

LOGISTICS IN MIDDLE EAST: STATE OF THE ART AND LOOKING AHEAD

**Maharshi Dhada¹, Abdelrahman E. E. Eltoukhy², Adriana Gabor³,
Andrei Sleptchenko³, Duncan McFarlane¹**

¹*Institute for Manufacturing, Department of Engineering, University of Cambridge, 17 Charles Babbage Road, Cambridge, UK*

²*Management Science & Engineering Department, Khalifa University, Abu Dhabi, UAE*

³*Khalifa University, Shakhbout Bin Sultan St - Hadbat Al Za'faranah - Zone 1 - Abu Dhabi - United Arab Emirates*

Abstract

Purpose: This paper aims to provide a comprehensive review of the current state of logistics in the Middle East, identifying key challenges and opportunities. It explores how advancements in technology and strategic initiatives can address existing inefficiencies and leverage the region, unique geographical advantages to enhance logistics operations.

Design/methodology/approach: A mixed-methods approach is employed, combining quantitative data analysis with qualitative insights from industry experts. The study analyses logistics performance indicators across Middle Eastern countries, examining parameters such as infrastructure quality, regulatory environment, and technological adoption via interviews and local analyses. Secondary data from industry reports and academic literature is also integrated to ensure a robust analysis.

Findings: The study finds that while the Middle East has made strides in improving logistics infrastructure, significant disparities exist between countries. Gulf Cooperation Council (GCC) states show higher logistics performance due to substantial investments in port and airport facilities. However, issues such as regulatory bottlenecks, lack of skilled workforce, and uneven technological adoption persist. The research highlights the potential of digital technologies to streamline operations and improve supply chain transparency, offering a roadmap for future developments.

Originality/ value: This paper provides valuable insights for policymakers, industry leaders, and researchers by presenting a detailed overview of the logistics landscape in the Middle East. It identifies critical areas for improvement and potential research avenues, emphasizing the need for collaborative efforts to foster innovation and efficiency in the sector. By outlining strategic recommendations and highlighting the role of emerging technologies, the study contributes to the discourse on sustainable logistics development in the region, ultimately supporting economic growth and regional integration.

Keywords: Logistics in Middle East, Shipping, literature review, digital logistics, global logistics, multimodal logistics

Introduction

The Middle East region comprises parts of Western Asia and North Africa. This region has historically played a crucial role in global trade, and includes countries like Saudi Arabia, the United Arab Emirates, Iran, Iraq, Israel, and Turkey, among others. Its position in the centre of Europe, Asia, and Africa makes it a strategic Logistics hub globally. Historically, the Middle East's central location connected the key trade routes like the Silk Road, facilitating the exchange of goods between Asia, Europe, and Africa. Cities like Babylon and Damascus were also the hubs for spices, textiles, and precious metals. The region's control of maritime routes, including the Red Sea and Persian Gulf, also made it important for global logistics and commerce (Acar et al., 2015; Shaw, 2002).

For the modern global logistics, the Middle East is significant due to its natural resources, particularly oil and natural gas, making it a vital energy hub. Countries such as Saudi Arabia and Iran are among the largest oil exporters, and the region's energy resources fuel industries around the world. Critical maritime trade routes like the Suez Canal and the Strait of Hormuz facilitate the movement of goods between Europe, Asia, and Africa. The region's airports and ports, such as Dubai's Jebel Ali Port, the Port of Salalah, and the Port of Jeddah, serve as major hubs for cargo transportation and air freight (Devlin & Yee, 2005).

While being key for global logistics, the Middle East also faces challenges in the Logistics sector, including geopolitical instability in certain regions, which potentially disrupt supply chains.

Infrastructure gaps in some countries hinder efficient transportation, despite advancements in others like the UAE. Heavy reliance on oil exports makes the region vulnerable to global energy market fluctuations. Regulatory barriers and inconsistent customs procedures across countries also complicate cross-border trade. Environmental factors, such as extreme temperatures and water scarcity, add further complexity, affecting transportation efficiency and the development of sustainable logistics solutions.

Drawing from the above, this paper presents a discussion around the state of Logistics sector in the Middle Eastern region, highlighting the key challenges, and the anticipation for the future of Logistics in Middle East. The following section is structured as follows: Section 2 discusses the current state of Logistics assets in some of the Middle East including the infrastructure, technological adoption, etc. Section 3 discusses the key challenges faced by the Middle Eastern Logistics sector. Section 4 presents the opportunities that lie for the Middle Eastern Logistics sector primarily thanks to its geographical advantages, finally followed by some strategic recommendations in Section 5.

