

## THE IMPACT OF DIGITAL MARKETING ON TOURIST ENGAGEMENT: EXPLORING SUSTAINABLE DEVELOPMENT IN JORDAN

Eyad Mohammad Malkawi<sup>1</sup>, Zaid Akram AL-Malahmeh<sup>2</sup>, Iyad A. Al-Nsour<sup>3</sup>,  
Mahmoud Allahham<sup>\*4</sup>

<sup>1</sup>Department of Finance and Banking Science, Irbid National University

<sup>2</sup>Assistant Professor, Department of Hospitality and Tourism Management, Luminus Technical University College (LTUC), Amman, Jordan, ORCID: <https://orcid.org/0009-0001-2360-6609>

<sup>3</sup> College of Media and Communication, Imam Mohammad ibn Saud Islamic University (IMSIU), Riyadh, Saudi Arabia, , Oricd.org/0000-0002-1364-563

<sup>4</sup>Faculty of Business, LTUC, Amman, Jordan, <https://orcid.org/0000-0002-8125-5130>

eyad63jo@yahoo.com<sup>1</sup>  
z.almalahmih@ltuc.edu.jo<sup>2</sup>  
laalnsour@imamu.edu.sa<sup>3</sup>  
m.allahham@ltuc.edu.jo<sup>4</sup>

### Abstract:

**Purpose:** This study investigates how logistics frameworks and digital marketing jointly influence sustainable tourism development in Jordan, with sustainable development acting as a mediator. **Design/methodology/approach:** Data were gathered through a structured questionnaire distributed to 150 professionals, including tourism operators, logistics managers and digital marketing specialists in Amman, Petra and Aqaba. The instrument measured three logistics dimensions resource allocation efficiency, connectivity mechanisms and cultural-heritage safeguarding) and three digital marketing dimensions geospatial promotion, social-media engagement and content personalization. Structural equation modelling assessed direct effects and the mediating role of sustainable development. **Findings:** Integrated logistics and digital marketing capabilities both yield significant gains in visitor experience, economic revenue and environmental protection. Sustainable development mediates these relationships: firms that embed environmental, social and economic sustainability in their operations report stronger returns on logistics and marketing investments. **Research limitations/implications:** The model was tested solely in Jordan's major tourist destinations. Future work should validate the framework in other cultural and geographic settings to confirm its broader applicability.

**Originality/value:** This paper offers a novel composite framework that links logistics and digital marketing with sustainable tourism outcomes. It demonstrates how aligning operational and promotional strategies through sustainable development delivers enhanced performance for destinations and stakeholders.

**Keywords:** Digital Marketing, Supply Chain Optimization, Transportation Services, Technology Integration, Sustainable Development

### 1. Introduction

Increasing interest has been drawn through the recent years for combinatory challenges in logistics and digital marketing in fostering sustainable growth of a town (Pereira et al., 2021). To maintain this balance between modernization and preservation, particularly in tourist with enormous historical and economic value, all of these interrelated fields are needed (Guojun, 2008). With these developments, sustainability has become a major concern for planners, and any scholars studying cities, with calls for comprehensive strategies that balance economic, social, and environmental benefits (Lin, 2022). Through the logistic and digital marketing utilization of various innovative tools and practices can face the different challenges of urbanization while remaining with a cultural and historical background. Jordan, a country with rich historical monuments and a lively cultural heritage (Sharabati et al., 2024). Some tourist ,

like Petra and Jerash, serve not only as hosts of national identity but also create revenue through tourism and related services to help boost the economy significantly(Sikandar et al., 2017). But this has been coupled with rapid urbanization and rising tourist flows that have put infrastructure, environmental resources, and cultural preservation under pressure(Diab, 2021). The problem becomes even more pressing try to scale solutions by relying on old paradigms of urbanism paired with the latest tech trends(Henry Ejiga Adama & Chukwuekem David Okeke, 2024). Logistics and digital marketing provide an excellent way to balance these needs and improve tourism through more efficient resource allocation, an enhanced experience and long-term sustainability(Alvim & Galizio, 2020).Improving systems such as traffic, waste management, and infrastructure development rely heavily on logistics. Digital marketing, through its mechanism of mapping tourism, increases the visibility and accessibility of tourist spots, allowing for marketing campaigns that cater to the varied need of visitors and stakeholders alike(Aljabari et al., 2024b). Combining these two spheres can ultimately lead to more streamlined operations and work toward sustainable habits across. With this comes a sense of understanding the necessity for holistic solutions that focus on inclusivity, sustainability, and cultural preservation as well as economic development and social equality(Hermawan et al., 2024). The imperative for these efforts is emphasized by the rapidly growing populations in developing countries, where heritage preservation and development famously need to find a balancing act(Arshad et al., 2024). This research aims to examine the role of logistics and digital marketing in supporting sustainable growth in Jordanian tourist (Dwivedi et al., 2021). From traffic congestion to waste management to the vast networks of infrastructure that make up a city, all depend on logistics for their smooth functioning. In parallel, by customizing the marketing strategies and efforts to adjust the various preferences of visitors and stakeholders, digital marketing makes tourist attractions more visible and accessible(Deb et al., 2024). Factors such as the rapid advances in related fields of information and communication technologies help them synergistically be more and more efficient as a solution to future life. It also emphasizes the importance of a holistic approach that balances economic development, social inclusion, and cultural preservation while promoting responsible investment practices, as well as equitable and sustainable economic outcomes(Rather et al., 2022). The increasing rapidity of urbanization in developing countries adds to the urgency of this work, where heritage preservation in the face of development presents a particular balancing act(Orji et al., 2024). The current study thus, aims to understand the transformation of logistics and digital marketing in supporting sustainable development in the tourist of Jordan. It aims to bridge existing gaps in knowledge and practice by addressing the following research questions:

1. How does logistics influence the effectiveness of digital marketing in tourist ?
2. What role does sustainable development play in mediating the relationship between logistics and digital marketing?
3. How can integrated strategies enhance sustainability and the tourism experience in Jordan?

By answering these questions, this study seeks to provide actionable insights and frameworks for fostering a more sustainable and culturally enriched future for centers in Jordan and beyond.

## 2. Literature Review

We conduct a literature review on the effects of logistics on digital marketing by exploring the mediating factor of sustainable development in Jordan's tourist. The review is organized along

five dimensions: Supply Chain Optimization, Transportation, Technology Integration, Digital Marketing, and Sustainable Development(Alzoubi et al., 2024). These are essential aspects for how the understanding of logistics strategies can impact on tourism management and thus contribute to ensuring the sustainability of areas in the long term.

### **2.1 Supply Chain Optimization**

Logistics refers to supply chain optimization (Henry Ejiga Adama et al., 2024). This is especially important for tourist where fast and secure supply chains are in high demand. Studies show that the optimization of supply chains in tourism can significantly improve mobility and the quality of services in terms of delivery times, lowering traffic congestion. Well run supply chains are crucial for the rapid delivery of both tourists and locals and have a role to play in efficiency within tourism system. This is a dimension that is in line with digital marketing, which needs data to be moved and distributed in real time to allow the creation of insightful marketing strategies for tourists(Yunani & Kamilla, 2023). Moreover, embracing advanced technologies such as cloud-based platforms, handling management tools, and advanced real-time tracking systems are also found to be the most significant factors influencing supply chain optimization(Huda et al., 2024). This improves customer satisfaction and operational efficiency by facilitating coordination among stakeholders in these sectors.

### **2.2 Transportation**

Transportation in tourist is the core element of logistics systems that has a significant effect on local and global tourism flows. Sustainable tourism development is highly dependent on efficient movement of goods and people (Balázs et al., 2022). Those infrastructure improvements span the full range from public transit systems to road networks to create a situation in which tourists can easily reach major locations while reducing traffic and environmental impacts in Jordan's tourist (Patella et al., 2021). This regards transportation logistics, which intersects with sustainable development by advocating for mobility solutions that minimize the carbon impact of tourism actions. Strategies to enhance the environmental efficiency of tourism logistics (such as electric buses, shared mobility alternatives, and low-emission transport technologies (Andres et al., 2024). Digital marketing tools can optimize transport and tourism operations in conjunction with smart transportation systems, capable of better redirecting tourists and goods to and from key areas(Villarreal et al., 2016).

