

The Role of Transportation Management in Optimizing Supply Chain Management at Industrial Estate

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Abstract

Transportation management is able to integrate various components that are highly needed in order to ensure the distribution of goods and services runs effectively and efficiently. The effects of integrated transportation systems have major contribution to business processes and the sustainability of supply chain system. This study measures role of transportation management, supply chain management, and business performance which carry out business in industrial estate. The aim is to measure effectiveness in optimizing transportation management to support supply chain management in order to strengthen business performance in manufacturing industry. Survey was conducted on 150 employees working in manufacturing industry at industrial estate in Bekasi regency. The technique analysis uses structural equation modeling. The result states that transportation management has significant positive effect towards supply chain management, and has significant effect towards business performance, especially for manufacturing industry. In order to grow, develop and produce optimal business performance, transportation management support with good, integrated and supported management from various sectors is needed to create superior supply chain management so that transportation management support is needed with good governance, integrated, and supported from various sectors to create superior supply chain management and ensure the availability of industry needs. Vehicle scheduling, procurement and manufacturing, and profitability need to be considered by manufacturing industry at industrial estates in developing industrial productivity in order to produce sustainable business in the future. Recommendations for planning the transportation management systems that support the needs in industrial estate for success of business.

Keywords: Transportation Management, Supply Chain Management, Business Performance, Industrial Estate

Introduction

Based on study of World Economic Forum in 2018, Indonesia's transportation infrastructure ranking is in 30th position, while among ASEAN members it is third. While the best ranking is held by Singapore because it has public transportation system that can facilitate people's lives, and followed in second place is Malaysia. Efforts to build transportation infrastructure by government in various remote, outermost, and foremost areas include construction of docks in the eastern part of Sumatra and western part of Kalimantan, ports

in northern part of Sulawesi and Kalimantan, as well as airports and cattle boats in Papua (Bappenas 2019). With various efforts that

have been made by government, there has indeed been an increase in ranking in assessment of transportation infrastructure from year to year, but more serious efforts are needed to develop the transportation system (Kadarisman, Gunawan, and Ismiyati 2015), sustainability has been a focus in the transportation industry (Shi et al. 2019), special areas need to be developed especially industrial estates. Strategic efforts in encouraging the growth of industrial centers are carried out through the development of industrial estate (Sarjana and Khayati 2018). Efforts to develop transportation system are closely related to the growth of Indonesia's logistics competitiveness, where conditions are still lagging behind when compared to other countries in ASEAN. Based on

World Bank data related to Logistics Performance Index in 2018 at level of 3.15 on a scale of 1-5. Indonesia's logistics competitiveness index is still below Singapore (4.0), Thailand (3.41), Vietnam (3.27) and Malaysia (3.22). Although, in last few years, Indonesia's competitiveness has shown an improvement in which Indonesia's ranking in 2018 ranks 46th in the world. For this reason, special strategy is needed in handling logistical performance in order to support fulfillment and complete various things needed in adequacy of supply chain management.

Industrial sector played a pivotal role to increase economic development, and today the role of management is centered on the efficient performance of organization (Ayub and Zaman 2015). Industry has transformed, and many tangents have emerged, from the sporadic home-based cottage industries to geographically scattered large manufacturing industries to co-located industrial parks (Sharma 2013). The manufacturing firms have to monitor their performance to maintain competitive advantages and sustain improvements (Akyuz and Aka 2015). In disruptive business environment, tendency of business sector in manufacturing industry to achieve optimal corporate performance (Sarjana and Khayati 2019). Industrial estates is engines driving economic growth (Fan and Fang 2020), to accelerate industrialization (Yu et al. 2020), affect organizational competitiveness both national and international levels and introduces new perspective towards the location of business establishment, most countries use industrial cluster development strategy (MirHosseini 2016), effective form industrial activity in terms of ease of business world to obtain ready-built industry plot that has been equipped with various infrastructure and supporting facilities, obtaining legal certainty related to location of business, overcoming the spatial problems and simultaneously addressing the environmental impact problems caused by industrial activity and it is intended to encourage growth of industrial sector more focused, integrated and provide more optimal results for area where industrial estate is located (Sarjana and Khayati 2018), influence competition through increasing of productivity based on settlement of companies and providing

quick guidelines for development and innovation and encouraging of new business (MirHosseini 2016).

