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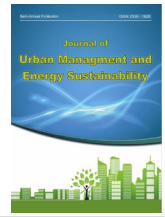

CASE STUDY RESEARCH PAPER

# The Role of Digital Marketing in Implementing Supply Chain Agility in the Iraqi Transportation Industry

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ABSTRACT

The rapid advancement of digital transformation has fundamentally reshaped the strategic alignment between marketing and supply chain operations across global industries. Despite growing recognition of digital marketing's potential, its specific role in fostering supply chain agility within Iraq's transportation sector characterized by infrastructural deficiencies, political instability, and limited digitalization remains insufficiently understood. This qualitative study employed thematic analysis within a three-phase framework proposed by King and Horrocks (2010), involving 19 semi-structured interviews with supply chain experts, academic faculty, and transportation industry professionals in Iraq, conducted until theoretical saturation was achieved. Findings reveal that digital marketing operates through two principal dimensions components (flexibility and adaptability, targeted marketing, stakeholder collaboration and integration, proactive demand sensing, and digital multi-channel customer experience) and instrumental components (SEO and advertising optimization, content and social media marketing, AI-driven data analytics, IoT and blockchain technologies, and specialized software) which collectively enhance supply chain agility requirements including comprehensive supply chain visibility, operational automation, real-time data sharing, and inventory management, ultimately generating outcomes such as improved market responsiveness, operational efficiency gains, enhanced brand image, personalized service delivery, real-time cargo tracking, and better inventory control. These findings advance the theoretical understanding of digital marketing–supply chain integration in emerging market contexts, offering actionable insights for transportation firms seeking to strengthen agility and resilience in volatile operating environments.

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## INTRODUCTION

In the era of digital transformation, businesses are increasingly required to integrate activities and functions across the supply chain to enhance efficiency and responsiveness. Digital marketing has emerged not merely as a tool for brand visibility and customer engagement, but as a strategic instrument that generates real-time, actionable insights into consumer behavior, preferences, and demand trends. Concurrently, supply chain management has evolved from a back-office support function into a core strategic capability that directly shapes a firm's ability to deliver value to customers. Traditionally, marketing and supply chain functions operated in silos, with minimal overlap in objectives or processes (Mentzer et al., 2008). However, in today's data-rich and dynamic environment, this functional divide has become a principal barrier to achieving organizational performance goals. Digital marketing now generates enormous volumes of data through social media interactions, search engine analytics, e-commerce platforms, and customer feedback mechanisms. When effectively shared with supply chain teams, these data can inform decisions related to production planning, inventory levels, logistics scheduling, and demand forecasting.

Companies such as Amazon, Zara, and Walmart have demonstrated the competitive advantage of aligning digital marketing insights with supply chain operations. These firms leverage real-time online consumer data to optimize the entire value chain—from warehousing to last-mile delivery—ensuring speed, cost efficiency, and high customer satisfaction. Nevertheless, many organizations, particularly small and medium-sized enterprises (SMEs), continue to face challenges in harnessing digital marketing's potential in this context. The increasing complexity of global supply chains, combined with rising customer expectations for personalized, timely, and sustainable delivery, underscores the need for an integrated approach between digital marketing and supply chain management. Iraq's transportation sector presents a particularly compelling, yet under-studied, context. Ongoing reconstruction of war-damaged infrastructure, complex regulatory environments, and limited digital adoption create unique challenges that existing literature—largely focused on developed economies has not addressed (Mentzer et al., 2008). This study therefore investigates the role of digital marketing in implementing supply chain agility within Iraq's transportation industry, offering empirical evidence from a qualitative investigation.

## MATERIALS AND METHODS

### The Transportation Supply Chain in Iraq

Iraq's transportation sector, as one of the country's key economic sectors, plays a vital role in facilitating domestic and international trade. As Iraq continues rebuilding its infrastructure after years of conflict, the industry has experienced considerable growth, with ambitious projects such as the 'Development Road' under active implementation. The supply chain in Iraq's transportation industry encompasses raw material procurement, production, warehousing, distribution, and logistics management, resting on multimodal transport networks road, rail, air, and maritime operated by a diverse array of companies. Primary transport modes include road transport, which is the dominant domestic freight mode benefiting from recent improvements in regional connectivity; rail transport, which remains limited but is expanding through projects such as the Basra–Shalamcheh railway and the Development Road corridor; air transport, which has the fastest growth rate at 7.6%, primarily serving passenger and high-value or time-sensitive cargo; and maritime transport, which is expanding through ports such as the Grand Faw Port with moderate growth.(Tab. 1)

Key international players active in Iraq's transportation sector include DHL, Aramex, DSV, GAC, and CEVA Logistics, while prominent local firms include Almas Group, Rafidain Group, SMG, and Grand Path. These companies provide

comprehensive supply chain activities including multimodal transportation, warehousing, customs clearance, and reverse logistics.

