management literature [6]; [16]. Other researchers have examined the

theoretical implications of supply chain collaboration through unilateral supply policies [14]; [27]. Other researchers have employed theoretical models to examine bilateral information exchange rather than unilateral policy incentives [10]; [20]. The practitioner-oriented research into supply chain collaboration tends to focus on the emerging concept of Collaborative Planning, Forecasting and Replenishment (CPFR) and Vendor Managed Inventory (VMI) [1]. Though rigorously reported empirical data are rare, [15] presents results for 31 grocery retail chains that adopted Campbell's continuous replenishment process and showed a significant improvement in inventory turns and a simultaneous reduction in stock-outs. Sharing of physical assets as suggested by our concept of structural supply chain collaboration has been examined in pieces but not holistically. For example, [8] examine the benefit of coordinated shipments to improve truck utilization.

The definitions of collaboration made by researchers as well as column writers in business magazines are not incongruous, nor are they ever the same; it seems extremely difficult to develop a general one-sentence definition of collaboration [4]. Collaboration can (similar to [19]) understanding of the SCM term), be considered to contain two different things. First, collaboration can be characterized as a certain type of relationship between independent companies or functions in a company where trust, win-win thinking, commitment and openness are important ingredients [20]; [21]; [22]. Second, collaboration also consists of activities that are performed by the participating actors within the collaboration [19]. Collaboration within the logistics area, which is the focus in this dissertation, typically means sharing information and jointly negotiating and deciding upon logistics activities in the supply chain such as transportation and inventory. This means a two-way communication with jointly, voluntary agreed goals [23]. Since collaboration should contribute to improvements in the supply chain, the possibility for the involved parties to influence the collaboration is important; otherwise there is a risk that major opportunities for improvements can be lost as well as the win-win situation [13]; [24]

Collaboration variable in the research is grouped as follow :

- 1) *Information Collaboration*
 Cooperation amongst collecting and disseminating relevant and functnal information using all resources to make decision, planning, and supply chain operation. The collaboration indicators include : Demand Forecasting, Sales Administration, Inventory level, Promotion Plan, Delivery Schedule, Information Technology [23].
- 2) *Decision Synchronization Collaboration*
 Cooperation of decision making is based on adjustment of planning and supply chain operation standard. Collaboration indicators include : Purchasing, Target Market, Price Policy, Service Level [22]; [2].
- 3) *Incentive Alignment Collaboration*
 Cooperation of risk equivalent regulation and benefit which is caused by planning and supply chain operation. Administrative fee and utilizing technology are normally handed together amongst members of supply chain to keep commitment. Collaboration indicator include: Discount Program, Research & Development, Inventory Management, Product Warranty [22]; [2]
- 4) *Organization Collaboration*
 Collaboration organization and making use of cross firm function focusing on planning and supply chain operation. The collaboration indicators are : Information Technology Implementation, Supply Chain Design, Customer Satisfaction Measurement [2].

Based on the problem faced by modern retailers and relevant literature study. The research paradigm shows as follow :

