



THE ROLE OF DIGITALIZATION IN TRANSFORMING TRADITIONAL LOGISTICS OPERATIONS IN THE E- COMMERCE SECTOR IN THE UAE

E-commerce has become a significant component of the worldwide economy, re-defining business in the UAE. UAE is among the rapidly expanding markets in the region.

Some of the most effective solutions are found within digitalisation. It converts logistics into smarter, efficient, and quicker operations. Such technologies as AI, IoT, blockchain, and automation enhance prediction, tracking, transparency, and errors minimisation.

The digital shift was accelerated by COVID-19. Logistics has become a source of customer satisfaction. The speed and flexibility of traditional logistics are not very good which lead to delays.

UAE e-commerce is estimated to grow to \$8 billion in 2024. Smarter logistics can increase the visibility and decision-making.

RESEARCH BACKGROUND & MOTIVATION



RESEARCH RATIONALE

- Competitive e-commerce logistics require digitalisation.
- Clients demand quicker and transparent deliveries
- Conventional systems lead to higher expenses and lower ability to keep customers .
- Firms encounter financial, technical and operational obstacles.
- Limited current studies examining this issue on an operational and strategic basis.



PROBLEM STATEMENT

- Digitalisation is expensive to implement (Karthik and Rathore, 2021).
- Incompatible legacy systems disable smooth integration.
- There is an issue of employee skill shortage and resistance.
- The logistics businesses are pressured with high market costs.
- The UAE companies find it difficult to balance between innovation and practical limits



RESEARCH AIM, OBJECTIVES AND QUESTION

AIMS AND OBJECTIVES

The study proposes to investigate the role of digitalisation in reshaping traditional logistics processes within UAE e-commerce business.

Objectives

- To identify key digital technologies adopted in UAE e-commerce logistics.
- To determine the effects of digitalisation on logistics responsiveness and efficiency.
- To assess the difficulties and obstacles encountered by e-commerce companies in the UAE when deploying digital logistics solutions.
- To investigate the customer service and strategic advantages made possible by digital transformation in logistics.

QUESTION

What is the impact of digitalisation on the performance and efficiency of logistics functions in the UAE?



Theoretical framework

Enabling real-time data, end-to-end visibility and predictive analytics (Zafarzadeh et al., 2021)

Digitisation integrates artificial intelligence, the Internet of Things, cloud services and logistics automation (Bigliardi et al., 2022).



TAM describes technology acceptance based on ease of use and usefulness.

RBV focuses on digital capabilities as sources of competitive advantage.

