

# The Role of Integration of Logistics and Production Systems in Improving Organisational Performance: Evidence from Iraq

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This paper aims to test the effect of the integrative relationship between logistics and production systems on the level of organisational performance of companies. This paper uses the explorative survey method using a questionnaire consisting of 45 items dealing with the main study variables represented in production, supply and organisational performance based on the relevant literature on the subject of the research. The results show an integrative relationship between logistics and production systems in Iraqi companies. The results also show that there is a positive relationship of statistical significance between both the production and logistics systems with the level of corporate organisational performance and that the complementarity between these two systems leads to improved organisational performance. The integration between the production system and the logistics system helps to enhance the positive interaction between the various functions of the company and thus leads to improving the performance of the company as a whole. The results of this study are the main factors to help managers understand the best ways to facilitate positive change. The result is that cooperation with customers, suppliers, and workers is the first step towards effective cooperation within the company.

**Key words:** *Logistics Performance, Production System, Organisational Performance, Marketing.*



## Introduction

The contemporary world is characterised by the emergence of large organisations with huge goals and ambitions linked to each other: specifically, with interrelated and contradictory relations, and many contradictions and complexities. Organisations are aiming to be of excellent performance in order to fulfil future expectations and accomplish their objectives. For this reason, a large number of researches and studies have concentrated on the study of organisational success, based on its meaning and significance, in an attempt to draw an image of performance in different fields and disciplines in order to achieve the productivity that is used to determine the nature of the organisation and its potential.

The importance of organisational performance is highlighted by the fact that it is a step that defines the current location, how far it is from the desired endings, or how it matches with it. And that the organisation's operations and its performance are examined are very important issues to understand how organisations work to correct deviations in the organisation and raise the level of performance, and design the organisational structure in a way that is effective and efficient, as well as the ability to identify the extent of the need for change and how to achieve it in the organisation (Gao, Chang, Fang, & Luo, 2018).

Wang, Yi, Li, Meng, and Wang (2019) indicate that the issue of performance is of critical importance for considerations related (first) as a central point to estimate the success or failure of organisations in their strategic decisions and plans, and for researchers to establish criteria that enables them to explain all aspects of the organisation's performance. The study of performance and its measurement faces several challenges represented in the variation of the concept and its measurement indicators based on the variation of the organisation's goals and their nature and the different goals of the entities associated with them, which must determine the type of appropriate measures that can be used to measure performance, determine its importance, the source of information adopted in the measurement, and how to integrate different sizes to provide a true picture of the organisation.

Shanker, Bhanugopan, Van der Heijden, and Farrell (2017) explain that identifying the organisation's performance helps in revealing a number of aspects. These aspects include the extent of the organisation's ability to face environmental determinants and the degree to which strategic measures are appropriate to the organisation's goals and resources. The importance of organisational performance comes from the organisation's ability to create desired results in achieving the desires of beneficiaries as it represents the extent to which the organisation can successfully accomplish a mission or achieve a goal (Gunasekaran et al., 2017). So, organisational performance is the indicator that measures the organisation's goals, which are survival, adaptation and growth. The current study attempts to examine the integrative relationship between logistics and production performance in Iraqi companies on the one hand,

and on the other hand, it shows the effect of that relationship on the level of organisational performance of Iraqi industrial companies operating in the Nineveh Governorate.

## **Literature Review**

### ***Logistics and Production Performance***

The management of logistics operations is one of the modern manifestations of management in facing the challenges of the economic, technological, and information age (Pinto, Alves, & de Carvalho, 2017), (Almagtome, Shaker, Al-Fatlawi, & Bekheet, 2019). It expresses one of the integrated management models for a mix of business and basic activities in the organisation. In other words, the practice of logistic activities in an advanced, integrated and homogeneous manner can help the organisation to expand in the market and increase the market share, no matter how large the volume of production (Ali, Hameedi, & Almagtome, 2019). In the end, the importance of logistical activities was embodied in the rapid response of customers in the market, through the speed in providing goods and services that are consistent with the needs and desires of customers, and for the organisation to ensure its success and continuity (Es, Hamzacebi, & Firat, 2018). It needs high performance compared to competitors in light of the effectiveness of its logistic management and through which you reach to achieve what customers need with the lowest costs, the least time and the greatest possible quality. Several studies have begun to emerge that aim to implement logistics in the field of business in what is known as Business Logistics (Popov, Yelisyeva, Gubka, & Kryivulia, 2019). Studies conducted in this field show that about 40% of the cost of producing any commodity in developed countries can be returned to logistical activities.

