



## Exploring the Dynamics of Technological Innovation in Contemporary Environments and their Impact on Logistics Management Efficiency: An Empirical Study

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### ABSTRACT

The research aims to explore the extent of the impact of the interaction of (the contemporary environment and technological innovation) on the level of efficiency of supply management in the electric power production company in Basra Governorate. To achieve the purpose of this paper, The methodology was by the contents of the descriptive approach, where the theoretical presentation and discussion of the research topic were carried out. The population of the research was the Electric Power Production Company in Basra Governorate. The questionnaire was used as a survey instrument to collect data from on service employees in the company. The SPSS used to assess the statistics of the data. It became clear from the analysis and discussion that technological innovation significantly enhances the efficiency of logistics management of the Iraqi Energy Production Company in the contemporary environment. Technological innovation was measured to fill the past studies gap to enhance the efficiency of logistics chain management, because we rarely find in Arab and foreign studies that have dealt with three variables, and this paper provides added scientific value to researchers in the field Electrical energy in Iraq, and the economic value of the company.

### 1. INTRODUCTION

In light of the scientific and technological development that has included the industrial sectors nationally and globally, these sectors have become more in need of expansion in logistics services, so an increasing number of manufacturing organizations are trying to pursue operational excellence so that these organizations can provide excellent logistics operations to expand their market share and contribute to supporting Economic growth and sustainable development in the country, (Wang.M et al , 2020), However, any problems in the logistics system may hinder the direction of industrial organizations toward excellence in their operations. The contemporary manufacturing environment is characterized by multiple characteristics, including (complexity, and severe turmoil), (Juarez, F et al,

2013) which results in continuous challenges to the operations of the logistics system, The efficiency of its management poses a difficulty for the administration in making successful decisions according to traditional decision-making formulas such as (planning, forecasting, and scenario planning), Therefore, it has become necessary to adopt decision formulas based on technological innovation to pursue such complex environmental impacts. Which leads to strengthening logistics systems? This is done by focusing on improving individual operations of logistics services and improving the logistics system as a whole, because logistics services have become global, they constitute the core of global competitive power (Vasiliauskas, Jakubauskas, 2007), In the field of the Iraqi electricity production sector, the need

becomes more urgent to integrate technological innovation into the stages of the logistics chain. Due to problems in administration on the one hand, and the effects of the political and social environment on the other hand, In addition to the complexities in the global environment, global proposals on modern and advanced supply management systems constitute, Iraq needs a radical change in the logistic system in the current electric power industry, relying on technological innovation as a fundamental variable in this process of change. Justification for choosing (The Impact of the Interaction of the Contemporary Environment with Technological Innovation on the Efficiency of Logistics Management: A Study in a Sample of the Iraqi Industrial Sector) as the research title, The Electric Power Production Company in Basra was chosen as a field of study because it is one of the important companies in the field of Iraqi electric power, which suffers from many logistical problems, as well as waste in supply operations, most of which are from foreign countries. And the high costs of electrical energy production operations, mainly in Iraq. Electrical energy is a hot problem in Iraq today. The research problem revolves around the possibility of addressing the problems of the logistics system in Iraqi electric power production companies, and was determined by the following main question: (To what extent can the interaction of the contemporary environment with technological innovation affect the efficiency of logistics management?), Despite the scarcity of Arab and foreign studies that dealt with the problems of logistics management and ways to overcome them, However, the current research has addressed the essence of the problems of logistics management in the Iraqi electric power production sector, Based on three variables in its main hypothesis, this distinguishes the current research from other research in the same field and makes it an addition to the theoretical knowledge. The importance of research is evident in the scientific aspect by providing a wealth of information and treatment methods to researchers, scholars, and professional managers. On the economic side, creating additional financial returns as a result of addressing waste in the joints of the logistics system chain, the research used the questionnaire as a tool for collecting data, and it was distributed to a sample size of (60) people. The researcher

faced difficulties, the most important of which were (some of the participants' poor awareness of modern concepts of logistics management and their global extensions, Difficulty in obtaining some information due to confidentiality, or lack of responsibility, as well as complications in Iraqi energy production companies), The research was structured based on (an introduction and four parts), the first part is a review of previous literature, the second part: a method, the third part: is results, and the fourth part is: a discussion of results, conclusions, and recommendations). The research reached a set of results, the most important of which is (The interactive variable (technological innovation) increased the strength of the influence of the independent variable (modern environment) on the dependent variable (Efficiency of logistics system management).

