

# COMPETENCE MODEL OF HUMAN RESOURCES, INFRASTRUCTURE, AND REGULATION IN IMPROVING LOGISTICS PERFORMANCE

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## COMPETENCE MODEL OF HUMAN RESOURCES, INFRASTRUCTURE, AND REGULATION IN IMPROVING LOGISTICS PERFORMANCE

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### ABSTRACT

*Logistics problems often occur in the competence of human resources, infrastructure, and regulation. This problem occurs in less precise time in handling and distributing consumer requests such as the request process, negotiation, and purchase, delivery, receipt and storage process of goods. The research objective is to see the relationship of competencies of Human Resources, infrastructure and regulations used. Processing data based on the Structural Equation Model. The results of the study positively influence the Competence of Human Resources, infrastructure and regulations on Logistics Performance*

**Keywords:** Competence Model, Infrastructure, Regulation, Logistic Performance

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## 1. INTRODUCTION

Effective and efficient logistics is the key to the success of the company and marketing [1], [2] stating that increasing logistics requires the support of advanced information and communication technology from logistics providers. Logistics is the backbone of the global supply chain [3]. Apart from the critical are cost efficiency, infrastructure and customs components that need to be discussed, there are also some relevant things such as information and interesting knowledge about logistical performance and industry challenges 4.0 regarding the lack of adequate skills for human resources [4].

The impact of poor logistics performance is the number of customers who still experience delays in receiving shipments, frequent stock scarcity and price fluctuations, high service time and operational barriers which indicate that logistics distribution performance is far from customer expectations. These factors can cause adverse effects on the expected performance of logistics.

Indonesian logistics declined based on the results of the 2016 Logistics Performance Index survey published by the World Bank that Indonesia ranked 63 out of 160 countries with an overall score of 2.98 or down 10 points compared to 53 in the previous year.

The decrease in logistics performance in value is based on six parameters that effect, namely customs, infrastructure, competency, shipping goods abroad, tracking and recording and limiting the delivery of goods [4]. From the six parameters, three parameters are more influential in reducing performance, namely customs, infrastructure, and competencies can be seen in table 1.

Researcher's analysis of the above problems that human resources are the most important thing for a country because having skilled and quality human resources will be able to manage existing natural resources. Problems that occur such as the inaccurate service time in completing customs shows that HR is not skilled in carrying out its duties. The quality of information and communication technology that has not supported the availability of reliable infrastructure and networks and the lack of inadequate human resources are obstacles to logistics efficiency.

Table 1. Indonesia LPI Scores for 2014 and 2016.

Logistics Performance in Indonesia	2014	2016	Increase/ Decrease
International LPI Score	3.08	2.98	↓ 0.10
Customs	2.87	2.69	↓ 0.18
Competence	3.21	3	↓ 0.21
Infrastructure	2.92	2.65	↓ 0.27
Timeliness	3.53	3.46	↓ 0.07
International Shipping	2.87	2.9	↑ 0.03
Search for Goods	3.11	3.19	↑ 0.08

The better the quality of logistics performance with human resources can provide solutions in handling customer demand, reduce conflicts and customer complaints, increase efficiency levels to reduce time so that there is a need for quality human resource competencies to improve logistics efficiency and the possibility of meeting time targets [1].

Studies conducted [5] studied the impact of topography and transportation on improving the economy and infrastructure involvement. The results of the study indicate that the main

geographical factors influencing global market participation and infrastructure facilitate increased economic and international contributions.

Technological developments accelerating the globalization process have also included all modes of transportation. The effect of this progress is the development of an integrated system by an all-computerized, technology and robotization industry 4.0 that is online that makes it possible to transport transportation with various interconnected modes. Economic development and transportation cannot be separated, so it is necessary to study infrastructure that supports logistics to improve transportation [6].

Based on the background above, the researcher wanted to see the extent of the contribution. Based on the background above, the researcher wanted to see the extent of the contribution of human resources, infrastructure, and regulation to improving logistics performance.

### 1.1. Problem Formulation

Based on the background and previous research studies, the formulation of the problem is presented as follows:

1. What variables are the most influential in improving logistics performance so that they can answer the weaknesses of why logistics has not been integrated so far?
2. How much is the contribution of human resource, infrastructure and regulatory competencies in improving logistics performance to form a maximum level of service to overcome the weaknesses of logistics performance?.
3. What is the relationship between the competence of human resources, infrastructure and regulations in improving logistical performance so that the integration of logistics in the future?

The purpose of this study is to design an effective conceptual framework model used to identify weaknesses in logistical performance. The purpose of this study is described below:

1. Analyzing human resource competency factors to find out what competency variables are more dominant in improving logistics performance that can generally apply in the company.
2. It knows how much the contribution of the variable competence of human resources, infrastructure and effective regulation to improve logistics performance in the system.