Table 1: Market Size and Growth of Iraq's Transportation Industry

| Indicator | Value |
|---|---|
| Market volume (2025) | Approximately USD 7.7 billion |
| Annual growth rate | 6.2% |
| Projected market volume (2030) | Over USD 10.4 billion |
| Projected market volume (2032) | Over USD 12 billion (est.) |

*Challenges and Opportunities*

Core challenges confronting Iraq's transportation sector include: damaged road and bridge infrastructure resulting from years of conflict, making transportation management unpredictable; complex and variable customs regulations combined with limited adoption of smart technologies in customs operations; security risks arising from armed groups and smuggling activities; a fragmented market; shortages of skilled labor; and the country's heavy economic dependence on oil and associated price volatility. Key opportunities include: mega-projects such as the Development Road (a USD 17 billion investment creating a 1,200-kilometer road and rail corridor from the Grand Faw Port to the Turkish border, potentially replacing the Suez Canal as a global transit route); green logistics, an entirely untapped field requiring investment given the mounting urgency of environmental and climate challenges; advanced warehousing, digitalization, cold-chain logistics, and public–private partnerships; and regional integration through initiatives such as China's Belt and Road Initiative and expanded trade with neighboring states. Iraq's transportation sector thus possesses the potential to become a regional logistics hub, contingent on sustained reform.

*Marketing and Supply Chain Management*

The relationship between marketing and supply chain management (SCM) has evolved substantially over recent decades. Early studies largely treated marketing and supply chain as distinct organizational functions with minimal overlap in objectives or processes (Mentzer et al., 2008). Marketing traditionally focused on demand creation, market segmentation, and promotional activities, while supply chain management concentrated on efficiently managing the flow of goods from suppliers to customers (Jüttner et al., 2010). With globalization and technological advances reshaping the competitive landscape, the traditional boundaries between marketing and supply chain are dissolving. Researchers have recognized that the two functions are deeply interconnected, and that both play critical roles in customer value delivery (Kozlenkova et al., 2017). This shift toward customer-centric business models demands greater coordination between marketing and supply chain to meet consumer expectations for high-quality, timely, and cost-effective product delivery (Garai & Roy, 2020). Consequently, the integration of marketing and SCM has become a focal research theme, with numerous studies examining how firms leverage this synergy to build competitive advantage.

One of the earliest and most prominent integration areas concerns demand forecasting and supply chain responsiveness. Marketing provides valuable insights into consumer behavior and market trends, significantly enhancing demand prediction accuracy. Research demonstrates that embedding marketing intelligence into SCM decisions enables firms to build more agile, responsive supply chains (Wook Kim, 2006). Lambert and Cooper (2000) further emphasize the critical role of marketing–supply chain integration in augmenting customer value

through improved service delivery, arguing that an understanding of customer needs and preferences is essential for designing supply chains capable of delivering the right product at the right time and place. Flint et al. (2014) demonstrate that synchronizing marketing strategies with supply chain processes through optimizing distribution channels, ensuring product availability, and fulfilling brand promises via logistics management highly effective in enhancing the overall customer experience. Sustainability has emerged as another important integration dimension: marketing can influence supply chain design by aligning strategies with consumer demands for sustainability and ethical practices (Brindley & Oxborrow, 2014). The emergence of digital technologies—big data analytics, artificial intelligence, and the Internet of Things (IoT has further accelerated marketing–SCM integration, enabling real-time data collection and analysis that improves decision-making quality in both domains (Reddy, 2025).

*Digital Marketing and Supply Chain Management*

The growing visibility, efficiency, and connectivity enabled by digital marketing across supply chain networks highlights its vital role in supply chain optimization. Businesses can manage inventory and procurement plans more precisely by leveraging targeted online campaigns to gauge consumer demand. Through market insights and data analytics derived from digital marketing campaigns, businesses can reduce excess inventory, optimize stock levels, and forecast demand trends outcomes that collectively reduce inventory costs and improve cash flow (Reddy, 2025). Digital marketing facilitates coordination and communication among manufacturers, distributors, suppliers, and retailers through diverse online platforms and tools. Supply and demand signals have become more timely through online information exchange enabled by social media, email marketing, and interactive online tools, resulting in improved coordination across the supply chain. By tailoring marketing messages and advertising using consumer data and behavioral analytics, digital marketing enhances customer engagement, retention, and loyalty, thereby increasing conversion rates and repeat purchases (Sinha et al., 2023). The integration of traditional SCM practices with digital marketing methods has become a fundamental determinant in the landscape of modern firms. Once primarily associated with customer-facing activities, digital marketing now permeates all aspects of supply chain operations, providing unprecedented opportunities for efficiency improvement. Through SEO, content marketing, and social media advertising, businesses can expand their online presence and attract broader customer bases increases in brand awareness and e-commerce traffic that, in turn, drive revenue growth (Sharma et al., 2021). Using digital marketing tactics and technologies can enhance supply chain agility and streamline supply chain processes, providing competitive advantage in rapidly changing markets. Real-time stakeholder communication regarding inventory levels, production schedules, and delivery statuses enabled by digital platforms promotes flexibility and agility, enabling rapid adaptation to shifting consumer preferences and market conditions (Wang et al., 2024). Furthermore, digital marketing enables personalized customer interaction at every stage of the supply chain, allowing businesses to customize product offerings, promotions, and marketing messages to meet specific customer demands.