### 1.2 Problem Statement

Various production companies, including the Electric Power Production Company in Basra, face intense competition for supply sources at the global level, as well as environmental fluctuations that create complications in transportation and storage activities across the logistics process networks, resulting in a loss of time and an increase in overall costs. For the logistics system, this reflects negatively on the efficiency of the system's performance, and this requires reconsidering the existing logistics system, focusing on technological innovation decisions that contribute effectively to addressing the main logistical problems, activating and directing technological innovation directed towards solving logistical problems resulting from the influences of the contemporary environment, The problem is defined by the following questions:

-To what extent does the contemporary environment affect the level of efficiency of logistics system management in the company under study?

-To what extent does technological innovation affect the level of efficiency of logistics system management in the company under study?

-To what extent does the interaction of (the contemporary environment and technological innovation) affect the level of efficiency of logistics system management in the company subject of the study?

## 2. REVIEW OF PREVIOUS LITERATURE

### 2.1 Contemporary business environment

The external environment often determines the internal operations of all organizations (Elfahmi.S et al ,2021), Especially if the operations extend from outside the organization to inside it, the level of its results depends on time, Over time, the environment tends toward complexity and ambiguity. The contemporary environment, or today's environment, is characterized by (complexity, disorder, relativity, uncertainty, and multiple faces) (Juarez, F et al., 2013), Therefore, it is difficult to predict its future and control its internal and external complexities. Especially since the organization is an open system, it exchanges a relationship and influence with its environment. Logistics activities include transporting goods, warehousing, inventory management, and material handling. Systems for collecting and processing relevant information. The first task of the logistics system is to coordinate these logistical activities in a way that meets customer requirements at the lowest cost (Fawcett, S.E. et al., 20122). The second task of the logistics system is to reduce the cycle time of the logistics system to the minimum possible, by reducing the time of incoming and outgoing flows. Some of this is done by reducing transportation and storage time as much as possible, by using a precise control system for material flows, some of this is done by reducing transportation and storage time as much as possible, by using a precise control system for material flows (TAMBOVCEVS.A, TAMBOVCEVA.T, 2012). The movement of the logistics system to achieve the two tasks above is greatly affected by environmental fluctuations and environmental disturbance in the environment of the logistics system, as the impact on logistics operations is reflected in the level of efficiency and effectiveness of the management of the logistics system (Helm, M. D. , 2018)., Therefore, the environment, with its economic, cultural, political, and environmental characteristics, may hinder the regular movement of the logistics operations system in energy production companies in general and Iraqi ones in particular. It may also cause a delay in the materials required to be prepared or an increase in the costs involved, and thus the environment becomes a source of logistical problems (Yasmeen, et al., 2020). At the same time, these problems motivate management to search for alternative solutions, so the requirements for improving logistics

performance in light of the contemporary environment push towards the use of advanced technology, especially digital technologies, in managing logistics services. (Kuteyi.D, Winkler.H, 2022).

### 2.2 Technological innovation

With the intensity of competition for supply resources, and the increasing influences of the contemporary environment, an increasing number of companies are trying to reconsider the operational performance of the logistics system. So that you can provide excellent logistics operations to gain market share for the company for long-term (Mentzer, J.T, Flint, D.J,1999) sustainable development, However, the risks of the logistics system chain may prevent companies from achieving the desired operational excellence, which is achieved by focusing on the logistics system and reducing cost and speed (Christopher, M, Peck, H, 2004). However, an important aspect of the risks of the logistics system chain is caused by environmental influences of various kinds, so the environment must be monitored and its problems addressed first and foremost (Choi, Donghyun, and Bomi Song. 2018). With the aim of reducing or stopping the negative effects of the environment on the logistics system process, and reversing the process that leads to environmental degradation (Vidová.H et al., 2012), The influences of the environment often create obstacles to the movement of the logistics operations system (upward and downward), This reflects negatively on the two main objectives of the processing system (reducing costs and speeding up processing) (Zhang, et al., 2019). Detecting environmental impacts on logistics activities can significantly reduce negative environmental impacts on logistics system operations. This is done by working to reduce negative environmental impacts in every episode of the logistics system process. Activities to reduce or eliminate negative environmental impacts require technological innovations within this field. We often find the logistics environment stimulating for the development of technological innovation decisions, so many innovations have been developed to enhance logistics systems. These focus on innovations to improve individual logistics operations, and innovations to improve the entire logistics system ,The complexity of the

