

## Business Intelligence Capabilities, Green Logistics Practices, and Sustainability Performance in Logistics Service Systems

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**Abstract.** Logistics and supply chain management are being managed like service systems that are more information-intensive in nature where value is co-created based on data-driven coordination, high quality decision-making and quality service delivery. Within this context there has been increasing pressure in organizations to enhance sustainability performance and maintain efficient and responsive logistics services. The Business Intelligence (BI) capabilities have become critical informatics tools that enable logistics companies to transform the operation data into service insights. However, the present studies provide only partial theoretical explanations of the way digital intelligence capacities can be operationalized in service practices to achieve sustainability results, in particular in the context of emerging economies. Using the Resource-Based View and a service-based approach, the current investigation is designed to explore the relationship between the BI infrastructure capability and the BI analytical capability on the sustainability performance in the logistics and supply chain industry and the conceptualization of green logistics practices is to mediate the service processes. A quantitative cross-sectional study design was used, which resulted in collecting data concerning 362 Jordanian based logistics firms' managers and decision-makers and analyzing it with the help of Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that the BI infrastructure and the BI analytical capabilities have a positive relationship with the green logistics practices, and the BI analytical capability has a relative stronger impact. Green logistics practices, in their turn, significantly enhance the sustainability performance, which confirms their role as the operational service mechanisms according to which digital intelligence enhances the environmental, economic, and social results. The mediation analysis proves that BI capabilities and sustainability performance are partially mediated by green logistics practices. This research adds a minor theoretical enhancement by explaining how the BI capabilities can be transformed into sustainability results by means of service-based logistics operations. Empirically, it provides a source of evidence focused on an emerging economy this is a previously under-explored context and practically, it highlights the importance of analytics-based service design in ensuring logistics performance sustainability. The findings are particularly important to logistics companies and policy makers who wish to use informatics-based service systems to further the sustainability agenda.

**Keywords:** Business Intelligence; Analytics Capability; Green Logistics Practices; Sustainability Performance; Service Systems; Logistics and Supply Chain Management; Emerging Economies.

## **1. Introduction**

Over the past years, the logistics and supply chain industry has been under increasing pressure to improve its sustainability performance due to the increasing environmental issues, regulatory requirements and stakeholder expectations. Transportation, warehousing, and distribution play a major role in carbon emissions, energy consumption, and environmental degradation, which are the logistics activities. As a result, sustainability has become a strategic necessity of logistics and supply chain organizations that aim at balancing economic efficiency with environmental and social responsibility (Abousweilem et al., 2023). The logistics and supply chain management can be imagined as the information-rich service systems where the service value can be co-created due to constant coordination of firms with customers, regulators, and other stakeholders. In these systems, performance of service is indicated in service quality, service reliability, timeliness, visibility and responsiveness. These service outcomes are facilitated by the business-intelligence capabilities to allow a flow of information in real-time, coordinated decision-making, and evidence-based service design. Specifically, a BI infrastructure capability strengthens service reliability by ensuring interoperable quality data in the logistics activities whereas a BI analytical capability improves service quality and responsiveness by converting the operational data to predictive and actionable information. Various infrastructures of this service-system frame also reinforce the correspondence of this manuscript with JLISS in that it clearly connects informatics-enabled logistics services with sustainability-oriented value creation.

The development of digital technologies has significantly changed the logistics and supply chain management. One of such technologies that have received widespread interest is Business Intelligence (BI) as a data-driven technology that helps organizations to gather, combine, analyze, and visualize vast amounts of operational data to make sound decisions. BI systems can increase organizational visibility and increase the accuracy of the forecasting process and real-time monitoring of performance, which in turn helps to make the logistics activities more efficient and responsive (Obaid, Eneizan, Abumandil, et al., 2022). In addition to operational efficiency, the recent research shows that the BI capabilities can be extremely significant in supporting the sustainability-focused strategies as it allows organizations to recognize inefficiencies, minimize waste, and optimize resource utilization (Ali et al., 2021).

Theoretically, the Resource-Based View (RBV) argues that both performance and competitive advantage are brought out as a result of the valuable, rare, inimitable, and non-substitutable resources and capabilities within organizations (Barney, 1991). Here, the associated strategic digital resources that can improve organizational decision-making and operational efficiency may include BI infrastructure capability, including data quality, system integration, and technological flexibility, and BI analytical capability, including advanced analytics, reporting tools, and predictive modeling. These BI capabilities, used properly, can help logistics companies facilitate environmentally friendly operations and enhance sustainability in terms of results (Ali et al., 2023; Kerzner, 2025).