Indonesia is developing country with an abundant supply of natural resources, fundamentally strong and growing economy, and a tourism sector with huge potential, however, there are still many places that lack the necessary infrastructure and other supporting facilities in order to maximize their potentials and further enhance economic growth (Jababeka 2018). Communities living in rural areas in general and in the developing countries in particular contend with number of socioeconomic challenges due industrialization and lack of awareness (Mohammed, Melkania, and Kumar 2014). Global competition requires high speed, accuracy, creativity and consistency to win business through strengthening optimal competitiveness (Sarjana and Khayati 2019). The demand for industrial estate land was not as high as the previous year as seen from the decline in such evenly throughout Indonesia (Jababeka 2018), ability of methods to assess the resilience of industrial networks (Genc et al. 2019). Industrial estate is zoned specifically for the location of industrial facilities (Yu et al. 2020), tract of land that is subdivided and developed systematically, according to a comprehensive plan, to provide serviced sites for community of compatible industries (Sharma 2013), community of manufacturing and service businesses located together in a specific area (Khodakarami and Shabani 2014), industrial regions with infrastructures such as roads, transport, hospitals, and public utilities for the use of a set of companies (Tian et al. 2014). Sustainable industrial estate is strategically significant in sustainable development of countries, and it aims at achieving economic, environmental, and social benefits, simultaneously (H. Li 2013). Industry practitioners should focus on the implementation of innovation policies that promote long-term economic growth, creating more favorable and better technological and infrastructure institutional conditions to lead to substantial improvements in this economic growth (Pintado, Kaufmann, and Diaz-de-Cerio 2015). The acceleration of national infrastructure projects,

have yet to show optimal contribution to the economic growth (Jababeka 2018).

Transportation management

Transport management and physical distribution practices on the other hand allows faster and cost effective flow of goods and raw materials thus improving operational efficiency (Mukolwe and Wanyoike 2015). Transportation service is a critical business and important to the economic and social demand especially in the era of borderless world (Ngamvichaikit 2017). Transportation can be defined as the act of moving goods or people from an origin to require destination, also includes the creation of time and place utilities, and the modes of transportation can be divided into five: rail, road, air, water and pipeline. Intermodal freight transport involves the transportation of freight in an intermodal container or vehicle, using multiple modes of transportation (rail, ship, air, water and truck), without any handling of the freight itself when changing modes (Mukolwe and Wanyoike 2015). Transportation plays a very useful role in the development of the production sector in a country as well as the service provision so long as supply and demand is a concern (Mei and Afli 2017). Multimodal transportation is defined as the carriage of goods by two or more modes of transport, under single responsible service provider for the entire transportation (Ko 2009), requires high skill of managing the carriage according to combining risks of route places a negative effect toward the quality of transportation, in terms of cost and timeliness of delivery or damaged freight (Banomyong and Beresford 2001). Collaborative transportation management aims to reduce inefficiency, improve services, and provide mutual outcome to all parties (Okdinawati, Simatupang, and Sunitiyoso 2015). Collaborative transportation management as a holistic process that not only does it bring all parties together in the supply chain to drive inefficiencies out of the transportation planning and execution process but also it improves the operating performances of all parties through collaboration (J. Li and Chan 2012). Infrastructure development in industrial estates requires major contributions such as transportation, roads and bridges to facilitate access to supporting facilities

for economic system (Sarjana and Khayati 2019). Industrial estate brought about some visible beneficial impacts and drawbacks (Mohammed, Melkania, and Kumar 2014). Transportation is a legal source to take or carry things from one place to another (Qureshi and Abdullah 2013). Elements of competency in multimodal transportation management relate with planning, monitoring, controlling, and evaluating the services of combined modes of operating multimodal transportation services, managing customer relationship, supplier relationship and information technology of managing multimodal transportation services, whereas developing service quality and human resource as well as planning and executing for organizational development of developing multimodal transportation management (Ngamvichaikit 2017). The need for materials movement along a supply chain puts transport management at the core of logistics (Musau et al. 2017).