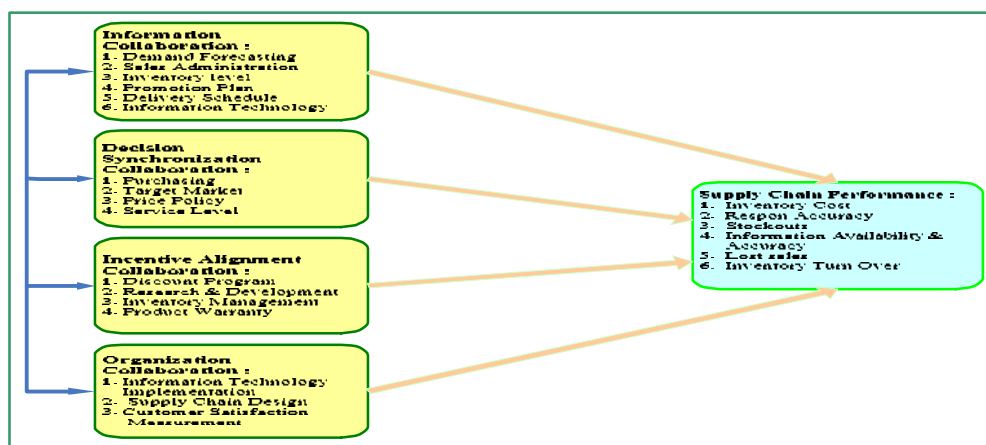


Figure 1. Research Paradigm

State of the art for this research presented in table 1 below:

Table 1. Research State of The Art

No	Authors	Year	Research Title	Type of Collaboration				Analysis Technique
				Information	Decision Synchronization	Incentive Alignment	Organization	
1	Patnayakuni and Patnayakuni	2002	Towards a Theoretical Framework of Digital Supply Chain Integration	✓				Linier Regression
2	Dooley and King	2004	Efficient Consumer Response and the Importance of Collaboration for Supermarkets	✓				Linier Regression
3	Simatupang and Ramaswami Sridharan	2005	The collaboration index: a measure for Supply Chain collaboration	✓	✓	✓		Index
4	Prabir K. Bagchi and Tage Skjoett-Larsen	2005	Supply Chain Integration: a European Survey		✓	✓	✓	Path Analysis
5	J. Taco Van der Vaart and Dirk Pieter Van Donk	2007	Supply Chain Integration and Performance : The Impact of Business Conditions.	✓				Correlation
6	Agus Purnomo	2008	The Influence of Collaboration to The Supply Chain Performance (A Survey on Modern Retails at DKI Jakarta and Bandung City)	✓	✓	✓	✓	SEM

3. RESEARCH METHOD

Research methods used in this study are descriptive and explanatory survey. In descriptive survey, the researcher wants to have a description about level of collaboration which aims to headwaters (key distributor). It has been conducted by retailers from DKI Jakarta and Bandung. Explanatory survey is captured out in to 250 head gerai hypermarket, supermarket, and mini market in DKI Jakarta and Bandung as sample. The purpose of the survey is to know how is the correlation inter variable amongst information collaboration, Decision Synchronization Collaboration, Incentive Alignment

Collaboration, and Organization Collaboration to The Modern Retailer Supply Chain Performance, through hypothesis test. Investigation type used in the research is causality, a kind of research type stating the existence of causal correlation of research variable between independent variable and dependent variable. Data analysis has been completed by using quantitative method. It is statistically tested the hypothesis used Structural Equation Modeling (SEM) processed by software Lisrel 8.30 for Window NT.

Structural Equation Model shows the correlation between endogenous latent variable and exogenous latent variable as following formula:

$$Y = \gamma_{Y1}X_1 + \gamma_{Y2}X_2 + \gamma_{Y3}X_3 + \gamma_{Y4}X_4 + \zeta_y \quad (1)$$

Where : Y=Supply Chain Performance; X₁= Information Collaboration; X₂= Decision Synchronitiozan Collaboration; X₃= Incentive Alignment Collaboration; X₄= Organization Collaboration; $\gamma_{1,y}, s.d \gamma_{4,y} =$

influence value exogenous latent variable to endogenous latent variable.

Figure 2 below describes a research model for all variables in SEM diagram form.