## 2. LITERATURE REVIEW

### 2.1. Competence

Competence is a combination of knowledge, skills, attitudes, and other personal characteristics needed to achieve success in a job, which can be measured using agreed standards, and which can be improved through training and development [9]. Competence is an ability to carry out or do a job or task based on skills and knowledge and supported by the work attitude demanded by the job. Competence shows skills or knowledge characterized by professionalism in a particular field as the most important and superior in particular fields [10].

Research [11] explains that the factors that influence human resources are cost, quality, delivery, asset, marketing, product, and Economic factor from indicators that affect human resources positive results on logistics performance. According to [12], management of human resources has positive results on performance. Indicators that affect human resources are inputs and innovations in achieving performance. These indicators are employee knowledge, skills, abilities, and abilities. Based on the results of research from [13] HR competencies consist of

three competency factors consisting of basic knowledge, skills, and seta meta-quality attributes. Competency model according to [14] consists of know-how, skill, and self-concept. Based on the literature relating to human resource competencies, there are three variables, namely Knowledge, Skills and attitudes.

These variables each have indicators related to logistics. Indicators of knowledge variables are inventory, warehouse, and procurement; Skills with indicators of the initiative, connectivity and control, and Attitudes consist of indicators of commitment, timely, communicative and trust. This indicator is an indicator of the competence of human resources selected to be included in the survey questionnaire and used to collect data or information in writing this journal. The incorporation of these indicators is outlined in the framework of the research concept.

## **2.2. Infrastructure**

Economic growth requires infrastructure development. Infrastructure is needed because it is one of the determinants of economic development (industry) [15]. Good infrastructure development will affect production activities and other sectors, [16]. Factors affecting infrastructure are roads, water, electricity, and telephone [17]. The results of the study [18], found that transportation infrastructure and communication technology had a significant positive effect on regional economic growth. Infrastructure plays a key role in determining logistics performance. The principal logistics activities include transportation and warehousing, needing, airport infrastructure, seaport, road, railway, and information and communication technology (ICT). Based on the previous researcher, the researcher took the indicator factor in the infrastructure is Transfortasi, Electricity and Information Technology.

## **2.3. Regulation**

Regulations and legislation protect the interests of the State and the interests of various other parties in the logistics sector, guarantee legal certainty, and create a conducive business climate for national logistical activities, the conditions to be achieved in the future are the availability of law enforcement, and implementation of laws and regulations related to logistics. Research [3] states that logistics and customs services are positively related to logistics performance, but infrastructure and environment are negatively related. The indicators examined by Bakar consist of infrastructure, service competencies, customs, and a friendly environment. Research [19] regulation does not affect and does not provide results for increased transportation. In his research, states that transportation and regulation do not support each other because there are different laws in each sector. Regulation is negatively related to supporting smooth transportation. Policies or regulations in the logistics sector are still partial and sectoral. Even though the regulation has been established, law enforcement is still low [19].

## **2.4. Logistics**

Logistics according to the Council of Supply Chain Management Professionals [20] is part of supply chain management in planning, implementing, and controlling the flow and storage of goods, information, and services that are effective and efficient from the point of origin to the destination point on-demand consumer. To flow goods from the origin to the destination point will require several activities known as principal activities in logistics including 1) Transportation, 2) Location, 3) warehousing and storage, 4) Third-party Logistics, 5) Strategic Decision (material handling, Inventory, Packaging), [20].

The logistics system and inventory system initially are derived from the term supply chain system. The term supply chain systems are often exchanged with logistical systems while the

## Competence Model of Human Resources, Infrastructure, and Regulation in Improving Logistics Performance

inventory system is understood as an integral part of both. Logistics is a set of resources such as capital, labor, the information described with receiving, handling, storing, moving and shipping of tangible materials. This definition includes transportation and distribution activities [21].

In the literature, various empirical studies, such as [22], show that logistics is a strategic factor in corporate organization and affects performance, namely concerning service quality and overall profitability. Management of logistics activities has become a valuable way to secure competitive advantage and improve organizational performance [23].

Logistics research and analyzing logistical performance were first shown in work [24], which reported that logistical performance measurement consisted of a methodology for analyzing the sources of logistical functions, and the primary objective was monitoring and control of logistics operations. In line with the importance of internal logistics also has an impact on effectiveness and profitability, [1].

Empirical research is to analyze reciprocal relationships between different indicators of logistical performance and their impact on organizational dimensions. Indicators of logistics performance consist of efficiency, effectiveness, and differentiation [1]. The results of the research found [1] were developed [25], becoming the basis for the development of research for researchers by taking Variables in Logistics Performance [26,27].