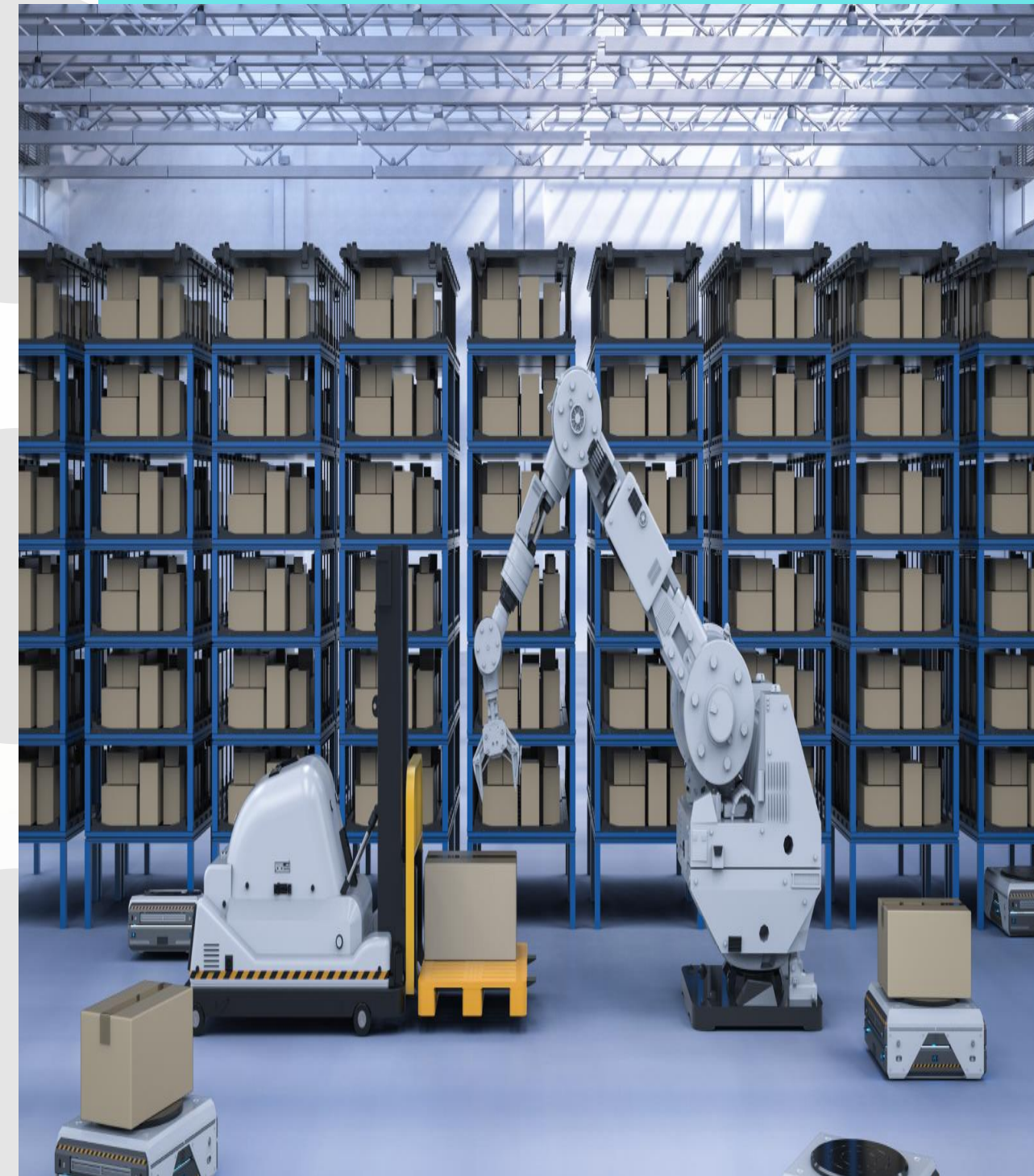
PRIMARY TECHNOLOGIES ADOPTED IN E-COMMERCE LOGISTICS



- AI is more effective in demand forecasting, sorting efficiency and route optimisation (Aliyev, et al., 2024).
- ML uses big customer data to make behavioural predictions and improve decision making.
- Blockchain enhances security and traceability of transactions and transparency.
- Robotics make repetitive jobs faster ,minimise mistakes and lowers labour expenses.
- Integrated Industry 4.0 technologies improves warehouse and customer experience in general.

IMPACT OF DIGITALISATION ON LOGISTICS OPERATIONS IN THE UAE

- Allows visibility of shipments in real-time and faster customs processes
- Improves forecasting, route planning and delivery efficiency .
- Automation enhances accuracy and minimizes operation errors.
- IoT and cloud systems and AI increase responsiveness and flexibility.
- Security threats, information silos, are among the most critical barriers (Yerra, 2024).



CHALLENGES IN DIGITAL LOGISTICS SOLUTIONS



- The use of such technologies as AI and automation is difficult with the use of old systems that persist in use (Mikl, et al., 2020).
- It demands high investment in infrastructure, software and skilled labour making it unattainable by SMEs.
- Risks to cybersecurity are increasing because more information is shared on online platforms (Gunasekara, 2023).
- The issue of skill gaps and resistance to new technology slows down digital transformation.

