

# THE CONFIRMATORY ANALYSIS OF TRANSFORMATIONAL LEADERSHIP, CUSTOMER LOYALTY AND SUPPLY CHAIN PERFORMANCE

**Wissawa Aunyawong\* & Mesinee Yuyangyuen\*\***

*\*, \*\*Suan Sunandha Rajabhat University, 1-U-Thong Nok, Dusit, Bangkok, Thailand,  
E-Mail: \*Wissawa.au@ssru.ac.th, \*\*Mesinee.yu@ssru.ac.th*

## ABSTRACT

Abstract—The objectives of this research are to 1) study the levels of transformational leadership (TRA), customer loyalty (LOY), and supply chain performance (SCP), and 2) analyze the appropriate factors of TRA, LOY, SCP. The sample was 300 Thailand logistics service providers (LSPs), arisen from stratified random sampling. The instruments used in the research were questionnaires. The statistics used for data analysis were frequency, percentage, mean, standard deviation, confirmatory factor analysis using structural equation modeling. The findings revealed that 1) the levels of TRA, LOY and SCP of Thailand LSPs were at a high level, and 2) for appropriate factor analysis results, TRA comprised idealized influence, inspiration motivation, intellectual stimulation, and individualized consideration, LOY consisted of company commitment, company trust, and company satisfaction, and SCP contained reliability, responsiveness, agility, costs, and asset management. For practical recommendation, such findings can be a guideline for LSPs to improve their supply chain performance. For theoretical recommendation, academicians and interested persons can bring the research results to conduct further research on other potential industries and innovative issues as essential factors in logistics and supply chain management.

Keywords—Customer Loyalty, Transformational Leadership, Supply Chain Performance

## INTRODUCTION

The value of the business will increase and decrease in proportion to the expansion of gross domestic product or GDP. It was found that in the year, the gross product of each country has decreased continuously. Due to factors including the COVID-19 epidemic, government budget delays and drought. The country's economy may slow down. This may be due to many factors such as the decline in domestic consumption and political instability (Aunyawong et al., 2021). Consistently, the expected global economic slowdown due to higher policy interest rates, resulting in negative impact on expansion opportunities in terms of export-import (Soonthornpipit et al., 2021) such as loss of financial liquidity and local currency depreciation comparatively. These cause these countries to lose their capability to trade, including higher financial costs of entrepreneurs and the problem of business wars that are intensifying sequentially (Setthachotsombut & Aunyawong, 2020). Especially, Thailand as the ASEAN Economic Community (AEC) members has more international people to do business in the country, which will increase the number of competitors in the market (National Science and Technology Development Agency, 2022)

These events will greatly affect the logistics service business in Thailand because in addition to the intense domestic competition, there will be more foreign business competitors to cut market share, coupled with the new trend of economy driven by innovation, technology and creativity, taking into account both social and environmental sustainability (Sommanawat et al., 2021). As a result, logistics service providers (LSPs) in Thailand face high investment costs to compete in the increasingly intense market. The government has no a clear strategy to develop the Thai logistics industry to cope with these obstacles (Nualkaw et al., 2021), which is consistent with the data from the Ministry of Commerce (2019) found that the logistics service business is gaining a lot of attention from both Thai and foreign investors. It can be seen from the number of small and medium-sized LSPs entering the market tending to increase continuously. This is partly due to the government's acceleration in infrastructure development, such as railways, ports, roads, distribution centers and warehouses, etc, more convenience of various transportation modes, and the exponential growth of the domestic e-commerce business. The government, moreover, promotes of the Eastern Economic Corridor (EEC) and the Southern Special Economic Zone (SEC)

(Srisawat & Aunyawong, 2021). These cause logistics service business to compete in the market and need to find a way to survive from the economic crisis and more intense competition.