Current State of Logistics in the Middle East

This section discuss the recent advancements and the state-of-the-art of the Middle Eastern Logistics.

Infrastructure and Development

In the recent years, countries like United Arab Emirates, Qatar, Saudi Arabia and Turkey have heavily invested in improving and expanding logistics infrastructure, aiming to become global logistics hubs (Harmon, 2024; Rebello, 2024). Jebel Ali Port in Dubai and King Abdullah Port in Saudi Arabia have been expanded, automated, and upgraded with state-of-the-art digital tracking technologies to be able to handle the latest generation container ships and improve cargo throughput (Harmon, 2024). Major airports in Qatar (Hamad International Airport), UAE (in Dubai) and Turkey have expanded their cargo facilities and introduced advanced logistics technologies to boost airfreight transportation (Rebello, 2024).

Besides developing the ports and airports infrastructure, the region aims to build a multi-modal transportation network for a more agile transportation of cargo. The Gulf Railway, connecting six GCC countries, is expected to boost intra-GCC trade and facilitate transportation to and from major logistics hubs in the region. At the national level, UAE builds Etihad Railways, linking important industrial and urban centers with maritime hubs (Harmon, 2024). Turkey is also investing in high-speed railway lines, expecting its cargo transport to increase from 5.08% in 2023 to 21.93% in 2053.

In order to support the logistics operations, several sustainable logistics parks, containing state-of-the-art warehousing and distribution centers have been established in the region (Agility, 2024). A few examples of such parks are Hamad Port Free Zone (Qatar), Jebel Ali Free Zone (UAE), Khalifa Industrial Zone Abu Dhabi (UAE), King Abdullah Economic City (Saudi Arabia). These parks play an important role in streamlining transportation and connectivity across the region, ensuring smooth supply chain operations, green transportation, efficient custom procedures and an improved trade environment.

Technological Adoption

Currently, various digital technologies, including the Internet of Things (IoT), blockchain, Industry 4.0, and artificial intelligence (AI), are increasingly applied to logistics to enhance efficiency, transparency, and sustainability. (Balfaqih et al., 2023) presented a blockchain-enabled IoT logistics system designed for GCC countries to enhance the tracking and management of high-value shipments in smart cities. This system addresses challenges such as transparency and growing logistics volumes by integrating smart contracts for automatic approval and payment, alongside intelligent parcels (iParcels) equipped with sensors for violation detection. (Bleik, 2024) further examined factors influencing blockchain implementation in UAE logistics, highlighting critical aspects such as security, privacy, and technology infrastructure. The study found a strong correlation between blockchain adoption and awareness of the IT infrastructure, emphasizing the importance of data security for effective decision making.

(Alsharidah & Alazzawi, 2020) explored the role of digital technologies, particularly artificial intelligence and digital transformation, in enhancing supply chain management in Saudi Arabia. Their findings emphasize the positive impacts on efficiency, quality, flexibility, and productivity, highlighting the importance of these technologies for achieving sustainable economic growth in line with Saudi Arabia's Vision 2030 initiative. (Khan, 2019) identified eight major challenges associated with big data analytics (BDA) in UAE service supply chains, including technical, cultural, ethical, and operational issues, and proposed a comprehensive framework for effective integration of BDA. (Rahman et al., 2022) focused on the implementation of Industry 4.0 practices in the GCC logistics sector, noting that adoption remains in its early stages and requires further investment. (Albreem et al., 2023) explored green IoT (GloT) practices in GCC countries to mitigate environmental impacts, evaluating renewable energy opportunities and AI integration to reduce carbon emissions and e-waste. Their research positions GloT implementation as a key strategy for GCC nations to diversify their economies and promote environmental sustainability. Collectively, these studies highlight the critical role of digital transformation in optimizing logistics and promoting sustainable economic growth in the GCC.