Although the BI and supply chain performance has continued to gain research, it has hardly been demonstrated empirically how BI capabilities can be specifically applied in enhancing sustainability performance in logistics, especially in the emerging economies. Furthermore, the theorization of how BI capabilities affect the results of sustainability remains under-researched. Green logistics, including the optimization of routes, energy-efficient delivery, minimization of wastes, and environmentally friendly packaging, are also becoming recognized as important causes of sustainable logistics performance (Abualrejal et al., 2022). But little focus has been paid to their mediating role in digital capabilities to sustainability performance translation.

This study fills these gaps by looking at how Business Intelligence infrastructure capability and analytical capability affect the sustainability performance with the green logistics practices as a mediating variable. Additionally, this paper will present empirical findings regarding the logistics and supply chain industry in Jordan, which is a developing economy and logistics is a critical component of both national economy and trading activities between various countries in the region. The present

research will address the recent demands to conduct more empirical studies on the concept of digital transformation and sustainability in developing regions by targeting the Jordanian context. Despite the wide range of use of the Resource-Based View (RBV) in explaining how information technology and analytics capabilities can promote organization performance, the theory only provides a few clues on how these digital resources may be transformed into sustainability results. In order to address this gap, the present research extends RBV by drafting the green logistics practices into operational service routines that moderate the correlation between business intelligence capabilities and sustainability performance. The study does not assume the existence of a direct resource-outcome relationship, but rather follows the process-oriented point of view where it shows how business intelligence infrastructure and analytical capacity can be used to design, implement, and perform environmentally responsible logistics processes. The explicit theorizing of this mediating process allows the study to extrapolate RBV accounts of the deployment of digital capability and provides a more detailed insight into sustainability-related value co-creation in logistics and supply-chain management, especially in the context of emerging economies.

The results of the study will have an impact, both theoretical and practical. Theoretically, the research builds on the RBV by including the BI capabilities and green logistics practices to describe sustainability performance. In practice, it provides useful information on the roles of BI-based decision-making in sustainable logistics planning and improving the long-term performance of organizations.

## **2. Literature Review and Hypotheses Development**

### **2.1 Business Intelligence Capabilities in Logistics and Supply Chain Management**

The Business Intelligence (BI) capabilities refer to the ability of an organization to collect, combine, examine, and transform information into an actionable, and informative data that supports the decision process of managers and the attainment of strategic goals. In logistics and supply chain management, BI can help enhance the visibility, coordination and operational efficiency in more complex, data-intensive processes, including transportation planning, inventory control and demand forecasting, among others (Mahmoud et al., 2025; Mahmoud & Othman, 2023). Informatically, business intelligence can be conceptualized as an information service infrastructure that supports the creation, synthesis and distribution of decision relevant knowledge between the logistics and supply-chain operations. The capability of the BI infrastructure reflects the main characteristics of the informatics, including data management, quality of information, the ability to connect systems, and real-time access to data, all of which guarantee the stable and high-quality flow of information between logistics participants. The attributes allow to ensure efficient coordination between transportation, warehousing, and distribution operations especially in data-dependent and time sensitive logistics contexts.

BI analytical capability refers to a greater maturity in the field of informatics related to high analytics, decision-support architecture, and predictive modelling. Analytical capability increases the quality of decision-making by enabling managers to use complex logistics information, predict disruptions, and react quickly to operational and environmental problems through dashboards, analytics engines and real-time monitoring tools. The responsiveness based on analytics is required in the logistics service scenarios where the operational decisions need to be aligned with the sustainability goals as these solutions can allow the business firms to constantly restructure the routes, energy use, and resources deployment as the real-time information is displayed.

Existing body of literature conceptualizes BI capabilities as multidimensional and typically makes a distinction between BI analytical capability and BI infrastructure capability. BI infrastructure capability is the level of technological basis in which data management is built such as data quality, integration of the system, data warehouse as well as accessibility of information. A strong BI infrastructure allows organizations to handle high sales of logistics information with ease creating an immediate response to the organizations in making decisions (Obaid, Eneizan, Naser, et al., 2022; Salah & Alzghoul, 2024).

Such infrastructure in the logistics contexts has enabled the optimization of routes, fleet management, and performance tracking, which are critical to the efficiency of the operations and environmental management.

On the other hand, BI analytical capability refers to the ability of an organization to utilize analytical capabilities and techniques like dashboards, predictive analytics, and performance report to draw insights out of data. Advanced analytical instruments help logistics companies to identify inefficiencies, predict collisions, and evaluate other operational conditions, so that economic and environmental performance is enhanced (Alzubi, 2025b). The Resource-Based View (RBV) regards such BI capabilities as strategic digital resources that can generate sustainable competitive advantage provided that they are put in place effectively (Barney, 1991).