Logistics was heavily used during World War II (Ohl, 2020). It was one of the most important factors that contributed to the Allied victory. As a result of the contribution of the logistics in the victory of the allies, the trend was to apply them in the field of business and thus this term moved to economic activity to include all activities supporting the production process, and the role of business logistics has grown rapidly over time, especially, in light of the trend to fragment the production process globally and the globalisation of production (Straka et al., 2017), (Al-Wattar, Almagtome, & AL-Shafeay, 2019). Logistic services function is the management of the flow of different resources such as energy and goods or even human services from the production area until it reaches the consumer, as it is difficult to carry out any global trade and commercial activity to transport various goods and resources without professional logistical support. Logistics includes several hubs, including transportation, inventory, and warehousing (Almagtome & Abbas, 2020). Thus, logistics services play a major role in promoting and supporting economic growth within the country. Improving the performance of logistics services contributes to an improvement in commercial activity, whether in terms of exports or imports, and hence the balance of trade and economic performance as a whole. Logistics management is part of the supply chain management that plans, implements and controls the effective and efficient flow of

forward and reverse, and the storage of goods, services and related information between the point of origin and the point of consumption in order to meet customer requirements (Khaghaany, Kbelah, & Almagtome, 2019). Complex logistics model can be designed, analysed, visualised and improved with a dedicated simulation program. Reducing resource use is a common driver in all areas of logistics. Logistics goals can be summarised as follows (Russo & Comi, 2018):

- Create an atmosphere of competition by providing better logistical services.
- Create a clearer picture of the popular goods in a country.
- Organising after-sales services.
- To benefit as much as possible from the investments.
- Helping organisations to control various problems.
- Improve physical flow processes.

Through the definition of logistics management, the relationship between supply and marketing and the activities of logistics and production management is clearly shown. These interrelations and interrelationships between the organisations' management came from the organisations' adoption of the systems entrance (Khan, Ali, Usman, Saleem, & Jianguo, 2019). This overlap leads to cooperation and achieving efficiency for the organisation and is considered one of the main factors for its success as we find that the production scheduling activity is subject to production management and logistics business management. Here, coordination is important; pricing, packing and packaging activities are subject to marketing management and logistics business management. In order to achieve efficiency between these two departments, the production department must submit to the logistics department, for example the following information (requirements of raw materials and materials for production, programs and plans, as well as providing accurate information on performance and its efficiency. etc. As for the logistics department, it provides information about the arrival times of raw materials and requirements of production and the possibilities of delays in these materials, and of technical developments in the raw materials industry.

### ***Organisational Performance***

The concept of performance is one of the concepts that receives a large share of attention and research in administrative studies in general and human resources studies in particular. This is because of the importance of the concept at the individual and organisational level, and the overlapping of influences that affect performance and its diversity (Andrews & Smits, 2018). Performance means the outputs and objectives that the organisation seeks to achieve through its employees (Umar & Hassan, 2019). So, it is a concept that reflects both the goals and the means necessary to achieve them. In other words, it is a concept that links the aspects of activity with the goals that organisations seek to achieve through tasks and duties performed by workers within those organisations. The ultimate goal of organisations is to improve human wellbeing. Just as



the human being is the child of the environment, he is also the child of the organisations, so the connection of man with the organisations spans from the cradle to the grave. Here we have the hospitals, schools, universities, media, sports clubs, airlines, local administration units and other organisations that we deal with on a daily basis – we sometimes affect them, and they always affect us. In the past, the perception of managing organisations' affairs was an internal matter that was not of concern to those dealing with it (Schommer, Richter, & Karna, 2016). However, the rapid and sharp changes that have occurred since the middle of the last century necessitated reconsidering the philosophy and form of the relationship between man and all organisations, whether or not one deals with them, whether or not these organisations aim at profit, and whether they are local, regional or global. More specifically, the common bond is the desire of all parties to achieve the desired luxury through improving and developing organisational performance.