### **2.3 Technology Integration**

Tourism can use digital marketing tools that require fast and accurate adaptation of technology at logistics and development(Fadhila & Ghazali, 2024). Therefore, to improve logistics through the application of digital technologies such as GIS, IoT and AI, real-time collection of data, help to manage traffic, personalized experiences for tourists (Chow et al., 2006). Digital tools drive logistics and marketing efforts, helping tourism stakeholders make decisions based on real-world data. These technologies allow to attract more tourists and optimize resources while providing them with personalized interaction within a locality, digital marketing offers on-the-fly plans for the traveler depending on real-time location data(Moskovics et al., 2024). The implementation of logistics and technology contribution to effective tourism operations emphasizes to achieve sustainable development by im(Kurdi et al., 2022)proving resource management and maximizing system efficiency(Faber et al., 2018).

### **2.4 Digital Marketing**

Digital marketing makes it possible to use big datafor the choice of more optimal, specialized, tailored offers for tourists through digital marketing(Hasanah et al., 2021). As the tourist of the

future emerge, marketing techniques can help businesses and city planners enhance the customer experience. Combining marketing in a digital way with logistics, tourist in Jordan will match the services they offer with what tourist want, enhance marketing strategies and manage the process of welcoming tourists in the right way(Ramachandran, 2024)More specifically, research suggests that digital marketing can facilitate the positioning of tourist attractions, improve the effectiveness of advertising, and enhance real time decision making regarding how to get tourists to move(Aljabari et al., 2024a). It also helps to align logistical components of tourism—including accommodation, transportation, and so onto tourists' requirements, thus contributing to a frictionless, more sustainable travel experience [32].

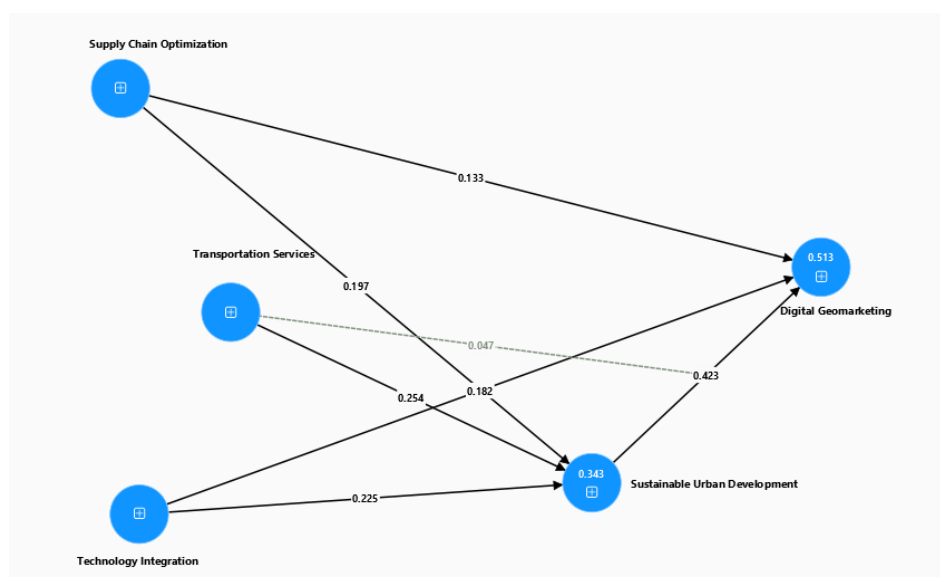
### **2.5 Sustainable Development**

Sustainable development is arguably the catchphrase of the sustainable future series and involves ensuring the growth , often in tourist hotspots, is balanced with the environmental, social and economic impact(Olan et al., 2021). In tourist in Jordan sustainable development strategies include the preservation of cultural heritage, reduction in environmental impacts, and the overall enhancement of quality of life for local inhabitants while at the same time meeting the requirements of visitors (Stahl et al., 2019). By offering frameworks that complement green logistics, smart city technologies, and effective planning, sustainable development can facilitate this interaction and bridge the complementary link to connect the innovations of and green logistics, and sustainable development(Shamma & Hassan, 2013). By embedding sustainability in logistics systems, management of tourism can be optimized to in order to minimizing eco footprint of tourism. Also, policies to protect urban assets and improve the ecological quality of tourist locations are in line with digital marketing strategies that prioritize eco-tourism and sustainable travel (Bataineh et al., 2023). the role of logistics, in conjunction with the state-of-the-art technological innovations and sustainable development paradigms adopted in settings reflects the virtue of logistics supporting an optimal tourism management in Jordan's tourist (Almustafa et al., 2023). This will lead to more efficient, sustainable, and visitor-friendly through the integration of supply chain optimization, transportation, technology, and digital marketing(Jawabreh et al., 2023). The interactions of these dimensions form synergies that increase the satisfaction of tourists and the durability of resources(Sharabati & Izzat, 2024).

### **3.Theoretical Framework**

The theoretical framework of this study integrates Logistics and Supply Chain Management Theory (LSCM) and Sustainable Development Theory (SUDT) to elaborate on the effect logistics has on digital marketing strategies and whether sustainable development serves as a mediating factor between them( m. . sharabati a, hatamlah, h. . ahmad, a. Y. B. . sabra, s. . & daoud, m. K. Allahham, n.d.) . Effectiveness of logistics systems have become a major aspect of Logistics and Supply Chain Management Theory and is founded on the basis that the movement of goods and services through supply chains is highly effective and that their respective products arrive in a timely and effective manner(M. Allahham, Sharabati, Al-Sager, et al., 2024). Efficient logistics operations play a pivotal role in tourism by ensuring the smooth transfer of travelers, products, and services, thereby improving the overall travel experience. In addition, logistics systems help to manage transportation networks, optimize resource allocation and enhance responsiveness to fluctuations in demand (M. Allahham, Sharabati, Almazaydeh, et al., 2024).Tourist can create a more attractive environment and convenience for visitors through logistics capability. According to this theory, logistics serves as the core facilitator of successful

digital marketing by providing the real-time data needed to develop marketing strategies targeting tourists (Alkhazaleh et al., 2023). Sustainable Development Theory is vital, being based on the principle that growth must be managed in a way that mitigates environmental degradation and social inequality while fostering economic development. Sustainable development in tourist guarantees the appropriate use of resources, while mitigating negative environmental effects (Sohail et al., 2024). development sustainable, green, resource-conserving, low-carbon, and environmentally friendly, where people live and tourists travel, creating a green infrastructure that ensures that people travel as little as possible and with low carbon emissions. According to this theory, sustainable practices , the implementation of smart city technologies or green logistics solutions make more resilient and enhance the quality of life of all involved stakeholders. In formulating sustainable development in relation to logistics and tourism, that leads to the creation of infrastructure that allows tourists to flow as much as possible and reduce environmental impacts, so that the city can function more attractively for long-term tourism (Shehadeh et al., 2024).. Raising logistics system efficiency through means of energy-efficient transportation modes, waste minimization and smart resource management aligns with the goals of digital marketing propelled as well as inspired by sustainable development. Moreover, sustainable development generates settings that provide a ground for integrating high-end technologies as Geographic Information Systems (GIS) and tools for geolocation-based marketing, crucial for effective marketing actions aimed at tourists.Hence, this study integrates both of these theories, investigating how logistics systems can leverage digital marketing in our tourist in Jordan, all while supported by sustainable development. Logistics functions represent the operational basis of digital marketing, but sustainable development practices can mediate and reinforce the runs of the two systems on each other by guaranteeing the functioning of logistics systems and digital marketing technologies in an environmentally friendly, resilient and resource-conscious environment(Vázquez-Parra et al., 2024). By integrating these theories, this study offers a nuanced understanding of tourism development in Jordan's environments by demonstrating the significance of the intersection between logistics, technology and sustainability(Wang et al., 2021).





