



**Faculty of Technology Management and Technopreneurship**

**DEVELOPING COLLABORATIVE PERFORMANCE SYSTEM  
FRAMEWORK FOR FRESH PRODUCE SUPPLY CHAIN IN WEST  
JAVA, INDONESIA**

اونيورسيتي تيكنيكل مليسيا ملاك  
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

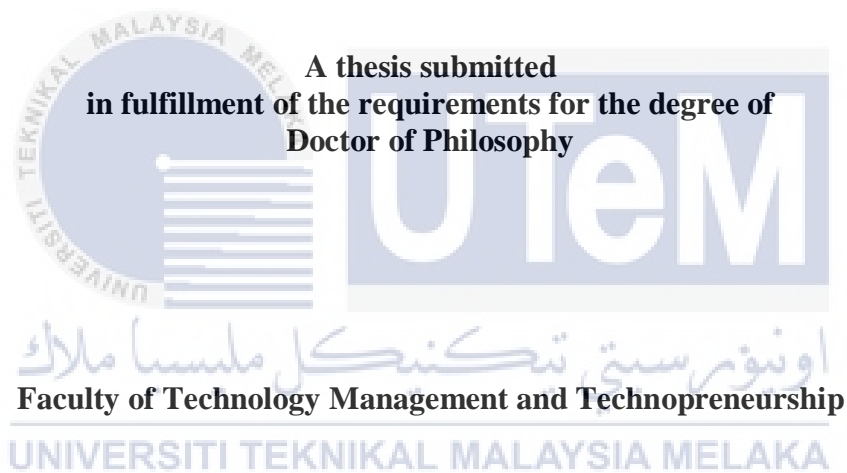
**Edi Susanto**

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FOR FRESH PRODUCE SUPPLY CHAIN IN WEST JAVA, INDONESIA**

**EDI SUSANTO**



**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

**2024**

## DEDICATION

My mother 'Nurachni Sodikin' and my father 'Dasmun Suryadi'

My childrens who loved me, 'Mba Bila'; 'Kak Arumi'; 'Mas Rabbany'; and 'Dek Abiem'

My wife 'Deajeng Desi'



## ABSTRACT

Considering the current context of business competition, it exists not only between individual companies but also between supply chain organizations. Supply chain organizations in business competition need a performance system that enables all simultaneous performance in a collaborative performance with all parties involved. Fresh produce is an important element of a healthy lifestyle for most individuals. Studies on collaborative performance systems (CPS) in fresh produce supply chains (FPSC) have attracted public attention due to their important role in food availability, safety, and security (SAS). Unfortunately, the use of performance management systems (PMS) as part of supply chain management systems is still lacking, and studies focused on CPS in FPSC systems are still limited. Therefore, this study aim at determining the prospective application of CPS in FPSC. This study attempts to identify whether the implementation of CPS is proven to be successful in improving the performance of SC actors and provides evidence of whether CPS can improve the overall performance of the supply chain, explores the factors that influence the implementation of CPS, and develops a proposed framework to improve the implementation of CPS in the FPSC. The aim of this study was achieved through a thorough literature review, consists of the following: CPS in the supply chain, factors affecting CPS, individual company performance (CIP), and supply chain performance (SPO). The research methodology used a mixed method with a structural equation model-partial least squares (SEM-PLS) to evaluate theoretical models and hypotheses based on a sample of 190 respondents from FPSC partners. This study further employed a qualitative approach with semi-structured interviews with 21 farmer group informants (abbreviated as Gapoktan: farmer collectives are agricultural institutions formed to facilitate agricultural activities from the capital sector to processing agricultural products) and non-Gapoktan farmers, collectors/distributors, owners of transportation modes, supermarkets, experts in the field, academics and related associations. The mixed method approach is valuable for future research on CPS implementation development; practical contribution by investigating CPS factors that influence the composition of CPS actors, the influence of CIP and SPO that contribute to improving CPS implementation; the benefits and reasons why CPS needs to be implemented by producing certain CPS metrics, considered for the sustainability of CPS implementation in FPSC. These findings will help managers/owners and implementing farmers to understand external barriers and support for FPSC actors. In conclusion, these results have contributed to the literature on the implementation of CPS and the implications of its management for actors; managers should review and improve their multitasking and time management skills in engagement, supervision, and support at the partner and employee levels; a proactive approach is recommended to acquire external knowledge and integrate it with existing internal knowledge. Practitioners (academics/researchers) should take a long-term and holistic view of the overall benefits of implementing CPS rather than focusing only on the short-term benefits and risks usually associated with initial costs and hidden costs, seeking to gain management, motivation, and communication skills. The government is the policy maker; carry out the socialization of sustainability programs to activate all partners involved and provide appropriate education or knowledge to increase FPSC actors' understanding of sustainable development by the SDG.