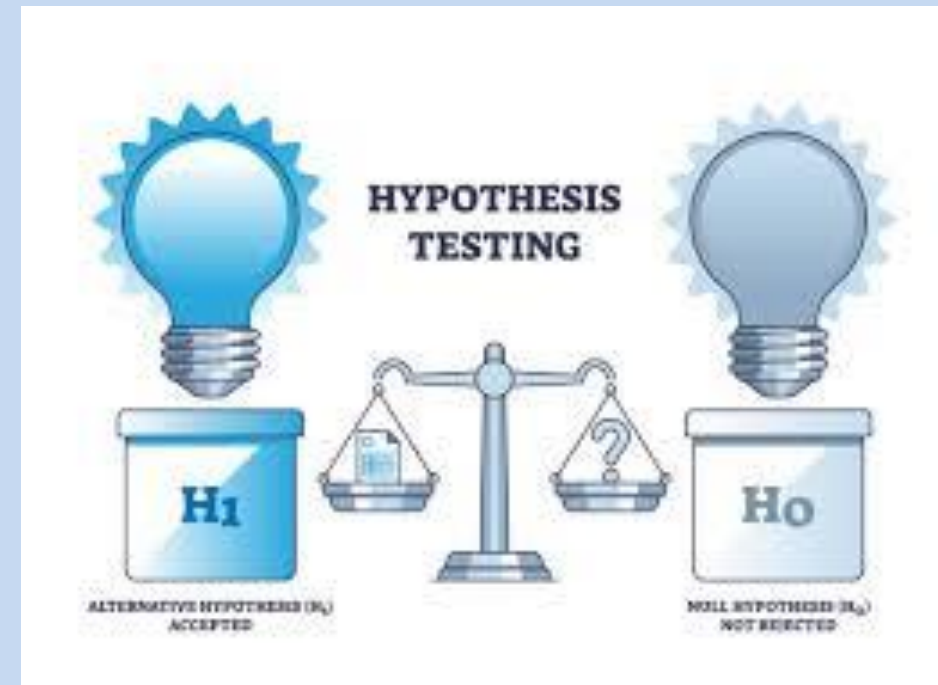
BENEFITS DIGITAL LOGISTICS SOLUTIONS

- Digital tools enhance the productivity and enable quicker and data-based decisions
- Companies get more transparent and flexible and this improves supply chain performance.
- AI and automation offer faster, personalised customer service and waiting time (Mvubu, et al., 2024).
- CRM and integrated systems boost customer satisfaction and long term loyalty.



RESEARCH HYPOTHESIS

H1: There is a strong effect of digitalisation on the performance of logistics operations in e-commerce companies based in the UAE.



H3: Customer satisfaction within e-commerce logistics services in the UAE is affected by the digitalisation in logistics operations.

H2: Responsiveness of supply chains in the UAE's e-commerce sector is affected by digitalisation in logistics operations.