Regulatory Environment

The logistics sector in the Middle East encounters substantial regulatory challenges, particularly in non-GCC countries, where bureaucratic hurdles and inconsistent regulations remain significant obstacles to efficient operations. Despite recent efforts to streamline processes, these bureaucratic complexities continue to slow down the movement of goods, create operational inefficiencies, and elevate costs for businesses involved in cross-border trade. Inconsistent regulations across different countries further exacerbate these issues, leading to delays and unpredictable compliance requirements that can disrupt supply chains. Moreover, restrictive trade policies in certain countries within the region add an additional layer of complexity, making it difficult for businesses to navigate the regulatory landscape and increasing the overall burden on logistics providers. These challenges underscore the urgent need for greater regulatory harmonization, streamlined customs procedures, and more open trade policies to enhance the efficiency and competitiveness of logistics operations across the Middle East (Obrecht et al., 2022)

Human Capital and Workforce

The logistics workforce in the Middle East heavily depends on expatriate talent, especially in the GCC countries, where rapid sector growth and technological advancements have outstripped the development of local expertise. Although expatriates bring important skills and experience, this reliance challenge workforce stability, with frequent disruptions due to high turnover rates and visa issues. Additionally, there is a noticeable shortage of skilled professionals in the sector, particularly in areas like supply chain management and technology-driven logistics roles. As the logistics industry more widely adopts advanced technologies such as AI, IoT, and data analytics, the gap in specialized skills becomes more evident, hindering the sector's ability to fully leverage these innovations (Benayoune, 2018; Koyuncu, 2023).

To address these challenges, both governments and private sector companies in the Middle East are ramping up investments in training and development initiatives. This includes the establishment of industry-specific training programs in collaboration with educational institutions and industry associations, focusing on logistics and supply chain management. Additionally, there is a pressing need for technological training programs that equip the workforce with digital skills necessary for modern logistics operations. As GCC countries implement localization policies like Saudization, which aim to reduce reliance on expatriate labour, these training efforts are crucial for building a skilled local workforce capable of sustaining the sector's growth and meeting the demands of a rapidly evolving logistics landscape. Continuous professional development programs are also essential, allowing existing workers to stay updated with the latest industry trends and technological advancements (Adair et al., 2024; Li & Miller-Hooks, 2023; Rosi & Obrecht, 2023).

Challenges and Gaps in the Middle Eastern Logistics Sector

This section discusses the key challenges faced by the Middle Eastern Logistics sector, primarily including infrastructure disparities, regulatory issues, technological gaps, and a shortage of skilled labour. These issues collectively hinder the full potential and development of an integrated logistics network across the region.

Infrastructure Disparities

A prominent challenge in the Middle East logistics sector is the disparity in infrastructure development across countries. The Gulf Cooperation Council (GCC) states, particularly the United Arab Emirates (UAE), Saudi Arabia, and Qatar, have made substantial investments in logistics infrastructure. As discussed earlier, Dubai's Jebel Ali Port and Khalifa Port in Abu Dhabi are among the largest and technologically advanced ports globally, and state-of-the-art airports like Dubai International and Hamad International Airport in Qatar which serve as air cargo hubs. These countries have prioritized the development of roads, railways, and digital logistics solutions, positioning themselves as leading global logistics centers.

In contrast, several Middle Eastern countries face infrastructure challenges often due to the geopolitical tensions. There have been instances of prolonged conflicts leading to relatively underdeveloped logistics infrastructure. Disconnected road networks, outdated ports, and the absence of rail systems in the regions of conflicts contribute to the inefficiencies in transportation and trade.

This infrastructure gap exacerbates regional inequality and increases logistics costs, hindering economic integration across the Middle East.

Regulatory Issues

Regulatory issues present another major obstacle to the integrated logistics sector in the Middle East. For example, the non-GCC countries face complex and fragmented regulatory frameworks that complicate cross-border trade. Customs regulations, tariffs, and trade policies vary significantly from one country to another, creating delays and increasing operational costs for logistics companies (Obrecht et al., 2022).

There exists an especially visible regulatory disconnect between the countries within and outside the GCC, such as Jordan, Lebanon, and Iraq, leading to additional bureaucratic inefficiencies. Inconsistent import-export regulations, labour laws, and safety standards hinder the free movement of goods across borders and reduce the overall competitiveness of logistics operations. Regulatory inefficiencies not only affect logistics within countries but also disrupt regional supply chains, undermining the Middle East's potential to facilitate global trade efficiently (Obrecht et al., 2022).

Technological Adoption

Technological adoption in the logistics sector is uneven across the Middle East. The UAE and Saudi Arabia are at the forefront of adopting these technologies, investing in smart ports, digital customs processes, and automated warehouses to improve logistics operations. This has been discussed in detail Section 2.

However, many countries in the region have not kept pace with technological advancements. Limited financial resources, outdated infrastructure, and insufficient government incentives hinder the adoption of advanced logistics technologies. The lack of digitization in some countries leads to inefficiencies in inventory management, cargo tracking, and customs processing. The absence of integrated technological systems across the region further hampers the potential to form a seamless logistics network, resulting in operational delays and higher costs.