# **MEMBANGUNKAN RANGKA KERJA SISTEM PRESTASI KOLABORATIF UNTUK RANTAI BEKALAN HASIL SEGAR DI JAWA BARAT, INDONESIA**

## **ABSTRAK**

Mengambil kira konteks semasa persaingan perniagaan, ia wujud bukan sahaja antara syarikat individu tetapi juga antara organisasi rantaian bekalan. Organisasi rantaian bekalan dalam persaingan perniagaan memerlukan sistem prestasi yang membolehkan semua prestasi serentak dalam prestasi kerjasama dengan semua pihak yang terlibat. Hasil segar adalah elemen penting dalam gaya hidup sihat bagi kebanyakan individu. Kajian mengenai sistem prestasi kolaboratif (CPS) dalam rantaian bekalan hasil segar (FPSC) telah menarik perhatian orang ramai kerana peranan penting mereka dalam ketersediaan, keamanan dan keselamatan makanan (SAS). Malangnya, penggunaan sistem pengurusan prestasi (PMS) sebagai sebahagian daripada sistem pengurusan rantaian bekalan masih kurang, dan kajian tertumpu kepada CPS dalam sistem FPSC masih terhad. Oleh itu, kajian ini bertujuan untuk menentukan aplikasi prospektif CPS dalam FPSC. Kajian ini cuba mengenal pasti sama ada pelaksanaan CPS terbukti berjaya dalam meningkatkan prestasi aktor SC dan memberikan bukti sama ada CPS boleh meningkatkan prestasi keseluruhan rantaian bekalan, meneroka faktor yang mempengaruhi pelaksanaan CPS, dan membangunkan rangka kerja yang dicadangkan untuk menambah baik pelaksanaan CPS dalam FPSC. Matlamat kajian ini dicapai melalui tinjauan literatur yang menyeluruh, terdiri daripada yang berikut: CPS dalam rantaian bekalan, faktor yang mempengaruhi CPS, prestasi syarikat individu (CIP), dan prestasi rantaian bekalan (SPO). Metodologi penyelidikan menggunakan kaedah bercampur dengan model persamaan struktur-separa kuasa dua terkecil (SEM-PLS) untuk menilai model teori dan hipotesis berdasarkan sampel 190 responden daripada rakan kongsi FPSC. Kajian ini seterusnya menggunakan pendekatan kualitatif dengan temu bual separa berstruktur dengan 21 informan kumpulan peladang (disingkat Gapoktan: kolektif peladang ialah institusi pertanian yang dibentuk untuk memudahkan aktiviti pertanian daripada sektor modal kepada memproses hasil pertanian) dan petani, pengumpul/pengedar bukan Gapoktan, pemilik mod pengangkutan, pasar raya, pakar dalam bidang tersebut, ahli akademik dan persatuan berkaitan. Pendekatan kaedah campuran adalah berharga untuk penyelidikan masa depan mengenai pembangunan pelaksanaan CPS; sumbangan praktikal dengan menyiasat faktor CPS yang mempengaruhi komposisi pelakon CPS, pengaruh CIP dan SPO yang menyumbang kepada penambahbaikan pelaksanaan CPS; faedah dan sebab mengapa CPS perlu dilaksanakan dengan menghasilkan metrik CPS tertentu, dipertimbangkan untuk kemampunan pelaksanaan CPS dalam FPSC. Penemuan ini akan membantu pengurus/pemilik dan petani pelaksana untuk memahami halangan luaran dan sokongan untuk aktor FPSC. Kesimpulannya, keputusan ini telah menyumbang kepada literatur tentang pelaksanaan CPS dan implikasi pengurusan untuk pelakon; pengurus harus menyemak dan meningkatkan kemahiran berbilang tugas dan pengurusan masa mereka dalam penglibatan, penyeliaan dan sokongan di peringkat rakan kongsi dan pekerja; pendekatan proaktif disyorkan untuk memperoleh pengetahuan luaran dan mengintegrasikannya dengan pengetahuan dalaman sedia ada. Pengamal (akademik/penyelidik) harus mengambil pandangan jangka panjang dan holistik tentang faedah keseluruhan pelaksanaan CPS dan bukannya menumpukan hanya pada faedah dan risiko jangka pendek yang biasanya dikaitkan dengan kos awal dan kos tersembunyi, berusaha untuk mendapatkan pengurusan, motivasi, dan kemahiran komunikasi. Pemerintah adalah pembuat dasar; menjalankan sosialisasi program kelestarian untuk mengaktifkan semua rakan kongsi yang terlibat dan menyediakan pendidikan atau pengetahuan yang sesuai untuk meningkatkan pemahaman aktor FPSC tentang pembangunan mampan oleh SDG.