## **2.2 Business Intelligence Capabilities and Green Logistics Practices**

Some of the green logistics practices are environmentally-friendly operations aimed at reducing the environmental effect of logistics operations like consumption of fuel, route optimization, environmentally friendly packaging, minimization of waste and energy-efficient warehousing (Ibrahim & Alzubi, 2024). The introduction of these practices also depends more and more on the data-driven decision-making and access to real-time data.

BI infrastructure capability provides the technological framework that is required to track environmental pointers such as fuel consumption, emissions, and energy usage. The integrated data systems would help the logistics managers to follow the metrics related to sustainability along the entire supply chain and be able to spot any chance to improve environmental indicators (Alashqar et al., 2025). To this effect, companies that have well-built BI infrastructure stand in a better position to establish and administer green logistics projects.

Likewise, the efficiency of green logistics practices can be improved with the help of the BI analytical capability that allows taking the analysis and optimization to the next level. Analytical tools enable organizations to model transportation paths, predict emissions, and assess the environmental impact of the logistics decision. Previous studies suggest that operational decisions that are supported by analytics may foster more sustainable operation and help to shift towards more ecological logistics systems (Borges et al., 2019).

In the light of this discussion, it is proposed that the hypotheses are as follows:

### **H1:**

BI infrastructure capability has a positive effect on green logistics practices.

### **H2:**

BI analytical capability has a positive effect on green logistics practices.

## **2.3 Green Logistics Practices and Sustainability Performance**

Sustainability performance is the ability of an organization to achieve balanced economic, environmental and social performance. It is often evaluated using the triple bottom line model in logistics and supply chain management that embraces cost effectiveness, environmental conservation, and social responsibility (Alzghoul et al., 2024).

Green logistics practices are generally recognized to be a key driving force behind sustainability performance. Green transportation and warehousing activities save on costs due to improved fuel efficiency and quantity of waste and decreased carbon emission and impact on the environment (Alrawahna et al., 2025). In addition, green logistics projects enhance corporate reputation, regulatory compliance, and stakeholder trust, which form the basis of long-term feasibility of the organization (Alsheikh et al., 2025).

Empirical studies always prove that companies implementing green logistics achieve high sustainability results in comparison with those that use traditional logistics methods (Alhanatleh et al., 2024; Khaddam & Alzghoul, 2025). Based on this, the thesis of this paper is as follows:

**H3:**

Green logistics practices have a positive effect on sustainability performance.

**2.4 The Mediating Role of Green Logistics Practices**

Although business intelligence capabilities are expected to impact the sustainability performance, it is likely that they would not have a direct impact. Instead, the BI capabilities are more likely to improve organizational decision-making and operational control, thus making it simple to adopt practices oriented towards sustainability. Green logistics practices, therefore, form an important tool by which BI capabilities can be converted into material sustainability results.

Using the resource-based view, the BI infrastructure and analytics capabilities serve as enabling resources which serve as the foundation of the creation of environmentally-friendly logistics processes. The potential of sustainability of green logistics practices may not be exploited without the proper implementation of the BI capabilities. Ongoing research on the digital transformation and sustainability shows that operational practices are important as mediators between digital capabilities and performance outcomes (Agarwal et al., 2019).

This study therefore assumes that the relationship between the BI capabilities and sustainability performance is mediated by green logistics practices which result in the following hypotheses.

**H4:**

Green logistics practices mediate the relationship between BI infrastructure capability and sustainability performance.

**H5:**

Green logistics practices mediate the relationship between BI analytical capability and sustainability performance.