*Supply Chain Management*

Supply chain management encompasses the management of flows of goods and services between businesses and locations, including the movement and storage of raw materials, work-in-process inventory, and finished goods, as well as order fulfillment from point of origin to point of consumption. Timely and accurate supply chain information allows manufacturers to produce and ship only sellable product. Effective supply chain systems help manufac-

turers and retailers reduce redundant activities, lowering the costs of producing, transporting, insuring, and storing goods that cannot be sold. Over the past two decades, researchers have examined diverse perspectives on SCM, with supply chain integration emerging as a particularly important concept (Yu & Fang, 2023). A fully integrated supply chain aims to achieve effective and efficient flows of products and services, information, money, and decisions, delivering maximum value at low cost and high speed. Supply chain integration is defined as the strategic collaboration of intra- and inter-organizational processes, leading to a more cohesive supply chain (Zhang, 2024). The adoption of environmental management systems and agility in supply chains for sourcing quality raw materials and responding rapidly to market needs is of paramount importance. Supply chain agility plays a key coordination role among suppliers, distributors, and customers, ultimately improving product quality and health outcomes.

*Supply Chain Agility*

Agility has been defined from multiple perspectives. According to Jiang et al. (2017), agility from a collaborative perspective equals (Sensing + Adapting) × (Reactivity + Efficiency). In this formula, agility has two functional characteristics sensing and adapting and two non-functional characteristics reactivity and efficiency. Agility is defined as the capacity of a system to 'perceive an unexpected situation (sensing)' that requires 'changing behavior (adapting)'. Additionally, reactivity and efficiency are considered from a performance perspective, reflecting the dynamics of agility, namely the speed of sensing and adapting.

In the supply chain context, Christopher and Peck (2004) defined agility as the ability to respond rapidly to unpredictable changes in demand or supply. This definition highlights two key aspects: response to change, and speed also referred to as 'visibility' and 'velocity' (Beigi Firoozi & Bashokouh, 2023). Visibility, as the basis for responding to change, encompasses upstream and downstream inventories, demand, and production. Velocity reflects the time elapsed from generating an order to its delivery and the time required to respond to upward or downward changes. Supply chain agility can also be achieved through three capabilities: effectiveness (the ability to deliver the right order—correct product, quantity, time, condition, documentation, and customer), responsiveness (the ability to respond to changes in a timely manner), and flexibility (the ability to change or react with minimum penalty in terms of time, effort, cost, or performance) (Charles et al., 2010; De Toni & Tonchia, 2005).

*The Role of Technology in Marketing and Logistics*

The penetration of technology into marketing and logistics yields significant reductions in operational costs through automation and process optimization. Technology-enabled acceleration improves process speed in logistics enabling faster goods delivery and greater targeting precision in marketing. Personalized offerings and enhanced services improve customer satisfaction (Beigi Firoozi & Bashokouh, 2024). Modern technologies also support transparency and security, helping companies remain at the development frontier and deliver more efficient, innovative solutions. Technologies such as blockchain increase trust and security levels in supply chains and data management (Peter & Mbohwa, 2018). Nevertheless, implementing new technologies requires substantial investment in hardware, software, and personnel training. Increased reliance on digital solutions heightens the risk of data breaches and system attacks, which can erode customer and partner confidence. Complete reliance on automated systems can cause serious operational disruptions if technical failures occur. Effective technology use requires highly skilled personnel a challenge for companies facing IT talent shortages. Integrating new technologies with existing legacy systems, particularly in larger organiza-

tions, can be complex and costly.

*Methodology*

This study adopts a qualitative research paradigm aimed at achieving deep and meaningful understanding of the data. The primary approach is thematic analysis a systematic method for identifying, analyzing, and interpreting patterns and themes in qualitative data (Braun & Clarke, 2006). Thematic analysis was selected for its flexibility and capacity to uncover latent meanings embedded in the data, enabling the identification and interpretation of complex relationships among data elements. Specifically, this study employs the three-phase thematic analysis framework proposed by King and Horrocks (2010), chosen for its precise and transparent structure, which is well-suited to qualitative data analysis in social and managerial contexts. The three phases are:

•Descriptive Coding: Qualitative data (interview transcripts) were carefully reviewed and sections relevant to the research objectives extracted. Key points were summarized and initial descriptive codes were developed as preliminary labels capturing the essential content of the data.

•Interpretive Coding: The descriptive codes were organized and categorized in relation to the research questions and theoretical framework, focusing on identifying relationships among codes and extracting deeper meanings to understand latent patterns.