logistics process chain increases the risks of managing it efficiently (Baryannis et al., 2019; Colicchia and Strozzi, 2012) , Although risks can occur at any time and place in the logistics system process chain, they are difficult to predict or to find appropriate solutions at the time, as the logistics system process is currently operating in volatile economic and political conditions. In an ambiguous and risky environment, it must rely primarily on its ability to innovate, that is, the ability to create and implement innovations by absorbing modern knowledge (Cichosz, M, et al., 2017). On the environmental impacts and internal resources of the company (Zhu et al., 2019; Druehl et al., 2018), The environment stimulates technological innovation, and technological innovation provides the best solutions to environmental problems related to the logistics system. The interaction or mutual influence between (the environment and technological innovation reflects positively on reducing the total cost of the logistics system, and on the speed of the system's movement (upward and downward (Germain, R., Droge, C. and Daugherty, P.J, 1994). However, there are many difficulties facing the implementation of technological innovation in

Iraqi organizations in particular, including economic factors, such as high costs, lack of demand, and factors specific to the organization itself, such as the lack of modern technology, tools, skills, or relevant knowledge. Because the contemporary model of network links in the logistics chain carries an increasing risk of losing control (Afriz et al., 2021), There is a relationship between (technological innovation and environmental degradation), as technological innovation may contribute to achieving environmental sustainability, It may lead to a significant reduction in the negative environmental impact (environmental degradation) on the organization, and finally, and most importantly, it is the reflection of the effect of the interaction between (technological innovation and the level of environmental impact) on improving the state of environmental stability (Khan.A *et al.*, 2023), It is understood from this that technological innovation may significantly reduce the negative impact of the organization on the logistics system process cycle in its two important aspects (cost reduction and processing speed).

Result: The interaction between the environment and technological innovation leads to improving the efficiency of the organization's logistics system, regardless of whether the organization is industrial or commercial, and this forms the basis for the second and third hypotheses.

### 2.3 Efficient logistics system management

The most important measures of performance of productive organizations are (efficiency and effectiveness). Efficiency focuses on the means of doing things, while effectiveness focuses on the ends or results, Protectionists have developed another measure that combines efficiency and effectiveness and includes the entire system (sub-primary), under the name (comprehensive efficiency), such as (comprehensive efficiency of equipment, and comprehensive efficiency of maintenance) (Sun, X, et al., 2020). Production companies generally work to develop and maintain their market share. By focusing on its capabilities and capabilities that contribute to reducing costs and creating added value. As well as maximizing consumer satisfaction through a more efficient and rational flow of products and primary goods (Manzouri , Ab Rahman, 2013), Therefore, attention should be paid to the operations of the console system (up and down) in order to detect

points that show a defect in the quality and efficiency of these operations. This is done through logistics planning, which includes the process of making important decisions (regarding logistics operations and resources), and this ultimately leads to reducing the operating costs borne by the organization, for the better management of human resources (Daroń .M. (2013)., Because the essence of the efficiency of managing the logistics system and its operations is organizing the flows of the logistics process chain, whose efficiency is affected (by time and cost), By developing strategies oriented toward time, flexibility, quality, and innovation. Because the logistics process is linked to its proper completion (time and best use of resources) (Bellingkrodt, S. and Wallenburg, C.M, 2013). Therefore, attention should be paid to differences in quality and cost infrastructure, policies and procedures because they often affect the speed and cost of logistics services (upstream and downstream) (Bakar.A, *et al.*, 2014, p.3),

Improving logistics efficiency is achieved by controlling the overall costs of the logistics system. And work to uncover the factors that contribute to improving logistics outcomes. This requires better use of the logistics system's resources and operations, as well as diagnosing environmental impacts and technological innovation decisions that mitigate the negative effects of the environment on the stages of the logistics system's

operations flow, especially those related to the costs of transportation and storage operations , This may take place in some stages at the level of the logistics information system, the rate of technological progress, and other factors that may impede the flow of the logistics system process chain (Wang.Q ( 2017).