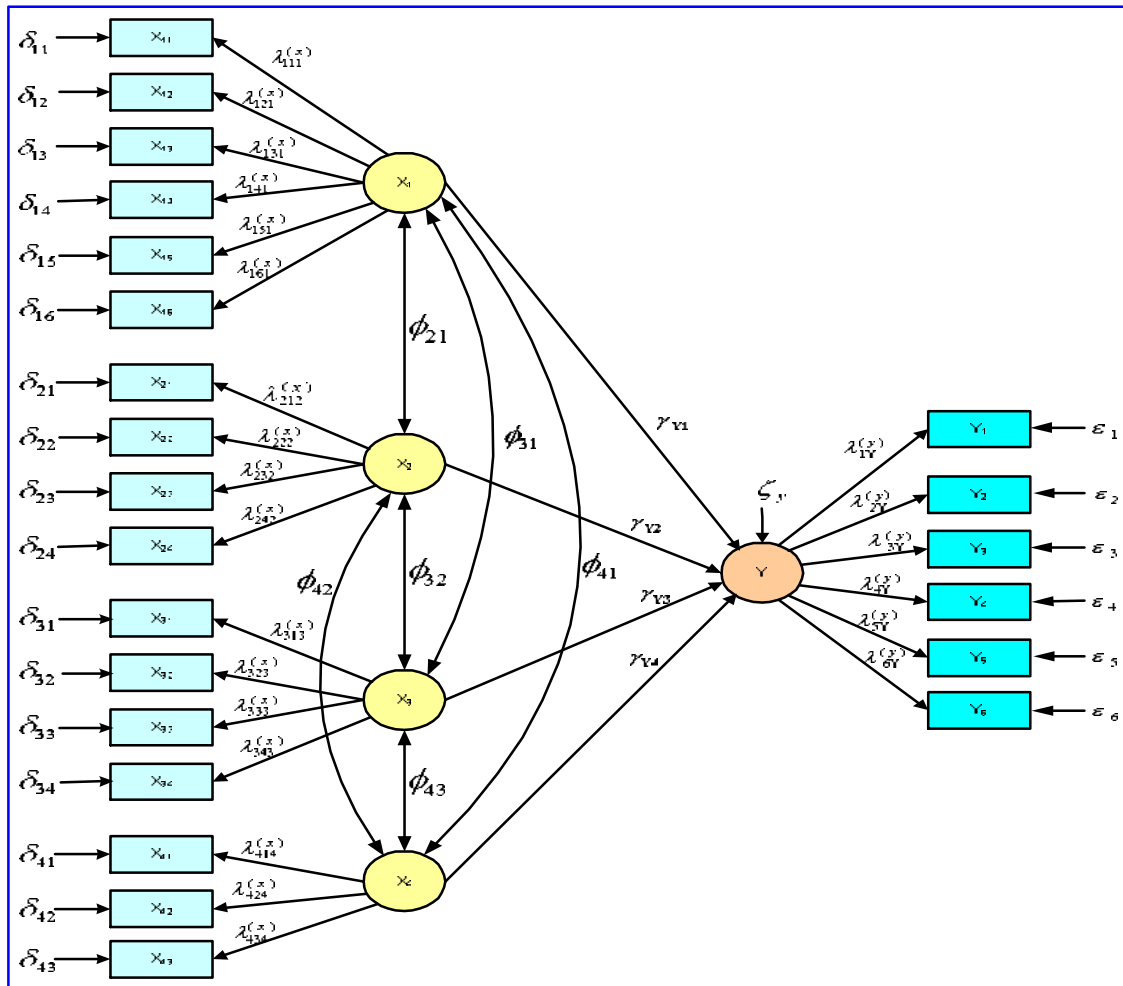
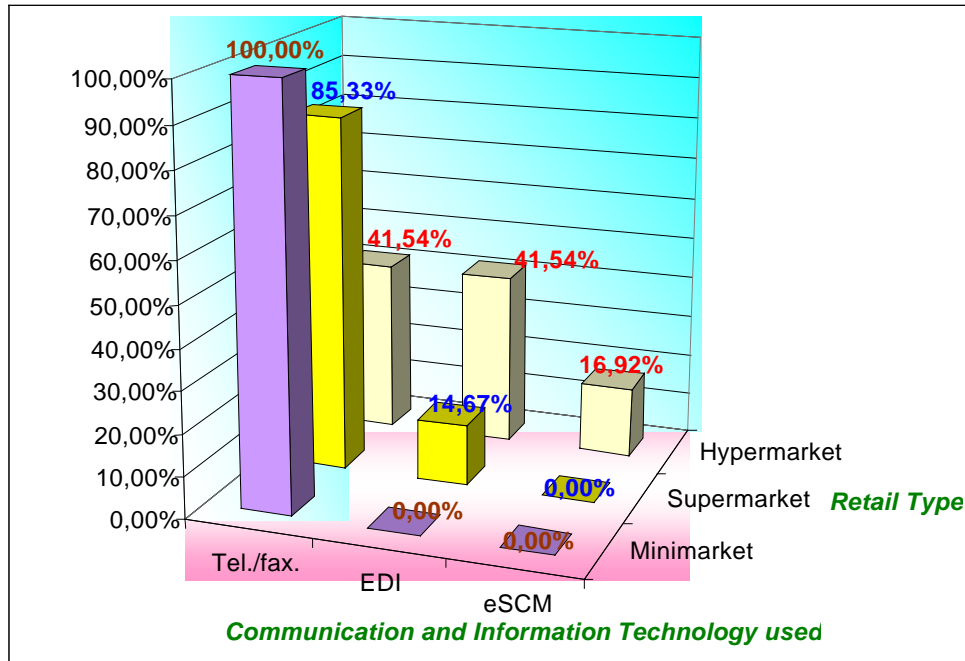