RESEARCH METHODOLOGY

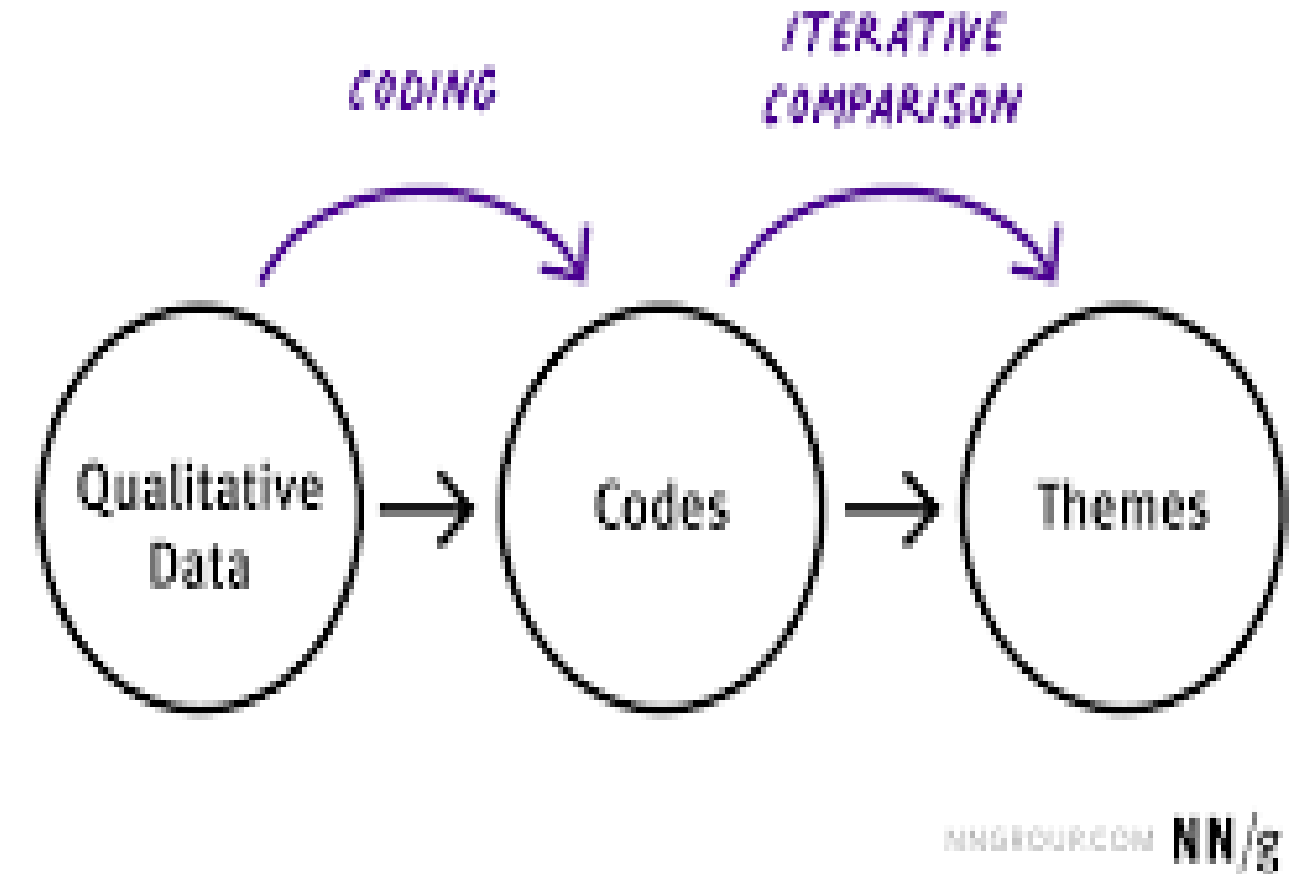
- The research utilized both primary and secondary data in a qualitative format, which ensured rich and varied information on the topic of digitalization in UAE e-commerce logistics.
- The primary data was gathered by semi-structured interviews with 5 industry professionals
- Secondary data was obtained through trusted academic databases such as Google Scholar, Scopus, Sage, ScienceDirect, and e-commerce industry association reports.
- The systematic keyword-based search strategy has been done through the use of terms such as digitalisation in e-commerce logistics, digital supply chain UAE and logistics technology adoption.
- Search results were refined with the help of Boolean operators (AND, OR) and filters to ensure relevance, accuracy, and alignment to research objectives.



CONTINUED

- Peer-reviewed journals, industry reports, and reliable sources of information on the news were only considered to provide accuracy
- Purposive sampling was done to sample participants who have relevant expertise
- Interview and secondary data were analysed using thematic analysis as suggested by Braun and Clarke (Byrne, 2022)
- The research design is cross-sectional which examines data at one point.
- Systematic data collection and consistent procedures were used to ensure reliability

Thematic Analysis





RESEARCH ETHICS

- commitment to ethical guidelines ensuring trustworthiness and responsibility
- Informed consent obtained from all participants.
- Participant anonymity protected using pseudonyms.
- Use of credible, peer-reviewed and verified information sources.
- Accurate understanding of data while using proper citations and references

