

THESIS DEFENSE

EM Normandie
Business School
UAE Campus

May 2026

Using AI Predictive Analytics to Improve E-Commerce Supply Chain Performance and Customer Experience in the UAE

Mixed-Methods Research

UAE E-Commerce

Supply Chain AI

Predictive Analytics

Submission Date: 6th May 2026

Presentation Agenda

A structured walkthrough of the research journey

01 Research Background & Problem Statement

02 Research Questions, Objectives & Hypotheses

03 Theoretical Framework & Literature Review

04 Research Methodology

05 Key Findings & Statistical Results

06 Discussion & Implications

07 Conclusions & Recommendations

Research Background & Context

The UAE's e-commerce landscape and the AI imperative

The UAE E-Commerce Boom

The UAE e-commerce market is expanding at 12.9% a year.

reaching \$34.63B in 2025, projected to \$51.14B by 2029.

By 2026, there will be 7.82M digital commerce users.

The projected rate of growth for retail logistics is 17.74% CAGR till 2029.

Internet penetration: 96% · 75% cashless transactions by 2026.

AI is a national priority in UAE AI Strategy 2031.

The Research Gap

Studies on AI-supply chain are largely targeted at Western/East Asian economies.

There is little empirical evidence available for UAE on the impact of AI on supply chain efficiency, resilience & customer experience.

\$34.63B

UAE E-Commerce
Market (2025)

17.74%

Logistics Sector
CAGR to 2029

96%

UAE Internet
Penetration Rate

+20%

E-Commerce Growth
Since Early 2026

Research Questions & Hypotheses

Guiding the empirical investigation

AI predictive analytics' potential to enhance efficiency, resilience, and customer experience in the UAE e-commerce supply chain.

H1

AI Predictive Analytics → Supply Chain Efficiency

H2

AI Predictive Analytics → Supply Chain Resilience

H3

AI Predictive Analytics → Customer Experience

H4

Digital Transformation → Supply Chain Efficiency

H5

Digital Transformation → Supply Chain Resilience

H6

Digital Transformation → Customer Experience

Conceptual Framework & Theoretical Foundations

CAS Theory + Resource-Based View

Complex Adaptive Systems (CAS)

Provide supply chains as adaptive agent's networks that constantly adapt to market changes. AI improves information processing capacity and assists in faster adaptation and non-linear shock simulation.

Resource-Based View (RBV)

AI and digital technologies as strategic tools that can be used to develop sustainable competitive advantages when they are used appropriately within the operations of the supply chain.

**AI Predictive
Analytics Adoption**

**Digital
Transformation**

**Supply Chain
Efficiency**

**Supply Chain
Resilience**

**Customer
Experience**

Research Methodology

Mixed-methods positivist approach

Philosophy

Positivist

Objective, observable, measurable reality.
Hypothesis-driven testing of AI-supply chain relationships.

Approach

Deductive

Theory → hypotheses → empirical data
collection → statistical testing.

Strategy

Mixed-Methods

Cross-sectional survey + semi-structured
interviews for depth & breadth.

Quantitative

110 valid responses (n=110) from supply chain & e-commerce
professionals all over the UAE

Online survey via Google Forms through out 4 weeks

Five-point Likert scale across 5 constructs from 1 to 5

SPSS v26: Descriptive, Pearson Correlation & Multiple Linear Regression

Qualitative

few semi-structured interviews supply chain & e-commerce managers

Video conference interviews: Around 30 minutes minutes each

Thematic Analysis (Braun & Clarke, 2006), 5 key themes identified

Sample Demographics

110 UAE supply chain & e-commerce professionals

61.8%

Male respondents
(UAE industry norm)

40.9%

Aged 31-40
years (largest group)