•Extraction of Overarching Themes: Main and overarching themes were derived from comprehensive analysis of the codes and categories, with a diagram constructed to visually represent the relationships among different coding levels. (Fig. 1)


Figure 1: Thematic Analysis Process (King & Horrocks, 2010)

The study population comprised specialists, experts, and academic faculty in supply chain management in Iraq's transportation sector possessing sufficient and relevant expertise. (Tab. 2)

Table 2: Expert Selection Criteria

| | Expert Selection Criteria |
|---|---|
| 1 | Expertise in domains related to supply chain management in the transportation industry |
| 2 | Research activity in supply chain management; membership of university academic faculty |
| 3 | Mastery of supply chain management in the transportation industry and the specific conditions of Iraq |

Theoretical sampling was used to determine the sample size. Data were collected through in-depth semi-structured interviews, a process that continued until theoretical saturation was reached. Saturation was achieved after 17 interviews; interviews 18 and 19 were conducted for additional confirmation, yielding a total of 19 interviews.

## FINDINGS AND DISCUSSION

*Respondent Demographics*

Table 3: Demographic Characteristics of Respondents

| Characteristic | Category | Frequency | Percentage (%) |
|---|---|---|---|
| Gender | Male | 15 | 79% |
| | Female | 4 | 21% |

| | | | |
|---|---|---|---|
| Educational Attainment | Bachelor's degree | 4 | 21% |
| | Master's degree | 8 | 42% |
| | Doctoral candidate | 3 | 16% |
| | PhD | 4 | 21% |
| Professional Domain | Logistics and customs business manager | 7 | 37% |
| | Academic faculty (supply chain management) | 3 | 15.7% |
| | Transportation industry researcher | 5 | 26.3% |
| | Supply chain researcher | 4 | 21% |

Based on the demographic characteristics outlined in Table 3, respondents were confirmed as qualified and capable of providing substantive responses on the subject matter.

*Reliability Assessment*

Interview reliability was assessed using the intra-subject agreement method (inter-rater reliability). Two experts with substantive knowledge of the research topic were invited to serve as co-researchers (coders). The researcher and the two co-researchers coded three interviews collaboratively, and the percentage of intra-subject agreement—used as the reliability index—was calculated using the following formula:

Reliability = (2 × Number of Agreements) / Total Number of Codes × 100%

The total number of codes recorded by the researcher and the co-researcher was 50, with 40 agreements. The resulting inter-rater reliability was 84.2%. Given that reliability exceeds 60%, coding reliability was confirmed as adequate.

*Thematic Analysis Results*

Following 19 interviews, the three-phase thematic analysis framework of King and Horrocks (2010) was applied. In the first phase open coding all recorded interview transcripts were reviewed multiple times to extract key points, yielding 112 initial codes. After merging similar codes and eliminating redundancies, 96 final open codes were identified. (Tab. 4)

Table 4: Open Codes Identified from Interviews

| No. | Description | Category |
|---|---|---|
| 1 | Social considerations for adjusting marketing in the supply chain | Marketing Effectiveness |
| 2 | Logistics visibility for real-time marketing campaigns | Marketing Effectiveness |
| 3 | Automated logistics marketing based on digital tools | Marketing Effectiveness |
| 4 | Leveraging smart technology for supply chain marketing | Marketing Effectiveness |
| 5 | Predictive analytics for marketing strategies | Marketing Effectiveness |
| 6 | Utilizing IoT technology in marketing | Marketing Effectiveness |
| 7 | Omni-channel customer experience in logistics marketing | Marketing Effectiveness |
| 8 | AI-based personalization in supply chain marketing | Marketing Effectiveness |
| 9 | Leveraging blockchain for transparent marketing in transportation | Marketing Effectiveness |
| 10 | Future-oriented marketing in logistics | Marketing Effectiveness |
| 11 | Operational efficiency in digital campaigns | Marketing Effectiveness |
| 12 | Sustainability-driven marketing using digital tools | Marketing Effectiveness |
| 13 | Targeted social media campaigns | Marketing Effectiveness |
| 14 | Developing personalized marketing strategies based on customer data | Marketing Effectiveness |
| 15 | Consumer behavior analysis for targeted supply chain marketing | Marketing Effectiveness |