The complexity of the transportation management system includes order management systems, asset management systems, human resource management systems, slot booking systems, navigation tools, communication tools and administration tools, and potentially all of these systems use different software applications (YAP and Lam 2020). Intelligent transportation system provides solution to these problems with the help of new technologies, and integrated system that implements broad range of communication, control, vehicle sensing and electronics technologies to solve and manage the traffic problems (Singh and Gupta 2015). The development of transportation network can increase the growth of economic sector for society, increase the value of land, development of small, medium and large scale businesses, occurrence of product specialization between regions, concentration and urbanization of population, especially in areas that have opened access roads and transportation (Kadarisman 2016). The globalization increases business competitiveness and provides competitive advantages to different parties in the supply chain, especially in the transportation area (Okdinawati, Simatupang, and Sunitiyoso 2015). In an effort to maximize the use of limited funding

due to decreasing tax revenue, transportation agencies across the country are giving greater consideration to low cost strategies as a means of addressing transportation problems (Hurwitz, Heaslip, and Moore 2012).

Supply chain management

Supply chain management is the management of relations between upstream and downstream with suppliers and customers to provide superior customer value at lower cost for entire supply chain (Christopher 2013), coordination and cooperation between suppliers and customers to share information and exchange goods and services and the purpose is to reduce uncertainties and risks associated with supply chain, and contribute to reducing inventory levels and cycle times, improving business processes, improving customer service, ultimately increasing profitability and increasing company competitiveness (Turban et al. 2008), contributes to the reduction of inventory and working capital, creates close relationship between suppliers and customers (Davenport and Brooks 2004), refers to the possibility to optimize and coordinate the whole supply chain (G. Li, Shao, and Zhang 2019). Strengthen supply chain management to support various needs of manufacturing industry, commitment is needed to ensure the continuity for integration of internal functions and readiness of production functions (Sarjana and Khayati 2019). Supply chain management as a tool helps to accomplish corporate strategic objectives such as reduction in working capital, the accelerating cash-to-cash cycles, taking assets off the balance sheet and increasing inventory turn among other, and encompasses all those activities associated with moving goods from the raw material stage through to the end user (Mei and Afli 2017). Logistics system is made up of logistics services, information systems and infrastructure (Mukolwe and Wanyoike 2015). Physical distribution and logistics were envisioned to have broad responsibilities for managing activities associated with product flow from the points of raw material acquisition to the end consumer (Ballou 2007). Efficient supply chain management design and efficiency in its management is the fundamental basis for the growth and the sustainability of the organization (Mei and Afli 2017), approach by

utilizing power to consider the entire supply chain refers to the perspective of the company (Wieland et al. 2020). Key factors that separated global manufacturers with successful supply chains from others included the way these companies consists of collaborated with customers, effectively managed the product life cycle for their goods, and implemented technology throughout their supply chain operations (Griffis and Goldsby 2007). Logistics is the flow of goods or services from source to destination which includes efficient and effective process of planning, implementing, and controlling flow and related information from the point of origin to the point of use to meet customer needs, with aim of providing goods with right amount, time right, right location, and right cost, where main activities include procurement, storage, inventory, transportation, warehousing, packaging, security, and handling of goods and services both in the form of raw materials, intermediate goods, and finished goods and important alternative to consider in realizing company performance that is increasingly competitive, sustainable, and is always preparing to anticipate changes in the future (Bantacut and Fadhil 2018).

Business performance

Business performance is measure of performance related to markets such as market share, sales growth, diversification, product development, not only to measure current market but also as the company's position in coming competition (Lijun et al. 2014), evaluation of all efforts made to realize business goals (Yıldız and Karakaş 2012), illustration the achievement of company goals through increased sales and markets (Walker, Ritter, and Gemunden 2011), output or results the application of all activities related to business activities with indicators including growth, sales and profitability (Hubbard and Beamish 2011). The strategy aims to achieve best performance in manufacturing is therefore on sustaining the process of improving human well-being (Sarjana 2015). Superior organizational innovation and business creativity have an impact on business performance that is moderated by competitive intensity in the strategic entrepreneurial dimension (Sriboonlue 2019). Measurement of business performance is

recommended with several criteria including profitability or based on the market (Yıldız and Karaka 2012), measured by both return on assets and return on main business (G. Li, Shao, and Zhang 2019).