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## TABLE OF CONTENTS

	PAGE
<b>DECLARATION</b>	<b>i</b>
<b>APPROVAL</b>	<b>ii</b>
<b>DEDICATION</b>	<b>iii</b>
<b>ABSTRACT</b>	<b>iv</b>
<b>ABSTRAK</b>	<b>ix</b>
<b>ACKNOWLEDGEMENTS</b>	<b>xi</b>
<b>TABLE OF CONTENTS</b>	<b>xii</b>
<b>LIST OF TABLES</b>	<b>xiii</b>
<b>LIST OF FIGURES</b>	<b>xv</b>
<b>LIST OF APPENDICES</b>	
<b>LIST OF PUBLICATIONS</b>	
<b>LIST OF SYMBOLS AND ABBREVIATIONS</b>	
 <b>CHAPTER</b>	
<b>1. INTRODUCTION</b>	<b>1</b>
1.1 Background	1
1.2 Problem statement	3
1.3 Research questions	10
1.4 Research objectives	12
1.5 Scope of research	16
1.6 Contribution of research	16
1.6.1 Theoretical contribution	16
1.6.2 Methodological contribution	19
1.6.3 Practical contributions	21
1.7 Thesis outline	27
 <b>2. LITERATURE REVIEW</b>	<b>29</b>
2.1 Introduction	29
2.2 Collaborative performance system in supply chain	29
2.2.1 Types of collaborative structure	33
2.2.2 Collaborative planning	41
2.2.3 Collaborative network	42
2.3 Factors influencing of CPS	43
2.4 Supply chain performance	44
2.5 Company individual performance	45
2.6 Fresh produce supply chain	46

2.6.1	Overview of FPSC	46
2.6.2	Collaboration issues on FPSC	49
2.6.3	FPSC in Indonesia	50
2.6.4	Gap of FPSC in Indonesia	51
2.7	Developing CPS frameworks in the FPSC in Indonesia	53
2.7.1	Models of CPS	53
2.7.2	Model of factors that influence the success of CPS	59
2.7.3	Models of supply chain performance	59
2.7.4	Models of individual/ company performance	61
2.8	Hypothesis and conceptual framework	65
2.9	The theories underlying the implementation and development of CPS	69
2.9.1	Stakeholder theory	70
2.9.2	Institutional theory	71
2.9.3	Network theory	73
2.10	Concluding remarks	74
<b>3.</b>	<b>RESEARCH METHODOLOGY</b>	<b>76</b>
3.1	Introduction	76
3.2	Research design	76
3.2.1	Research framework	78
3.2.2	Linkage of research questions with hypotheses and frameworks	84
3.3	Research methodology stage	84
3.4	Quantitative study approach	90
3.4.1	Research instruments	90
3.4.2	Questionnaire testing	91
3.4.3	Structural equation modelling	92
3.4.4	Pre-test	96
3.4.5	Questionnaires of research	102
3.4.6	Operational variables	104
3.4.7	Quantitative data analysis	111
3.4.8	Smart Partial Least Square- SEM	111
3.4.9	Model Construction of PLS	113
3.5	Qualitative study approach	118
3.5.1	Clarification of the findings from quantitative study	118
3.5.2	Qualitative analysis	121
3.6	Summary	124
<b>4.</b>	<b>QUANTITATIVE DATA COLLECTION</b>	<b>120</b>
4.1	Introduction	120
4.2	Quantitative data collection method	120
4.2.1	The development of measurement models	121
4.2.2	Measurement scale	121
4.2.3	The questionnaire formats	122
4.3	The sample selection for the quantitative study	124



4.3.1	Demographic analysis of respondents, target population, sample size, and sampling procedures	124
4.3.2	Main sample population	125
4.3.3	The main sample design and data collection	127
4.4	Unit of analysis for the quantitative study	133
4.4.1	Data analysis techniques	133
4.4.2	Outliers and multivariate normality in data processing	135
4.5	Fit indices for the quantitative study	136
4.5.1	Statistical research of model	136
4.5.2	Confirmatory factor analysis of FIC, CPS, CIP, SPO on FPSC	137
4.6	Summary	138
<b>5.</b>	<b>QUANTITATIVE ANALYSIS AND DISCUSSION</b>	<b>140</b>
5.1	Introduction	140
5.2	Characteristics of respondents	140
5.2.1	Gender	141
5.2.2	Age	142
5.2.3	Characteristics of respondents based on last education	142
5.2.4	Characteristics of respondents based on working experiences	143
5.3	Hypothesis testing	144
5.3.1	Measurement testing model (outer model)	144
5.3.2	Structural model (inner)	153
5.3.3	Inner model analysis	159
5.4	key findings and discussion	168
5.4.1	CPS implementation contributes positively to Company Individual Performance (CIP)	168
5.4.2	CPS implementation contributes positively to supply chain performance	169
5.4.3	Knowledge of business actors is beneficial collaborative performance increases the level of CPS	169
5.4.4	The higher the reluctance to change chain actors, the lower the degree to which they can perform CPS	170
5.4.5	The higher the trust of the chain actor, the higher the CPS level	170
5.4.6	The higher the collaborative culture of the chain actors, the higher the level of CPS they can perform	170
5.4.7	The existence of social relations between actors in the chain increases the level of CPS	171
5.4.8	The higher the level of technology chain actors possess, the higher the level of CPS they can perform	171
5.4.9	The existence of environment friendly owned by chain actors contributes to the CPS they can do	171
5.4.10	The higher the level of safety and security by chain actors, the higher the level of CPS they can do	172
5.4.11	Chain actor unknowledge of the benefits of using a performance system due to partners' reluctance/desire to change	172