## **4. Research Method**

### **4.1. Qualitative Inductive Research Design**

An explanation has been provided regarding the essence of Logistics and Supply Chain Management Theory and Sustainable Development Theory, as the theoretical framework of this research. One of the central ideas in Logistics and Supply Chain Management Theory is the premise that logistics systems provide processes for the transportation of goods and services throughout supply chains facilitating the timely and efficient arrival of products in the desired location. Logistics in tourism allows the smooth flow of people, goods and services, making travel easier. These logistics capabilities can enhance the attraction of tourist city by ensuring easy access to key and services for visitors faster. According to this theory, logistics is a key success factor for digital marketing because it serves as a basis for the delivery of data required to develop marketing strategies for potential visitors in real. Sustainable Development Theory better play a mediating role that accept in economic growth, social equity and environmental sustainability. Sustainable development in tourist should be responsible for efficient use of resources and mitigate environmental damage(Trivellas et al., 2020) . Responding to the needs of residents and visitors, sustainable development means developing livable real estate, enhancing green infrastructure, lowering carbon footprints and supporting sustainable modes of transport. According to this theory, sustainability: comprises practices including technological advancements like smart city practices or smart green logistics and related results improve resilience and the quality of specific and total quality of life for all participating parties. This sustainable way of thinking applied to logistics and tourism makes it possible for to build the proper infrastructure to accommodate tourists without harming the environment and allow for the city to become more attractive for long-lasting tourism (Orji et al., 2024). This study, thus, contends that the theories of sustainable development in tourist mediate the relationship between logistics and the following strategies for implementation of marketing digitalization. Sustainable development has the potential to work hand-in-hand with logistic systems, as by adopting energy efficient transportation practices, minimizing waste, and managing resources smartly, digital marketing will be implemented (All in all, green urbanization establishes an atmosphere and space for developing cutting-edge technology like GIS and location-based marketing systems that are critical for efficient marketing of travelers .Using an inductive qualitative research design, this study combines Logistics and Supply Chain Management Theory and Sustainable Development Theory to examine the impact of logistics on digital marketing and the mediation of this relationship by sustainable development in the setting of tourist in Jordan. Through the conceptual frameworks, it is determined that tourism is supported by logistics, specifically in the fields of transportation, supply chain, and technology. Simultaneously, sustainable development theory emphasises green environment and socially sensitive planning, which can lead to increased appeal and functionality of tourist . This study aims to explore these dimensions and their relationship, especially concerning digital marketing strategies, through an inductive approach. How logistics processes affect digital marketing efforts and vice versa, largely depends on the mediation of sustainable development. The research design will enable conclusions to be made on how logistical integration and sustainability-led practices in environments can be utilized to build marketing strategies that enhance tourism and consequently economic activity. This research seeks to take a deeper look into the effects of logistics, sustainability and digital technologies on tourism in Jordan.

#### **4.2. Data Collection**

In order to gather the data necessary for this study, we will conduct semi-structured in-depth interviews with relevant stakeholders and experts from the logistics, planning, tourism, and digital marketing sectors. The specific experts will be chosen according to their substantial understanding and background in logistics systems, sustainable growth, and the application of digital marketing devices in tourism. Selected participants will include those from sectors such as government agencies, tourism boards, logistics providers, development authorities. The semi-structured interviews will be conducted virtually using Google Meet, providing flexibility and convenience for collecting rich, qualitative data. Using an interview protocol designed in advance, the interviews will cover topics of interest regarding logistics, marketing, and sustainable development, but also will allow for other topics to be added. In doing so, the researcher can not only compile specificities in practices but also nuances of given perspectives with regards to the relationship between logistics, development and digital marketing strategies. These will have planners, logistics managers and policy development experts and more from digital marketing. Their insights will give a more comprehensive and diversified view of the impact of logistics and sustainable development on digital marketing in Jordanian tourism. About 15-20 participants across the three segments, to capture variety in the perspectives.

#### **4.3. Data Analysis**

Data analysis will be in accordance with the procedures of Braun and Clarke (2006) thematic analysis. The process will start with becoming familiar with the interview transcripts through reading and listening recordings to get a general sense of the data. This will be followed by a coding of themes and patterns on logistics, sustainable development and digital marketing. The major sections of data that capture sensitive aspects of the study will be given codes and major labels. Next, these codes will be classified into groups to determine connections between logistics services sustainability, sustainability practices and digital marketing strategies (efficiency). At the last stage of data analysis, these categories will be knitted into a consistent concept closely associated to the theoretical framework and research objectives. The stream will interrogate the ways that logistics systems and sustainable development strategies influence the effective use of digital marketing and the outcomes of tourism. We will also perform a mediation analysis to investigate whether sustainable development mediates the relationship between logistics and digital marketing. This will help discussion around mechanisms by which sustainable development practices impact the efficiency of logistics and digital marketing.

#### **4.4. Trustworthiness**

Various strategies will be adopted during the research process to enhance the credibility and validity of the research findings. These strategies include: Transparency: the entire research process (from data collection to analysis and interpretation) will be clearly outlined to ensure clear and traceable findings; Member checking: interview participants will be asked to review the transcripts and confirm the accuracy of their responses in order to minimize researcher bias; Peer review: thematic analysis will be checked by colleagues or co-authors for valid coding and interpretations relating to research questions; and Ethical considerations, which include obtaining informed consent, anonymity and participants' rights, to ensure that the integrity of the research process is maintained. Consequently, using this plan, the research should contribute to the theory and practice of theory, particularly in terms of logistics, sustainable development, and tourism marketing, the aim is (i) to provide dependable and substantial information regarding

logistics, sustainability, and digital marketing in Jordan; and (ii) to offer trustworthy information on these issues.

## 5.Results

### 5.1 Analysis result

Variance-based data analysis methods, as recommended by Hair et al. (2010), were utilized in this study. Specifically, Partial Least Squares Structural Equation Modelling (PLS-SEM) was chosen to analyze the relationships of logistics and digital marketing in tourist of Jordan, with the mediating role of sustainable development. Smart PLS 4 software was applied due to its ability to handle nonlinear relationships and its suitability for smaller sample sizes, which were a consideration in this research (Hair et al., 2022). This approach is particularly effective for examining complex, nonlinear relationships, which are essential for understanding the interplay between logistics, sustainable development, and digital marketing. Using Smart PLS 4, the study explores how logistics and development influence the effectiveness of digital marketing strategies, while also evaluating the evolving relationships and potential causal links between the variables involved. The analysis will offer a comprehensive understanding of how logistics and sustainable development contribute to the competitive positioning of Jordan's tourist through digital marketing.

**Table 1.** Factor loadings

Constructs	Items	Factor loadings	Cronbach's Alpha	C.R.	AVE
<b>Digital Marketing</b>	<b>DG1</b>	0.847	0.835	0.889	0.668
	<b>DG2</b>	0.811			
	<b>DG3</b>	0.781			
	<b>DG4</b>	0.829			
<b>Supply Chain Optimization</b>	<b>SCO1</b>	0.858	0.899	0.922	0.665
	<b>SCO2</b>	0.797			
	<b>SCO3</b>	0.861			
	<b>SCO4</b>	0.759			
	<b>SCO5</b>	0.824			
	<b>SCO6</b>	0.79			
<b>Sustainable Development</b>	<b>SUD1</b>	0.848	0.868	0.91	0.717
	<b>SUD2</b>	0.888			
	<b>SUD3</b>	0.811			
	<b>SUD4</b>	0.839			
<b>Technology Integration</b>	<b>TI1</b>	0.836	0.871	0.912	0.722
	<b>TI2</b>	0.851			
	<b>TI3</b>	0.897			
	<b>TI4</b>	0.811			
<b>Transportation Services</b>	<b>TS1</b>	0.794	0.913	0.931	0.658
	<b>TS2</b>	0.786			
	<b>TS3</b>	0.839			
	<b>TS4</b>	0.804			
	<b>TS5</b>	0.836			
	<b>TS6</b>	0.833			
	<b>TS7</b>	0.783			



Table I: As evidenced in the table presented, the measurement model exhibits strong psychometric properties for each of the constructs. All factor loadings of the items are higher than the threshold of 0.7, indicating strong relationships between the items and the respective constructs. All Constructs also exhibit excellent internal consistency based upon reliability measures like Cronbach Alpha and Composite Reliability (C.R.). The lowest Cronbach's Alpha value is 0.835 (Digital Marketing), and 0.913 (Transportation Services) is the highest, while C.R. values are in the 0.889–0.931 range, all higher than the recommended minimum of 0.7. Convergent validity, based on Average Variance Extracted (AVE), indicates that all constructs possess acceptable AVE values of 0.5 or higher (AVE = 0.658 to 0.722). This suggests that the constructs represent a large portion of the variance of their corresponding items. Sustainable Development and Technology Integration have the highest factor loadings and validity metrics among the constructs, and Transportation Services (7-items; 2021) indicates the highest degree of reliability out of the seven constructs.