One of the most essential factors in organizational development is the ability to analyze and assess the supply chain performance (SCP) to compare with benchmarks or indicators of the same organization nationally and internationally (Wisedsin et al., 2020). This will allow entrepreneurs to know the weaknesses and strengths of the organization and can use the information obtained for efficiently and competitively organizational development since supply chain management is a comprehensive measure of business activities in managing cost, time and customer satisfaction (Waiyawuththanapoom et al., 2020b; Pintuma & Aunyawong, 2021), such as order fulfillment, on-time delivery, operating cost reduction and the number of inventory rotations, etc. (Sinthukhammoon et al., 2021; Pintuma et al., 2020).

Past research found that activities based on transformational leadership can enhance a business's customer loyalty (Binu Raj, 2021; Keskes et al., 2018; Jain & Duggal, 2018) and supply chain performance (Pham et al., 2021; Pham et al., 2022; Eng et al., 2022). If LSPs can implement transformational leadership and maintain customer loyalty within the organization, it should help entrepreneurs to adapt themselves to the situation of free trade competition and the trend of the new economic direction. The researchers are therefore interested in studying the transformational leadership and customer loyalty patterns influencing SCP of logistics service providers in Thailand. The results of this research are expected to be a guideline for the adjustment of LSPs in Thailand away from the crisis of free trade competition and entering a new economic era. It is also a guideline for the government to implement policies to help the logistics service industry in Thailand to be sustainable in the future. When the LSPs are competitive, it will contribute to the economic development of Thailand and lead to Thailand 4.0. In addition, the research results will be consistent with the policy of the Department of Business Development, Ministry of Commerce, which has an important goal for the development of the business management system of LSPs is to be competitive. By comparing the operations and evaluation according to ISO standards, it can analyze the weaknesses - strengths that will be used to develop business operation system creditability, respond to customer requirement, and generate domestics and international countries. This will affect the sustainable and growing business operations as well as market responsiveness to increase the performance of the transportation system, resulting in increasing the domestic business competitiveness, particularly the small and medium enterprises (SMEs).

## LITERATURE REVIEWS

### 1. Transformational leadership

Transformational leadership not only promotes supply chain learning, but also has significantly positive effects on firms' innovation in product and process. Especially, apart from positive impact of transformational leadership, it is found that process innovation is also significantly affected by supply chain learning (Pham et al., 2021). Thus, it could be concluded that the linkage between transformational leadership and process innovation is mediated by supply chain learning (Pham et al., 2022). Strategic and transformational leadership behaviors can facilitate supply chain knowledge integration on-demand, resulting in responsiveness, such as real-time access to critical supply chain information on live inventory levels and product performance, timely and accurate customer services through tracking and up-to-date product specification, and ability to coordinate and integrate information and knowledge instantaneously to fashion trends and access to live customer data and real-time inventory management (Eng et al., 2022; Tirastittam et al., 2020).

### 2. Customer loyalty

Whereas Gyensare et al. (2016) and Binu Raj (2021) depicts that transformational leaders had a positive direct influence on organizational commitment. Keskes et al. (2018) explains that a business with transformational leadership can make operations successful and efficient. This leads to customer loyalty, while Jain and Duggal (2018) portrays that transformational leadership is a success factor of business because knowledge is tied to a task or activity of each individual in the organization. Such knowledge used in the work will be created by the operators or a group of workers themselves. This may be built on the selection of theoretical or external knowledge to adapt it for use or created directly from work experience. If transformational leadership is applied to find best practices by using the visit to learn exchange activities to make it easier to discover best practices and when personnel have a method of excellence, it will cause excellent performance and ultimately lead to customer loyalty.

