

Disruption to Adaptation: Leveraging AI For Organizational Resilience in E-Commerce

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Abstract

E-commerce has become one of the important catalyst in transformation of digital economy, offering unprecedented advantages in terms of scalability, convenience, real-time responsiveness, and customized customer engagement. It reduces transaction costs, scaling global expansion, and creating opportunities from data-driven insights. However, the very characteristics that enable their rapid growth also to expose them to significant vulnerabilities. The fragility of this sector was highlighted by supply chain volatility, dependency on digital platforms, cyber threats, and sudden demand fluctuations. Moreover, during systemic disruptions such as the Covid-19 pandemic, e-commerce was paralysed, which indicate the embedded hindrances. In this turbulent context, organizational resilience is no longer an optional attribute but a strategic imperative. Organizational resilience has become a fundamental strategic capability for e-commerce firms. It ensures the continuity of digital services, preservation of consumer trust, and the capacity to reconfigure operations and business models when market conditions shift abruptly. Without resilience, firms risk operational paralysis, reputational erosion, and loss of competitiveness in an industry where consumer expectations for speed, reliability, and personalization are exceptionally high. Hence, cultivating resilience is central to sustaining long-term viability in this sector. At the same time, Artificial Intelligence (AI) is reshaping the e-commerce landscape. AI-enabled applications such as real-time demand forecasting, intelligent anomaly detection, adaptive logistics planning, and customer personalization enhance visibility, flexibility, and responsiveness. These capabilities position AI as a potential catalyst for strengthening resilience. Yet AI adoption is not without friction. Organizational studies highlight challenges related to data quality, interoperability with legacy systems, cultural readiness, and governance frameworks. Moreover, AI introduces new forms of vulnerability, such as model brittleness, algorithmic bias, and risks of over-reliance on automated systems without sufficient human oversight. This paradox underscores the characteristics of AI as both a disruptive force and a potential enabler of resilience. Despite increasing scholarly attention, the intersection of AI and organizational resilience remains underexplored and fragmented. Current literature on AI in e-commerce largely emphasizes operational efficiency gains, while resilience research stresses strategic mechanisms such as agility, redundancy, and diversification. The purpose of the present study is to explore how AI adoption influences the development of organizational resilience in e-commerce firms. Positioned as an exploratory qualitative inquiry, the study seeks to capture rich, practice-based insights from managers, domain experts, and practitioners to illuminate how AI is integrated, leveraged, and governed in real organizational contexts. The study aims to move beyond the narrow focus on operational efficiency to unpack the broader systemic role of AI in supporting resilience outcomes.

This study adopts an exploratory qualitative research approach to investigate how the adoption of Artificial Intelligence (AI) shapes organizational resilience in e-commerce firms. Given that this phenomenon is both

emergent and under-theorized, a qualitative design enables the generation of rich, context-specific insights rather than prescriptive generalizations. The research employs purposive sampling to identify participants such as managers, technology leads, and domain experts who are directly involved in AI-driven initiatives across e-commerce operations. Data are collected primarily through semi-structured interviews, which allow for flexibility in probing respondents' experiences while maintaining coherence with our central themes of research. To strengthen the robustness of insights secondary data are also reviewed, facilitating triangulation of evidence. The interviews are transcribed and subjected to inductive thematic analysis; wherein open and axial coding techniques are done to identify recurring patterns and interdependencies among the information received from the data. The analysis is iterative, enabling refinement of codes and categories until thematic saturation is achieved. Through this structured yet interpretive approach, the study aims to move beyond efficiency-centric narratives to capture the broader systemic role of AI in achieving organisational resilience within e-commerce firms. Primary data for this study were collected through semi-structured interviews with purposively selected participants directly engaged in AI-driven initiatives within the e-commerce sector. The sample comprised managers, technology leads, and domain experts, ensuring representation across functional areas such as operations, supply chain management, logistics, procurement, and customer experience. This diversity of perspectives enabled the study to capture how AI adoption influences resilience not only at the operational level but also in strategic and cultural dimensions of organizational functioning. Each interview lasted between 45 to 75 minutes and was conducted either virtually or in person, depending on participant availability and logistical feasibility.