**Table 2. HTMT**

	Digital Marketing	Supply Chain Optimization	Sustainable Development	Technology Integration	Transportation Services
Digital Marketing					
Supply Chain Optimization	0.628				
Sustainable Development	0.749	0.582			
Technology Integration	0.639	0.797	0.579		
Transportation Services	0.591	0.686	0.561	0.617	

Table 2: Table 2 depicts the Heterotrait-Monotrait Ratio (HTMT) to demonstrate the construction of Discriminant Validity among constructs in the analysis. This is TO FORTH Heterotrait-monotrait (HTMT) ratios. HTMT is another criterion for estimating the assessment of discriminant validity, with a generally accepted threshold of 0.85 and below indicating that there is sufficient discriminant validity. All HTMT values reported in this table are well below the threshold, indicating discriminant validity. For instance, there is significant distinction between Supply Chain Optimization and Sustainable Development but the HTMT value is confirmed to be 0.628 (well below 0.90), suggesting a clear specification of the constructs. Technology Integration has similar values of 0.749 with Supply Chain Optimization and 0.582 with Sustainable Development, and both of these are at high but available levels. The HTMT values show that Transportation Services has values of Heterotrait-Monotrait ratio (HTMT) from 0.579 to 0.797 with associations to other constructs, thus proving its distinctiveness. Additionally, the interaction term, Transportation Services x Sustainable Development, retains adequate HTMT values against all constructs, varying from 0.561 with Technology Integration to 0.686 with Sustainable Development. These findings confirm that sufficient discriminant validity exists between constructs in the study, meeting the minimum requirement for establishing the accuracy of the measure model. the HTMT analysis demonstrates strong

discriminant validity among all constructs, further supporting the robustness of the theoretical framework. So, this separation of constructs makes the future analysis and interpretations of study more credible.

**Table 3.** Fronell-Larcker

	Digital Marketing	Supply Chain Optimization	Sustainable Development	Technology Integration	Transportation Services
Digital Marketing	0.817				
Supply Chain Optimization	0.55	0.816			
Sustainable Development	0.644	0.515	0.847		
Technology Integration	0.55	0.709	0.506	0.849	
Transportation Services	0.523	0.623	0.502	0.555	0.811

Table 3: Further evidence is provided for discriminant validity in Table 3, which tests the Fornell-Larcker Criterion. According to this criterion, the square root of the Average Variance Extracted (AVE) for each construct (diagonal values) should be greater than the correlations between that construct. This guarantees that every construct shares more variance with its indicators than with other constructs. In the diagonals of the table – corresponding to the square root of the AVE – are all higher than 0.8, which confirms the convergent validity strong. An example of this is that Digital Marketing has a square root AVE of 0.817, which is greater than its correlations with Supply Chain Optimization (0.55) and Sustainable Development (0.644). Likewise, for Supply Chain Optimization, its square root AVE (0.816) exceeds its correlations with every other construct; 0.55 with Digital Marketing and 0.515 with Sustainable Development, for example. The same trend can be observed with other constructs as well. The average variance extracted (AVE) of Sustainable Development (0.847) is greater than its correlations with the other constructs, including 0.506 with Technology Integration. Similarly, Technology Integration and Transportation Services have square root AVE values of 0.849 and 0.811, respectively; again both are greater than their respective inter-construct correlations. According to Fornell-Larcker Criterion in results confirm that all constructs have enough discriminant validity. We expect that each construct has a stronger association with its own indicators than with any other construct, which further indicates the soundness of the measurement model. Such strong discriminant validity supports the use of constructs in further analyses.

**Table 4:** R2 Adjusted

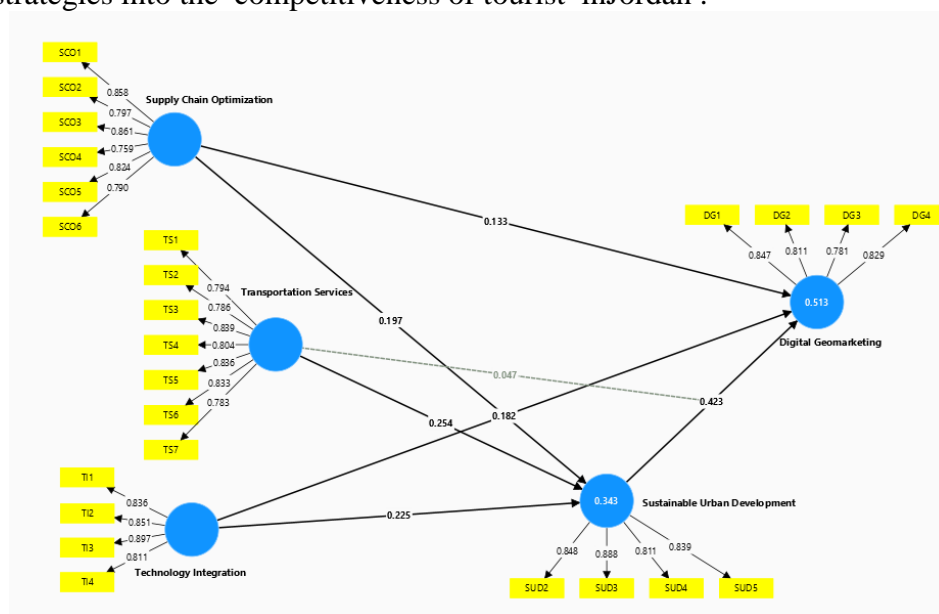
Variable	R2	R2 Adjusted
Digital Marketing	0.513	0.504
Sustainable Development	0.343	0.336

Table 4: In Table 4, we explore  $R^2$  and  $R^2$  Adjusted, to determine how much of the variation of the dependent variables can be explained by the model [41]. The  $R^2$

statistic shows us the % of variance in a dependent variable that can be accounted for by its predictors and the  $R^2$  Adjusted adjusts for the number of predictors in the model, giving a better overview if you are working with several variables. In this case, the  $R^2$  value corresponds to 0.513 for Digital Marketing, indicating that the variance explained by its predictor's accounts for 51.3% of this variable. Even after correcting for potential overfitting, the  $R^2$  Adjusted value of 0.504 confirms that the explanatory power is robust. This shows excellent model fit for Digital Marketing. For Sustainable Development, the  $R^2$  value is 0.343 meaning this value indicates that 34.3% of the variance in this variable is explained by its predictors. The  $R^2$  Adjusted of 0.336 is slightly reduced but still close enough to the  $R^2$  with a value of (0.364) that indicates that this construct remains viable for explanation through this model.  $R^2$  and  $R^2$  Adjusted factors indicate that the constructs are indeed well explained, especially the Digital Marketing, therefore, are reliable for further analysis. These results strengthen the reliability of the model to explain the relationships between variables and their predictors.

## 5.2 Hypotheses Result

In this study the path hypotheses were tested by determining whether the path coefficients were significant (as were the “beta weights” in the traditional regression analysis; Baron & Kenny, 1986). Path coefficients are the standardized regression coefficients varying from -1 to +1, where the strength and direction of the relationship between two variables can be concluded. Relationships closer to -1 or +1 indicate strong negative or positive relationships respectively, whereas a value of 0 indicates a weak to non-existent relationship. Statistical significance was determined by the coefficient, standard error, T-value and P-value with  $P\text{-value} \leq 0.05$  defining a significant difference. If the path coefficient was  $P\text{-value}$  at or below .05, then the sample supports the hypothesized theoretical model. Using path coefficients further demonstrates that logistics and sustainable development serve as mediators that translate the effect of digital marketing strategies into the competitiveness of tourist in Jordan .