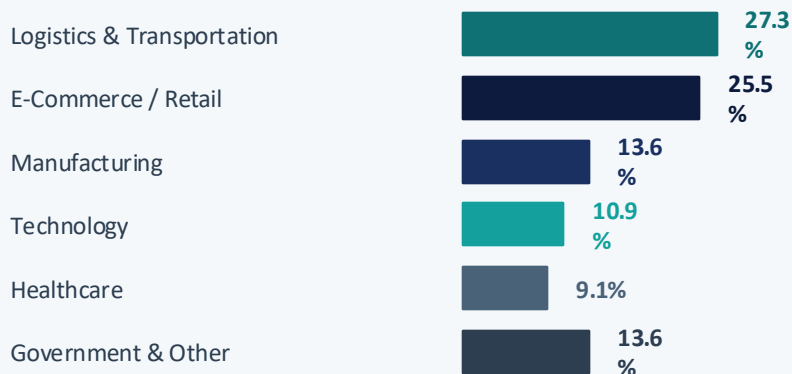
83.6%

3+ years
work experience

45.5%

Large organizations
(>250 employees)

Industry Sector Breakdown



Descriptive Statistics

All constructs show moderate to high agreement (Mean is greater than 3.5 on 5-point Likert scale)

Construct	Mean	SD	Visual Scale
AI Predictive Analytics (AA)	3.57	0.67	
Supply Chain Efficiency (SCE)	3.64	0.72	
Supply Chain Resilience (SCR)	3.65	0.73	
Customer Experience (CX)	3.61	0.70	
Digital Transformation (DT)	3.56	0.74	

Correlation Analysis

Pearson correlation matrix, all AI adoption relationships significant at $p < 0.001$

$$r = 0.608^{**}$$

AA → Supply Chain
Efficiency

*Strongest
correlation*

$$r = 0.532^{**}$$

AA → Customer
Experience

*Strong positive
association*

$$r = 0.479^{**}$$

AA → Supply Chain
Resilience

*Moderate positive
association*

$$r = 0.419^{**}$$

AA ↔ Digital
Transformation

*Positive linkage
confirmed*

Key Insight: Digital Transformation alone shows modest correlations with efficiency ($r=0.283$) and customer experience ($r=0.245$) but is NOT significantly correlated with supply chain resilience ($r=0.175$, $p=0.068$). DT acts as an enabler, not a direct driver.

Reliability Statistics (Cronbach's Alpha)

AA

$\alpha = 0.914$

SCE

$\alpha = 0.931$

SCR

$\alpha = 0.930$

CX

$\alpha = 0.889$

DT

$\alpha = 0.887$

Multiple Regression Analysis

AI Predictive Analytics is the primary significant predictor across all three models

Model 1

Dependent Variable:
Supply Chain Efficiency

$R^2 = 37.1\%$

AI Adoption: $B = 0.636$, $p < 0.001$

DT: $p > 0.65$ (not significant)

AI adoption explains 37.1% of variance in SC efficiency

Model 2

Dependent Variable:
Supply Chain Resilience

$R^2 = 23.0\%$

AI Adoption: $B = 0.538$, $p < 0.001$

DT: $p > 0.65$ (not significant)

AI adoption explains 23.0% of variance in SC resilience

Model 3

Dependent Variable:
Customer Experience

$R^2 = 28.3\%$

AI Adoption: $B = 0.585$, $p < 0.001$

DT: $p > 0.65$ (not significant)

AI adoption explains 28.3% of variance in CX outcomes

Hypothesis Testing Results

Summary of empirical outcomes

H1	AA → Supply Chain Efficiency	$r=0.608^{**}$, $B=0.636$, $p<0.001$	SUPPORTED
H2	AA → Supply Chain Resilience	$r=0.479^{**}$, $B=0.538$, $p<0.001$	SUPPORTED
H3	AA → Customer Experience	$r=0.532^{**}$, $B=0.585$, $p<0.001$	SUPPORTED
H4	DT → Supply Chain Efficiency	$r=0.283^{**}$ (bivariate); $B=0.033$, $p=0.685$	PARTIALLY SUPPORTED
H5	DT → Supply Chain Resilience	$r=0.175$ (n.s.); $B=-0.031$, $p=0.734$	NOT SUPPORTED
H6	DT → Customer Experience	$r=0.245^{*}$ (bivariate); $B=0.012$, $p=0.891$	PARTIALLY SUPPORTED

Qualitative Findings

5 key themes from 12 UAE supply chain & e-commerce manager interviews

Operational Benefits

AI significantly improved demand forecasting accuracy, reduced stockouts by around 30% during peak seasons, and optimized inventory across warehouses.