Figure 2. Research Model in the Form of SEM Diagram for All Variables

4. FINDINGS

Based on 207 respondent, the retailer characteristic description based on communication and information technology which is used in collaboration with key suppliers (figure 3) shows that 100% of minimarkets used telephone/facsimile to have communication and information exchange when they collaborate with their key suppliers. While 85,33% supermarket used

telephone/facsimile in the same time with 14,67% electronic data interchange (EDI) to exchange information and communication when collaborating with key suppliers, 41,54% hypermarkets used telephone/facsimile, Electronic Data Interchange/EDI (41,54%) and 16,92% esupply Chain Management / eSCM to have communication and information exchange when collaborating with key suppliers.

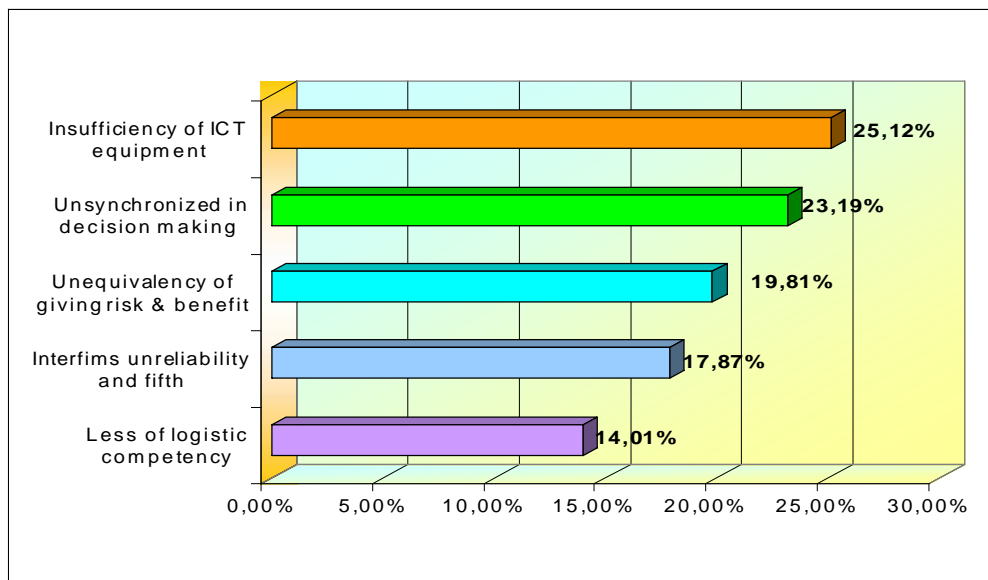


Source : questioner (n=207), 2009

Figure 3. Characteristics of Retailers according to Communication and Information Technology used in Collaboration with Key Suppliers