**Figure2.** Measurement Model

Figure 2: This model is done by analyzing the effects of logistics on Digital Marketing with Sustainable Development as a mediator in tourist of Jordan. Supply Chain Optimization, Transportation Services, Technology Integration, Digital Marketing, and Sustainable Development are the core elements in this model. The finding indicates that logistics determinants, namely Supply Chain Optimization and Transportation Services, are significant predictors of Sustainable Development, which mediates the relationship with Digital Marketing. But those interconnectivities indicate that sustainable development can improve the efficacy of digital marketing strategies, thereby benefitting tourism dynamics. The model also emphasizes Technology Integration as a supporting factor to Sustainable Development and Digital Marketing. Through structural paths, it presents a circular relationship, such that logistics and improvements will feed back into marketing improvement for the promotion and competitiveness of tourist in Jordan.

**Table5.** Hypotheses testing estimates -Path Coefficient - Direct

Hypo	Relationships	Standardized Beta	Standard Error	T-Statistic	P-Values	Decision
H1	Supply Chain Optimization -> Digital Marketing	0.216	0.074	2.91	0.004	Supported
H2	Supply Chain Optimization -> Sustainable Development	0.197	0.084	2.351	0.019	Supported
H3	Sustainable Development -> Digital Marketing	0.423	0.083	5.114	0	Supported
H4	Technology Integration -> Digital Marketing	0.277	0.085	3.278	0.001	Supported
H5	Technology Integration -> Sustainable Development	0.225	0.085	2.642	0.008	Supported
H6	Transportation Services -> Digital Marketing	0.256	0.076	3.373	0.001	Supported
H7	Transportation Services -> Sustainable Development	0.254	0.074	3.418	0.001	Supported
H8	Transportation Services x Sustainable Development -> Digital Marketing	0.047	0.035	1.331	0.183	Unsupported

Table 5: The findings of the hypotheses testing show the direct relationships between constructs in terms of standardized beta coefficients, statistical significance, and t-statistics. The results mostly conformed with the proposed hypotheses, with the exception of one case. The first hypothesis (H1) has the first, a positive correlation between Supply Chain Optimization and Digital Marketing, what suggests a fundamental positive effect. The second hypothesis which tests the relationship between Supply Chain Optimization and Sustainable Development is supported as well, confirming its significance on development strategies. The third theoretical hypothesis which states that Sustainable Development affects Digital Marketing has the highest path coefficient of all showing that Sustainable Urban Development plays a significant role in digital marketing. Moreover, the results of the fourth and fifth hypotheses, despite of being connections representing Technology Integration, exhibits highly positive corresponding leadership on both Digital Marketing and Sustainable Development supporting the suggested relationships extensively. Hypothesis 6 and 7 (role of Transportation Services) both exhibited significant positive effects on both Digital Marketing and Sustainable Development respectively, verifying Transportation Services as a crucial role player in both constructs. Nevertheless, the eighth hypothesis, which tested the interaction effect of Transportation Services and Sustainable Development on Digital Marketing, was unsupported, indicating that this interaction does not significantly impact Digital Marketing. In conclusion, the results corroborate most of the proposed relationships, indicating constructs like Technology Integration, Supply Chain Optimization and Transportation Services are significant drivers for Digital Marketing and Sustainable Development. This finding, albeit underlined by unsupported hypothesis, suggests an avenue for future investigation to see if moderation or alternate paths exist within the relationship of Digital Marketing.

**Table6.** Hypotheses testing estimates -Path Coefficient - Indirect

Hypo	Relationships	Standardized Beta	Standard Error	T-Statistic	P-Values	Decision
H8	Supply Chain Optimization -> Digital Marketing	0.083	0.042	1.97	0.049	Supported
H9	Technology Integration -> Digital Marketing	0.095	0.04	2.367	0.018	Supported
H10	Transportation Services -> Digital Marketing	0.107	0.029	3.658	0	Supported

Table 6 : Examining the indirect effects of key relationships in the model underscores the importance of mediated pathways. The sixth hypothesis testing was concerned with indirect effect of Supply Chain Optimization on Digital Marketing (H8) indicating as mediating variable, as the hypothesis is supported, thus in this investigation Supply Chain Optimization has the role of an antecedent of Digital Marketing. Most importantly, this positive effect was statistically significant. Likewise, the indirect effect of Technology Integration on Digital Marketing (H9) is significant and positive, providing evidence that Technology Integration indirectly influences Digital Marketing. Finally, H10 examines the mediated relationship between Transportation Services and Digital Marketing, and it has the highest indirect effect, indicating that Transportation Services have an essential indirect impact on Digital Marketing through other



constructs in the model. In that sense, these results highlight the importance of mediated effects in studying how different constructs influence Digital Marketing, revealing the mechanisms driving such relationships that have been observed.

## **6. Discussion and Proposed Conceptual Model**

This section offers a full discussion of the theoretical contribution of the study, including the novel contributions related to the mediating role of Sustainable Development in the link between Logistics and Digital Marketing in Jordan's tourist . This study also highlights the growing importance of integrating logistics into digital marketing and the role of sustainable development in providing a basis for this integration. It means that the implications discussed here are already relevant for logistics, planning and digital marketing researchers, as well as practitioners.

### **6.1. Contribution of the Study**

Apart from being the first one to explore the moderating role of Sustainable Development between Logistics and Digital Marketing for the tourist . The study adds on the academic debate about how logistics, sustainable services, and planning can be integrated into a productive dialogue when seeking to enhance the effectiveness of digital marketing through a conceptual model. The model demonstrates the need for sustainable urban development to facilitate logistics systems and digital marketing approaches . This study is the first to examine this mediating role in tourist , contributing to both theory and practice.

### **6.2. Drivers for Logistics and Sustainable Development in Enhancing Digital Marketing**

Our results pinpoint critical movers for the further optimization of logistics as well as sustainable development for increasing virus-triggered marketing application. This includes the development of urban infrastructure, for example, transportation and connectivity, thus improving logistics operations. The ability to have access to real-time data gives the benefit of being able to carry out targeted digital marketing initiatives, making sure that resources are utilized effectively to attract tourists. Additionally, promoting sustainable planning in conjunction with these logistics enhancements encourages sustainable growth over time. These drivers, combined with sustainable logistics systems, are in line with the current literature, where further adaptations of roads to digital marketing's nodes become essential in reinforcing the tourist recontact, as well as of the tourist city competitive structure.

### **6.3. Barriers to the Integration of Logistics and Sustainable Development for Digital Marketing**

Despite the opportunities of integrating logistics and sustainable development, there are still a number of hurdles that prevent this from being fully realized. Modernization costs for both infrastructure and logistics technologies, the narrow managerial scope needed for meeting the demands of sustainability and digital marketing, and resistance within organizations to integrated logistics practices. Also, regulatory limits and time lag for project execution may become a big challenge. Such barriers have been documented in similar studies for digital transformation and planning, but the tension among logistics, sustainability, and marketing efforts for a persistent last mile pathway cannot be rewarded. Tackling these challenges will be crucial to unlock the full benefits of digital marketing in tourist .

### **6.4. The Mediating Role of Sustainable Development in Enhancing Digital Marketing**

This study identifies the indispensable mediating role of Sustainable Development in enhancing the relationship between logistics and digital marketing. The combination of sustainable planning and effective logistics system will enhance the delivery of digital marketing activities to tourists.

The results demonstrate that green development ensures the logistics functioning and creates a strong basis for effective digital marketing campaigns as well. In addition to boosting tourism, this frees up certain types for economic energy to sustain themselves in the future.

### **6.5. Managerial Implications**

These results of the study could provide essential managerial implications for stakeholders in tourist towns to make improvements to their digital marketing strategies. This further emphasizes the role of marketing in sustainable development, which should be reconciled with logistics in the manager's strategies. Investing in smart infrastructure and technologies that enable real-time data collection is crucial for better decision-making and operational efficiency. Organizations also need to cultivate a culture of innovation and continuous improvement among its logistics and planning teams. Engaging with external stakeholders, including local authorities, planners and tourism agencies to drive sustainability and support, inform and find common ground with tourism businesses. Integrating logistics with sustainable development and digital marketing tools have earned lessons for successful tourist around the world.