The importance of organisational performance is highlighted by the fact that it is a step that determines the current location, how far it is from the desired ending, or how it matches with it (Mallén, Chiva, Alegre, & Guinot, 2016). Examining the organisation's operations and identifying its performance is a very important issue for understanding how organisations work to correct deviations in the organisation and raise the level of performance; designing the organisational structure in a way that is effective and efficient, as well as the ability to identify the extent of the need for change and how to make it in the organisation. The researchers differ in their identification of indicators for measuring organisational performance: some of them have adopted economic indicators to measure the performance of the organisation, and some of them have adopted behavioural indicators while a third team has adopted economic and behavioural indicators together. They can be classified into five groups – the first group includes a number of researchers who have measured organisational performance through one indicator (Alabadi, Sultan, & Alkaseer, 2019; Ali, Almagtome, & Hameedi, 2019; Almagtome et al., 2019; da Silva & Borsato, 2017; de Moraes, Cunha, & Terlizzi, 2017; Faris, Jamous, & Arafat, 2018; Jafari, Nodoushan, Shirali, Khodakarim, & Zare, 2018; Koohang, Paliszkievicz, & Goluchowski, 2017). As a result, several measures have emerged in order to learn how to measure the performance of the organisation, and these standards differ from one goal to another, and from one strategic orientation to another, where there are measures that clarify what happened and not what will happen, and thus the organisation needs with each new strategy the use of new measures to forecast potential profits, and they can be classified into: -

1. Financial measures
2. Personnel measures
3. Marketing measures
4. Measures of stakeholders
5. Value-added measures
6. Measures for evaluating senior management
7. Measures of an organisation's quality of transformation

8. Measures of shareholder value of ownership
9. Balanced Scores Card

The previous presentation of the concepts supports the lack of agreement on a unified concept of organisational performance, and the reason is due to the difference in the views of researchers in what organisational performance means to them, in addition to the organisations having many goals that are reflected in the nature of continuous change.

## Materials and Methods

This study includes a sample of 50 large and medium companies operating in Iraq, with a focus on those working in the Nineveh Governorate. A pilot survey was conducted by distributing 200 questionnaire forms to supply managers and senior management (4 people from each company), depending on the list obtained. A random sample of questionnaires applied to 50 institutions was used in this study. 190 questionnaires were retrieved with a 95% response rate. Table 1 indicates the descriptive statistics for the study variable.

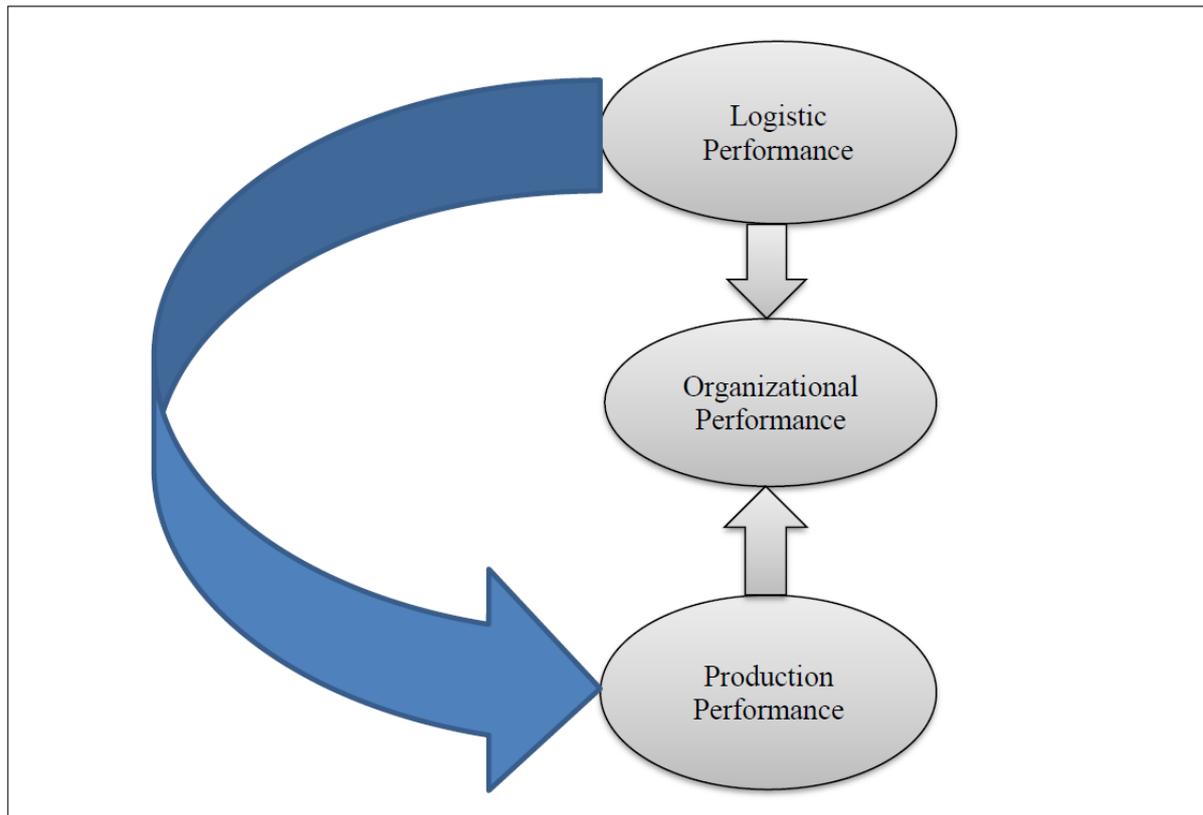
**Table 1:** Descriptive statistics of the main variables