The description of retailers characteristic according to arrangement collaboration constraint with key suppliers (figure 4) are: first, insufficiency of information and technology equipment (25,12%), second, unsynchronized in decision making (23,19%), third, unequivalency of giving risk and benefit (19,81%), fourth, interfirms unreliability and fifth, less of logistic competency

(14,01%). According to the description above, we find that the insufficient of information technology equipment has placed the first constraint in collaboration with suppliers. It is relevant to communication and information technology which is used by retailers collaborating with key suppliers mostly used telephone/facsimile.

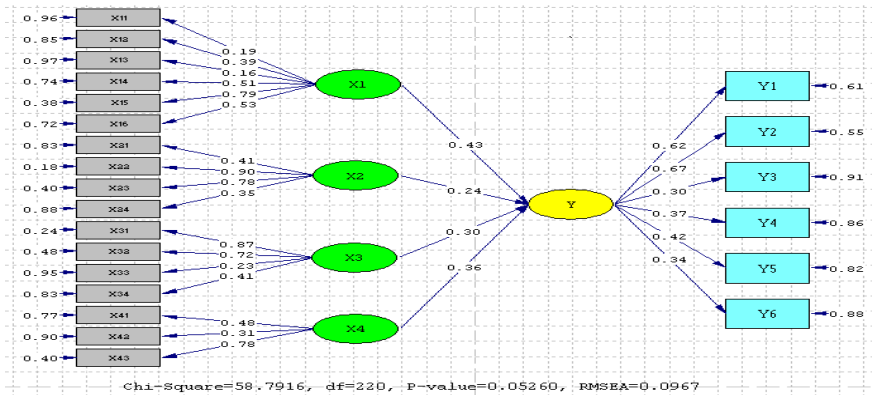


Source : resulted from questioner (n=207), 2009

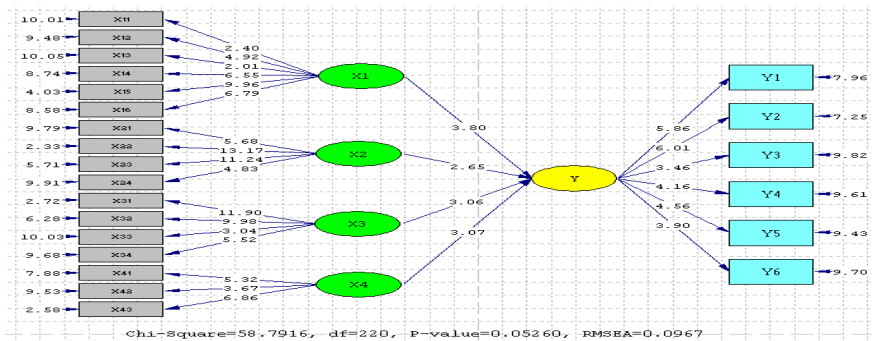
Figure 4. Retailer characteristic according to the arrangement of collaboration constraints with key suppliers

The result of validity test in correlation with product moment and reliability test using Alpha Cronbach Test, show that each value is significant, the data is valid

to be processed with Structural Equation Modeling (SEM) using software Lisrel 8.30.



Source : Processed from questioner (n=207) with software Lisrel 8.30, 2009
 Figure 5. Complete Stripe Diagram Standardized Solution
 The Effect of Collaboration to Supply Chain Performance



Source : Processed from questioner (n=207) with software Lisrel 8.30, 2009
 Figure 6. T – Value Complete Stripe Diagram
 The Effect of Collaboration to Supply Chain Performance

Structural model test is done according to Figure 6 the result shows the existence of positive and significant correlation Exogenous Latent Variable (Information Collaboration / X_1 , Decision Synchronization Collaboration / X_2 , Incentive Alignment Collaboration / X_3

and Organization Collaboration X_4 with Endogenous Latent Variable (supply chain performance / Y). The model compatibility test used Goodness – of – Fit – Test (GOF) presented in table 2.