### **7. Conclusion**

The study aimed to investigate the mediating role of Sustainable Urban Development in the relationship between logistics and digital marketing in tourist of Jordan. Through the synthesis of logistics systems and sustainable planning, we presented a conceptual framework that shows how their synergy optimizes the impact of digital marketing approaches. This study is, to the best of our knowledge, one of the first to investigate the relation between logistics, sustainable development and digital marketing. Our research contributes to the literature in at least three ways: (a) we propose an initial conceptual framework that positions logistics and sustainable development as mechanisms to enhance digital marketing effectiveness, (b) we present central facilitators that promote the application of digital marketing in tourist settings, and (c) we furnish theoretical and managerial implications that provide guidance on how logistics and sustainability can be integrated into digital marketing strategies. The results reveal the impact of sustainable development, as a carrier of the relationship between logistics and digital marketing, on the overall tourist experience. Specifically, we find that the benefits accruing to tourism stakeholders can be expressed as rights to (i) improve logistics operations for more effective targeting of tourists, (ii) utilize data wealth better for real-time data to feed digital marketing decisions, (iii) position in the market and different in the tourist sector and (iv) grow sustainably long-term in tourism. But this study underlines the hurdles in connecting logistics and sustainable growth with digital marketing, such as: (i) elevated expenses in enhancing the infrastructure and technology (ii) apprehension to adapt to digital transformation (iii) coordination challenges between logistics and marketing strategies (iv) a continuous requirement for workforce competence development and cross-functional collaboration. This also shows the results that future proof data is an important factor in the mediation of development on the logistics influence in the tourism sector of digital marketing. The proposed theoretical model builds groundwork for future research and has practical implications for tourists, policymakers and practitioners working in the sector of tourism. From my standpoint, the insights are particularly pertinent to use logistics and sustainable development as strategic enabling factors to operationalize their digital marketing. These improvements in logistics, coupled with sustainable planning and targeted digital marketing, can give these tourists the winning edge as they recover from the pandemic analogous to the most successful cases in another tourist.

## References:

- Aljabari, M., Althuwaini, S., Bouguerra, A., Sharabati, A. A. A., Allahham, M., & Allan, M. (2024a). The impact of digital marketing strategies on innovation: The mediating role of AI: A critical study of SMEs in the KSA market. *International Journal of Data and Network Science*, 8(4), 2029–2036. <https://doi.org/10.5267/j.ijdns.2024.7.006>
- Aljabari, M., Althuwaini, S., Bouguerra, A., Sharabati, A. A., Allahham, M., & Allan, M. (2024b). *International Journal of Data and Network Science*. 8, 2029–2036. <https://doi.org/10.5267/j.ijdns.2024.7.006>
- Ahmad, A. Y. B., Kumari, D. K., Shukla, A., Deepak, A., Chandnani, M., Pundir, S., & Shrivastava, A. (2024). Framework for Cloud Based Document Management System with Institutional Schema of Database. *International Journal of Intelligent Systems and Applications in Engineering*, 12(3s), 672-678.
- Ahmad, A. Y. Bani ahmad , (2019). Empirical Analysis on Accounting Information System Usage in Banking Sector in Jordan. *Academy of Accounting and Financial Studies Journal*, 23(5), 1-9.
- Alhawamdeh, H., Al-Saad, S. A., Almasarweh, M. S., Al-Hamad, A. A.-S. A., Bani Ahmad, A. Y. A. B., & Ayasrah, F. T. M. (2023). The Role of Energy Management Practices in Sustainable Tourism Development: A Case Study of Jerash, Jordan. *International Journal of Energy Economics and Policy*, 13(6), 321–333. <https://doi.org/10.32479/ijeep.14724>
- Alkhazaleh, A., Assaf, A., Shehada, M., Almustafa, E., & Allahham, M. (2023). Analysis of the Impact of Fintech Firms' Lending on the Expansion of Service Base Companies in Jordan. *Information Sciences Letters*, 12(8), 2891–2902. <https://doi.org/10.18576/ISL/120837>
- Allahham, m. . sharabati a, hatamlah, h. . ahmad, a. Y. B. . sabra, s. . & daoud, m. K. (n.d.). *Big data analytics and AI for green supply chain integration and sustainability in hospitals*.
- Allahham, M., Sharabati, A. A. A., Al-Sager, M., Sabra, S., Awartani, L., & Khraim, A. S. L. (2024). Supply chain risks in the age of big data and artificial intelligence: The role of risk alert tools and managerial apprehensions. *Uncertain Supply Chain Management*, 12(1), 399–406. <https://doi.org/10.5267/j.uscm.2023.9.012>
- Allahham, M., Sharabati, A. A. A., Almazaydeh, L., Sha-Latony, Q. M., Frangieh, R. H., & Al-Anati, G. M. (2024). The impact of fintech-based eco-friendly incentives in improving sustainable environmental performance: A mediating-moderating model. *International Journal of Data and Network Science*, 8(1), 415–430. <https://doi.org/10.5267/j.ijdns.2023.9.013>
- Almustafa, E., Assaf, A., & Allahham, M. (2023). IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE FOR FINANCIAL 1 INTRODUCTION Artificial intelligence ( AI ) is the intelligence of robots , not humans . Most academic textbooks characterize artificial intelligence as studying “ intelligent agents .” These agent. *RGSA – Revista de Gestão Social e Ambiental*, 17(9), 1–17.
- Alvim, S., & Galizio, O. (2020). Lean Supply Chain Management: a lean approach applied to distribution-a literature review of the concepts, challenges and trends. *Federal University of Santa Catarina, December*, 1–20. <https://www.researchgate.net/publication/340266740>
- Alzoubi, H. M., Alshurideh, M., El, M., & Dawood, M. (2024). *Uncertain Supply Chain Management Navigating the interplay between innovation orientation , dynamic capabilities , and digital supply chain optimization : empirical insights from SMEs*. 12,

- 649–658. <https://doi.org/10.5267/j.uscm.2024.1.019>
- Andres, B., Diaz-Madronero, M., Soares, A. L., & Poler, R. (2024). Enabling Technologies to Support Supply Chain Logistics 5.0. *IEEE Access*, 12(February), 43889–43906. <https://doi.org/10.1109/ACCESS.2024.3374194>
- Arshad, M. S., Aqeel, A., Arooj, L., & Amir, H. (2024). The Impact of Digital Marketing on Brand Awareness: A General Awareness Through Logos. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.4674895>
- Balázs, G., Mészáros, Z., & Péterfi, C. A. (2022). Process Measurement and Analysis in a Retail Chain To Improve Reverse Logistics Efficiency. *Operational Research in Engineering Sciences: Theory and Applications*, 5(2), 152–175. <https://doi.org/10.31181/oresta110722120g>
- Bataineh, A. Q., Abu-Alsondos, I. A., Idris, M., Mushtaha, A. S., & Qasim, D. M. (2023). The Role of Big Data Analytics in Driving Innovation in Digital Marketing. *2023 9th International Conference on Optimization and Applications, ICOA 2023 - Proceedings*, 1–5. <https://doi.org/10.1109/ICOA58279.2023.10308854>
- Chow, H. K. H., Choy, K. L., Lee, W. B., & Lau, K. C. (2006). Design of a RFID case-based resource management system for warehouse operations. *Expert Systems with Applications*, 30(4), 561–576. <https://doi.org/10.1016/j.eswa.2005.07.023>
- Deb, S. K., Nafi, S. M., & Valeri, M. (2024). Promoting tourism business through digital marketing in the new normal era: a sustainable approach. *European Journal of Innovation Management*, 27(3), 775–799. <https://doi.org/10.1108/EJIM-04-2022-0218>
- Diab, Y. (2021). Exploring Customer Relationship Management in Two Private Hospitals in Kuwait. *BAU Journal - Health & Well-Being*, 3(2), 1–13. <https://search.ebscohost.com/login.aspx?direct=true&db=edb&AN=150462723&site=eds-live&authtype=sso&custid=s9494728>
- Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., Jain, V., Karjaluoto, H., Kefi, H., Krishen, A. S., Kumar, V., Rahman, M. M., Raman, R., Rauschnabel, P. A., Rowley, J., Salo, J., Tran, G. A., & Wang, Y. (2021). Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management*, 59(June 2020), 102168. <https://doi.org/10.1016/j.ijinfomgt.2020.102168>
- Faber, N., De Koster, R. B. M., & Smidts, A. (2018). Survival of the fittest: the impact of fit between warehouse management structure and warehouse context on warehouse performance. *International Journal of Production Research*, 56(1–2), 120–139. <https://doi.org/10.1080/00207543.2017.1395489>
- Fadhila, A., & Ghazali, A. (2024). *International Journal of Current Science Research and Review Improving the KYC Onboarding Process Using Business Process Re-Engineering : A Case Study of a Foreign Bank in Indonesia*. 07(06), 4331–4343. <https://doi.org/10.47191/ijcsrr/V7-i6-85>
- Guojun, J. (2008). Study on 4PL as coordinating and constructing agent for supply chain System - A transaction cost theory approach. *5th International Conference Service Systems and Service Management - Exploring Service Dynamics with Science and Innovative Technology, ICSSSM'08*, 7(1), 71–106. <https://doi.org/10.1109/ICSSSM.2008.4598520>
- Hasanah, M., Jumriani, J., Juliana, N., & Kirani, K. P. (2021). Digital Marketing a Marketing Strategy for UMKM Products in The Digital Era. *The Kalimantan Social Studies Journal*,