The indicator of differentiation as the ability to create value for customers through the uniqueness and distinctiveness of logistics services. In fulfilling company goals and satisfying customers by adding indicators of service level and responsiveness in providing logistical competitiveness, [3]. In his research also added indicators of logistics costs and flexibility. Logistics costs in his research to see how much the cost reduction might be more efficient in logistics services while the flexibility to see how much time difference occurs when using e-systems. [26,27] explains that by using the seven indicators, it can be seen which indicators are more influential in improving logistics performance which is influenced by competency and competitive advantage

Based on the literature review, the conceptual model proposed would be presented in figure 1 below.

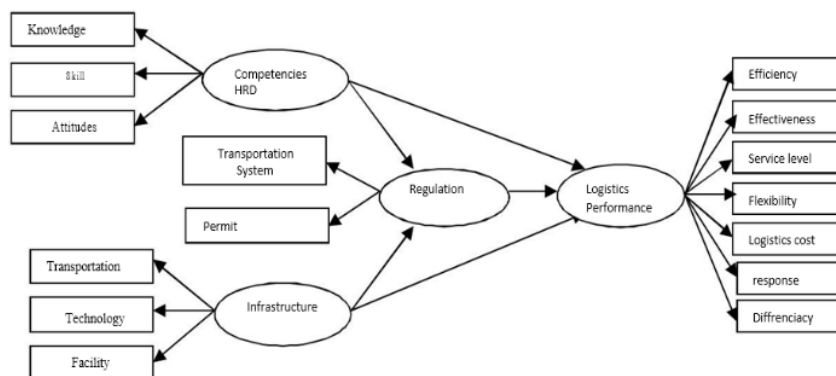


Figure 1. Conceptual Model

### **Formulation of the hypotheses**

Hypothesis formulation based on the conceptual model in figure 1:

#### **1. Formulation of the Hypothesis of Human Resource Competence**

There are still many influencing human resources for which researchers examine human resource competencies from three dimensions, namely the ability of knowledge, skills, and qualities of attitudes [28,29]. These three dimensions are tested whether it provides an increase in human resource competencies such as the following hypothesis

H1: Human resource competency factors have a positive effect on logistics performance

#### **2. Formulation of the Infrastructure Hypothesis**

Sislognas [19], stated that the cause of low logistics performance was caused by infrastructure. In this case, it is necessary to review and re-evaluate the extent of the influence of infrastructure in improving logistics performance. For this reason, it must be tested with variables that influence with the following hypothesis:

H2: Infrastructure Factors have a positive effect on Logistics Performance

#### **3. Formulation of the Regulation Hypothesis**

The competency of human resources and infrastructure still needs a study of regulations to see how far the effect on logistics performance. The hypothesis proposed is:

H1: Regulatory factors have a positive effect on logistics performance

### **3. RESEARCH METHODS**

The research method was conducted by questionnaire. Data collection was carried out on logistics-related activities in North Sumatra by taking a sample of 250 respondents using the probability sampling method, [7] with the reason that the North Sumatra region was so extensive that random sampling was conducted. The number of samples taken is based on generalized least squares estimation technique with the amount of data 200-500 samples, so that with the data 250, it has met the specified minimum limit. The results of the research by distributing questionnaires were processed using a structural equation model, [8].

### **4. RESULTS & EVALUATION**

#### **4.1. Test of Validity and Reliability**

Validity test to find out the measuring instrument used can measure real conditions. Item instrument question is said to be valid if t-count is greater or equal to t-table, and vice versa. In this study, the calculation of manual validity was not carried out, and the calculation was fully assisted with the Amos version 24 program.

Based on the r-table product moment, where the amount of data is 30 then the degrees of freedom ( $df = 30 - 22 = 28$ ), with a confidence level of 95%, the r value is 0.362 (r-critical = 0.362). The whole data is valid and reliable.

#### **4.2. Goodness of Fit Analysis**

Analysis of the level of data compatibility with the model is done through several stages, namely (Wijanto, 2008):

- a. Compatibility analysis of the whole model (overall model fit)
- b. Compatibility analysis of measurement model fit

c. Compatibility analysis of structural models (structural model fit)