Logistics Performance				Organisational Performance				Production Performance			
Indicator	Item	Mean	Standard Dev.	Indicator	Item	Mean	Standard Dev.	Indicator	Item	Mean	Standard Dev.
Transportation efficiency	1	2.845	0.646	Profitability	16	4.945	1.0093	Production Efficiency	31	4.645	0.937
	2	3.883	0.8835		17	3.883	1.0535		32	3.883	0.841
	3	4.938	0.939		18	3.938	0.937		33	3.938	0.5235
	4	3.948	0.949		19	4.948	0.841		34	4.948	1.031
	5	3.895	0.546		20	4.945	0.5235		35	4.545	0.646
Supply time	6	3.897	0.9971	Market share	21	4.797	1.031	Equipment effectiveness	36	3.797	1.0093
	7	3.996	1.0093		22	3.996	0.646		37	3.996	1.0535
	8	3.946	1.0535		23	3.976	0.8835		38	3.933	0.937
	9	2.888	0.937		24	3.888	0.939		39	2.888	0.841
	10	2.983	0.841		25	4.983	0.949		40	4.483	1.0093
Transportation effectiveness	11	3.986	1.0093	Customer turnover	26	3.986	0.546	Worker productivity	41	3.523	0.646
	12	3.952	0.5235		27	3.932	0.546		42	3.962	0.8835
	13	3.953	1.031		28	2.953	0.9971		43	4.254	0.939
	14	3.888	0.646		29	3.988	1.0093		44	4.884	0.949
	15	4.998	0.8835		30	4.232	1.0535		45	4.682	0.546
Average		<b>3.866</b>	<b>0.858</b>			<b>4.266</b>	<b>0.863</b>			<b>4.157</b>	<b>0.851</b>

## Research Hypotheses and Model

This research relies on a theoretical framework and was based on a model (see Figure 1). This model was constructed based on the causality model, since the generated research model aims to find a causal relation between variables and examine those causal relationships by the study.

**Figure 1:** Research Model



Three hypotheses have been developed in the direction of the research model. These hypotheses are shown below.

**H1:** There is a positive relationship between logistics performance and production performance

**H2:** There is a positive relationship between logistics performance and organisational performance

**H3:** There is a positive relationship between production performance and organisational performance

Finally, the interactive relationship between logistical performance, production, and organisational performance is an integrated relationship, and each part corresponds to the other to support the growth of the organisation's operations. Each business must use available

capabilities to improve its organisational performance. Figure 1 illustrates these interacting correlations and indicates the direct impact of logistical performance on both production and organisational performance, and also reveals the interactions between the two variables.

## Results

For the purpose of achieving the objectives of the study, the data contained in the questionnaire were classified and classified for the purpose of analysing and processing them according to appropriate statistical methods using the rank correlation coefficient of the Spearman Ranking, and accordingly the results of the nature of these relationships are as follows:

### *The Relationship between Logistics and Production Performance*

Table (2) indicates that there is a significant correlation between supply and production performance, as the correlation value (overall index) reached (\* 0.877). Through the results of the relationship between information technology and transparency, we find that this is consistent with the study of Giri and Sarker (2017), which emphasised the importance of logistics decisions in enhancing production efficiency – in addition to what was confirmed by Morash, Dröge, and Vickery (1996) on the impact of logistic services in developing good products that have a positive impact on growth and profitability. Also, what was confirmed by Ardito, Besson, Petruzzelli, and Gregori (2018), that there is a significant correlation between production techniques and the level of logistics performance. We therefore consider that the first hypothesis was accepted after the completion of the connection between logistics performance and production.