Table 2. Goodness-of-Fit-test Summary

GOF Value	Estimation	Critical value	Test Result
Nilai P	0.0526	$P > 0,05$: model <i>fit</i>	Model fit to data
RMSEA	0.0967	RMSEA $< 0,8$: model <i>fit</i>	
GFI	0.9710	GFI $> 0,9$: model <i>fit</i>	
AGFI	0.9876	AGFI $> 0,9$: model <i>fit</i>	
NFI	0.9763	NFI $> 0,9$: model <i>fit</i>	
NNFI	0.9725	NNFI $> 0,9$: model <i>fit</i>	

Source : Processed from questioner (n=207) with software Lisrel 8.30, 2009

The result of computation influence decomposition between exogenous latent variable and endogenous latent variable supply chain performance (Y), can be concluded that exogenous latent variable (information collaboration (X_1) showed the bigger total causal effect (TCE) compared to endogenous latent

variable supply chain performance (Y), namely 0,4269. Meanwhile, exogenous latent variable of decision synchronization collaboration (X_2) showed the smallest TCE compared to endogenous latent variable supply chain performance (Y), it is 0,2390. While exogenous latent variable organization collaboration (X_4) and incentive

alignment collaboration (X_3) showed the averaged TCE compared to endogenous latent variable supply chain performance (Y) one after the other, 0,3644 and 0,3010.

The explanation of hypothesis test found that information collaboration, decision synchronization collaboration positively and significantly influenced to the modern retailer supply chain performance, meaning that descriptively collaboration, decision synchronization collaboration, incentive alignment collaboration and organization collaboration have been applied and appropriately used by the modern retailer and key supplier in DKI Jakarta and Bandung. The successful of implementing collaboration, decision synchronization collaboration, incentive alignment collaboration and organization collaboration will hopefully increased the modern retailer supply chain performance inform of : lower inventory cost, accuracy respond, lower stock outs, information availability and accuracy, lower lost sales and higher inventory turn over.

5. Conclusion

The research has completely considered the collaboration aspect related to supply chain performance between the modern retailers and key suppliers namely about information collaboration, decision synchronization collaboration, incentive alignment collaboration and organization. The result of the study shows that there are some partial and simultaneously positive and significant influence between Information Collaboration, Decision Synchronization Collaboration, Incentive Alignment Collaboration, and Organization Collaboration to The Modern Retailer Supply Chain Performance. Based on the findings above the author concludes that Collaboration in Supply Chain between Modern Retailers and Key Suppliers are significantly able to enhance The Modern Retailer Supply Chain Performance.

Information Collaboration resulted the biggest TCE compared to supply chain performance, it means that employing the appropriate information and communication technology would become the main determination to improve the modern retailer chain performance.