| | | |
|---|---|---|
| 16 | Market trend analysis for agile and lean response in transportation | Marketing Effectiveness |
| 17 | AI-powered segmented targeted advertising for logistics customers | Marketing Effectiveness |
| 18 | Brand sentiment analysis using technologies such as social networks | Marketing Effectiveness |
| 19 | Developing personalized service proposals for transportation services | Marketing Effectiveness |
| 20 | Improving customer experience using digital tools in logistics | Marketing Effectiveness |
| 21 | Agile response to market changes | Marketing Effectiveness |
| 22 | Increasing customer engagement through digital channels | Marketing Effectiveness |
| 23 | Actionable insights from data for marketing and supply chain | Marketing Effectiveness |
| 24 | Real-time monitoring and tracking for marketing optimization in transportation | Supply Chain Effectiveness |
| 25 | Real-time data collection for rapid demand response in transportation | Supply Chain Effectiveness |
| 26 | Inventory optimization based on digital marketing data | Supply Chain Effectiveness |
| 27 | Supply chain transparency for trust-building marketing activities | Supply Chain Effectiveness |
| 28 | Monitoring and measuring marketing campaign performance in logistics | Supply Chain Effectiveness |
| 29 | Reducing lead time using digital marketing tools | Supply Chain Effectiveness |
| 30 | Green logistics marketing based on digital data | Supply Chain Effectiveness |
| 31 | Ecosystem-oriented supply chain for sustainable marketing | Supply Chain Effectiveness |
| 32 | Rapid adjustment of transport routes or logistics services based on technology | Supply Chain Effectiveness |
| 33 | Outsourcing cargo tracking to specialized companies | Supply Chain Effectiveness |
| 34 | Digital communication with suppliers and partners | Supply Chain Effectiveness |
| 35 | Inventory updates | Supply Chain Effectiveness |
| 36 | Reduction of delivery time | Supply Chain Effectiveness |
| 37 | Route navigation applications | Supply Chain Effectiveness |
| 38 | Use of digital tools to accelerate processes | Supply Chain Effectiveness |
| 39 | Automated notifications | Supply Chain Effectiveness |
| 40 | Use of online platforms to coordinate with drivers and ports | Supply Chain Effectiveness |
| 41 | Use of digital systems for inventory management | Supply Chain Effectiveness |
| 42 | Rapid adjustment of transport routes or logistics services | Supply Chain Effectiveness |
| 43 | Collaborative digital platforms for supply chain marketing | Supply Chain Effectiveness |
| 44 | AI-based decision-making in transportation marketing | Supply Chain Effectiveness |
| 45 | Use of warehouse inventory applications | Supply Chain Effectiveness |
| 46 | Security measures for regulatory compliance | Supply Chain Effectiveness |
| 47 | Intense competition in the transportation sector | Supply Chain Effectiveness |
| 48 | Logistics complexities (traffic, sanctions) | Supply Chain Effectiveness |
| 49 | Content production on supply chain efficiency | Supply Chain Effectiveness |
| 50 | Use of interactive tools for continuous communication with supply chain members | Supply Chain Effectiveness |
| 51 | Monitoring and predicting social movements such as strikes to anticipate disruptions | Supply Chain Effectiveness |
| 52 | Updating transport regulations and disruptions to align operations with customers | Supply Chain Effectiveness |
| 53 | Leveraging big data for market agility | Agility |
| 54 | Integrated planning with digital marketing for agility | Agility |
| 55 | AI-based demand forecasting for marketing–logistics coordination | Agility |
| 56 | Demand forecasting using smart technologies in dynamic marketing | Agility |

| | | |
|---|---|---|
| 57 | Flexibility and adaptability | Agility |
| 58 | Proactive demand sensing | Agility |
| 59 | Collaborative strategies for information sharing among partners and stakeholders | Agility |
| 60 | Daily alerts for supply shortage risks | Agility |
| 61 | Customer loyalty in the transportation industry | Outcomes |
| 62 | Rapid response to risks and increased supply chain flexibility | Outcomes |
| 63 | Improved brand image and customer attraction | Outcomes |
| 64 | Optimization of marketing campaigns and information flow for faster responsiveness | Outcomes |
| 65 | Increased operational speed in transportation supply chain | Outcomes |
| 66 | Reduction of human intervention and increased efficiency in logistics | Outcomes |
| 67 | Informed real-time decision-making to adapt to changes | Outcomes |
| 68 | Reduction of errors and increased operational speed in transportation supply chain | Outcomes |
| 69 | Rapid response to market changes and customer needs in transportation | Outcomes |
| 70 | Increased transparency and collaboration in the supply chain | Outcomes |
| 71 | Use of direct platforms to build stronger links with customers and suppliers | Outcomes |
| 72 | Leveraging delivery software for real-time order updates | Outcomes |
| 73 | AI-based route planning | Outcomes |
| 74 | Leveraging GPS tracking options to reduce fuel consumption and delivery time | Outcomes |
| 75 | Reducing waste and minimizing carbon footprint through digital marketing campaigns | Outcomes |
| 76 | Tracking products from origin to delivery using digital technologies | Outcomes |
| 77 | Identifying disruptions and fluctuations to mitigate risks | Outcomes |
| 78 | Increasing customer trust through ethical and environmentally sustainable activities | Outcomes |
| 79 | Reducing storage and transportation costs | Outcomes |
| 80 | Increased trust and transparency | Outcomes |
| 81 | Real-time cargo tracking | Outcomes |
| 82 | Reduction of transaction costs | Outcomes |
| 83 | Improved product tracking | Outcomes |
| 84 | Improved inventory management and reduction of losses | Outcomes |
| 85 | Accelerated document management | Outcomes |
| 86 | Reduction of operational costs | Outcomes |
| 87 | Accelerated order processing | Outcomes |
| 88 | Optimization of delivery routes | Outcomes |
| 89 | Technological complexity in integrating digital marketing with the supply chain | Challenges |
| 90 | Privacy concerns in digital marketing within the supply chain | Challenges |
| 91 | Organizational resistance to adopting modern digital marketing tools | Challenges |
| 92 | Digital inequality and internet access | Challenges |
| 93 | Shortage of initial investment capital | Challenges |
| 94 | Shortage of specialists and skilled personnel | Challenges |
| 95 | Data security and cyberattacks | Challenges |
| 96 | Legal and governance barriers in technology integration with marketing and supply chain | Challenges |