**Table 2:** Results of Pearson correlation analysis

Correlations		LP	PP	OP
LP	Pearson Correlation	1	.877**	.948**
	Sig. (2-tailed)		.000	.000
	N	190	190	190
PP	Pearson Correlation	.877**	1	.853**
	Sig. (2-tailed)	.000		.000
	N	190	190	190
OP	Pearson Correlation	.948**	.853**	1
	Sig. (2-tailed)	.000	.000	
	N	190	190	190

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**LP:** Logistics Performance

**PP:** Production Performance

**OP:** Organisational Performance

### ***The Relationship between Logistics and Organisational Performance***

Table (2) also indicates that there is a significant correlation between the level of organisational performance and the level of logistics performance, as the overall index reached (\* 0.948). This was confirmed by Green, Whitten, and Inman (2008) as it showed that there is a positive correlation relationship with regard to logistics performance and supply chain management and the impact of both on the financial performance of companies. In addition, the study of Stank and Traichal (1998) confirmed the provision of a good logistics result that supports senior management to make strategic and design decisions and support organisational performance. After completing the support relationship between the level of organisational performance and the level of logistics performance, the second hypothesis was accepted.

### ***The Relationship between Production and Organisational Performance***

The results show that there is a significant correlation between the level of organisational performance and the level of production performance, as the overall index reached (\* 0.853). This result was supported by Keitany and Riwo-Abudho (2014), who indicate there is a positive impact of lean production performance on organisational performance. In addition, the results of Bashar and Hasin (2019) and Palacio (2019) asserted that the production strategies have a positive impact on organisational performance. After completing the support relationship between the level of organisational performance and the level of production performance, the third hypothesis was accepted. After examining the study hypotheses through the results of the correlation test between their main variables, regression models were tested to also examine the main study hypotheses. The regression results are shown in Table 3.

**Table 3:** Results of regression models

Variables		<b>B</b>	<b>t</b>
Logistics performance	Production Performance	0.85	4.55
Logistics performance	Organisational	0.74	8.64
Production Performance	Organisational	0.76	5.86

***The First Hypothesis:*** *There is a positive relationship between logistics performance and production performance.* The results of the regression model indicate that the standardised path coefficients ( $\beta$ ) were found to be 0.85 and the relationship between these two variables was found to be high and meaningful ( $\beta$  0.85;  $t = 4.55$ ;  $p < 0.05$ ). This value implies that a one-point increase in logistics performance direction will result in a 0.86-point increase in production performance.

***The Second Hypothesis:*** *There is a positive relationship between logistics performance and organisational performance.* The standardised path coefficients ( $\beta$ ) were found to be 0.74 and it was understood that the relationship between these two variables was high and meaningful ( $\beta$  0.74;  $t = 8.64$ ;  $p < 0.05$ ). This means that a one-point increase in logistics performance direction would result in a 0.74 percentage point increase in organisational performance.

***The Third Hypothesis:*** *There is a positive relationship between production performance and organisational performance.* The standardised path coefficients ( $\beta$ ) were found to be 0.76 and it was understood that the relation between these two variables was high and meaningful ( $\beta$  0.76;  $t = 5.86$ ;  $p < 0.05$ ). This implies that a one-point increase in production performance direction would result in a 0.76 -point increase in organisational performance.

## Conclusions

The contemporary environment is characterised by the emergence of large organisations with huge goals and aspirations linked with each other: and broad, interrelated and contradictory relations, with many contradictions and complexities. Organisations strive to be of outstanding performance in order to meet future expectations and achieve their goals. For this reason, a lot of research and studies focusses on studying organisational performance, based on its concept and importance, in an attempt to draw a picture of performance in various fields and disciplines in order to achieve the effectiveness that is used to judge the effectiveness of the organisation and its future. The organisational management continuously strives to develop and use performance measurement indicators in order to judge the effectiveness of organisations, as well as its interest in studying performance measures with all their characteristics and variables, and its relationship to other variables and organisational phenomena. Therefore, this study attempts to test the effect of the relationship of complementarity between the logistics performance and production processes on organisational performance for companies to give a comprehensive vision for organisational performance in order to identify the concept and its importance and its determinants. The results of the correlations between the variables of the study model showed that the logistical performance is linked to a significant relationship with the production indicators, because there is a major relationship between logistical decisions and production performance indicators through the extent to which it meets the needs of accomplishing the tasks of the organisation assigned to it. In addition, the results show the logistical performance showed a relationship with the indicators of organisational performance, due to the presence of a positive impact of the decisions of the logistics strategy followed in the organisation in the indicators of organisational performance through its development of machines and equipment used in the production of the company's outputs and/ or the development of systems, methods and procedures necessary to complete the work. Finally, the results of the statistical analysis show that the production system has a relationship with the indicators of organisational performance, because the presence of heads of production departments are trained and competent and possess



the experience of the company's work that will lead to a rise in indicators of organisational performance and vice versa.



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