Expected goal can be generated in this research is creation model of developing transportation system specifically that can be developed in industrial estates that are limited to transportation management, supply chain management, and business performance. To accommodate, various indicators or dimensions are needed to support transportation management, supply chain management, and business performance. In addition, this study also aims to determine the value of influence for transportation management, supply chain management and business performance for manufacturing industry in industrial estates.

Methodology

Method used in this research is descriptive survey with verification approach. Influence between variables was tested through the application of verification analysis using structural equation modeling in transportation management, supply chain management, and business performance as can be seen in **Figure 1**. Descriptive survey is carried out as a step in describing the characteristics of sample so that systematic and accurate results are obtained. Primary data sources obtained through direct

observation of employees working in manufacturing industries located in industrial estates. The number of samples obtained as many as 150 employees in the form of questionnaires collected starting from March to May 2019. Sampling was carried out randomly on a number of manufacturing industries in various line businesses and industrial backgrounds located in the Bekasi region, consists of Jababeka , MM2100, and East jakarta industrial park. Population used in this study includes all manufacturing industries in three industrial estates in various business backgrounds. Operationalization of variables applied in the development of questionnaire was implemented to measure dimensions and indicators. Measurement of this research variable by utilizing five-scale Likert with the aim to describe relative efforts that are made to approach the truth in describing characteristics obtained from each respondent.

The development of transportation management models in industrial estate aims to improve business performance for companies that do business in manufacturing industry. Quantitative analysis applied in this study developed structural equation modeling (SEM) through Lisrel 8.8 to determine the effect between dimensions and variables tested. SEM is used in the analysis of research data because it is able to test data that has complex properties and can be done simultaneously. Results of the analysis are confirmed by previous theory so that the conclusions produced are compatible and support the previous theory.

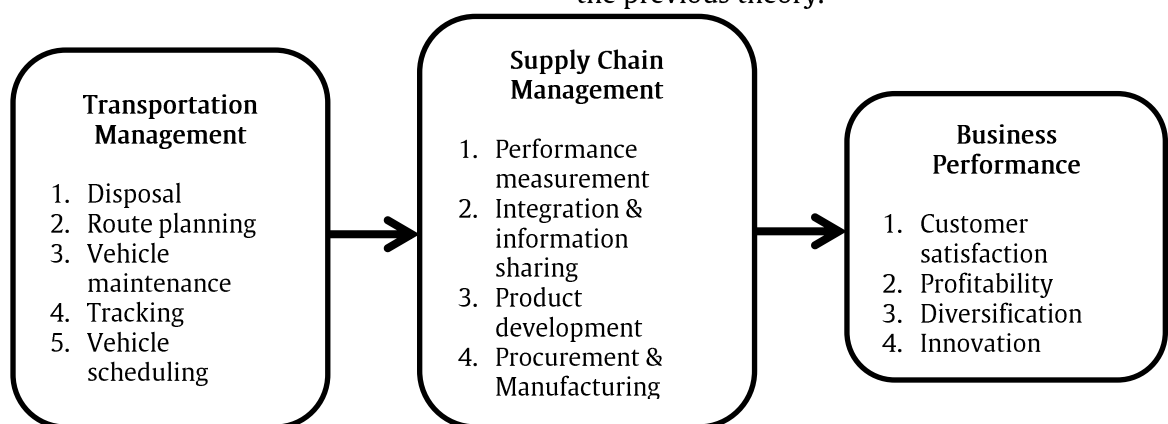


Figure 1. Research paradigm.

Hypotheses of this study can be described as follows

H_1 = Transportation management has significant effect on supply chain management

H_2 = Supply chain management has significant effect on business performance

Result and Discussion

This study develops an analysis based on multivariate statistical results through use of structural equation modeling. The model developed has an assessment complexity that refers to utilization of several variables that are tested where results of the construct are obtained based on indicators that shape it. SEM analysis in this study was carried out using Lisrel 8.8 because it was considered as the most appropriate way of calculating statistics in solving the research problems proposed in this study. SEM analysis that is developed is able to answer various things that are considered complex and may not be able to be done by other analysis systems. Amount of data collected as research sample is 150 obtained from various manufacturing industry employees located in industrial estates. The results of questionnaire collection can be seen that entire questionnaire has complete data that is in accordance with requirements so that questionnaire data collected can be used for further analysis process.