### 3. Supply chain performance

Customer loyalty arisen from the commitment affects the work satisfaction and operational performance. In Thailand's context, a study found that commitment positively influenced the dedication and good behavior of individual (Phrapratanporn et al., 2019; Aunyawong et al., 2018; Yuyangyuen & Aunyawong, 2023). Das & Hassan (2021), moreover, identify that customer relationship management as the part of customer loyalty creation affect organizational performance and mediates the effect of sustainable supply chain management on organizational performance. Besides, imitate that loyalty to partners influence sustainable supply chain performance affected by supply chain performance, supply chain environmental performance and supply chain social performance (Kumar & Goswami, 2019). Especially, the past studies on tourism supply chain (Sooksai et al., 2022; Hiranphaet et al., 2022), food supply chain (Pakornpongwatthana & Aunyawong, 2022; Wararatchai et al., 2022; Aunyawong, Waiyawuththanapoom, Setthachotsombut, & Wisedsin, 2020) and educational supply chain (Lievwachalermwong & Aunyawong, 2022) in Thailand reflected the similar results.

## METHODS

This research is quantitative research. The population in this section includes 1,500 road LSPs in Thailand registered with Thai Logistics and Manufacturing Association and the Thai Logistics Association. The sample consisted of 300 Thailand road LSPs, calculated from the sample size according to the condition for statistical analysis of the Structural Equation Modeling (SEM) not less than 20 times the observed variables in the model (Hair et al., 2010). From the research conceptual framework, there were 12 observable variables. Therefore, a sample of not less than or equal to 240 (12 x 20) was required. The sampling was done by convenience sampling.

A questionnaire was an instrument used as research instrument to collect data. The instrument accuracy was checked for validity and reliability. The validity consisted of content validity using IOC >0.5 and construct validity using confirmatory factor analysis (CFA), while the reliability was checked for Cronbachs' alpha coefficient >0.8 (Cronbach, 1990). The five-point Likert scale questionnaire comprised the items related on research variables and based on the concepts of past studies as discussed in literature review. For quantitative data interpretation, the criteria were recommended by Best and Kahn (2006).

For data analysis, first, the level of variables in the research were analyzed using descriptive statistics, including mean, standard deviation (S.D.), Skewness (Sk), and Kurtosis (Ku). The skewness between -3 and +3 and kurtosis between -10 to +10 indicating a normal distribution when using SEM (Kline, 2011) were considered. Second, discriminant validity was tested based on Maximum Shared Variance (MSV) < Average Variance Extracted (AVE) and Average Squared Shared Variance (ASV) < AVE; Also, the latent variable's AVE should be greater than the squared correlation between the latent variable and all other variables. In addition, the convergent validity was tested taking into account that the composite reliability value must be greater than 0.7 and AVE > 0.5 (Fornell & Larcker, 1981). Third, CFA was used to check the construct validity of the questionnaire using the criteria proposed by Diamantopoulos and Siguaw (2000).

## RESULTS

The descriptive statistical results showed that the observed variables averaged between .381 – 4.33, which was at a high level and had a standard deviation between .50 and .66. The variable with the highest mean was responsiveness, while the variable with the lowest mean was individualized consideration. Skewness ranged between -1.272 to -0.218 and Kurtosis ranged between -0.223 to 3.423, so the data was normally distributed, as shown in Table 1.

**Table 1**  
**Descriptive Statistics**

Variable	Min	Max	Mean	S.D.	Sk	Ku
Supply chain performance	-	-	4.23	0.06	-	-
SCP1: Reliability	1.00	5.00	4.16	0.56	-0.704	1.117
SCP2: Responsiveness	1.00	5.00	4.33	0.55	-0.743	1.279
SCP3: Agility	1.00	5.00	4.23	0.50	-0.218	1.170
SCP4: Costs	1.00	5.00	4.15	0.65	-0.980	1.722
SCP5: Asset Management	1.00	5.00	4.26	0.62	-0.936	1.973
Transformational leadership	-	-	3.97	0.03	-	-
TRA1: Idealized Influence	1.00	5.00	4.11	0.64	-1.272	3.423
TRA2: Inspiration Motivation	1.00	5.00	4.05	0.66	-0.976	1.725