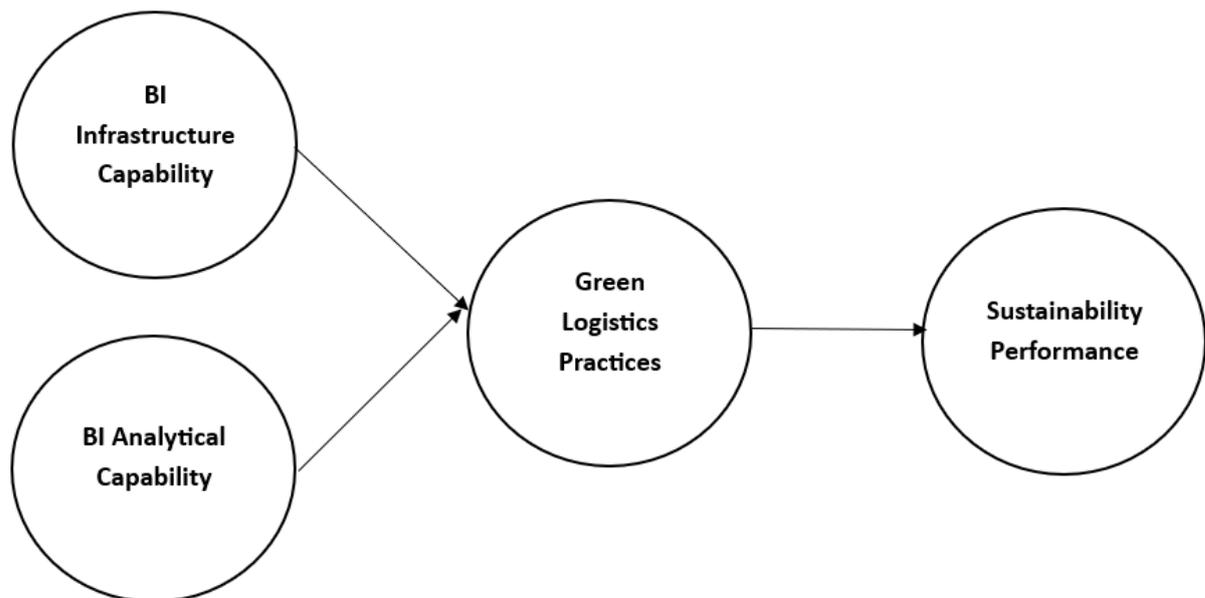


Fig.1: Model of Study

Figure 1. The theoretical framework of the research shows that the business intelligence infrastructure capabilities and analytical capacity have an impact on the sustainability performance, mediated by the green logistics practices in the logistics and supply chain industry in Jordan.

### **3. Methodology**

#### **3.1 Research Design**

The study will take a quantitative research design in exploring the relationships existing between Business Intelligence (BI) capabilities, green logistics practices, and sustainability performance within the logistics and supply-chain of Jordan. The quantitative method would be suitable because it would allow empirically testing the proposed relationships as well as evaluating the effects of mediation in the context of a complex research model (Hair & Brunsveld, 2020).

In order to examine the suggested conceptual framework, the research applies the Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS. PLS-SEM is especially convenient and desirable in predictive studies, in theory construction, and models of relationships of multiple constructs and media, when the research situation is under development, and assumptions of data distribution are not necessarily rigorously fulfilled (Hair & Brunsveld, 2020).

#### **3.2 Population and Sample**

The study population will consist of logistics and supply chain companies that are based in Jordan and includes logistics companies involved in transportation, freight forwarding, warehousing, distribution, and third-party logistics (3PL) services. These companies are the most important part of the Jordanian economic infrastructure and have a strong impact on the national and regional trade.

The unit of analysis is the organization and the unit of observation includes logistics managers, supply chain managers and operations managers and IT managers and senior decision-makers who are directly engaged in implementation of Business Intelligence system, logistics operations management and sustainability initiatives management in their respective organizations.

Non-probability purposive sampling method was used to ensure that the sampled respondents had sufficient knowledge and experience that were relevant in the use of BI and logistics decision-making. This type of sampling is commonly used in studies in the field of logistics and information systems that require the availability of knowledgeable respondents (Papadopoulos et al., 2016).

The targeted respondents in the logistics firms in Jordan were given 420 questionnaires electronically. After sifting data and discarding those that were either incomplete or invalid, 362 valid questionnaires remained to be considered in the final analysis and the response rate of 86.2 % was obtained.

The 362 respondents used as the final sample are more than those that are required as minimal requirements of PLSSEM analysis. The ten-times rule suggests that the largest size of structural paths directed at any latent construct must be ten times, and in this case, there are two paths intended at green logistics practices. Furthermore, the sample size is in accordance with the current computations on PLS-SEM research, thus providing a sufficient statistical power and strength of findings (Hair & Brunsveld, 2020).

#### **3.3 Measurement Instrument**

A structured questionnaire that has been customized based on already validated measurement scales was used to collect the data in order to ensure content validity and reliability. The questionnaire was designed so that it comprises the perception of the respondents about the Business Intelligence capabilities, green logistics practices and sustainability performance. Each measurement item was measured using a five-point scale of Likert scale, 1 (strongly disagree) to 5 (strongly agree) which is widely used in logistics and information systems research to create a consistent and easy to complete scale.

Business Intelligence Infrastructure Capability was evaluated using the adapted items of (Belhadi et al., 2019; Qaffas et al., 2023). These products were dedicated to the technology backbone of the BI systems, which includes the quality of the data, integrating the system, the availability of the data and the dependability of the information infrastructure. This construct also shows the ability of an organization to process and interlink logistics related information in order to facilitate operational as well as strategic decision making.