Characteristics of respondents obtained from recapitulation of research data. Profile characteristics of respondents can be classified

into four categories, namely gender, age, education level, and line business industry. Type of gender displayed on characteristics of respondents, male has greater number of respondents compared to female respondents that is 82.7% or 124 respondents, so it can be seen that employees with male sex who work in the manufacturing industry are more dominant and have greater contribution in this study. The biggest contribution occurred in productive age, 30-40 years old by 38% or 57 respondents. It is understandable that age productivity in manufacturing industry is highest level when compared with other productive age ranges. Bachelor degrees owned by respondents become largest contributor in education level category of 59.3% or 89 respondents so that adequacy of education for employees in manufacturing industry is in accordance with level of work positions owned by respondents generally at middle management level. In line business industry category, employees who work in automotive industry have biggest role of 42.7% or 64 respondents because growth of companies engaged in automotive industry tends to be more stable compared to other industries.

Table 1. Respondent characteristics

Profile	Respondent		
	Criteria	Number	%
Gender	Male	124	82.7
	Female	26	17.3
Age	< 30 years	26	17.3
	30 - 40 years	57	38.0
	40 - 50 years	38	25.3
	> 50 years	29	19.3
Education Level	SMA	8	5.3
	D3	39	26.0
	S1	89	59.3
	S2	14	9.3
Line Business Industry	Electronic	41	27.3
	Automotive	64	42.7
	Food & beverages	17	11.3
	Consumers Goods	19	12.7
	Pharmaceuthicals	9	6.0

Table 2. Validity and reliability test in variance extracted and construct reliability

Variable	Dimension	Standardized Loading (I)	T-value	Error Variance	Construct Reliability (CR)	Variance Extracted (VE)	Remark
TM	Disposal	0.77	10.58	0.41	0.980	0.576	Valid & reliable
	Route planning	0.75	10.20	0.44			
	Vehicle maintenance	0.70	9.31	0.51			
	Tracking	0.77	10.64	0.40			
	Vehicle scheduling	0.80	11.11	0.37			
SCM	Performance measurement	0.25		0.94	0.945	0.534	Valid & reliable
	Integration & information sharing	0.81	2.89	0.35			
	Product development	0.81	2.89	0.35			
	Procurement & measurement	0.82	2.90	0.32			
	Logistics	0.79	2.89	0.37			
BP	Customer satisfaction	0.70		0.51	0.962	0.512	Valid & reliable
	Profitability	0.75	6.18	0.44			
	Diversification	0.53	5.15	0.72			
	Innovation	0.55	5.32	0.70			

Exposure that is disclosed in detail to calculate the value of construct reliability (CR) and extracted variance (VE) on each dimension can be shown in table which is calculated based on structural equation modeling test with valid and reliable results of all dimensions tested. The dimensions tested refer to proposed hypothesis so that they are able to describe in detail the value of dimensions that form main variables consisting of transportation management, supply chain management and business performance. Standardize solutions, t_{value} and error variance values are used as reference in measuring values of construct reliability and variance extracted through structural equation modeling calculations. Variables used in research instrument are declared valid and reliable if value of variance extracted with loading factor ≥ 0.5 and construct reliability value ≥ 0.70 . From the results obtained through structural equation modeling test, it can be seen that construct reliability value and extracted variance of three variables tested get test values above the minimum allowable standard so that all variables tested consists of transportation management, supply chain

management and business performance are fit to be used as research instrument.

Structural equation modeling tests conducted for the analysis of this study are based on multivariate statistics. Model developed in this study has high complexity with three tested variables that can be formed by various indicators that support it. SEM applied through Lisrel 8.8 program is suitable program choice in completing calculations in this analysis. Evaluation of model is needed to determine whether structural model is feasible for further analysis. A total of 150 respondents who had been collected from various companies with complete data in filling out questionnaire had fulfilled the requirements used so that it was procedurally ready to be processed statistically.