Variable	Min	Max	Mean	S.D.	Sk	Ku
TRA3: Intellectual Stimulation	1.00	5.00	3.90	0.61	-0.749	0.541
TRA4: Individualized Consideration	1.00	5.00	3.81	0.58	-0.463	0.163
Customer loyalty	-	-	4.01	0.06	-	-
LOY1: Company Trust	1.00	5.00	3.83	0.50	-0.932	1.874
LOY2: Company Commitment	1.00	5.00	4.07	0.62	-0.879	0.057
LOY3: Company Satisfaction	1.00	5.00	4.14	0.52	-0.362	0.223

The results of measurement model found that the highest factor loading was company commitment and the lowest factor loading was company Satisfaction. The standard errors ranged from 0.046-0.067 and t-values ranged from 11.221-20.652, as shown in Figure 3 and Table 2. Moreover, the test results on composite reliability, convergent validity and discriminant validity depicted that all factors, comprising supply chain performance, transformational leadership and customer loyalty, were meet the acceptable criteria, as shown in Table 3.

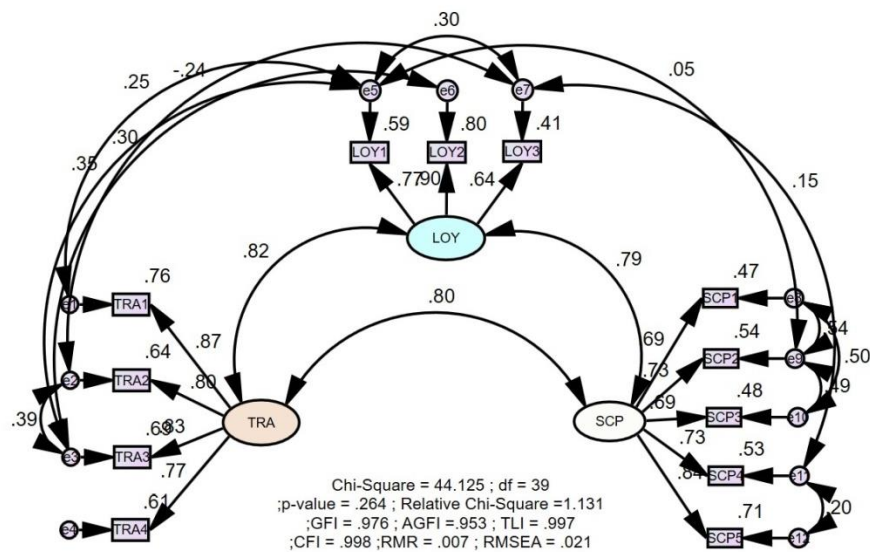


Figure 2  
CFA analysis

Table 2  
Measurement Model Results

	Supply chain performance	Transformational Leadership	Customer Loyalty	t	S.E.
SCP1	0.687			17.386	0.052
SCP2	0.734			<- ->	<- ->
SCP3	0.691			16.663	0.053
SCP4	0.728			12.570	0.066
SCP5	0.840			14.721	0.067
TRA1		0.869		16.979	0.060
TRA2		0.802		<- ->	<- ->
TRA3		0.829		20.652	0.046
TRA4		0.774		11.221	0.059
LOY1			0.766	14.697	0.057
LOY2			0.895	<- ->	<- ->
LOY3			0.644	11.624	0.052

Notes: SCP1: Reliability, SCP2: Responsiveness, SCP3: Agility, SCP4: Costs, SCP5: Asset Management, TRA1: Idealized Influence, TRA2: Inspiration Motivation, TRA3: Intellectual Stimulation, TRA4: Individualized

Consideration, LOY1: Company Trust, LOY2: Company Commitment, LOY3: Company Satisfaction, <- ->: Constrained Parameter, S.E.: Standard Error

**Table 3**  
**Reliability, convergent and discriminant validity**

	$\alpha$	CR	AVE	MSV	ASV
Supply chain performance	0.934	0.844	0.542	0.445	0.417
Transformational leadership	0.945	0.823	0.588	0.464	0.420
Customer loyalty	0.903	0.807	0.571	0.476	0.413

Notes: Threshold of reliability: CR>.70; Convergent validity: AVE>.50; Discriminant validity: AVE>MSV, ASV<AVE. CR =composite reliability; AVE = average variance extracted; MSV = maximum shared variance; ASV = average shared variance.