Workforce Training Needs

The logistics sector in the Middle East faces a particular shortage of skilled labour, relatively more in the non-GCC countries. Although the region has seen significant growth in logistics infrastructure, there has been insufficient emphasis on workforce development to support this growth. The shortage of specialized training programs in logistics, supply chain management, and related fields contributes to a skills gap, particularly in countries with underdeveloped education and training systems.

Most Middle Eastern countries rely heavily on expatriate labour to fill roles in logistics, particularly in highly technical and managerial positions. However, this reliance creates long-term challenges, as expatriates often do not remain in the region for extended periods, leading to a continuous turnover of

staff. Furthermore, there are limited opportunities for local talent to acquire the necessary skills through formal education or vocational training programs. This gap in training and education limits the capacity of the Middle Eastern logistics sector to adopt advanced technologies and practices in supply chain management. The shortage of a skilled workforce also reduces the region's ability to remain competitive in the global logistics industry.

Opportunities for Future Research and Development

There is a rising need for developments in the corresponding areas of infrastructure optimisation, technological integration, regulatory harmonization, and workforce development in the Middle East, as it is evident from Section 3. The Middle East logistics sector as such presents a range of opportunities for the Logistics research and development (R&D), more so by bringing together the industry and academia collaborations.

Infrastructure Development and Optimisation

The most prominent opportunity lies in mitigating the infrastructure disparities that exist across the Middle East. It must be explored how public-private partnerships (PPPs) and government-led initiatives can enhance logistics infrastructure, especially in underdeveloped regions. War-torn countries such as Iraq, Syria, and Yemen require reconstruction efforts that integrate modern logistical needs, and R&D could explore innovative approaches to rebuilding transportation networks, including roads, railways, and seaports.

Furthermore, there is potential for development of multi-modal logistics networks that combine road, rail, air, and maritime transport. Investigation of models for cross-border collaboration and supply chain integration, focusing on optimizing the use of existing logistics hubs, such as Dubai's Jebel Ali Port and Khalifa Port, must be deployed to facilitate seamless movement of goods across the region. Analysing the effectiveness of these hubs in serving both regional and global trade could help inform strategies for greater regional integration.

Technological Innovation and Digitalisation

As logistics moves increasingly toward digital transformation, there is significant potential for the adoption of advanced technologies in the Middle East. Areas of focus include blockchain for enhanced supply chain transparency, the Internet of Things (IoT) for real-time cargo tracking, and artificial intelligence (AI) for predictive analytics and demand forecasting. These technologies have already seen success in developed economies, but their tailored application to the unique challenges of Middle Eastern logistics is yet to be explored.

Countries with underdeveloped logistics sectors, provide fertile ground for research into low-cost, scalable Shoestring digital solutions. Future studies could explore the deployment of affordable technological innovations for improve inventory management, streamline customs processes, and increase efficiency in logistics operations. Such low-cost solutions have already been deployed in various applications for the small and medium scale enterprises in several other countries (Dhada et al., 2023; Macias-Aguayo et al., 2022; Yilmaz et al., 2022) Additionally, the potential use of AI for optimizing freight routing, predictive maintenance of vehicles, and minimizing fuel consumption offers valuable areas for exploration.

Regulatory Harmonisation

Regulatory harmonisation across the Middle East is instrumental in resolving cross-border trade inefficiencies. Inconsistent customs procedures, tariffs, and trade policies among countries create barriers to the free movement of goods, necessitating further research into standardization and best practices. Focus must now be on comparing successful models of regulatory harmonization from other regions, such as the European Union's single market, and how such frameworks could be adapted to the Middle East context.

E-government systems and digital customs platforms present additional opportunities for R&D. Research could examine how digitizing customs procedures might reduce bureaucratic delays and streamline trade across borders. The development of a regional trade corridor through harmonized

regulations and digital systems could significantly enhance the Middle East's role as a global logistics hub.

Sustainable and Resilient Logistics

The integration of sustainability practices into logistics operations is probably the most important and prominent emerging global trend, with significant research potential. As the Middle East moves towards more sustainable economic practices, the logistics sector could benefit from reducing the environmental impact of freight transport. This could be done by adopting electric and hydrogen-powered vehicles for freight transportation, as well as methods for reducing carbon emissions in air cargo, which remains one of the most polluting sectors of logistics (Rosi and Obrecht, 2023b; Obrecht et al., 2022).