**4.2.1. Compatibility analysis of overall model fit.**

Recapitulation of the results of calculations in table 2

**Table 2.** Results of Compatibility Analysis of the Overall Modification Model

Measurement GOF	Target Fit level	Estimation	Fit Level
		Result	
<i>Chi-square</i>	Minimum values	955.736	<i>good fit</i>
<i>Goodness of Fit Index (GFI)</i>	$\geq 0.90$	0.895	<i>marginal fit</i>
<i>Probability</i>	$\leq 0.05$	0.000	<i>good fit</i>
<i>Root Mean Square Error of Approximation (RMSEA)</i>	$\leq 0.08$	0.024	<i>good fit</i>
<i>CMIN / DF</i>	< 5 (wheaton,1977)	1.205	<i>good fit</i>
	< 2 (Byrne, 1988)		
<i>Non-Centrality Parameter (NCP)</i>	Minimum values	162.736	<i>good fit</i>
	< <i>Chi-square</i>		
<i>Tucker-Lewis Index (TLI)</i>	$\geq 0.90$	0.911	<i>good fit</i>
<i>Adjusted Goodness of Fit Index (AGFI)</i>	$\geq 0.90$	0.875	<i>marginal Fit</i>
<i>Normed Fit Index (NFI)</i>	$\geq 0.90$	0.867	<i>marginal Fit</i>
<i>Incremental Fit Index (IFI)</i>	$\geq 0.90$	0.925	<i>good fit</i>
<i>Comperative Fit Index (CFI)</i>	$\geq 0.90$	0.922	<i>good fit</i>
<i>Parsimonious Normed Fit Index (PNFI)</i>	$\geq 0.90$	0.596	<i>less good</i>
<i>Parsimonious Goodness of Fit (PGFI)</i>	$\geq 0.90$	0.750	<i>less good</i>

Based on Table 2. It can be seen that there are eight sizes of GOF showing good compatibility, three sizes of GOF showing marginal fit and two sizes of GOF showing poor compatibility. This work indicates that even though there are several GOF sizes that show marginal compatibility, but most GOF sizes show the good fit; it can be concluded that the overall fit of the model is a good fit.

**4.2.2. Compatibility analysis of measurement model fit**

All standard loading factors of the indicator variable ( $\geq 0.5$ ). Based on the statement that the validity of all manifest variables on latent variables is good. After the analysis of construct validity is done, then analyze construct reliability. The calculation results of construct reliability (CR) and variance extracted (VE) have been carried out.

Table 3. Measurement Model Analysis

Measuring	The calculation results		Analysis
	CR	VE	
Knowledge	0.885	0.556	Good
Skill	0.894	0.517	Good
Attitudes	0.902	0.508	Good
Regulation	0.857	0.501	Good
Infrastructure	0.893	0.526	Good
Logistics Performance	0.913	0.518	Good



**4.2.3. Compatibility Analysis of Structural Models (Structural Model Fit)**

The calculation results of all parameter values of latent variables in the structural model significantly give a positive influence on the endogenous latent variables. In Table 4. Summarized the results of the evaluation of the structural model in this study.

Table 4. Evaluation of the Structural Model Coefficient

Path	t-count	Value Parameter	Probability	Conclusion
KSDM→ KL	2.435	0.401	0.031	positive and significant
REG → KL	2.235	0.395	0.016	positive and significant
INF → KL	2.485	0.425	0.021	positive and significant

**4.3. Evaluation of Research Hypotheses**

Hypothesis 1: Value calculated (value of critical ratio) = 2,993 > 1.96 in the acceptance area and a probability of 0.008 < 0.05, then it can be stated that H1 is accepted, namely Competence Human resources have a positive and significant effect on logistics performance

Hypothesis 2: Values due to t-count (value of critical ratio) = 2.076 > 1.96 are in the acceptance and probability areas of 0.038 < 0.05, then it can be stated that H2 is accepted, that is, regulation has a positive and significant effect on Logistics Performance.

Hypothesis 3: Value calculated (value of critical ratio) = 2.514 > 1.96 in the acceptance area and a probability of 0.011 < 0.05, then it can be stated that H1 is accepted, that is, infrastructure has a positive and significant effect on logistics performance

**5. CONCLUSIONS & SUGGESTIONS**

**5.1. Conclusions**

The most influential variables in improving logistics performance based on the results of analysis and evaluation are infrastructure variables with a factor coefficient of 0.425, while Human Resource Competence with a factor coefficient of 0.401 and regulation 0.395 and the hypothesis is accepted and has a positive effect on logistics performance.

The results of the study show that the competence of human resources, regulation, and infrastructure significantly affects logistics performance. Based on the value of direct or indirect influence that competency in human resources contributes 0.894, regulation of 0.857 and infrastructure contributes 0.893 to logistics performance

The relationship between the competence of human resources, regulation, and infrastructure is positive and influential. It is judging from the results of the competency skills of information technology skills and technology infrastructure, and it is closely related to the developing industry 4.0.

**5.2. Suggestions**

The future researcher is expected to develop measurements of logistical performance by adding variables other than human resource and infrastructure competencies. Besides that, it can develop other indicators that affect logistics performance The results of the research that has

been conducted, still allow for further research related to logistics performance to be implemented to improve company performance

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