### CONCLUSION AND FUTURE WORK

Such findings can be a guideline for LSPs to improve their supply chain performance. Regarding leadership, LSPs' executives should have emotional intelligence, motivate employees, tolerate staff opinion and take care of employee work life. In terms of creating customer loyalty, LSPs should generate customer commitment, reliability and satisfaction. Concerning supply chain performance, LSPs should collaborate with supply chain partners to build reliability responsiveness and agility along with save costs and manage asset efficiently in supply chain. For theoretical recommendation, academicians and interested persons can bring the research results to conduct further research on other potential industries, such as automotive industry (Aunyawong, Wararatchai, & Hotrawaisaya, 2020), plus technological and innovative issues (Waiyawuththanapoom, 2020a) as well as the communication (Aunyawong, W., 2017; Villegas-Puyod et al., 2022; Aunyawong, Villegas-Puyod, Buaphiban, & Jitt-Aer, 2020). should be considered since they are essential factors in logistics and supply chain management.

### REFERENCES

- Asubonteng, P., McCleary, K.J. & Swan, J.E. (1996). SERVQUAL revisited: a critical review of service quality. *The Journal of Services Marketing*, Vol.10, No. 6, Pp.62-81.
- Aunyawong, W. (2017). Cultural differences in restaurant business: a case study of Thai restaurant in Sweden. *Journal of Logistics and Supply Chain College*, Vol. 3, No. 1, Pp. 40-50.
- Aunyawong, W., Wararatchai, P., & Hotrawaisaya, C. (2018). The mediating role of trust among supply chain partners on supply chain integration, cultural intelligence, logistics flexibility and supply chain performance. *Science International Journal*, Vol. 30, No. 4, Pp. 629-633.
- Aunyawong, W., Villegas-Puyod, J., Buaphiban, T., & Jitt-Aer, K. (2020). The Impact of Internal Communication Using LINE on Employee Engagement. *NKRAFA Journal of Science and Technology*, Vol. 16, No. 1, Pp. 31-45.
- Aunyawong, W., Waiyawuththanapoom, P, SETHACHOTSOMBUT, N., & WISEDSIN, T. (2020). Roles of 7R logistics management and consumer satisfaction on marketing performance of local bottled water SMEs in Thailand. *Test Engineering and Management Journal*, Vol. 83, Pp. 12220-12229.
- Aunyawong, W., Wararatchai, P., & Hotrawaisaya, C. (2020). The influence of supply chain integration on supply chain performance of auto-parts manufacturers in Thailand: a mediation approach. *International Journal of Supply Chain Management*, Vol. 9, No. 3, Pp. 578-590.
- Aunyawong, W., Wararatchai, P., Shaharudin, M.R., Hirunpat, A., & Rodpangwan, S. (2021). The mediating role of transportation practices during the COVID-19 crisis in Thailand. *The Open Transportation Journal*, Vol. 15, No. 1, Pp. 170-181.
- Office of Industrial Economics (2022). *Direction and trend in future Thai economics*. Bangkok: Ministry of Industry.
- Best, J. W., & Kahn, J.V. (2006). *Research in Education. (10th ed.)*. Cape Town: Pearson Education Inc.
- Binu Raj, A. (2021). Internal branding, employees' brand commitment and moderation role of transformational leadership: an empirical study in Indian telecommunication context. *Asia-Pacific Journal of Business Administration*, <https://doi.org/10.1108/APJBA-04-2021-0175>
- Cronbach, L. J. (1990). *Essentials of psychological testing (5th ed.)*. New York: Harper Collins Publishers.