Through inductive qualitative approach, we analysed the interview excerpts and identified the themes Eight analytically distinct themes were identified which are: (1) organisational learning (2) Predictive decision support; (3) risk management (4) Transparency (5) Agile procurement (6) supply chain consistency and (7) Last-mile delivery. The first theme, organizational learning, captures how firms integrate insights from AI-generated data into continuous improvement cycles. Interviewees emphasized that AI outputs inform decision-making, operational adjustments, and strategic reflection, allowing firms to translate episodic interventions into systemic capabilities. Second, predictive decision support highlights the role of AI in forecasting demand, anticipating market fluctuations, and enabling proactive resource allocation. Participants consistently noted that predictive analytics enhance responsiveness, reduce reactive firefighting, and strengthen operational continuity under uncertain conditions. Third, risk management emerged as a crucial mechanism, where AI facilitates identification, assessment, and mitigation of operational and supply chain risks. By modelling potential disruptions and simulating scenarios, firms can design contingency strategies and maintain service reliability. Transparency, the fourth theme refers to AI-enabled visibility across processes, transactions, and partner interactions. Enhanced transparency supports trust, accountability, and informed coordination across both internal teams and external stakeholders. Fifth, agile procurement reflects AI's capacity to optimize sourcing decisions by dynamically adjusting supplier selection, order quantities, and lead times based on real-time insights. This flexibility enables firms to respond quickly to changing demand or supply conditions, sustaining resilience under volatility. Sixth, supply chain consistency emerged as a key theme, wherein AI applications enhance synchronization across upstream and downstream operations, reduce variability, and improve the predictability of processes, ensuring continuity of goods and services. Finally, last-mile delivery, underscores AI's impact on operational execution and customer experience. Interviewees emphasized that AI optimizes delivery routes, predicts delays, and manages exceptions, thereby strengthening responsiveness and service reliability in the most vulnerable segment of the supply chain. Firms that actively cultivate a culture receptive to data-driven decision-making, experimentation, and continuous learning are better able to embed AI-driven insights into durable organizational capabilities. This theme emphasizes that technology alone is insufficient; cultural alignment and employee engagement are essential to realizing the resilience potential of AI.

This study contributes to the literature by addressing a critical gap at the intersection of AI adoption and organizational resilience in the e-commerce sector. While prior research has predominantly focused on operational efficiency gains from AI on general strategic mechanisms for resilience, few studies have examined the systemic pathways through which AI strengthens resilience across multiple operational and strategic dimensions. By adopting an inductive qualitative approach, this study captures rich, practice-based insights from managers and domain experts, thereby grounding theoretical propositions in real-world organizational contexts. The originality of this research lies in its integration of AI adoption with organizational resilience frameworks, highlighting seven derived themes organizational learning, predictive decision support, risk management, transparency, agile procurement, supply chain consistency and last-mile delivery that collectively illustrate how AI functions as both a technological and socio-technical enabler of resilience. Unlike prior studies that treat AI as a discrete operational tool, this research demonstrates its interdependent role across strategy, processes, supply chain management, and organizational culture.

Despite offering valuable insights into the role of AI in fostering organizational resilience within the e-commerce sector, this study possesses several limitations. First, its contextual focus on e-commerce firms constrains the transferability of findings to other industries where resilience dynamics and AI adoption pathways may differ considerably. Second, the reliance on an exploratory qualitative design, while effective for generating rich practice-based insights, limits the generalizability of results and remains dependent on the subjective interpretations of purposively selected managers and domain experts. Third, the cross-sectional nature of data collection provides only a snapshot of organizational practices at a specific point in time, without capturing the evolving trajectories of AI adoption and resilience strategies in dynamic environments. Additionally, the geographically bounded nature of the cases restricts the external validity of the findings, as variations in regulatory contexts, infrastructure maturity, and cultural readiness across regions could significantly influence resilience outcomes. Finally, as resilience is often recognized retrospectively, there remains a risk of retrospective rationalization in participant accounts, which may have overstated the positive role of AI while downplaying challenges or unintended consequences.

Keywords

Leveraging AI, Organizational Resilience, E-Commerce.