The Middle East's abundance of solar energy resources presents another area for exploration. R&D could focus on utilizing solar power in logistics operations, particularly in warehouses, ports, and transportation hubs. Further research could also examine how reverse logistics and sustainable packaging could be applied on a large scale, contributing to both environmental goals and operational efficiency (Rosi and Obrecht, 2023b; Obrecht et al., 2022).

Parallel to the notion of sustainability, there is also a rising need to make the Middle Eastern Logistics more resilient to geopolitical shifts and disruptions in the global supply chains. This involves investigating risk mitigation strategies by analysing the external factors, and at the same time deploying resilient strategies such as decentralized supply chains, flexible sourcing, and adaptive logistics operations that reduce dependency on a single mode of transport or supply route (Sundarakani & Onyia, 2021).

These opportunities align with broader global efforts to integrate sustainability into logistics, offering a framework for environmentally friendly and socially responsible logistics operations.

Workforce Development and Training

Workforce development represents a critical gap in the Middle East logistics sector, providing ample opportunities for research into education and training solutions. This combined with the growing pressure for localisation in certain countries amplifies the need for revamping the workforce training and motivation.

Many countries in the region rely heavily on expatriate labour for technical and managerial roles in logistics, highlighting the need for research into creating specialized training programs that can develop a local workforce capable of supporting the logistics industry's growth. Vocational training programs in collaboration with academic institutions and industry partners to bridge the skills gap must be organised. Additionally, there is a need for studies exploring the most effective ways to upskill the existing workforce in logistics technologies, including AI, blockchain, and IoT. Research into gender diversity and inclusivity in logistics could also inform policies aimed at increasing female participation in the workforce, helping to strengthen the sector by broadening its talent pool.

Strategic Recommendations and Conclusions

This section summarises the discussion in this paper. In Section 2 we see that the Middle East region, which has historically been pivotal for the global trade and logistics, continues to see unprecedented growth in the recent decade. Nonetheless, like with any other vast and diverse region, the Middle East still faces challenges which if address would unleash the maximum potential of an efficient and integrated logistics network. The key challenges faced by the Middle East Logistics sector, their impacts, and the opportunities that exist to mitigate those challenges are summarised in Table 1.

Table 1. Challenges, Impacts, and Strategic Recommendations for Middle Eastern Logistics

Challenge	Impact	Strategic recommendation
Infrastructure disparities across the Middle East, some countries investing and observing the rapid infrastructure growth while a few suffer from geopolitical conflicts	Hinders the connectivity in the region, leads to increased transportation costs, makes the logistics system less sustainable	Exploration into public private partnerships to close the gap between government focus and the on-ground reality. Research into post-disaster logistics, inclusion of the SMEs into the logistics infrastructure planning
Non-uniform regulatory laws, especially across the GCC and non-GCC countries	Hinders the logistics integration across the region, leads to increased operations costs, prevents the development of decentralised logistics networks	Thorough cost-effect analyses to facilitate free trade within the region, especially studying the impact through other global examples such as of the European Union and deploying pilot programmes for the short term
Technological gaps, where again we observe significant disparities in the technological adoption across the Middle East	Hinders the overall visibility of the logistics networks, increases the logistics network efficiency, could prevent the seamless integration with global logistics	In the short term, conduct systematic workshops with the SMEs to understand the prominent needs of the industry. Deploy pilots using low-cost technologies
The need for skilled workforce and updated training programmes in certain regions	Increases the reliance on expatriate labour, creates logistics network inefficiencies, hinders integrated logistics networks	Focus on talent retention, although expatriate, and enhance the collaboration between the experts and the trainee labour. Exhaustive training programmes in collaboration with global institutions

Acknowledgements

This research was sponsored by the SF Express Research Fellowship in Logistics.