- Das, S., & Hassan, H.M.K. (2021). Impact of sustainable supply chain management and customer relationship management on organizational performance. *International Journal of Productivity and Performance Management*, <https://doi.org/10.1108/IJPPM-08-2020-0441>.
- Diamantopoulos, A., & Sigauw, J.A. (2000). *Introducing LISREL*. London: Sage Publications.
- Eng, T.-Y., Mohsen, K. and Wu, L.-C. (2022). Wireless information technology competency and transformational leadership in supply chain management: implications for innovative capability. *Information Technology & People*, <https://doi.org/10.1108/ITP-06-2021-0489>
- Fornell, C., & Larcker, D.F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, Vol. 18, No. 1, Pp. 39-50.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R.E. (2010). *Multivariate Data Analysis.(7<sup>th</sup> ed.)*. Upper Saddle River, NJ: Prentice Hall.
- Hiranphaet, A., Sooksai, T., Aunyawong, W., Poolsawad, K., Shaharudin, M.R., & Siliboon, R. (2022). Development of value chain by creating social media for disseminating marketing content to empower potential of participatory community-based tourism enterprises. *International Journal of Mechanical Engineering*, Vol. 7, No.5, 431-437.
- Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling (5th ed.)*. New York: The Guilford Press.
- Kumar, G., & Goswami, M. (2019). Sustainable supply chain performance, its practice and impact on barriers to collaboration. *International Journal of Productivity and Performance Management*, Vol. 68, No. 8, Pp. 1434-1456.
- Lievchalermwong, T., & Aunyawong, W. (2022). The mediation effect of inventory management practices on operational performance in public university. *International Journal of Health Sciences*, 6(S5), 385-396.
- Nopphakate, K., & Aunyawong, W. (2022). The relationship of tourism logistics management and destination brand loyalty: the mediating role of Thailand tourist satisfaction. *International Journal of Health Sciences*, Vol. 6, S5, Pp.356-366.
- Nualkaw, S., Wararatchai, P., Sommanawat, K., & Aunyawong, W. (2021). Service value of transportation service providers for e-commerce products in the new economy era: creativity, society and environment. *Psychology and Education Journal*, Vol. 58, No. 4, Pp. 2016-2023.
- Pakornpongwatthana, K. & Aunyawong, W. (2022). Logistics Performance Affecting Logistics Service Provider Selection of Processed Seafood Manufacturers in Thailand. *Journal of Logistics and Supply Chain College*, Vol. 8, No.2, Pp. 17-27.
- Pham, H., Pham, T., & Dang, C.N. (2021). Assessing the importance of transformational leadership competencies and supply chain learning to green innovation: construction practitioners' perspectives. *Construction Innovation*, <https://doi.org/10.1108/CI-03-2021-0037>
- Pham, H.T., Pham, T., Truong Quang, H., & Dang, C.N. (2022). Impact of transformational leadership on green learning and green innovation in construction supply chains. *Engineering, Construction and Architectural Management*, <https://doi.org/10.1108/ECAM-05-2021-0379>
- Phrapratanporn, B., Wararatchai, P., Aunyawong, W., & Nik Ramli Nik Abdul Rashid (2019). Enhancing supply chain performance of SMEs in Thailand using the integrated personnel development model. *International Journal of Supply Chain Management*, Vol. 8, No. 5, Pp. 176-186.
- Pintuma, S., & Aunyawong, W. (2021). The effect of green supply chain management practices on environmental, operational and organizational performances of seafood manufacturers in Thailand. *International Journal of eBusiness and eGovernment Studies*, Vol. 13, No. 2, Pp. 33-48.
- Pintuma, S., Khaengkhan, M., Waiyawuththanapoom, P., & Aunyawong, W. (2020). Moderating effect of information sharing on the relationship of supply chain management capabilities and business performance: A study of the food industry. *International Journal of Supply Chain Management*, Vol. 9, No. 2, Pp. 341-351.
- Setthachotsombut, N., & Aunyawong, W. (2020). Agro-tourism service enhancement in Nakhon Pathom Province, Thailand: on capability increasing of the hospitality of agriculturists. *International Journal of Supply Chain Management*, Vol. 9, No. 6, Pp. 1403-1414.
- Sinthukhammoon, K., Hiranphaet, A., Aunyawong, W., & Chaladtanyakit, S. (2021). The supply chain management of the Vannamei Shrimp in Nakhon Pathom Province. *Turkish Online Journal of Qualitative Inquiry*, Vol. 12, No. 7, Pp. 8758-8768.
- Sommanawat, K., Hotrawaisaya, C., Waiyawuththanapoom, P., Srisawat, S., Aunyawong, W., Jernsittiparsert, K. (2021). The role of technological management, idea implementation, sustainable process innovation and logistic competency. *Journal of Management Information and Decision Sciences*, Vol. 24, No. S1, Pp. 1-13.