Results of the verification analysis based on the measurement of structural equation models show the influence of transportation management, supply chain management, and business performance in optimizing the business sector in the manufacturing industry. The value of the transportation management effect on supply chain management is $\gamma_{11} = 0.33$, and the value of the supply chain management effect on business performance is $\gamma_{21} = 0.28$. Based on the

verification test produced, it can be seen in **Figure 2** that the effect value between the variables tested has a significant effect. The results of hypothesis testing (H_1) are partially stated that transportation management has a significant effect on supply chain management. The results of the analysis explained that vehicle scheduling as an indicator with a large contribution in forming transportation management so that it has a significant effect on supply chain management in strengthening manufacturing in industrial estates. Meanwhile, the results of the hypothesis test (H_2)

stated that supply chain management has a significant effect on business performance. Contributions from procurement and manufacturing have contributed greatly to establishing and developing supply chain management for the operationalization of the manufacturing industry in industrial estate. Similarly, the role of profitability is an indicator that plays major role in shaping and improving business performance.

SEM test as a multivariate analysis to analyze the influence between variables used in this study.

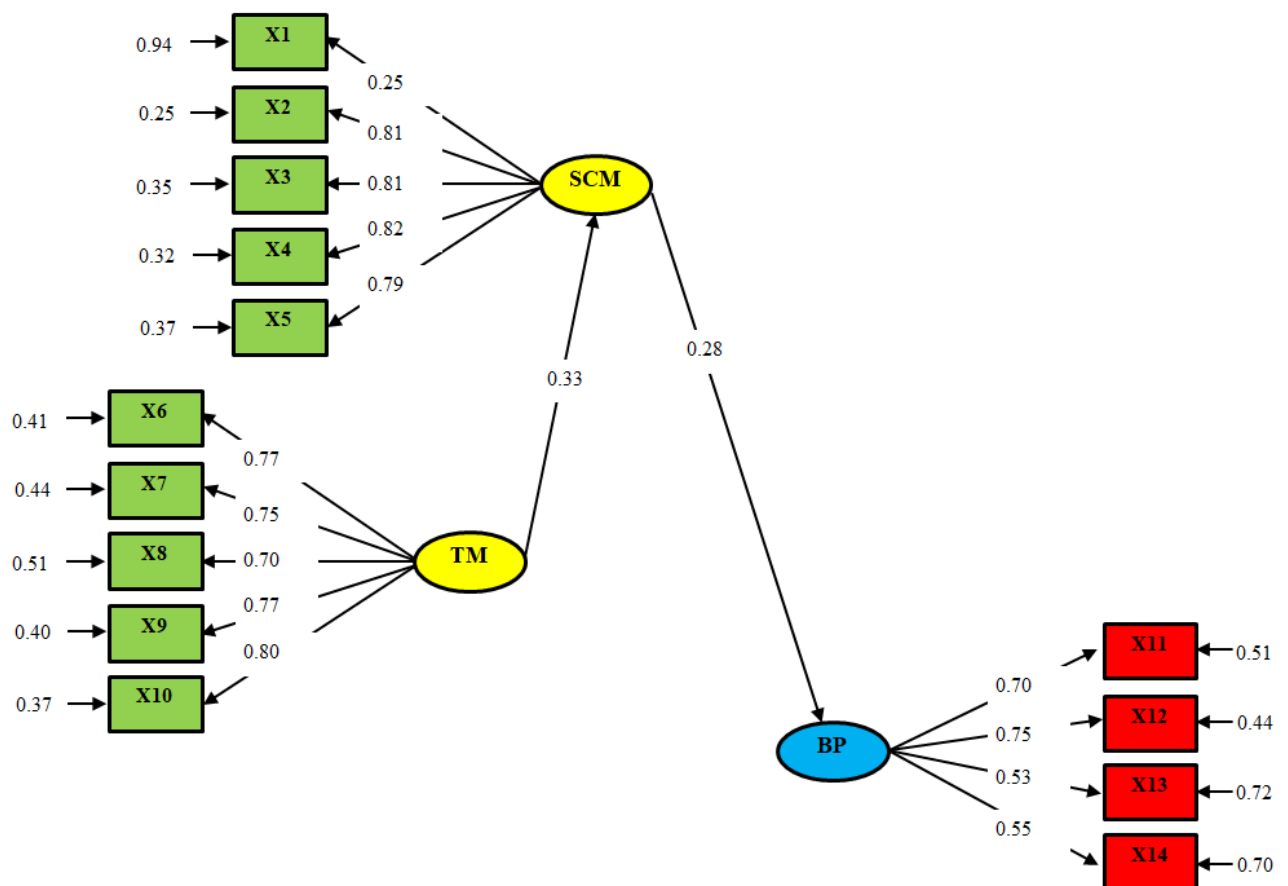


Figure 2. Standardize solution in SEM.