References

- Acar, A. Z., Bentlyn, Z., & Kocaoglu, B. (2015). Turkey as a regional logistic hub in promotion of reviving ancient Silk Route between Europe and Asia. *Journal of Management Marketing and Logistics*, 2(2).
- Adair, P., AlAzzawi, S., & Hlasny, V. (2024). Fostering decent jobs, formalising informal employment and spurring job mobility in MENA countries. *Economic Notes*, 53(2). <https://doi.org/10.1111/ecno.12240>
- Agility. (2024). *Sustainable Logistics Parks in the Middle East/GCC*. <https://www.agility.com/en/blog/sustainable-logistics-parks-in-the-middle-east-gcc/>
- Albreem, M. A., Sheikh, A. M., Bashir, M. J. K., & El-Saleh, A. A. (2023). Towards green Internet of Things (IoT) for a sustainable future in Gulf Cooperation Council countries: Current practices, challenges and future prospective. *Wireless Networks*, 29(2), 539–567.
- Alsharidah, Y. M. Y., & Alazzawi, A. (2020). Artificial intelligence and digital transformation in supply chain management a case study in Saudi companies. *2020 International Conference on Data Analytics for Business and Industry: Way towards a Sustainable Economy (ICDABI)*, 1–6.
- Balfaqih, M., Balfagih, Z., Lytras, M. D., Alfawaz, K. M., Alshdadi, A. A., & Alsolami, E. (2023). A Blockchain-Enabled IoT Logistics System for Efficient Tracking and Management of High-Price Shipments: A Resilient, Scalable and Sustainable Approach to Smart Cities. *Sustainability*, 15(18), 13971.

- Benayoune, A. (2018). Towards effective human capital development for the logistics industry. *International Journal of Trade, Economics and Finance*, 9(4), 153–158.
- Bleik, M. (2024). Factors that impact the implementation of blockchain in logistics in the United Arab Emirates. *African Journal of Science, Technology, Innovation and Development*, 16(3), 355–369.
- Devlin, J., & Yee, P. (2005). Trade logistics in developing countries: The case of the Middle East and North Africa. *World Economy*, 28(3), 435–456.
- Dhada, M., Macias-Aguayo, J., Mukherjee, A., & McFarlane, D. (2023). *Low-cost very narrow aisle pallet racking vehicle utilisation monitoring solution*.
- Harmon, R. (2024). *The Middle East's plan for a logistical future*. <https://www.logisticsmiddleeast.com/logistics/middle-east-logistics-strategy>
- Khan, M. (2019). Challenges with big data analytics in service supply chains in the UAE. *Management Decision*, 57(8), 2124–2147.
- Koyuncu, R. N. (2023). *Labour in Logisitcs: The Case of Intracity Transportation Workers in Türkl.iye*. Middle East Technical University.
- Li, W., & Miller-Hooks, E. (2023). Understanding the implications of port-related workforce shortages on global maritime performance through the study of a carrier alliance. *Maritime Economics and Logistics*, 25(3), 452 – 478. <https://doi.org/10.1057/s41278-023-00263-z>
- Macias-Aguayo, J., McFarlane, D., Schönfuß, B., & Salter, L. (2022). A catalogue of digital solution areas for logistics SMEs. *IFAC-PapersOnLine*, 55(10), 1828–1833.
- Obrecht, M., Feodorova, Z., & Rosi, M. (2022). Insights Into Logistics And Supply Chain Studies In Middle East. *International Maritime Transport and Logistics Conference*, 11(1), 159 – 164. <https://doi.org/10.21622/MARLOG.2022.11.159>
- Rahman, N. S. F. A., Hamid, A. A., Lirn, T.-C., Al Kalbani, K., & Sahin, B. (2022). The adoption of industry 4.0 practices by the logistics industry: A systematic review of the gulf region. *Cleaner Logistics and Supply Chain*, 5, 100085.
- Rebello, L. A. (2024). *Make way for the Middle East: UAE, KSA's ambitious drive to become global integrated logistics hubs*. <https://www.maersk.com/insights/integrated-logistics/2024/04/17/make-way-for-the-middle-east>
- Rosi, M., & Obrecht, M. (2023). Sustainability Topics Integration in Supply Chain and Logistics Higher Education: Where Is the Middle East? *Sustainability (Switzerland)*, 15(8). <https://doi.org/10.3390/su15086955>
- Shaw, I. (2002). Exploiting the desert frontier: the logistics and politics of ancient Egyptian mining expeditions. In *Social approaches to an industrial past* (pp. 258–274). Routledge.
- Sundarakani, B., & Onyia, O. P. (2021). Fast, furious and focused approach to Covid-19 response: an examination of the financial and business resilience of the UAE logistics industry. *Journal of Financial Services Marketing*, 26(4), 237.
- Yilmaz, G., Mukherjee, A., Aguayo, J. M., & McFarlane, D. (2022). Impact Assessment Model for Low Cost (Shoestring) Digitalisation in Small Construction Organizations. *IOP Conference Series: Earth and Environmental Science*, 1101(9), 92043.