Result: The efficiency of the logistics system is measured in the organization's production management capacity (electric power production, the field of study) by reducing to the minimum possible costs of each stage of the logistics system process cycle. Eliminating the waste of materials and time at each of these stages requires technological innovation decisions that contribute to mitigating negative environmental effects over time, and these form the basis for the main hypothesis (third).

### 3. METHODS

The hypothetical model of the study was founded on the sequential relationship between three main variables contemporary environment, technological innovation, logistics management efficiency). As shown in the diagram below, the purpose of interpreting the movement of the model is to reveal the level of ability of the interaction

between the Contemporary Environment and the technological Innovation in changing the level of relationship and influence on the efficiency of logistics system management, The diagram below includes figure (1) (the paths of the model and its hypotheses).

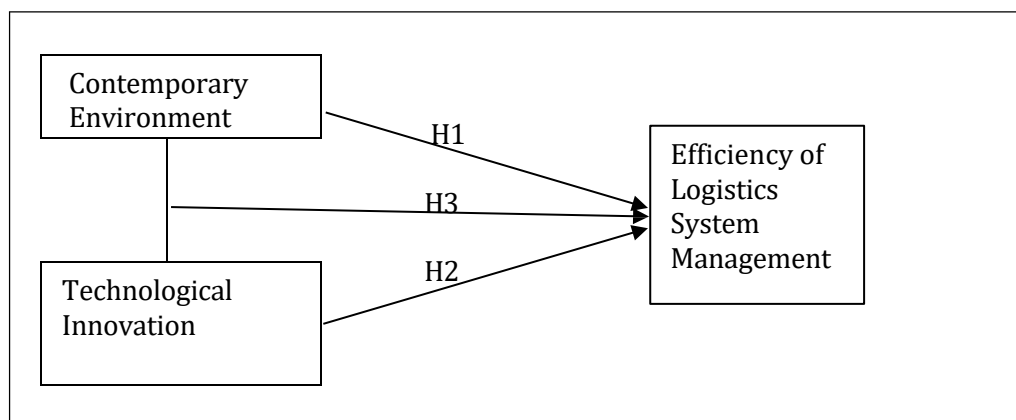


Figure 1: Research Model

Extracting from what was presented in the previous literature review, and drawing it into the paths of the hypothetical diagram, The following hypotheses were developed:

The first hypothesis (H1): There is a statistically significant effect of (the contemporary environment) on (the efficiency of logistics system management).

The second hypothesis (H2): There is a statistically significant effect of the technological innovation on logistics system management efficiency.

The third hypothesis (H3): There is a statistically significant effect of contemporary environment and technological innovation on Efficiency of Logistics System Management.

The research followed a descriptive approach, which includes integration between (deductive and inductive approaches),

The theoretical aspect included (presentation, discussion, and conclusion), and the field aspect relied on quantitative analysis techniques. The field of research was (the Electricity Power

Production Company in Basra), and the study population included (72) individuals, from which a sample size of (60) individuals was selected,

according to the method (Herbert Arkin equation), fig (1) indicated to sample characteristics.

% comment		Properties
The percentage of males is slightly higher than that of females, and the work effort is shared between them		%63 male
		%37 female
<b>Experience</b>		
The largest percentage of experience (5-10) years is among young people with average experience		%32 - 1Less than five years
		%43 - 5Less than 10 years
		%11 - 10less than 15 years
		%14 15years and over
<b>Career center</b>		
The largest percentage of job positions are from middle management and below, because they are the departments responsible for implementation from each poition		%13 Higher Management
		%32 Middle management
		%33 Line management )supervisory(
		%22 Employees (less than Supervisor degree(
<b>Educational level</b>		
Most of the employees in the company include :Bachelor's degree, and this is compatible with Holders of certificates in Iraqi industrial organizations.		%7 Diploma or less
		%76 Bachelor's
		%14 Higher Diploma
		%صفر M.A.
		%3 Ph.D

Figure (1) sample characteristics

For the purposes of collecting data, the questionnaire was used as a tool for collecting data, and its paragraphs were organized according to the sequential path of the study plan. A five-point Likert scale was used to measure the level of

responses. The analysis method was supported by some appropriate statistical methods, using the (SPSS) software.