Table 5: Axial and Selective Codes

| Selective Codes | Axial Codes | Related Codes |
|---|---|---|
| Digital Marketing | Flexibility and adaptability | Codes 1–23 |
| | Targeted and precise marketing | |
| | Proactive demand sensing | |
| | Digital and omni-channel customer experience | |
| | Stakeholder collaboration and integration | |
| Supply Chain Agility Requirements | Comprehensive supply chain visibility | Codes 24–60 |
| | Automation of operational and logistics processes | |
| | Real-time data sharing | |
| | Inventory management | |
| Outcomes | Improved responsiveness and adaptability to market changes | Codes 61–88 |
| | Increased operational efficiency | |
| | Improved brand image | |
| | Improved service personalization | |
| | Real-time cargo tracking | |
| | Improved inventory management | |
| Barriers and Challenges | Capital barriers | Codes 89–96 |
| | Human resource barriers | |
| | Legal and organizational barriers | |
| | Data security and cyberattacks | |

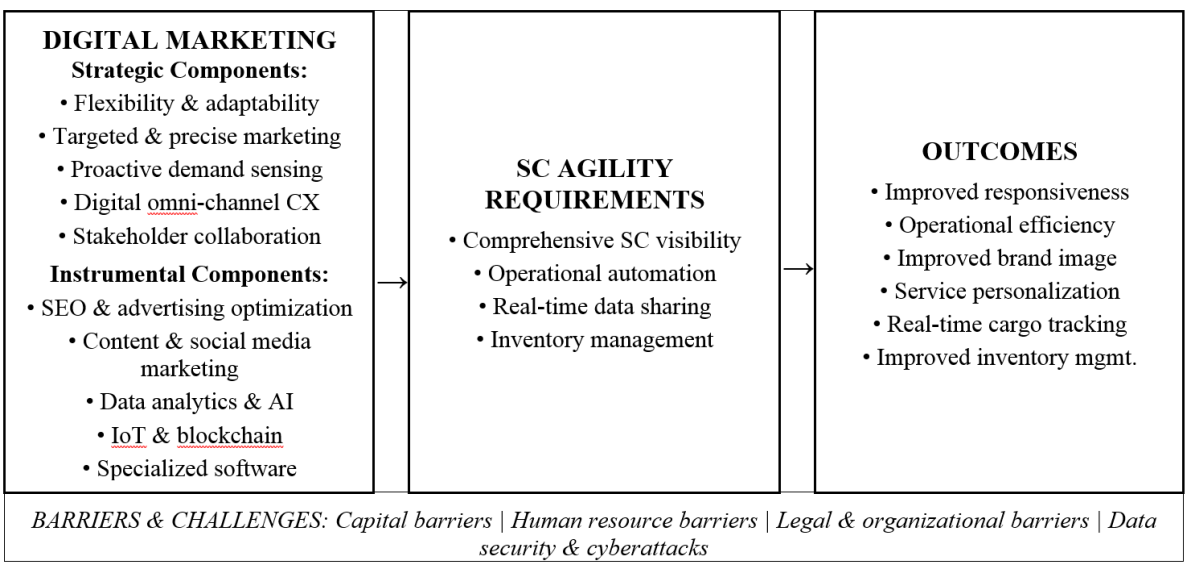


Figure 2: Conceptual Model of the Study

## RESULTS AND CONCLUSION

Iraq's prevailing challenges including political instability, weak logistics infrastructure, and lagging digitalization have historically focused academic research on industries such as textiles, oil, and agriculture. Consequently, specialized research on the role of digital marketing in supply chain agility within Iraq's transportation sector remains limited. The present findings nevertheless demonstrate that digital marketing, through the integration of technologies such as artificial intelligence, data mining, and social platforms, substantially enhances firms' capacity to respond rapidly to market changes, thereby contributing to greater sustainability and operational efficiency. In Iraq, where challenges such as inefficient transport infrastructure (including heavy reliance on road freight in the oil sector) persist, digital marketing can strengthen agility by optimizing logistics operations, reducing costs, and building customer trust. It can also mitigate negative effects such as the bullwhip effect in the supply chain, improve marketing innovation, enhance demand forecasting, enable real-time coordination, and reduce operational disruptions. Digital transformation in SMEs and the oil sector can act as a catalyst for agility in the broader transportation sector (logistics and freight). Digital marketing tools—including online advertising, electronic ordering, and digital market research—can increase operational speed, flexibility, and customer responsiveness. In Iraq's transportation sector, using digital marketing for monitoring transport systems (such as GPS-based tracking and online updates) reduces delivery times, operational costs, and geographic and security disruptions, while enabling companies to respond rapidly to seasonal demands, crises, and potential disruptions. Instagram and Facebook offer low-cost entry points for SMEs to build social presence and engage customers. Challenges such as weak internet infrastructure and the absence of standardized delivery addresses can be managed through digital strategies such as order tracking and cash-on-delivery options.