5.4.12	Social relations between chain actors increase trust among partners	173
5.4.13	Trust between chain actors enhances the collaborative culture among partners	173
5.4.14	KBP between chain actors improves CPS implementation through DFC	173
5.4.15	COC between Chain Actors Improves CPS Implementation through TRO	173
5.4.16	SOR between chain actors improves CPS implementation through TRO	174
5.5	Conclusion	174
5.6	Summary	175
<b>6.</b>	<b>QUALITATIVE STUDY DESIGN AND DATA COLLECTION</b>	<b>176</b>
6.1	Introduction	176
6.2	Procedure for qualitative data collection	179
6.3	Qualitative questionnaire design	179
6.4	Qualitative sampling technique	181
6.5	Qualitative study sampling and participants	182
6.5.1	Informants or resource persons	182
6.5.2	Identifying process of target informants	183
6.6	Interview protocol and techniques	185
6.6.1	Interview protocol	185
6.6.2	Interview techniques	187
6.7	Establishing ethical guidelines for both mix method-explanatory sequential	188
6.8	The semi-structured interviews procedure for conducting	189
6.9	Qualitative study analysis	191
6.9.1	Phase 1: Familiarity with data	191
6.9.2	Phase 2: Encoding data	192
6.9.3	Phase 3: Finding a theme	193
6.9.4	Phase 4: Reviewing themes	193
6.9.5	Phase 5: Defining and naming the theme	194
6.10	Conclusion	195
6.11	Summary	195
<b>7.</b>	<b>QUALITATIVE ANALYSIS AND DISCUSSION</b>	<b>196</b>
7.1	Introduction	196
7.2	Case description	197
7.3	Clarification of findings from quantitative analysis to qualitative analysis	200
7.4	Thematic templates for interviews	203
7.5	Key findings	203
7.5.1	Theme 1: Structure of the CPS model on FPSC	204

7.5.2	Theme 2: Company or individual performance has a positive impact on CPS	236
7.5.3	Theme 3: Improved SPO performance will have an impact on optimal CPS implementation	250
7.5.4	Theme 4: The success of CPS implementation is influenced by factors that influence CPS	257
7.6	Findings	299
7.7	Integrated results from the current mixed methods of applying CPS to FPSC	302
7.7.1	Identification and evidence of increasing CIP, SPO, and CPS influence factors effectively increasing CPS implementation	303
7.7.2	Identification of CPS Influence Factors That Are Integrated Into The Implementation of CPS in The FPSC	307
7.7.3	Integrated development of the proposed model to improve CPS implementation	307
<b>8.</b>	<b>CONCLUSION AND RECOMMENDATIONS</b>	<b>319</b>
8.1	Introduction	319
8.2	Conclusions	319
8.2.1	Objective One: To determine the presence of CPS for all organizational members in the SC	319
8.2.2	Objective Two: To generate CPS factors that influence cps implementation	320
8.2.3	Objective Three: To develop a proposed framework to improve CPS implementation on FPSC in Indonesia	321
8.3	Implication managerial and recommendations	321
8.4	Limitations of this study and suggestions for future research	325
8.5	Implementation of CPS development framework in the FPSC toward	326
<b>REFERENCES</b>		<b>317</b>
<b>APPENDICES</b>		<b>357</b>

## LIST OF TABLES

<b>TABLE</b>	<b>TITLE</b>	<b>PAGE</b>
Table 1.1:	Indonesia's growth of grocery retail outlets and sales (2011-2016)	5
Table 1.2:	Summary of research problem	9
Table 1.3:	Summary of research questions	11
Table 1.4:	Summary of the RP, RQ, and RO	12
Table 2.1:	Performance metrics for CPS level	31
Table 3.1:	Previous research methods in collaborative systems at FPSC (2007-2021)	88
Table 3.2:	Instrument validity test results for CPS variables	97
Table 3.3:	Instrument validity test results for CIP variables	99
Table 3.4:	Instrument validity test results for SPO variables	99
Table 3.5:	Instrument validity test results of influencing factors for success CPS	100
Table 3.6:	Reliability test	101
Table 3.7:	Definition of operational research	107
Table 3.8:	Summary of the rule of thumb evaluation of the outer model	115
Table 3.9:	Summary of structural model evaluation (inner model)	117
Table 3.10:	Resume of data collection procedures and all group of participants and status	122
Table 5.1:	Characteristics of respondents by gender-main sample	141
Table 5.2:	Characteristics of respondents by age-main sample	142
Table 5.3:	Characteristics of respondents based on last education-main sample	143
Table 5.4:	Characteristics of respondents based on working experience-main sample	143
Table 5.5:	Outer loading	146
Table 5.6:	Summary of second iteration outer loadings	149
Table 5.7:	Reliability test	153
Table 5.8:	Cross loading	154