Result: The main personal characteristics of the sample indicate their suitability to the nature of the jobs assigned to them, as well as their ability to accurately answer the questionnaire items.

4. RESULTS

4.1. Test the type of data distribution by using test (skewness, kurtosis).

All the values of the variables fell between (314 – 1.225) and they are all less than (+,- 1.96 ), indicating that the data is normally distributed.

Table (1) Test the type of data distribution using ( skewness , kurtosis ) tes

► Descriptives

[DataSet1] C:\Users\Muslim Allawi\OneDrive\المستندات\khalil.sav

Descriptive Statistics

	N	Mean	Skewness		Kurtosis	
			Statistic	Std. Error	Statistic	Std. Error
VAR00001	60	2.8500	.181	.309	-1.184	.608
VAR00002	60	2.7333	.658	.309	-.434	.608
VAR00003	60	2.4833	-.261	.309	-.380	.608
VAR00004	60	2.7500	.131	.309	.213	.608
VAR00005	60	3.0667	-.051	.309	-.665	.608
VAR00006	60	2.7500	.111	.309	-.500	.608
VAR00007	60	2.8000	.315	.309	-.471	.608
VAR00008	60	2.6000	.181	.309	.038	.608
VAR00009	60	2.6500	.100	.309	-.897	.608
VAR00010	60	2.9000	-.065	.309	-.588	.608
VAR00011	60	2.9000	.191	.309	-1.046	.608
VAR00012	60	2.5833	.220	.309	-.314	.608
VAR00013	60	2.5667	.406	.309	-.475	.608
VAR00014	60	3.0167	-.232	.309	-.973	.608
VAR00015	60	2.9500	-.111	.309	-1.255	.608
Valid N (listwise)	60					

4.2. Summary of exploratory factor analysis:

The factor analysis results indicated the suitability of the indicators of the study model. (Schumacher & Lomax, 1996).

Table (2) Results of exploratory factor analysis

Rotated Component Matrix<sup>a</sup>

	Component		
	1	2	3
VAR00001		.617	.695
VAR00002		.871	
VAR00003			.854
VAR00004			.569
VAR00005	.587		
VAR00006	.530	.774	
VAR00007	.624	.596	
VAR00008	.696		.576
VAR00009	.808		
VAR00010	.863		
VAR00011	.840		
VAR00012	.851		
VAR00013	.751		
VAR00014	.739		
VAR00015	.859		

4.3. Scale consistency test:

Internal consistency is one of the most important measures of reliability. Because it describes the homogeneity of the result derived in the test, this means that homogeneity gives an idea of how well the survey or test items are designed to measure construction. Cronbach alpha is one of the most widely used measures of reliability or survey data in the social and organizational sciences. When we need to test the internal consistency

(reliability) of multiple [Likert](#) questions in a survey (scale), Because the building is essential to any subject under study, the typical value (for Konbash Alpha) is estimated at (70%) or more. Values higher than (70%) indicate higher internal consistency; as for the lower ones, they indicate the weakness of the internal consistency of the scale, the scale of consistency indicated (0.951).

Table (3): Cronbach's Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.951	15

Table (4): Cronbchs Alpha

Item-Total Statistics	
	Cronbach's Alpha if Item Deleted
VAR00001	.952
VAR00002	.952
VAR00003	.950
VAR00004	.946
VAR00005	.948
VAR00006	.948
VAR00007	.946
VAR00008	.946
VAR00009	.944
VAR00010	.947
VAR00011	.945
VAR00012	.947
VAR00013	.948
VAR00014	.947
VAR00015	.946

Result 3: The internal consistency of the questionnaire indicates the internal homogeneity of the questionnaire items.