Table 3. Goodness of Fit Index

Index	Goodness of Fit		
	Criteria	Result	Remark
GFI	≥ 0.90	0.89	Marginal fit
NFI	≥ 0.90	0.90	Good fit
NNFI	≥ 0.90	0.94	Good fit
CFI	≥ 0.90	0.95	Good fit
IFI	≥ 0.90	0.95	Good fit
RFI	≥ 0.90	0.88	Marginal fit
PNFI	0-1	0.74	Marginal fit
AGFI	0-1	0.89	Marginal fit

Table 4. Result of Hypotheses

Hypotheses	t _{value}	Standardized Solution	Conclusion
H ₁	2.29	0.33	Accepted
H ₂	2.00	0.28	Accepted

Test results in this multivariate analysis can be represented by measurements of GFI, NFI, NNFI, CFI, IFI, RFI, PNFI, AGFI. Match index criteria for measuring goodness of fit include eight criteria. Index is categorized as fit if the index value is obtained ≥ 0.9 , or if index is close to 1 then criteria are categorized as fit. The measurement index can be categorized as marginal if value obtained is $0.8 \leq \text{GOF} \leq 0.9$. Four criteria for results obtained through test model in this study illustrate four criteria stated good fit consisting of NFI, NNFI, CFI, IFI, and four other criteria stating marginal fit consists of GFI, RFI, PNFI, and AGFI.

Two hypotheses in this study by utilizing three variables tested such as transportation management, supply chain management, and business performance with results that can be explained that both hypotheses are significant and acceptable. The second value of hypothesis tested has $t_{\text{value}} > 1.96$ so that the hypothesis is declared significant. The greatest significance value is determined by the effect of transportation management on supply chain management with $t_{\text{value}} = 2.29$. Vehicle scheduling and tracking have major contribution in strengthening

transportation management. This can be interpreted that vehicle scheduling and tracking is able to strengthen business performance by optimizing transportation management so as to make supply chain management superior in industrial estate. In addition, another significant value is significant influence of supply chain management on business performance with $t_{\text{value}} = 2.00$. The contribution of procurement, manufacturing and logistics plays an important role in developing supply chain management in manufacturing industry so that it can drive growth of the manufacturing industry business and even be able to optimally improve business performance. Results that can be disseminated in the findings of this study are in the form of novelty in transportation management model at industrial estate. This model emphasizes the importance of optimizing transportation management for the operationalization of various companies doing business in industrial estate in effort to strengthen supply chain management. Vehicle scheduling and tracking as a major contributor in the development of transportation management for manufacturing industry has an important role in coordinating supply chain implementation in industrial estate. So that one of

things that makes supply chain management to the needs of manufacturing industry is that proper transportation management can be applied. This effort becomes major part of business success in manufacturing industry which can be measured by improvement in business performance it achieves. Transportation management can indirectly affect the business performance of various companies with background in the manufacturing industry doing business in industrial estate.

Transportation management model at industrial estate as novelty is produced in this study is influenced by three main dimensions that have greatest contribution in supporting each of the variables used including vehicle scheduling, procurement and manufacturing, and profitability. A large contribution to the vehicle scheduling dimension is in forming the transportation management variable so that transportation management is able to influence supply chain management by 33% while the rest is influenced

by other factors. Procurement and manufacturing contribute the biggest in forming variable supply chain management compared to other dimensions, thus causing supply chain management to have significant influence on business performance by 28%, while the rest is influenced by other factors. As result of the main contribution for dimensions that form variable transportation management and supply chain management, including vehicle scheduling, procurement and manufacturing so that it affects the business performance by manufacturing industry. Profitability is an important dimension that needs to be considered by manufacturing industry in improving business performance as can be seen in **Figure 3**. Three dimensions, consists of vehicle scheduling, procurement and manufacturing, and profitability need to be considered by manufacturing industry especially those located in industrial estates in developing their industrial productivity in order to produce sustainable business in the future.