Results

THEMATIC ANALYSIS

Theme 1 – UAE e-commerce organizations are gradually implementing advanced digital technologies to enhance traditional logistics accuracy, transparency, and decision-making

- Artificial intelligence, automation, the Internet of Things, real-time tracking, and cloud platforms are changing the traditional course of logistics.
- Literature and interview results indicate that AI is effective at enhancing forecasting and delivery planning, warehouse processes are accelerated through automation.
- They also show that real-time tracking increases shipment visibility and customer communication.
- Interview participants confirmed that tools like barcode scanning, WMS, and smart sensors reduced errors and improved decision-making.
- these technologies have upgraded logistics operations in the UAE by increasing efficiency, accuracy, and visibility”

Theme 2 – Digitalisation significantly speeds up logistics processes while enhancing accuracy and reducing chances of human error

- Digitalisation enhances logistics by minimizing manual activities and increasing processing of orders and dispatches.
- Automation, WMS, cloud platforms and real-time tracking greatly increase the efficiency of the workflow and minimize delays in operations.
- The respondents affirmed significant processing time gains or processing tasks that previously took hours now took minutes.
- Accuracy and reduction of human error are enhanced by digital technologies like barcode reading, GPS tracker, AI and IoT sensor.
- The interview findings are in line with the literature that integrated digital solutions enhance the security of physical activities and enhancement of data accuracy in e-commerce logistics in UAE.

Theme 3: Digital logistics solutions highly improve customer satisfaction by offering faster communication, better transparency, and personalised services

- Digitalisation enhances transparency degree too as well as real time visibility, which gives customer confidence and declines uncertainties.
- CRM systems and chatbots allow customers to have real-time updates and track shipments and faster communication.
- Quick response and customised services are very effective to enhance the quality of services and customer satisfaction.
- Experimental evidence on interviews also verifies that digital tools build trust and responsiveness within the UAE e-commerce logistics.

Theme 4 – Despite the benefits, companies still face barriers, including resistance to change, issues in integration, skill gaps, and cybersecurity challenges

- Companies encounter change resistance and high skills gaps as workers find it difficult to modify towards new digital systems.
- The concept of integrating AI, IoT and cloud solutions with the current systems is complex, expensive and disruptive.
- The risks associated with cybersecurity are rising as more logistics networks are digitally connected and data shared.
- The results of the interview indicate that system compatibility and security vulnerabilities are some of the greatest constraints to digital transformation in the UAE e-commerce logistics.

Theme 5: Training , leadership and Strategic Alignment allow Successful Digital Transformation

- Effective digital transformation would be clearly based on strong leadership support and positive change management culture.
- Reskilling and constant training allows the employees to adjust to the new tools and diminish resistance.
- Technologies must be strategically aligned to fit organisational requirements and work well with exsisting systems
- The information gained during the interview highlights the importance of being ready to adapt to new ways, leadership support, and collaboration with technology specialists.

Research Contribution

- Offers UAE-specific information concerning the digital transformation of e-commerce logistics processes.
- Aligns technology effectiveness, customer service and strategic decision making in logistics digitalisation.
- Describes the key obstacle to adoption including skills shortages, integration challenges and cost constraints.
- Offers practical recommendations that can be implemented by managers to deliver sustainable and customer-oriented digital logistics.
- Extends existing logistics digitalisation theories by integrating technology, operations, and customer experience

Conclusion

- Logistics in the UAE is highly integrated with digital technologies, including AI automation IoT blockchain and cloud systems.
- Digitalisation enhances operational efficiency, accuracy ,speed and responsiveness across e-commerce logistics operations.
- The cost of investment, skills gaps, system integration problems, and resistance are obstacles to digital adoption.
- Digital transformation increases customer satisfaction service, reliability flexibility and long term competitive advantage.

Recommendations

- Adopt digital change management programs to minimise resistance
- Teach employees new skills by training and certifying continuously
- Improve integration between systems to match technologies with the current infrastructure
- Enhance cybersecurity and data management

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