*Application of Emerging Technologies*

Artificial Intelligence for Demand Forecasting and Service Personalization: Companies can analyze website or social network user behavior data from digital marketing to forecast demand. In transportation, this enables optimization of delivery routes and prevention of cargo accumulation. Logistics companies can deploy machine learning algorithms to predict arrival times and adjust routes based on real-time traffic, reducing transport costs. As Toorajipour et al. (2021) demonstrate, AI not only improves supply chain process efficiency but also enables companies to respond more rapidly to market demand changes through more precise, real-time data analysis. Similarly, Sohrabpour et al. (2021) examined AI use for export sales forecasting—a critical dimension of global supply chain management.

*Internet of Things (IoT) for Real-Time Monitoring:* IoT smart sensors enable cargo tracking throughout the transport route, supporting digital marketing in providing personalized updates (via email or app). This accelerates agility through disruption management, such as delivery delays. In maritime transportation, sensors monitor cargo condition and reroute when problems arise. Installing IoT tags on vehicles and integrating them with marketing platforms such as HubSpot for automated customer notifications is recommended.

*Process Automation for Cost Reduction and Operational Speed:* Automation tools such as warehouse robots and cloud platforms accelerate order processing. In digital marketing, this corresponds to automated email campaigns for delivery status updates. In transportation, this approach reduces processing times and supports agility against sudden demand spikes. Integration of marketing systems with SCM software and automated information flow are recommended.

*Blockchain for Transparency and Trust Enhancement:*
Blockchain secures and transparentizes supply chain data, used in digital marketing to promote 'full traceability' of goods. In transportation, it reduces intermediaries and operational risks, enabling rapid response to changes. Ahluwalia et al. (2020) discuss blockchain's role in startup financing from a transaction cost economics perspective, demonstrating its capacity to reduce transaction costs and increase trust among supply chain parties. Rahmanzadeh et al. (2019) corroborate blockchain's role in product design and tactical supply chain planning, allowing companies to design products more efficiently and accelerate delivery to consumers.

*Big Data Analytics for Risk Management and Customer Segmentation:*Big data collected from digital campaigns—including purchase patterns and social data—enables risk prediction and management by adjusting inventory to market trends. In transportation, this prevents shortages and optimizes resources. Using data analytics tools integrated with targeted social media campaigns (LinkedIn, Instagram) to attract customers is recommended.

*Social Media Marketing and Targeted Advertising for Rapid Feedback:* Platforms such as Facebook and Instagram enable real-time customer feedback collection and operational adjustments enhancing agility through rapid route or service modifications. Launching campaigns on social media and using customer feedback to update supply chain strategies is recommended.

*Content Marketing for Transparency and Customer Education:* Creating content such as blogs or videos about transportation processes and sharing cargo tracking success stories builds trust and prepares customers for changes, strengthening agility by reducing complaints. Content production supported by digital tools, SEO-driven online visibility, and integration with tracking systems are recommended for companies.

*Barriers to Supply Chain Agility in Iraq*

*Digital divide:* Many regions of Iraq have limited internet access; mobile marketing represents the most accessible channel for data exchange.
*Shortage of initial investment:* Given investment constraints, starting with small-scale projects such as AI integration in one segment of the supply chain appears most appropriate.

*Skills deficit:* The shortage of specialized personnel requires training programs for marketing and operations teams on the use of digital tools within the supply chain.

*Data and cybersecurity:* Implementing secure protocols to protect information in Iraq's unstable environment is essential for building customer and partner trust.

## REFERENCES

*Ahluwalia, S., Mahto, R. V., & Guerrero, M. (2020). Blockchain technology and startup financing: A transaction cost economics perspective. Technological Forecasting and Social Change, 151, 119854. https://doi.org/10.1016/j.techfore.2019.119854*

*Beigi Firoozi, A., Bashokouh, M., Seifollahi, N., & Zarei, G. (2024). A systematic review with meta-analysis of supply chain agility antecedents and its effect on firm performance. Journal of Manufacturing Technology Management, 35(4), 894–917. https://doi.org/10.1108/JMTM-09-2022-0345*

*Beigi Firoozi, A., Bashokouh, M., Seifollahi, N., & Zarei, G. (2023). Supply chain agility as a strategic asset and its effect on financial performance with the moderating role of industry type: A meta-analysis study. Journal of Asset Management and Financing, 11(3), 47–68. https://doi.org/10.22108/amf.2023.135989.1737*

*Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research*

in Psychology, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Brindley, C., & Oxborrow, L. (2014). Aligning the sustainable supply chain to green marketing needs: A case study. Industrial Marketing Management, 43(1), 45–55. https://doi.org/10.1016/j.indmarman.2013.08.003

Charles, A., Lauras, M., & Van Wassenhove, L. (2010). A model to define and assess the agility of supply chains: Building on humanitarian experience. International Journal of Physical Distribution & Logistics Management, 40(8/9), 722–741. https://doi.org/10.1108/09600031011079274

De Toni, A., & Tonchia, S. (2005). Definitions and linkages between operational and strategic flexibilities. Omega, 33(6), 525–540. https://doi.org/10.1016/j.omega.2004.07.014

Flint, D. J., Lusch, R. F., & Vargo, S. L. (2014). The supply chain management of shopper marketing as viewed through a service ecosystem lens. International Journal of Physical Distribution & Logistics Management, 44(1/2), 23–38.