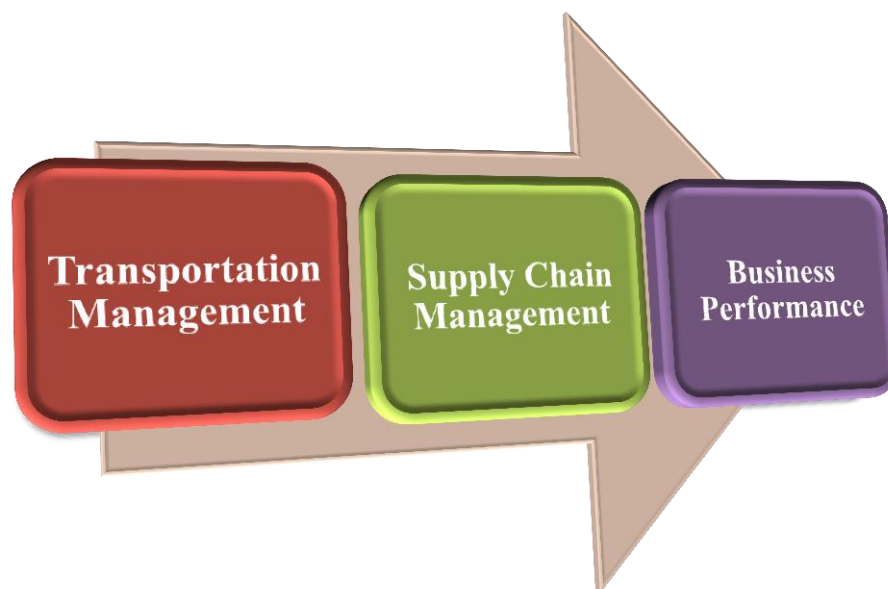


Figure 3. Transportation Management Model in Industrial Estate.

Conclusion

Based on analysis that has been presented in this study conducted on various companies engaged in the manufacturing industry which have main focus on transportation management, supply chain management, and business performance with business locations in industrial estates. The results of this study concluded that transportation management has significant effect on supply chain management and has significant impact on business performance. Transport management posse the potential of positively influencing supply chain performance (Musau et al. 2017). Supply chain performance is influential simultaneously and partially to business performance (Mustikaningsih et al. 2019). The entire supply chain must be integrated when exploring the relationship between supply chain management and business performance (Ni and Sun 2019). Make more famous brands to increase profit margins so as to produce supply chain development and good business performance (G. Li, Shao, and Zhang 2019). Vehicle scheduling has dominant contribution in supporting the development of transportation management, especially to serve the needs of transportation system for companies in industrial estates. Transportation system for companies in industrial estate also requires optimal transportation management so it needs to be well considered route planning, vehicle maintenance and disposal systems. Meanwhile, to strengthen supply chain management, it is necessary to support and make major contributions from procurement and manufacturing systems, as well as superior logistics to provide guarantees for business actors in industrial estate to be more optimistic in conducting business. Performance measurement, integration and information sharing, and product development are also indicators needed in carrying out good supply chain management so that they are able to integrate various needs to ensure the sustainability of supply for manufacturing industry. To strengthen business performance for manufacturing industry in industrial estate, transportation management is needed that is able to fully integrate the needs of

transportation services for manufacturing industry to support supply chain management can be done optimally. Competition in manufacturing industry at industrial estate as an effort in development of corporate identity is absolutely done through increase of companies to actively engage in social activities (Sarjana et al. 2018).

Findings of this study can used as reference by various stakeholders, especially for business people and manufacturing industry in relation to planning of transportation management systems that support the needs of manufacturing industry in industrial estate so as to understand strategies that must be carried out for the success of its business. Business performance implemented by manufacturing industry in developing industrial estates has not been fully influenced by transportation management and supply chain management so that for next research several different variables are needed to have different focus and research characteristics so that research results are able to complement the various areas of knowledge needed in an effort to developing manufacturing industries. Integrated approach is able to explain how supply chain management improves business performance (Ni and Sun 2019). It is important for industrial parks to understand the individual performance level and to adapt best practice in all areas (Festel and Wurmseher 2014). To survive and thrive in highly competitive environment, it is very important that businesses can adapt to the environment by creating harmony with the surrounding business (Chang and Li 2019).

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