Table 5.9: Collinearity statistics (VIF)	157
Table 5.10: Correlation between latent variables	158
Table 5.11: Direct effect model	160
Table 5.12: Direct effects-Model 1	161
Table 5.13: Direct effects-Model 2	162
Table 5.14: Direct effect-Model 3	163
Table 5.15: Direct effect-Model 4	164
Table 5.16: Specific indirect effect model	165
Table 5.17: R square and R square adjusted	166
Table 5.18: F square	166
Table 5.19: Prediction relevance ( $Q^2$ )	168
Table 6.1: Types and characteristics of interview methods (Adapted from Gray (2014))	180
Table 7.1: Business actor in the study	197
Table 7.2: Key informant in the study	198
Table 7.3: Thematic template	200
Table 7.4: Identification results of CPS, CIP and SPO metrics in increasing implementation of CPS in the FPSC	305
Table 7.5: Identification result of driving influence factors on CPS implementation	307
Table 7.6: Comparison of the integrated results of the current CPS and the development of CPS implementation in the FPSC	308
Table 7.7: Comparison of the integrated results CIP To CPS implementation in the FPSC	311
Table 7.8: Comparison of the integrated SPO results of the current CPS and the development of CPS implementation in the FPSC	312
Table 7.9: Comparison of the integrated of influences factors CPS results CPS current and development of CPS implementation in the FPSC	314

## LIST OF FIGURES

FIGURE	TITLE	PAGE
Figure 2.1:	Types of Collaboration (Barratt, 2004; Veen, 2021)	33
Figure 2.2:	Model of collaboration structure-Vertical 1	34
Figure 2.3:	Model of collaboration structure-Vertical 2	35
Figure 2.4:	Model of collaboration structure-Vertical 3	35
Figure 2.5:	Model of collaboration structure-Vertical 4	36
Figure 2.6:	Model of collaboration structure-Vertical 5	36
Figure 2.7:	Model of collaboration structure-Horizontal 1	38
Figure 2.8:	Model of collaboration structure-Horizontal 2	38
Figure 2.9:	Model of collaboration structure-Lateral 1	39
Figure 2.10:	Model of collaboration structure-Lateral 2	40
Figure 2.11:	Fresh produce distribution chain structure (Adopted from SCI, 2015)	51
Figure 2.12:	CPS Framework In The Retail DC (Papakiriakopoulos and Pramadari (2010)	55
Figure 2.13:	Model metrics SPO in the FPSC (Adopted from Simatupang and Sridharan, 2005)	61
Figure 2.14:	Model metrics CIP in the FPSC (Adopted from Aramyan et al., 2007)	62
Figure 2.15:	Conceptual framework	69
Figure 3.1:	Research methods combination of explanatory sequential	78
Figure 3.2:	Stages of research methodology	89
Figure 3.3:	Exogenous and endogenous latent variables	93
Figure 4.1:	Six steps to conduct SEM (Adopted from Hair et al., 2019)	135
Figure 4.2:	Model of statistical research	137
Figure 5.1:	Model outer	145
Figure 5.2:	Testing of measurement model	152
Figure 5.4:	Diagram Step 2 bootstrapping T value and P value	160
Figure 8.1:	Collaborative performance system framework in the FPSC toward	327

## LIST OF APPENDICES

APPENDIX	TITLE	PAGE
A	Final Questionnaire-1 (Quantitative)	357
B	Final Questionnaire-2 and Interview Transcripts (Qualitative)	366
C	Validity Test (Pre-Test: 56 Indicator, 33 sample): IBM_SPSS-25	428
D	Validity Test (Pre-Test: 54 Indicator, 33 sample): IBM_SPSS-25	432
E	Reliability Test (Pre-Test: 54 Indicator, 33 sample): IBM_SPSS-25	436
F	Appendix F. Result of Smart-PLS-Algorithm (190 sample; Smart-PLS-Ver3.3.3)	437
G	Result of Smart-PLS-Bootstrapping: (1. Result of Reliability and Validity Test, 2. Direct Model)	440
H	Result of Prediction Relevance (Q2)-Blindfolding	441

## LIST OF PUBLICATIONS

The followings are the list of publications related to the work on this thesis:

### Indexed Journal

**Susanto, E., Othman, NA.,** Tahir, MNH., 2020. A Review Of Collaborative Performance System Implementation In The Fresh Produce Supply Chain To Improve Performance. *HSSR Journal*, 8(3), pp.1363-1382. (Scopus indexed Q1- IF:2.73 (2020).