4.4. Descriptive statistics

The descriptive analysis depends on the two measures of central tendency (the arithmetic mean) and dispersion (the standard deviation). Variance and standard deviation are measures of dispersion that reveal how close each observed value is to the mean of the entire data set. In data sets with small dispersion, Dispersion or variance in the data is measured by (standard deviation). Small standard deviation values indicate that the data is centered around its arithmetic mean (Kaur. Stoltzfus. Yellapu1. 2001).

Table (5): Descriptive statistics

Variable code	Definition	Mean	Std. Deviation	comment
VAR00001	The speed of environmental change	2.8500	1.21885	Relatively little interest in pursuing the



					environment		
	VAR00002	Difficulty predicting the future	2.7333	1.03934	Limited attention to forecasting environmental change		
	VAR00003	Environmental uncertainty	2.4833	.79173	Limited attention to Environmental uncertainty.		
	VAR00004	Understanding the internal and external environment	2.7500	1.01889	A relative understanding of external and internal environment conditions		
	VAR00005	Intensity of competition	3.0667	1.07146	Intense competition for supply sources		
	VAR00006	Innovative techniques in shipping and distribution	2.7500	1.00212	Relatively limited interest in modern transportation and shipping technologies		
	VAR00007	Regular improvement of operational systems	2.8000	1.00507	Some improvements in logistics system operations		
	VAR00008	Technologies and innovative solutions to problems	2.6000	.96023	Practicing some technological and creative solutions to problems in the logistics system		
	VAR00009	Simplify logistics system operations	2.6500	1.03866	Limited attempts to simplify some logistics system processes		
	VAR00010	Avoid risks in logistics system process	2.9000	1.05284	Fairly good procedures to avoid risk in logistics		

						system operations
	VAR00011	Expansion in the market	2.9000	1.29798		Moving towards expanding supply sources
	VAR00012	Eliminate waste in your logistics system	2.5833	1.01333		Some activities to eliminate waste in the stages of the logistics system
	VAR00013	Reducing processing time in the logistics system stages	2.5667	1.18417		Reducing the time of some stages of the logistics system
	VAR00014	Maintain reliable supply sources	3.0167	1.28210		Retain by some reliable suppliers
	VAR00015	Reducing shipping and transportation costs	2.9500	1.37070		Relatively limited attention to improving transportation and shipping costs
	Valid N (listwise)					
Hypothetical mean = 3: Higher than it is towards strength, below it is towards weakness.						
<p>Result 4: Although most of the indicators are lower than the expected average (weak interest in the questionnaire items), the result from the viewpoint of the sample members indicates attempts to reduce the time and cost of logistics system operations</p>						

**4.5. Hypothesis Testing:**

H1: The first hypothesis: There is a statistically significant effect of contemporary environment on the efficiency of logistics system management. Contemporary environmental problems may negatively affect the efficiency of the logistics system’s performance, but at the same time, they

Table (6) Hypothesis 1 test:

motivate management to search for technological innovation techniques to reduce these environmental impacts to the minimum possible extent and improve the efficiency of system operations. This indicate to hypothesis one that there is a statistically significant effect of contemporary environment on efficiency of logistics system management.

Model	R	R Square	Adjusted R Square	sig	comment
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1	.623 <sup>a</sup>	.389	.378	0.00	0.00 < 0.01 It indicates the significance of the test model and acceptance of the first hypothesis.
Result: Accept the first hypothesis that: There is a statistically significant effect of contemporary environment on the efficiency of logistics system management.					

Result 6: accept the first hypothesis that: There is a statistically significant effect of the contemporary environment on efficiency of logistics system management.

H2: Technological innovation may greatly reduce the organization's negative impact on the logistics system process cycle in its two important aspects (cost reduction and processing speed). This

indicate to hypothesis that; There is a statistically significant effect of technological innovation on logistics system management efficiency.

Table 7: Hypothesis 2 test: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig	comment
1	.872 <sup>a</sup>	.760	.756	.53455	0.00	0.00 < 0.01 It indicates the significance of the test model, and acceptance of the second hypothesis.
There is a statistically significant effect of (technological innovation) on the (logistics system management efficiency).						

a. Predictors: (Constant), var17

**Result 7:** There is a statistically significant effect of technological innovation on logistics system management efficiency.