The scales that were used to measure Business Intelligence Analytical Capability were modified based on (Jung & Jeong, 2020; Pothumsetty, 2020). The measurement items reflected the capability of an organization to interpret data with the help of the advanced analytical tools, reporting systems, dashboards, and predictive analytics. This potential means how far logistics companies can transform raw data into useful insights that help in the planning, forecasting, and optimization of performance (Abahussain, 2026).

The evaluation of Green Logistics Practices involved the items adapted by (Trivellas et al., 2020). These categories evaluated how logistics companies have adopted environmental responsible behavior, including green transport, green warehouse, minimizing wastes, and green packets. This construct is the artwork of operational processes through which the sustainability-based strategies are incorporated into the logistics operations.

Lastly, Sustainability Performance was evaluated through the triple bottom line methodology which includes the economic, environmental and social performance aspects. The measurement items based on (Negri et al., 2021) were modified to measure the overall sustainability results of logistics firms. The economic performance was aimed at cost efficiency and operational effectiveness, environmental performance was concerned with the emissions and resource consumption reduction, social performance was concerned with compliance, employee wellbeing and social responsibility.

### **3.4 Data Analysis Technique (PLS-SEM)**

The smartPLS (version 4) was used to analyze the data using a two-step method. First, measurement model was tested on the evaluation of indicator reliability, internal consistency reliability (Cronbachs alpha and composite reliability), convergent validity (average variance extracted, AVE) and discriminant validity based on Fornell-Larcker criterion and HTMT ratio.

Second, structural model was evaluated as the path coefficients, coefficient of determination ( $R^2$ ) and variance inflation factors (VIF) were examined in order to determine the presence of collinearity issue. The direct and indirect impact, along with the mediation hypotheses, were also tested through a bootstrapping process with 5,000 resamples, as suggested by Hair et al. (2022).

### **3.5 Ethical Considerations**

Interviewing the survey was optional and the interviewees were promised confidentiality and anonymity. None of the personally identifiable information was gathered, and the data were utilized merely as a part of academic research.

## **4. Results**

### **4.1 Descriptive Statistics**

Table 1 shows the descriptive statistics of constructs of study. The average scores show that the state of business intelligence capacity and green logistics is relatively high among logistics companies in Jordan, which means that the attention to the data-based and sustainability-oriented activities is on the rise.

Table 1. Descriptive statistics

Construct	Mean	SD
BI Infrastructure Capability	3.89	0.71
BI Analytical Capability	3.94	0.68
Green Logistics Practices	3.76	0.74
Sustainability Performance	3.82	0.69

## 4.2 Measurement Model Assessment

The model of measurement was tested by looking at indicator's reliability, internal consistency reliability, convergent and discriminant validity. The acceptable levels of reliability and validity of all the constructs show that the respondents have a consistent and clear meaning of business intelligence capabilities, green logistics practices, and sustainability performance. Remarkably, the high efficiency of the BI analytical capability construct signifies the increased focus of the decision-making of logistics companies on analytics-based decisions instead of focusing on infrastructure availability exclusively. Although the ability to analyze data using BI infrastructure offers the required technological backbone, analytical capability takes the next level of competencies that are associated with interpreting data, predictive analysis, and creation of actionable information. This difference explains why BI analytical aptitude is more explanatory in the model, which means that analytics maturity is a more decisive factor than fundamental infrastructures in facilitating sustainability logistics practices.

### 4.2.1 Reliability and Convergent Validity

Table 2 shows that all constructs have achieved Cronbach alpha ( $\alpha$ ) and composite reliability (CR) values above the recommended value of 0.70 thus, showing satisfactory internal consistency. Moreover, the average variance extracted (AVE) values were above the minimum threshold (0.50) of convergent validation.

Table 2. Reliability and convergent validity

Construct	Cronbach's Alpha	CR	AVE
BI Infrastructure Capability	0.88	0.91	0.67
BI Analytical Capability	0.90	0.93	0.71
Green Logistics Practices	0.87	0.90	0.64
Sustainability Performance	0.89	0.92	0.69

#### 4.2.2 Discriminant Validity

The Fornell Larcker criterion was used to assess the discriminant validity. The square roots of the average variance extracted of all the constructs (i.e., the diagonal elements), as reported in Table 3, are higher than the Interco struct correlations, thus establishing that there is satisfactory discriminant validity.

Table 3. Fornell–Larcker criterion

Construct	BI Infra	BI Analyt	Green Log	Sustain Perf
BI Infrastructure Capability	0.82			
BI Analytical Capability	0.56	0.84		
Green Logistics Practices	0.49	0.58	0.80	
Sustainability Performance	0.44	0.52	0.61	0.83

#### 4.3 Structural Model Assessment

The assessment of the structural model consisted of the path coefficients analysis, the coefficient of determination ( $R^2$ ), as well as the predictive relevance ( $Q^2$ ). The measure of multicollinearity was done through the use of variance inflation factors (VIF), and the value was not higher than the recommended value of 3.3, implying that there were no questions of multicollinearity.