Implementation Challenges

Data quality inconsistencies across systems emerged as the primary barrier, more than the technology itself.

Readiness

Leadership support, change management, and workforce training identified as critical success factors.

Customer Experience Impact

AI-powered real-time tracking reduced 'Where is my order?' queries by 40%. Delivery optimization directly improved CSAT scores.

Outlook

Hopeful yet cautious, concerns about data privacy, algorithmic transparency, and workforce displacement in a developing regulatory environment.

Discussion & Theoretical Implications

Connecting findings to theory and literature

AI as Primary Performance Driver

Findings correspond with Ivanov (2020) and Syntetos et al. (2016): AI predictive analytics have a direct and significant impact on supply chain efficiency, resilience and customer experience. The UAE digital infrastructure adds to these impacts.

Digital Transformation as Enabler

The core principles of DT are supported by Ali & Haq (2025) and RBV theory, which means DT is not a driver of AI itself, but rather serves as a platform for it. To realize performance improvements, organizations need to align digital investments with specific AI capabilities.

CAS Theory Validation

CAS propositions are supported by results: Artificial Intelligence is able to aid agent information processing, and this allows faster adaptation. Real time data sharing minimizes information delay and aids in non-linear shock simulation.

UAE-Specific Contribution

This is the first multi-outcome quantitative research in UAE context. The findings expand on the findings of literature that has been done in the West and East Asia to a unique regulatory, infrastructural, and consumer environment.

Recommendations

Evidence-based guidance for three stakeholder groups

E-Commerce Managers

- Prioritize AI predictive analytics investment, not generic DT
- Conduct data quality audits before AI deployment
- Invest in workforce AI literacy programmes
- Start with focused use cases: demand forecasting & route optimization
- Link AI investments to customer-facing improvements

Logistics Companies

- Define AI roadmap aligned to specific supply chain challenges
- Build ecosystem-level partnerships and data standards
- Prioritize change management alongside technology deployment
- Create measurable ROI metrics for AI investments

UAE Policymakers

- Develop unified AI regulatory framework for supply chains
- Expand AI literacy programmes via public-private partnerships
- Establish logistics innovation hubs within free zones
- Create targeted SME AI adoption support programmes

Limitations & Future Research Directions

Acknowledging boundaries and charting the path forward

Study Limitations

Sample size (n=110) may limit generalizability beyond UAE

Cross-sectional design, causal direction cannot be definitively established

Self-reported measures may introduce response bias

Unexplained variance (R^2 range: 23–37%), other factors at play

Study scope limited to AI predictive analytics; excludes other AI types

Future Research Directions

Longitudinal studies to establish causal relationships over time

Mediation analysis (SEM) to explore DT → AI → Performance pathways

SME-focused research on AI adoption challenges and support needs

Blockchain-AI integration for enhanced GCC supply chain transparency

Consumer-perspective research validating AI-driven customer experience

Conclusion

This research provides the first multi-outcome quantitative evidence of AI predictive analytics impact on UAE e-commerce supply chains. Key conclusions:

1

AI predictive analytics adoption is the strongest predictor of all three performance outcomes — efficiency, resilience, and customer experience.

2

Digital Transformation functions as an enabler of AI, not an independent performance driver; regression results clearly separate their roles.

3

The UAE provides a uniquely conducive environment — government AI strategy, advanced infrastructure, and a dynamic logistics ecosystem support rapid adoption.

4

Challenges remain: data quality, implementation costs, AI literacy gaps, and evolving regulatory frameworks must be addressed for sustained value.

Thank you — Questions Welcome