- 3(1), 36. <https://doi.org/10.20527/kss.v3i1.4146>
- Henry Ejiga Adama, & Chukwuekem David Okeke. (2024). Comparative analysis and implementation of a transformative business and supply chain model for the FMCG sector in Africa and the USA. *Magna Scientia Advanced Research and Reviews*, 10(2), 265–271. <https://doi.org/10.30574/msarr.2024.10.2.0067>
- Henry Ejiga Adama, Oladapo Adeboye Popoola, Chukwuekem David Okeke, & Abiodun Emmanuel Akinoso. (2024). Economic Theory and Practical Impacts of Digital Transformation in Supply Chain Optimization. *International Journal of Advanced Economics*, 6(4), 95–107. <https://doi.org/10.51594/ijae.v6i4.1072>
- Hermawan, A., Hurriyati, R., Hendrayati, H., & Sultan, M. A. (2024). Implementation of Blue Ocean Strategy in Facing Business Competition: A Startup Case Study of Lapangbola.Com. *Jurnal Manajemen Bisnis*, 15(1), 1–12. <https://doi.org/10.18196/mb.v15i1.20486>
- Huda, I. U. H., Karsudjono, A. J., & Darmawan, R. D. (2024). Pengaruh Content Marketing Dan Lifestyle Terhadap Keputusan Pembelian Pada Usaha Kecil Menengah Di Media Sosial. *AL-KALAM: JURNAL KOMUNIKASI, BISNIS DAN MANAJEMEN*, 11(1), 69. <https://doi.org/10.31602/al-kalam.v11i1.3453>
- Alhawamdeh, H., Abdel Muhsen Irsheid Alafeef, M., Abdel Mohsen Al-Afeef, M., Alkhawaldeh, B. Y., Nawasra, M., Al\_Rawashdeh, H. A. A., ... & Al-Eitan, G. N. (2024). The relationship between marketing capabilities and financial performance: the moderating role of customer relationship management in Jordanian SMES. *Cogent Business & Management*, 11(1), 2297458.
- Alamad, T., Alrawashedh, N. H., Alhawamdeh, H., Harahsheh, A. A., Zraqat, O., Hussien, L. F., ... & Alkhawaldeh, B. Y. (2024). The Impact of Strategic Leadership on Strategic Performance in Higher Education Institutions: The Mediating Role of Change Management.
- Alhawamdeh, H., Alkhawaldeh, B. Y., Zraqat, O., & Alhawamdeh, A. M. (2024). Leveraging Business Intelligence in Organizational Innovation: A Leadership Perspective in Commercial Banks. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 14(1), 295-309.
- Alhawamdeh, A. M., Al-habash, M. A., Zraqat, O., Hussien, L. F., Taha, I. B., Alhawamdeh, H., & Alkhawaldeh, B. Y. (2023). The Effect of Religious and Ethnic Values on Executive Compensation in Jordanian Firms. *KEPES*, 21(3), 604-622.
- Alkhawaldeh, B. Y. S., Alhawamdeh, H., Almarshad, M., Fraihat, B. A. M., Abu-Alhija, S. M. M., Alhawamdeh, A. M., & Ismaeel, B. (2023). The effect of macroeconomic policy uncertainty on environmental quality in Jordan: Evidence from the novel dynamic simulations approach. *Jordan Journal of Economic Sciences*, 10(2), 116-131.
- Al-Afeef, M. A. M., Fraihat, B. A. M., Alhawamdeh, H., Hijazi, H. A., AL-Afeef, M. A., Nawasr, M., & Rabi, A. M. (2023). Factors affecting middle eastern countries' intention to use financial technology. *International Journal of Data & Network Science*, 7(3).
- Alhawamdeh, H., Al-Saad, S. A., Almasarweh, M. S., Al-Hamad, A. A. S., Ahmad, A. Y., & Ayasrah, F. T. M. (2023). The role of energy management practices in sustainable tourism development: a case study of Jerash, Jordan. *International Journal of Energy Economics and Policy*, 13(6), 321-333.
- Jawabreh, O., Baadhem, A. M., Ali, B. J. A., Atta, A. A. B., Ali, A., Al-Hosaini, F. F., & Allahham, M. (2023). The Influence of Supply Chain Management Strategies on Organizational Performance in Hospitality Industry. *Applied Mathematics and Information*



- Sciences*, 17(5), 851–858. <https://doi.org/10.18576/AMIS/170511>
- Kurdi, B. Al, Alshurideh, M., Akour, I., Alzoubi, H. M., Obeidat, B., & Alhamad, A. (2022). The role of digital marketing channels on consumer buying decisions through eWOM in the Jordanian markets. *International Journal of Data and Network Science*, 6(4), 1175–1185. <https://doi.org/10.5267/j.ijdns.2022.7.002>
- K. Daoud, D. . Alqudah, M. . Al-Qeed, B. A. . Al Qaied, and A. Y. A. B. . Ahmad, “The Relationship Between Mobile Marketing and Customer Perceptions in Jordanian Commercial Banks: The Electronic Quality as A Mediator Variable”, *ijmst*, vol. 10, no. 2, pp. 1360-1371, Jun. 2023
- Kai, Z., Sharaf, M., Wei, S. Y., Al Shraah, A., Le, L. T., Bedekar, A. A., & Ahmad, A. Y. B. (2024). Exploring the asymmetric relationship between natural resources, fintech, remittance and environmental pollution for BRICS nations: New insights from MMQR approach. *Resources Policy*, 90, 104693
- Liang, P., Guo, Y., Nutakki, T. U. K., Agrawal, M. K., Muhammad, T., Ahmad, S. F., ... & Qin, M. (2024). Comprehensive assessment and sustainability improvement of a natural gas power plant utilizing an environmentally friendly combined cooling heating and power-desalination arrangement. *Journal of Cleaner Production*, 436, 140387.
- Liang, P., Guo, Y., Chauhdary, S. T., Agrawal, M. K., Ahmad, S. F., Ahmad, A. Y. A. B., ... & Ji, T. (2024). Sustainable development and multi-aspect analysis of a novel polygeneration system using biogas upgrading and LNG regasification processes, producing power, heating, fresh water and liquid CO<sub>2</sub>. *Process Safety and Environmental Protection*, 183, 417-436..
- Mohsin, H. J., Hani, L. Y. B., Atta, A. A. B., Al-Alawneh, N. A. K., Ahmad, A. B., & Samara, H. H. (2023). The impact of digital financial technologies on the development of entrepreneurship: evidence from commercial banks in the emerging markets. *Corporate & Business Strategy Review*, 4(2), 304-312.
- Ramadan, A., Alkhodary, D., Alnawaiseh, M., Jebreen, K., Morshed, A., & Ahmad, A. B. (2024). Managerial Competence and Inventory Management in SME Financial Performance: A Hungarian Perspective. *Journal of Statistics Applications & Probability*, 13(3), 859-870.
- Almestarihi, R., Ahmad, A. Y. A. B., Frangieh, R., Abu-AlSondos, I., Nser, K., & Ziani, A. (2024). Measuring the ROI of paid advertising campaigns in digital marketing and its effect on business profitability. *Uncertain Supply Chain Management*, 12(2), 1275-1284.
- Daoud, M. K., Al-Qeed, M., Al-Gasawneh, J. A., & Bani Ahmad, A. Y. (2023). The Role of Competitive Advantage Between Search Engine Optimization and Shaping the Mental Image of Private Jordanian University Students Using Google. *International Journal of Sustainable Development & Planning*, 18(8).
- Yahiya Ahmad Bani Ahmad (Ayassrah), Ahmad; Ahmad Mahmoud Bani Atta, Anas; Ali Alawawdeh, Hanan; Abdallah Aljundi, Nawaf; Morshed, Amer; and Amin Dahbour, Saleh (2023) "The Effect of System Quality and User Quality of Information Technology on Internal Audit Effectiveness in Jordan, And the Moderating Effect of Management Support," *Applied Mathematics & Information Sciences*: Vol. 17: Iss. 5, Article 12.
- C. Verma, V. P, N. Chaturvedi, U. U, A. Rai and A. Y. A. Bani Ahmad, "Artificial Intelligence in Marketing Management: Enhancing Customer Engagement and Personalization," 2025 *International Conference on Pervasive Computational Technologies (ICPCT)*, Greater