##### 4.3.1 Path Coefficients and Hypotheses Testing

Bootstrapping of 5, 000 resamples was used to test the significance of the proposed relationships. Table 4 provides summary of the results.

Table 4. Structural model results

Hypothesis	Path	$\beta$	t-value	p-value	Result
H1	BI Infrastructure → Green Logistics	0.29	4.87	<0.001	Supported
H2	BI Analytical → Green Logistics	0.41	6.92	<0.001	Supported
H3	Green Logistics → Sustainability Performance	0.55	9.14	<0.001	Supported

The findings demonstrate that the capability of the BI infrastructure and the capability of BI analytics have significant positive impacts on the green logistics practices. As a result, green logistics activities positively impact on the achievement of sustainability.

##### 4.3.2 Coefficient of Determination and Predictive Relevance

$R^2$  and  $Q^2$  were used as an assessment of the explanatory power of the model. As Table 5 demonstrates, the proportion of the variance in green logistics practices attributed to the capabilities of BI is also a significant proportion, as is the proportion of the variance in sustainability performance attributed to green logistics practices.

Table 5.  $R^2$  and  $Q^2$  values

Endogenous Construct	$R^2$	$Q^2$
Green Logistics Practices	0.46	0.31
Sustainability Performance	0.38	0.27

Such findings show that the explanatory power and satisfactory predictive relevance of the proposed model are moderate to substantial.

#### 4.4 Mediation Analysis

The mediating nature of the green logistics practices was tested using the bootstrapping methodology to evaluate the indirect effects. The mediation analysis results are shown by Table 6.

Table 6. Mediation results

Indirect Path	$\beta$	t-value	p-value	Mediation Type
BI Infrastructure → Green Logistics → Sustainability Performance	0.16	4.21	<0.001	Partial mediation
BI Analytical → Green Logistics → Sustainability Performance	0.23	5.87	<0.001	Partial mediation

The results verify the partial mediation of the relations between the two areas of BI infrastructure capability and BI analytical capability and sustainability performance by the green logistics practices.

On the whole, the results can be taken as strong empirical evidence of the suggested conceptual framework. The business intelligence ability largely contributes to green logistics practices and, thus, it improves the sustainability performance of logistics and supply chain companies in Jordan. The outcomes of the mediation process highlight the key role of the operational green practices as one of the mechanisms by which BI-based capabilities are converted into sustainability.

#### 5. Discussion

The aim of this research was to test how the Business Intelligence (BI) capabilities influence sustainability performance of logistics and supply chain sector in Jordan using green logistics practices as an intermediate. The results are very strong empirical validation of the suggested conceptual framework and can make a number of valuable theoretical and practical contributions.

First, the findings reveal the BI infrastructure capability is positively correlated with the green logistics practices significantly. This observation indicates that an advanced technological base, which is defined by superior quality of data, integration of systems, and accessibility to information, can help logistics businesses to monitor, regulate, and streamline logistics-related activities that deal with environment-related issues. Such an outcome corresponds to the previous research that focused on the significance of a solid information infrastructure in the context of the sustainable operations (Abbas et al., 2025; Alzubi, 2025a). It is possible to assume that BI infrastructure capability can be viewed as a competitive organizational resource helping to ensure that the implementation of sustainability-focused logistics practices becomes effective based on the Resource-Based View (RBV). The managerial inferences made out of this research should be construed and given priority based on the outcome of the research. Since the BI analytical potential has more impact on the green logistics practices than the BI infrastructure potential, the logistics managers must focus on the development of analytics-based skills development rather than the additional investments in infrastructures. Despite the fact that a sound BI infrastructure is still an essential backbone, the results have revealed that the utilization of analytical instruments and decision support systems is the leading factor of sustainability-based value creation.

In practical terms, logistics companies are advised to invest in analytics training programmed that would increase the ability of the managers to decode and use the data that would be relevant to sustainability. Green logistics can also be further endorsed through the development of sustainability-driven dashboards that incorporate environmental KPIs which include fuel consumption, emissions, route efficiency, and consumption of energy in everyday decision-making processes. In addition, integrating sustainability measurements with the current BI reporting and performance evaluation systems allow organizations to align their operational decisions to long-term sustainability goals. With a greater focus

on the creation of analytics capacity, logistics companies will be able to better design the digital intelligence into environmentally friendly and economic operations.