REFERENCES

- [1]. Aviv, Y. : Gaining benefits from joint forecasting and replenishment processes: the case of auto-correlated demand. *Manufacturing & Service Operations Management*, 4(1), 2002, pp. 56-74.
- [2]. Bagchi, P. K. and Skjoett-Larsen, T. : Supply Chain Integration: a European Survey. *International Journal of Logistics Management*, 16(2), 2005, pp. 275-294.
- [22]. Skjoett-Larsen, T., C. Thernoe and C. Andresen : *Supply chain collaboration Theoretical perspectives and empirical evidence*. International Journal of Physical Distribution and Logistics Management, 33 (6), 2003.
- [23]. Simatupang, T. M. and R. Sridharan : *The collaborative supply chain*. International Journal of Logistics Management, 13 (1), 2002.
- [3]. Barratt, M. and Oliveira, A. : "Exploring the experiences of collaborative planning initiatives", *International Journal of Physical Distribution & Logistics Management*, Vol. 31 No. 4, 2001, pp. 266-89.
- [4]. Barratt, M. : *Understanding the meaning of collaboration in the supply chain*. Supply Chain Management: An international journal, 9 (1), 2004, pp. 30-42.
- [5]. Bowersox, D.J. : "The strategic benefits of logistics alliances", *Harvard Business Review*, Vol. 68 No. 4, 1990, pp. 36-43.
- [6]. Bradenburger, A. and B.J. Nalebuff : *Co-opetition: A revolutionary mindset that redefines competition and cooperation in the marketplace*. New York. Doubleday, 1996.
- [7]. Callioni, G. and Billington, C. : "Effective collaboration: Hewlett-Packard takes supply chain management to another level", *OR/MS Today*, Vol. 28 No. 5, 2001, pp. 34-9.
- [8]. Cheung, K.L. and H.L. Lee. : The inventory benefit of shipment coordination and stock rebalancing in a supply chain. *Management Science*, 48(2), 2002, pp. 300-306.
- [9]. Corbett, C.J., Blackburn, J.D. and van Wassenhove, L.N. : "Partnerships to improve supply chains", *Sloan Management Review*, Vol. 40 No. 4, 1999, pp. 71-82.
- [10]. Governing, S. : Information flows in capacitated supply chains in fixed ordering costs. *Management Science*, 48(5), 2002, pp. 644-651.
- [11]. Handfield, Robert B. and Ernest L. Nichols. *Introduction to Supply Chain Management*. Upper Saddle River, NJ: Prentice Hall, 1998.
- [12]. Horvath, L. : "Collaboration: key to value creation in supply chain management", *Supply Chain Management: An International Journal*, Vol. 6 No. 5, 2001, pp. 205-7.
- [13]. Ireland, R. and R. Bruce : *CPFR Only the beginning of collaboration*. Supply Chain Management Review, Sept/Oct, 2000.
- [14]. Klastorin, T.D., K. Moinzadeh, et al. : Coordinating orders in supply chains through price discounts. *IIE Transactions*, 34(8), 2002, pp. 679-689.
- [15]. Lee et al. : "The bullwhip effect in supply chains", *Sloan Management Review*, Vol. 38 No. 3, 1997, pp. 93-102.
- [16]. Laseter, T.M. : *Balanced sourcing: cooperation and competition in supplier relationships*. San Francisco. Jossey-Bass Publishers, 1998.
- [17]. Lee, H.G., T. Clark, et al. : Research report. Can EDI benefit adopters? *Information Systems Research*, 10(2), 1999, pp.186-195.
- [18]. Lee, H. L. and S. Whang : *Information sharing in a supply chain*. International journal of Technology Management, 20 (3/4), 2000, pp. 373-87.
- [19]. Mentzer, et al. : "Defining Supply Chain Management." *Journal of Business Logistics*, 22(2), 2001, pp. 1-25,
- [20]. Moinzadeh, K. : A multi-echelon inventory system with information exchange. *Management Science*, 48(3), 2002, pp. 415-426.
- [21]. Parks, L. : "CRP investment pays off in many ways", *Drug Store News*, Vol. 21 No. 2, 1999, pp. 26.
- [24]. _____ : Benchmarking supply chain collaboration. *Benchmarking: An International Journal*, Vol. 11 No. 5, 2004, pp. 484-503.
- [25]. Spekman et al. : "An empirical investigation into supply chain management", *International Journal of Physical Distribution & Logistics Management*, Vol. 28 No. 8, 1998, pp. 630-50.
- [26]. Svensson, Goran. "A Firm's Driving Force to Implement and Incorporate a Business Philosophy into its Current

- Business Activities: the Case of ECR.” *European Business Review*, 14(1), 2002, pp. 20-29,
- [27]. Taylor, A.T. : Supply chain coordination under channel rebates with sales effort effects. *Management Science*, 48(8), 2002, pp. 992-1007.

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