- Noida, India, 2025, pp. 397-401, doi: 10.1109/ICPCT64145.2025.10940626.
- N. Parihar, P. Fernandes, S. Tyagi, A. Tyagi, M. Tiwari and A. Y. A. Bani Ahmad, "Using Machine Learning to Enhance Cybersecurity Threat Detection," *2025 International Conference on Pervasive Computational Technologies (ICPCT)*, Greater Noida, India, 2025, pp. 387-391, doi: 10.1109/ICPCT64145.2025.10939232.
- A. Y. A. Bani Ahmad, P. Sarkar, B. Goswami, P. R. Patil, K. Al-Said and N. Al Said, "A Framework for Evaluating the Effectiveness of Explainability Methods in Deep Learning," *2025 International Conference on Pervasive Computational Technologies (ICPCT)*, Greater Noida, India, 2025, pp. 426-430, doi: 10.1109/ICPCT64145.2025.10939073.
- Lin, Y. (2022). Social media for collaborative planning: A typology of support functions and challenges. *Cities*, 125(February), 103641. <https://doi.org/10.1016/j.cities.2022.103641>
- Maghfiroh, M., & Rahmawati, N. (2024). Penerapan Digital Marketing Sebagai Strategi Pemasaran Serta Membangun Brand Awareness pada UMKM Rengginang GR Wedoro. *Jurnal Nusantara Berbakti*, 2(1), 153–166. <https://doi.org/10.59024/jnb.v2i1.313>
- Moskovics, P., Wanke, P., Tan, Y., & Gerged, A. M. (2024). Market structure, ESG performance, and corporate efficiency: Insights from Brazilian publicly traded companies. *Business Strategy and the Environment*, 33(2), 241–262. <https://doi.org/10.1002/bse.3492>
- Olan, F., Liu, S., Suklan, J., Jayawickrama, U., & Arakpogun, E. (2021). The role of Artificial Intelligence networks in sustainable supply chain finance for food and drink industry. *International Journal of Production Research*, 0(0), 1–16. <https://doi.org/10.1080/00207543.2021.1915510>
- Orji, I. J., Kusi-Sarpong, S., & Okwara, U. K. (2024). *Sustainability and the Digital Supply Chain BT - The Palgrave Handbook of Supply Chain Management* (J. Sarkis (ed.); pp. 1467–1485). Springer International Publishing. [https://doi.org/10.1007/978-3-031-19884-7\\_93](https://doi.org/10.1007/978-3-031-19884-7_93)
- Patella, S. M., Grazieschi, G., Gatta, V., Marcucci, E., & Carrese, S. (2021). The adoption of green vehicles in last mile logistics: A systematic review. *Sustainability (Switzerland)*, 13(1), 1–29. <https://doi.org/10.3390/su13010006>
- Pereira, C. M., Anholon, R., Rampasso, I. S., Quelhas, O. L. G., Leal Filho, W., & Santa-Eulalia, L. A. (2021). Evaluation of lean practices in warehouses: an analysis of Brazilian reality. *International Journal of Productivity and Performance Management*, 70(1), 1–20. <https://doi.org/10.1108/IJPPM-01-2019-0034>
- Ramachandran, K. K. (2024). *EVALUATING ROI IN DIGITAL MARKETING CAMPAIGNS : METRICS , MEASUREMENT , AND. December 2023.*
- Rather, R. A., Hollebeek, L. D., Vo-Thanh, T., Ramkissoon, H., Leppiman, A., & Smith, D. (2022). Shaping customer brand loyalty during the pandemic: The role of brand credibility, value congruence, experience, identification, and engagement. *Journal of Consumer Behaviour*, 21(5), 1175–1189. <https://doi.org/10.1002/cb.2070>
- Shamma, H., & Hassan, S. (2013). Customer-driven benchmarking: A strategic approach toward a sustainable marketing performance. *Benchmarking*, 20(3), 377–395. <https://doi.org/10.1108/14635771311318144>
- Sharabati, A. A. A., Awawdeh, H. Z., Sabra, S., Shehadeh, H. K., Allahham, M., & Ali, A. (2024). The role of artificial intelligence on digital supply chain in industrial companies mediating effect of operational efficiency. *Uncertain Supply Chain Management*, 12(3),

- 1867–1878. <https://doi.org/10.5267/j.uscm.2024.2.016>
- Sharabati, & Izzat, A. M. (2024). *The Relationship between Supply Chain Resilience and Digital Supply Chain on Sustainability, Supply Chain Dynamism as a Moderator*. 1–20. [www.preprints.org](http://www.preprints.org)
- Shehadeh, H., Shajrawi, A., Zoubi, M., & Daoud, M. (2024). The mediating role of ICT on the impact of supply chain management (SCM) on organizational performance (OP): A field study in Pharmaceutical Companies in Jordan. *Uncertain Supply Chain Management*, 12(2), 1251–1266. <https://doi.org/10.5267/j.uscm.2023.11.011>
- Sikandar, A. W., Tawfeq, K., & Assaf, A. L. (2017). IMPACT OF ADVERTISING MESSAGES ACROSS SOCIAL NETWORKS ON CONSUMERS' PURCHASING BEHAVIOR OF MOBILE PHONES: A STUD Related papers Effect iveness of SMS Advert ising (A St udy of Young Cust o-mers in Bahrain) Effect ivenessso... IMPACT OF ADVERTISING MESSAGES A. *International Journal of Sales & Marketing Management Research and Development (IJSMMRD)*, 7(2), 9–14.
- Sohail, M., Khan, S., Akbar, A., & Svobodova, L. (2024). *Empowering sustainable development : The crucial nexus of green fintech and green finance in Luxembourg ' s banking sector*. 8(7), 1–18.
- Stahl, G. K., Brewster, C., Collings, D. G., & Hajro, A. (2019). Towards more relevant HRM research: understanding the role of HRM in corporate sustainability and social responsibility. *Human Resource Management Review*, 30(3), 1–46.
- Trivellas, P., Malindretos, G., & Reklitis, P. (2020). Implications of green logistics management on sustainable business and supply chain performance: evidence from a survey in the greek agri-food sector. *Sustainability (Switzerland)*, 12(24), 1–29. <https://doi.org/10.3390/su122410515>
- Vázquez-Parra, J., Suárez-Brito, P., Cruz-Sandoval, M., & Buenestado-Fernández, M. (2024). SEL4C: Mobile Application for the Development of Social Entrepreneurship Competency. *International Journal of Information and Education Technology*, 14(5), 778–784. <https://doi.org/10.18178/ijiet.2024.14.5.2102>
- Villarreal, B., Garza-Reyes, J. A., & Kumar, V. (2016). Lean road transportation – a systematic method for the improvement of road transport operations. *Production Planning and Control*, 27(11), 865–877. <https://doi.org/10.1080/09537287.2016.1152405>
- Wang, C. N., Dang, T. T., & Nguyen, N. A. T. (2021). Outsourcing reverse logistics for e-commerce retailers: A two-stage fuzzy optimization approach. *Axioms*, 10(1). <https://doi.org/10.3390/axioms10010034>
- Yunani, A., & Kamilla, Z. N. (2023). Pengaruh Content Marketing Tiktok terhadap Minat Beli @Somethincofficial Melalui Brand Awareness. *Al-Kharaj : Jurnal Ekonomi, Keuangan & Bisnis Syariah*, 6(2), 3809–3825. <https://doi.org/10.47467/alkharaj.v6i2.4100>