**Susanto, E. and Othman, NA,** 2021. The factors influencing modeling of collaborative performance supply chain: A review on fresh produce. *Uncertain Supply Chain Management*, 9(2), pp.373-392. (Scopus Indexed – Q2 - IF:2.84) (Published)

**Susanto, E., Othman, NA.,** Rahayu, S., Dzakiyullah, N., Handayani, E., Gunawan, S. and Hadiguna, R., 2022. Mediation effect of collaborative performance system on fresh produce supply chain performance with a lateral collaboration structure model. *Uncertain Supply Chain Management*, 10(4), pp.1147-1160. (Scopus Indexed – Q2 - IF:2.84) (Published)

**Susanto, E., Othman, NA.,** Tjaya, A.I.S., Rahayu, T.S., Gunawan, S., Saptari A., 2023. The Impact of Collaborative Network on Supply Chain Performance: A Case Study of Fresh Vegetable Commodities in Indonesia. *AGRARIS: Journal of Agribusiness and Rural Development Research*, 9(1), pp.79-99. (Scopus Indexed – Q2 - IF:0.47) (Published).

**Susanto, E., Othman, N. A.,** Novirani, D., & Gunawan, S. (2024). Collaborative Performance Metrics Model with Lateral Structure in Fresh Produce Supply Chains: A Review. *Jurnal Teknik Pertanian Lampung (Journal of Agricultural Engineering)*, 13(3), 978-996. (Published).



### **Conference Proceedings**

**Susanto, E., Othman, NA., Saptari, A., and Hayati, M.N.** 2018. Collaborative Performance System in Fresh Produce Supply Chain: The State-of-the-art and Recent Developments. *4thAsia International Conference - Advances Management Operation and Sustainable (AIC-AMOS-2018)*, 8-9 December 2018- Langkawi Malaysia.

**Susanto, E., Othman, NA.,** Tjaya, AIS., 2021, Hamzah, G., (2024, August). The effect of collaborative network, information sharing, and resource sharing on fresh vegetables supply chain performance. In AIP Conference Proceedings (Vol. 2744, No. 1). AIP Publishing. (Scopus Indexed-Q4) (Published).

**Susanto, E., Othman, NA.,** Tawwab, M. A., & Handayani, E. (2024, August). The relationship between collaborative performance system and supply chain performance: A study in fresh produce. In AIP Conference Proceedings (Vol. 2744, No. 1). AIP Publishing. **Recipient of the Best Paper Award.** (Scopus Indexed-Q4) (Published).

### **Book Chapters**

**Susanto, E., Othman, NA.,** 2022. Collaborative Performance System Classification Models in Fresh Produce Supply. ChainValue Chain Marketing: Strategy for Consumer Value Creation 1, 25-66. 1st Edition, UTeM Press. (Published)

## LIST OF SYMBOLS AND ABBREVIATIONS

<i>3PL</i>	- Third Party Logistics
<i>4PL</i>	- Fourth Party Logistics
<i>ABC</i>	- Activity Based Costing
<i>AHP</i>	- Analytic Hierarchy Process
<i>APL</i>	- Action-Profit Linkage Model
<i>AVE</i>	- Average Variance Extracted
<i>B2B</i>	- Business to Business
<i>BAM</i>	- Business Activities Monitoring
<i>BAS</i>	- Business Activity Services
<i>BEM</i>	- Business Excellence Model
<i>BP</i>	- Business Performance
<i>BRIN</i>	- Badan Riset dan Inovasi Nasional (National Research and Innovation Agency Republic of Indonesia)
<i>BSC</i>	- Balanced Scorecard
<i>BSC<sub>t</sub></i>	- Business Service Center
<i>BSCS</i>	- Balanced Supply Chain Scorecard
<i>BSR</i>	- Buyer-Supplier Relations
<i>CAGR</i>	- Compound Annual Growth Rate
<i>CBE</i>	- Digital Business Ecosystem
<i>CBS</i>	- Comparative Business Scorecard
<i>CEVITAE</i>	- Capability Economic Value of Intangible and Tangible Assets Model
<i>CFA</i>	- Confirmatory factor analysis
<i>CIP</i>	- Company Individual Performance
<i>CM</i>	- Centralized Model
<i>COC</i>	- Collaborative culture
<i>CP</i>	- Collaborative Performance
<i>CPMS</i>	- Consistent Performance Measurement System
<i>CPP</i>	- Collaborative Performance Planning (CPP)
<i>CPS</i>	- Collaborative Supply Chain