Garai, A., & Roy, T. K. (2020). Multi-objective optimization of cost-effective and customer-centric closed-loop supply chain management model in T-environment. Soft Computing, 24(1), 155–178. https://doi.org/10.1007/s00500-019-03887-5

Jiang, Z., Lamothe, J., & Benaben, F. (2017). A monitoring framework of collaborative supply chain for agility. IFAC-PapersOnLine, 50(1), 13072–13077. https://doi.org/10.1016/j.ifacol.2017.08.2032

Jüttner, U., Christopher, M., & Godsell, J. (2010). A strategic framework for integrating marketing and supply chain strategies. The International Journal of Logistics Management, 21(1), 104–126. https://doi.org/10.1108/09574091011042205

King, N., & Horrocks, C. (2010). Interviews in qualitative research. SAGE Publications.

Kozlenkova, I. V., Palmatier, R. W., Fang, E., Xiao, B., & Huang, M. (2017). Online relationship formation. Journal of Marketing, 81(3), 21–40. https://doi.org/10.1509/jm.15.0430

Lambert, D. M., & Cooper, M. C. (2000). Issues in supply chain management. Industrial Marketing Management, 29(1), 65–83. https://doi.org/10.1016/S0019-8501(99)00113-3

Mentzer, J. T., Stank, T. P., & Esper, T. L. (2008). Supply chain management and its relationship to logistics, marketing, production, and operations management. Journal of Business Logistics, 29(1), 31–46. https://doi.org/10.1002/j.2158-1592.2008.tb00067.x

Peter, O., & Mbohwa, C. (2018). The inter-link between sustainable supply chain management and technology development in industry. Proceedings of the International Conference on Industrial Engineering and Operations Management (Vol. 2018, pp. 425–430). IEOM Society.

Rahmanzadeh, S., Pishvaee, M. S., & Rasouli, M. R. (2019). Integrated innovative product design and supply chain tactical planning within a blockchain platform. International Journal of Production Research, 58(7), 2064–2083. https://doi.org/10.1080/00207543.2019.1651947

Reddy, R. P. (2025). Understanding cybersecurity risks in supply chain management. International Journal of Computer Trends and Technology, 73(6), 34–41. https://doi.org/10.14445/22312803/IJCTT-V73I6P106

Sharma, V., Raut, R. D., Mangla, S. K., Narkhede, B. E., Luthra, S., & Gokhale, R. (2021). A systematic literature reviews to integrate lean, agile, resilient, green and sustainable paradigms in the supply chain management. Business Strategy and the Environment, 30(2), 1191–1212. https://doi.org/10.1002/bse.2679

Sinha, R. K., Reddy, T., Ulle, R., & Kumar, V. N. (2023). Leveraging competitive advantage, financial gains and business performance through selective supply chain strategies in the steel industry in India. Korea Review of International Studies, 6(48), 4–12.

Sohrabpour, V., Oghazi, P., Toorajipour, R., & Nazarpour, A. (2021). Export sales forecasting using artificial intelligence. Technological Forecasting and Social Change, 163, 120480. https://doi.org/10.1016/j.techfore.2020.120480

Toorajipour, R., Sohrabpour, V., Nazarpour, A., Oghazi, P., & Fischl, M. (2021). Artificial intelligence in supply chain management: A systematic literature review. Journal of Business Research, 122, 502–517. https://doi.org/10.1016/j.jbusres.2020.09.009

Wang, B., Luo, W., Zhang, A., Tian, Z., & Li, Z. (2020).

*Blockchain-enabled circular supply chain management: A system architecture for fast fashion. Computers in Industry, 123, 103324. https://doi.org/10.1016/j.compind.2020.103324*

*Wang, M., Wang, B., Kim, N., Chan, R., Wang, M., & Shi, Y. (2024). Supply chain integration capability: A three-stage circular model of visibility, agility, and flexibility. Journal of General Management, 50(1), 78–89. https://doi.org/10.1177/03063070231155905*

*Wook Kim, S. (2006). Effects of supply chain management practices, integration and competition capability on performance. Supply Chain Management: An International Journal, 11(3), 241–248. https://doi.org/10.1108/13598540610662149*

*Yu, D., & Fang, A. (2023). The knowledge trajectory and structure of the supply chain integration: A main path and cluster analysis. Journal of Enterprise Information Management, 36(4), 1056–1079. https://doi.org/10.1108/JEIM-08-2021-0329*

*Zhang, S., Yu, Q., Wan, S., Cao, H., & Huang, Y. (2024). Digital supply chain: Literature review of seven related technologies. Manufacturing Review, 11, 8. https://doi.org/10.1051/mfreview/2024006*



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