Second, the research illustrates that BI analytical capability has a more positive impact on green logistics practices than the infrastructure capability. This demonstrates the importance of analytics and reporting and predictive tools in facilitating data-based environmental decisions. Logistical companies that efficiently use analytical information are in a better position to optimize transportation routes, consumptions, and wastes. This observation aligns with previous studies that propose that sophisticated analytics can promote the operational intelligence and environmental responsible practices (Belhadi et al., 2021; Wamba et al., 2017). The finding also supports the opinion that analytical capability is a higher-order dynamic capability enabling the firms to utilize data on sustainability (Lehyeh, 2024).

Third, the findings validate the argument that green logistics practices positively influence the performance of sustainability to a great extent. This observation confirms the triple bottom line view that shows that logistics practices that are environmentally friendly do not just bring results to the environment but also economic effectiveness and social responsibility. Logistics firms can improve their sustainability performance by cutting down on the emissions, optimizing the utilization of resources, and make sure that the environmental standards are upheld. This result aligns with the previous research on the subject of sustainable supply chain management (Liao, 2026).

Above all, the mediation analysis demonstrates that the green logistics practices partially mediate the association between the BI capabilities and sustainability performance. It implies that BI capabilities themselves cannot ensure direct improvements of sustainability outcomes unless it is turned into specific operational practices. In accordance with RBV, BI capabilities act as facilitating resources that facilitate the creation and implementation of green logistics that subsequently lead to sustainability performance. The discovery builds on existing studies by showing in an empirical manner how digital capabilities can lead to sustainability in the logistics setup especially in the emerging economies.

In the contextual sense, the findings are particularly applicable to the Jordanian logistics and supply chain industry in which digital transformation and sustainability efforts are developing. The findings suggest that the investments in BI systems are potentially central to the support of the green logistics strategies and improvements in the sustainability performance. This adds to the fact that there is little empirical research on BI-enabled sustainability in developing countries and offers region-specific research that can be added to the current studies that have been done in developed economies. Policy implications. To speed up the use of BI-enabled sustainable logistics, policymakers can provide digital infrastructures in the sector, introduce data standards and interoperability systems, and promote the implementation of sustainability reporting policies in logistics activities. The incentive programmed to encourage analytics education, observation of green key performance indicators, and tracking of green logistics data may also enhance the ability of firms to operationalize green logistics. These policy mechanisms can also improve transparency, coordination and accountability in the logistics service systems, especially that of the emerging economies.

On the whole, this research contributes to the existing body of knowledge because it combines BI skills, green logistics operations, and sustainability performance under a single empirical system. It stresses the need to harmonies digital intelligence with operational sustainability measures to ensure sustainable long-term performance in the logistics and supply chain management. The findings should be interpreted with caution with their regard to generalizability. Since the logistics and supply chain companies that are based in Jordan are solely the sources of the empirical evidence, the findings are best suited to the emerging economy conditions characterized by similar degrees of digital maturity, regulatory procedures, and sustainability requirements of these conditions.

Although the suggested connections can offer conceptual knowledge on the overall logistics sector, their practical implementation can most probably differ according to the developed economies that have more sophisticated digital facilities and institutional frameworks This research is recommended to be

replicated and implemented in other national and institutional settings to better improve the external validity in the future.

## **6. Conclusion**

It is imperative to mention that the results of this research must be understood with the consideration of the cross-sectional research design. Although the findings indicate all the statistically significant relationships between business intelligence capabilities, green logistics practices, and sustainability performance, they fail to prove any clear causal interdependencies. It is thus recommended that future studies take on longitudinal or panel-based studies to investigate how the digital intelligence abilities change over time and the causal relations between digital intelligence and sustainability outcomes in logistics and supply chain settings. The study examined how Business Intelligence (BI) capabilities could be used to improve sustainability performance in the Jordanian logistics and supply chain business by mediation through green logistics practices. Based on the Resource-Based View (RBV), the proposed study conceptualized and empirically explained a relationship between BI infrastructure capability and BI analytical capability to sustainability performance through green logistics practices with the help of Partial Least Squares Structural Equation Modeling (PLS-SEM).

The results reveal that both the BI infrastructure capability and BI analytical capability play important role in the adoption of the green logistics practices. Specifically, BI analytical ability became a more potent force, and it is important to note that advanced analytics and data-based insights matter more in contributing to environmentally friendly logistical decisions. Moreover, it was revealed that green practices of logistics have a strong positive influence on the sustainability performance, which proves the topicality of the triple bottom line approach in the logistics environment.

This study presents some contributions that need to be taken with a grain of salt and placed into a relevant contextual background. Theoretically, the study can be said to have made a slight modification to the Resource-Based View as it explains the mediating concept of green logistics practices as a means of operation to transform the business intelligence capabilities into sustainability performance. Instead of developing a new theoretical framework, the research moves the current explanations about RBV by becoming more process-oriented.