<i>CPS-ILCS</i>	- CPS Integrated with Lateral Collaboration Structure
<i>CRM</i>	- Customer Relationship Management
<i>CSP</i>	- Collaborative Supply Chain
<i>CV</i>	- Commanditaire Vennootschap
<i>CVA</i>	- Customer Value Analysis
<i>CVM</i>	- Customer Value Management
<i>DC</i>	- Distribution Centre
<i>DDP</i>	- Dynamic Development Process
<i>DEA</i>	- Envelopment Analysis
<i>DFC</i>	- Desire/reluctance to change
<i>DPMS</i>	- Dynamic Performance Measurement System
<i>DPMS-CN</i>	- Designing a PMS for a Collaborative Network
<i>EFS</i>	- Environment Friendly
<i>ERP</i>	- Enterprise Resource Planning
<i>EVA</i>	- Economic Value Added
<i>F3B</i>	- Farm Fresh Food Box
<i>FAHP</i>	- Fuzzy Analytic Hierarchy Process
<i>FAO</i>	- Food and Agriculture Organization of United Nations
<i>FDI</i>	- Foreign Direct Investment
<i>FFV-SC</i>	- fresh fruit vegetable SC
<i>FIC</i>	- Factors Influencing of CPS
<i>FLW</i>	- Food Loss and Waste
<i>FPSC</i>	- Fresh Produce Supply Chain
<i>FSC</i>	- Food supply chains
<i>FSQS</i>	- Food Safety and Quality System
<i>GAN</i>	- Global Agriculture Network
<i>GAP</i>	- Agricultural Practice
<i>GHP</i>	- Good Hygienic Practice
<i>GMP</i>	- Good Manufacturing Practices
<i>GSCM</i>	- Green Supply Chain Management
<i>GPS</i>	- Global Positioning System
<i>GVC</i>	- Global Value Chains
<i>HACCP</i>	- Hazard Analysis Critical Control Point
<i>ICT</i>	- Information and Communication Technology

<i>IoFTNP</i>	- Internet of Food Things Network Plus
<i>IoT</i>	- Internet of Things
<i>IPM</i>	- Integrated Pest Control
<i>IPMF</i>	- Integrated Performance Measurement Framework
<i>IPMS</i>	- Integrated Performance Measurement System
<i>ISH</i>	- Information sharing
<i>IT</i>	- Information Technology
<i>JIT</i>	- Just in Time
<i>KBP</i>	- Knowledge and benefits on CPS
<i>KPI</i>	- key performance indicators
<i>LCA</i>	- Life Cycle Assessment
<i>MNE</i>	- Multinational Corporations
<i>MOD</i>	- Make on-demand
<i>MSDD</i>	- Manufacturing System Design Decomposition
<i>MTO</i>	- Make-to-order
<i>PDCA</i>	- Plan-Do-Check and Action
<i>PDGBS</i>	- Performance, Development, Growth Benchmarking System
<i>PLS</i>	- Partial Least Square
<i>PMQ</i>	- Performance Measurement Questionnaire
<i>PMS</i>	- Performance Management System
<i>PMS-CSC</i>	- PMS-collaborative supply chain
<i>PP</i>	- Performance Prism
<i>PPM</i>	- Performance Measurement Matrix
<i>PPVC</i>	- Performance Planning Value Chain
<i>PT</i>	- Perseroan Terbatas (Limited Liability Company)
<i>QCC</i>	- Quality Control Circle
<i>RDF</i>	- Results and Determinants Framework
<i>RL</i>	- Reverse Logistics
<i>ROE</i>	- Return on Equity
<i>ROI</i>	- Return on Investment
<i>ROQ</i>	- Return on Quality Approach
<i>RSH</i>	- Resource sharing
<i>SAP</i>	- Systems Applications and Products
<i>RTM</i>	- Joint modes of transportation

<i>RTF</i>	- Contract Farming
<i>SAS</i>	- Sustainability-Safety and Security
<i>SC</i>	- Supply Chain
<i>SCC</i>	- Supply Chain Council
<i>SCI</i>	- Supply Chain Indonesia
<i>SCM</i>	- Supply Chain Management
<i>SCOR</i>	- Supply Chain Operations Reference
<i>SCP</i>	- Supply Chain Partnership
<i>SCR</i>	- Supply Chain Resistance
<i>SD</i>	- System Dynamics
<i>SDG</i>	- Sustainable Development Goal
<i>SEM</i>	- Structural Equation Modelling
<i>SET</i>	- Social Exchange Theory
<i>SFM</i>	- Sustainability forestry management
<i>SK3</i>	- Sistem Keselamatan dan Kesehatan Kerja (occupational safety and health system)
<i>SMCE</i>	- Spatial Multi Criteria Evaluation
<i>SME</i>	- Small and Medium Enterprise
<i>SOE</i>	- State-Owned Enterprise
<i>SOR</i>	- Social relationship
<i>SPC</i>	- Service Profit Chain
<i>SPO</i>	- Supply Chain Performances
<i>SSCM</i>	- Sustainability Supply Chain Management
<i>TBL</i>	- Triple Bottom Line
<i>TCE</i>	- Transaction Costs
<i>TIF</i>	- Technology of Information
<i>TOPSIS</i>	- Technique for Order Performance by Similarity to Ideal Solution
<i>TPB</i>	- Theory of Planned Behaviour
<i>TRO</i>	- Trust others
<i>UCDF</i>	- Unused Capacity Decomposition Framework
<i>UN</i>	- United Nations
<i>VBSC</i>	- Value-Based Supply Chain
<i>VIF</i>	- Variance Inflation Factor