- Sooksai, T., Aunyawong, W., Shaharudin, M.R., Poolsawad, K., Prapairak, J. (2022). Digital development to strengthen tourism supply chain potential of participatory community-based tourism enterprises. *International Journal of Mechanical Engineering*, Vol. 7, No. 5, Pp. 455-461.
- Soonthornpipit, H., Kortana, T., & Aunyawong, W. (2021). Expansion opportunities of community enterprises in Thailand to China. *Psychology and Education Journal*, Vol. 57, No. 8, Pp. 86-97.
- Srisawat, S., & Aunyawong, W. (2021). Development of business performance under environmental uncertainty: lesson from Thailand's Eastern Economic Corridor. *International Journal of Entrepreneurship*, Vol. 25, No. 5, Pp. 1-10.
- Tirastittam, P, Jernsittiparsert, K., Waiyawuththanapoom, P., & Aunyawong, W. (2020). Strategic leadership, organizational innovativeness and the firm supply performance: The mediating role of information technology capability. *International Journal of Supply Chain Management*, Vol. 9, No. 2, Pp. 291-299.
- Villegas-Puyod, J., Phungsoonthorn, T., Sithipo, P., & Aunyawong, W. (2022). The impact of cultural differences on LINE app communication among Thai and Chinese employees: its effects on employee engagement. *International Journal of Health Sciences*, Vol. 6, No. S5, Pp 367-384.
- Waiyawuththanapoom, P., Tiratittam, P., Aunyawong, W., & Keerativutisest, V. (2020a). The impact of innovation related organizational climate and organizational performance: mediating role of innovative work behavior in Thailand. *International Journal of Innovation, Creativity and Change*, Vol. 14, No. 10, Pp. 774-794.
- Waiyawuththanapoom, P., Tirastittam, P., Pintuma, S., & Aunyawong, W. (2020b). Moderating effect of innovation on the relationship of supply chain management practices and firm performance: a study of SMEs. *International Journal of Supply Chain Management*, Vol. 9, No. 2, Pp. 333-340.
- Wararatchai, P., Aunyawong, W., Jantamaneechot, T. (2022). Development of Supply Chain Performance of Thailand Juice Manufacturers: The Mediating Role of Customer Loyalty. *Journal of Logistics and Supply Chain College*, Vol. 8, No. 1, Pp. 123-136.
- Wisedsin, T., Jernsittiparsert, K., Thitrat, P., & Aunyawong, W. (2020). Role of advanced manufacturing technology, human capital and employee empowerment to enhance manufacturing industry supply chain performance. *International Journal of Supply Chain Management*, Vol. 9, No. 2, Pp. 411-418.
- Yuyangyuen, M., & Aunyawong, W., (2023). Casual factors affecting supply chain performance of Thailand seafood manufacturers. *Central European Management Journal*, Vol. 31, No. 1, Pp.125-132.