The research has an empirical contribution in the form of providing strong quantitative information on the correlations between BI capabilities, green logistics practices, and sustainability performance based on PLS-SEM. These results empirically support these relations in the logistics and supply-chain industry and provide information about the priorities of the analytic capabilities as compared to the infrastructure capabilities.

In contextual terms, the study is valuable as it concentrates on the logistics sector in Jordan thus providing evidence based on an emerging- economy setting that is still unrepresented in the literature on the digitization of transformation and sustainability. This contextual contribution aids in learning the functioning of BI-enabled sustainability practices in the context of institutional and technological conditions that are inherent of making a developing market.

The mediation analysis showed that green logistics practices mediate the relationships between BI capabilities and sustainability performance to some extent. This implies that BI capabilities are able to increase the sustainability outcomes only by enabling organizations to practice effective use of green logistics and not by direct effect only. These results highlight the relevance of converting digital capabilities into operation sustainability initiatives to determine practical performance enhancements.

Theoretically, this study builds on the RBV by incorporating digital intelligence abilities and green logistics practices in explaining the sustainability performance in the logistics and supply chain management. It is also considered an addition to the growing body of literature on digital transformation and sustainability since it presents empirical evidence in an emerging economy setting, which is a significant gap in the previous research.

In practice, the findings can be helpful to logistics managers and policymakers in Jordan. Green logistics strategies, better sustainability performance, and long-term competitiveness could be developed with the help of investments into BI infrastructure and analytical tools. Decision-making based on data and sustainability goals will enable logistics companies to react more efficiently to environmental issues and the pressure of regulations.

This study has limitations even though it has made some contribution. Applied cross-sectional research design makes it impossible to make a causal conclusion, and the results are not relevant elsewhere but in the Jordanian setting. A longitudinal study, addition of more digital functionalities, or studying moderating factors like environmental regulation or organizational culture can be utilized in future studies to further deepen the insight of BI enabled sustainability in logistics.

To sum up, this paper suggests that Business Intelligence capabilities play a significant role as the facilitator of sustainable logistics practices and offer a solid empirical basis to facilitate sustainability-related digital transformation in the field of logistics and the supply chain industry.

## **7. Limitations and Future Research**

Though this research has significant contributions, there are a few limitations that should be mentioned and, at the same time, offer prospects to the future studies. To begin with, the research design is a cross-sectional research design, which limits the ability to determine causal relationship between the variables under study. Although using the PLS-SEM is suitable in testing complex relations and mediation effects, further studies can use longitudinal or even experimental studies to understand causal dynamics and to determine how Business Intelligence capabilities and green logistics practices change over time. Since the data were gathered through a single source where measure of the data was self-reported, common method variance (CMV) could overstate the relationships observed. Despite these procedural remedies, further studies that can employ other statistical diagnostics, such as full collinearity VIFs, or markers (variable) procedures and gather data across multiple sources or use time-lagged designs will better address these issues, although the use of CMV, in future studies.

Second, the research is limited to the logistics and supply chain industry in Jordan and, thus, leaves the results to be generalized only to other industries or countries. The institutional, regulatory and technological structure in Jordan might not be the same with the developed economies or other upcoming markets. New studies can be done in the future to repeat the proposed model across various countries or make cross-country comparative analyses to gain an understanding on differences in contexts that influence the role of BI capabilities in sustaining performance.

Third, the questionnaire used to collect the data was self-reported and thus it could be susceptible to common method bias and perceptual bias of respondents. Though procedural remedies were used to minimize this type of bias, future research may embrace objective measures of performance, archival records or even a series of informants working in the same organization, to strengthen the research results.

Fourth, this paper has only two dimensions of BI capabilities and has taken green logistics practices as one mediating variable. The future research might expand the model to include several more digital capabilities including big-data analytics, artificial intelligence, or Internet-of-Things technologies. Furthermore, other mediators (e.g., sustainability-oriented decision-making or environmental transparency) or moderators (e.g., environmental regulation, corporate culture, or firm size) would also be considered to have a more detailed picture of the BI-sustainability relationship.

Lastly, sustainability performance was also measured through the application of perceptual indicators which was done under the triple bottom line approach. Although it is a common method, objective sustainability measures, e.g., carbon emission, energy usage, or waste-reduction data, may be a part of future studies to enhance the empirical soundness of sustainability evaluation.

Comprehensively, the role of eliminating these constraints in subsequent research would add to the

general applicability and explanatory capacity of results on BI-enabled sustainability in the field of logistics and supply chain management, thus contributing more to the knowledge in the area of significant importance in research.

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