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Background**

Currently, supply chain (SC) organizations in business competition require a performance management system (PMS) that can view observe performances simultaneously in one collaborative performance (CP) with its partners. A collaborative performance system (CPS) is one of the PMS. CPS is required to cope with the issue of the involvement of SC actors and their role in disclosing evidence and identifying in their environment between supplier chain partnership (SCP) in establishing solid relationships with each other, as a requirement of single control management (Chenhall and Moers, 2015). Collaboration encourages successful supply chain management (SCM) and fundamental skills (Gichuru et al., 2015; Park et al., 2022). In most SC organizations (SCOs) in various sectors, which demand collaboration in sustaining high levels of commitment, information sharing, and trust across SCPs within a single SCM organization, collaborative systems apply to establish CPS frameworks in present production systems.

Since the 1980s, various PMS models have been developed to help companies maintain performance and remain competitive. However, there is a lack of literature on collaborative PMS at the farm level, which requires collaboration with wholesalers like supermarkets. Collaborative performance is crucial for business actors to survive, while

smallholders face pressure from retailers and regulators to maintain and enhance their performance.

CPS is a relatively new integrated system that will keep evolving. Implementing CPS at the SC level has been extensively discussed previously requiring a total commitment to establishing long-term relationships with suppliers and other partner interests (Kurznack, Schoenmaker and Schramade, 2021), must incorporate information sharing, decisions, and incentive alignment to increase competitive advantage for firms (Shalle, Guyo and Amuhaya, 2014). Nevertheless, it is merely limited to adopt the relationship between buyers and suppliers in the procurement function (Ampe-N'DA et al., 2020) and less strong partnerships (Brüning and Bendul, 2017; Salam, 2017; Dania, Xing and Amer, 2018), which demand total commitment to build long-term relationships with the suppliers and other stakeholders (Kurznack, Schoenmaker and Schramade, 2021).

The study of Gichuru et al. (2015) stated that they were unable to illustrate how information sharing, joint decisions, and incentive alignment contribute to create suppliers and other stakeholders, and CSC involves all supply chain partners, such as supplier, distributor, wholesaler, retailer, and end-customer relationships (Petrovic-Lazarevic, Sohal and Perry, 2007). Performance measurement is the basis for improving performance; companies or farmers must have data on their present performance and need to know how good or poor it is before developing improvement plans (Cai et al., 2009); hence, the PMS is essential in its simplest form (Kubheka and Tshiyoyo, 2018). Currently, it is not provided much yet empirical evidence on the possibility for implementing CPS in FPSC (Crum and Palmatier, 2004) to improve the overall performance of supply chain performance (SPO) due to complex structural factors making it challenging to deploy a CPS system (Shalle, Guyo and Amuhaya, 2014).

This study examines the process of identifying current CPS implementations to determine if they are effective in boosting the performance of SC actors and presenting evidence of whether CPS might enhance the entire SCP. Furthermore, it analyzes and generates factors influencing CPS implementation and proposes a framework for developing CPS implementation for FPSC.

## **1.2 Problem statement**

In recent years, Indonesia's economy and infrastructure development have improved significantly and the agricultural sector has increased rapidly. The government has invested a lot in infrastructure specifically to support this industrial sector in various regions. Investment in the infrastructure sector has been extensive in several areas including the West Java region in the national strategic program in supporting the SDGs in Indonesia and the Indonesian Ministry of Agriculture's 2045 long-term program. On the other hand, the issue of sustainability is a critical issue to support the world community in program goals, sustainable development (SDGs); where Indonesia is one of the participants in this program the SDGs priorities focus on reducing poverty in the agricultural sector (Nugroho et al., 2022), it is important to have an in-depth study to improve the welfare, especially of farmers, as stated in the Ministry's long-term work program RI Agriculture in 2045. Meanwhile, with sustainability in efforts to maintain food safety and security, this is feasible to be realized amidst the issue of sustainability which is a critical issue to support the world community in the SDGs goal program. All require the collaboration of all stakeholders in an integrated system, where CPS is important as a solution to problems with this fresh produce commodity.