H3: Technological innovation may greatly reduce the organization's negative impact on the logistics system process cycle in its two important aspects (cost reduction and processing speed). technological innovation determines when or under what conditions it is used to measure the effect of the independent variable on the dependent variable, The technological innovation may enhance the direction of the relationship between a technological innovation and a logistics system management efficiency. However, it is often considered when there is an unexpectedly weak or inconsistent relationship between the

Table (8) Hypothesis 3 test:

contemporary environmen and the logistics system management efficiency. (Kim et al. pp. 64-66), and this supported the hypothesis that: (There is a statistically significant effect of the interaction of (the contemporary environment) with (technological innovation) on the dependent variable (the efficiency of logistics system management).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.872 <sup>a</sup>	.760	.756	.53455	.760	183.469	1	58	.000
2	.938 <sup>b</sup>	.880	.875	.38182	.120	56.681	1	57	.000

$0.00 < 0.01$ : It indicates the significance of the test model, and acceptance of third hypothesis.

Result: The interactive variable increased the strength of the influence of the independent variable on the dependent variable by (.120) or 12%.

a. Predictors: (Constant), var17

b. Predictors: (Constant), var17, var19

**Result 8:** The interactive variable increased the strength of the influence of the independent variable on logistics system management efficiency by (.120) or 12%

## 5. DISCUSS THE RESULTS AND CONCLUSIONS

The research attempted to explore the interactive role of the (The effect of the interaction of (the contemporary environment with technological innovation) on the efficiency of logistic management), as previous studies showed that, the efficiency of the logistics system is measured by the ability to manage the organization's production (electrical energy production) by reducing to the minimum possible the costs of each stage of the logistics system process cycle, by eliminating waste of materials and time at each of these stages, and this requires decisions. Technological innovation that contributes to alleviating negative environmental impacts over time. This means that the interaction between the contemporary environment with technological innovation contributes to strengthening the efficiency of logistic management, while the results of this study showed that the percentage of change in the independent variable (the efficiency of logistic management), after entering the interactive variable (development of university academic talents) reached (%12), although the rate of change is good, but it explores the positive impact of

the interactive variable in achieving efficiency of logistic management in Iraqi Electric power production company, It is clear from the above that the current study is an extension of previous studies but it differs from it in some results.

- Testing the relationship between three variables resulted in a positive result (technological innovation reduced negative environmental impacts and thus enhanced the efficiency of logistics system management). This study is consistent with some previous studies such as (Walasek. R et al, 2023), at implementing innovative technological solutions for environment problems, And also meets with a study (Khan.A et al, 2023) In terms of mitigating environmental degradation through technological innovation, However, the current study is distinguished from previous studies in that it explores that technological innovation mitigates the negative effects of the environment and that has a positive impact on the efficiency of logistics management.

- The current study showed that paying attention to and encouraging technological innovation greatly reduces the impact of negative environmental problems on the efficiency of the logistics system's performance because decisions of an innovative nature that are used to solve problems of

logistical operations in their time are the most useful in addressing them. Studies of (Wagner, S., Franklin, J. (2008) have provided support for this idea and (Walasek. R, et al., (2021) in need for productive organizations to participate continuously and regularly in the process of improving flows in the logistics system.

Conclusion: Creative decisions and practices at every stage of the logistics system contribute to solving many of the problems that hinder the overall effectiveness of the logistics system.

Conclusion: The mutual influence between environmental problems and innovative decisions in the stages of the logistics system has a major role in improving the performance of the logistics system (speed and cost reduction).

#### • Final Remarks

The research attempts to explore the extent of the impact of the interaction of (the contemporary environment with technological innovation) on the efficiency of logistical system management in the Iraqi Electric Power Production Company. By encouraging and developing technological innovation, which contributes to addressing environmental problems on the one hand, and improving the comprehensive performance of the logistics system of the Iraqi Electric Power Production Company on the other hand, as well as encouraging researchers to provide new ideas for developing the Iraqi energy sector and addressing its strategic problems.

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