The AI Revolution in Indian Quick Commerce: A Catalyst for Economic Transformation and Societal Change

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Abstract:

This paper examines the transformative role of Artificial Intelligence (AI) in India's flourishing Quick Commerce (Q-commerce) sector. As of late 2025, India's Q-commerce market has demonstrated explosive growth, evolving from a emerging industry into a significant segment of the nation's digital economy, with a gross order value projected to reach $7.1 billion by the end of fiscal year 2025. (Kumar, 2025) This research analyzes how AI is fundamentally reshaping the Q-commerce interface and operational backbone, focusing on algorithms for user behavior modeling, conversational commerce, logistics optimization, inventory management, and demand forecasting. We further investigate the profound economic and societal impacts, including contributions to economic growth, the creation of approximately 450,000 gig economy jobs, and the evolving regulatory landscape concerning data privacy under the Digital Personal Data Protection (DPDP) Act, 2023 and labor rights under the Code on Social Security, 2020. (IBEF, 2024) The paper concludes with policy recommendations for the Indian government to balance innovation with worker welfare and an exploration of future technological frontiers, such as AI integration in brick-and-mortar retail ('phygital' experiences) and the advent of VR-driven shopping experiences.

Introduction:

Quick Commerce is at the center of a significant shift in India's retail landscape. The market has expanded at an unprecedented rate, with gross order value rising from approx. $300 million in 2022 to an estimated $7.1 billion by the end of FY 2025. (TATED, 2025) Research estimates of the market size indicate that it will continue to expand rapidly, reaching between $35 billion and $40 billion by 2030. By 2024, Q-commerce made up more than two-thirds of all e-grocery orders and a tenth of all e-retail spending. (Datum Intelligence, 2024)

Several factors are causing this growth are: rapid urbanization, rising disposable incomes, high smartphone usage and internet access, and a major shift in consumer behavior toward instant gratification. There are a few major players in the market which are as follows: Blinkit, Zepto, and Swiggy Instamart. These platforms have grown by using a network of "dark stores," which are small, strategically located urban warehouses, and a complex, AI powered operational model. (MOHAN, 2025) (B L, 2025) (Indiratrade Blog, 2025)

Artificial Intelligence is not just an extra feature, but it is the primary component which drives the efficiency, personalization, and scalability that make up the whole Q-commerce value proposition. This paper utilizes a qualitative research methodology, using data from

government reports, think-tank analyses, industry publications, and corporate disclosures to examine the complex effects of AI on this transforming sector.

Review of literature:

The rapid rise of Quick Commerce (Q-commerce) in India has drawn significant scholarly and industry focus, emphasizing Artificial Intelligence (AI) as the key enabler of its scalability, efficiency, and personalization. Literature broadly categorizes into market dynamics, AI applications, economic/consumer impacts, labor implications, environmental effects, governance/risks, and future technologies.

Industry reports highlight explosive growth: Q-commerce gross order value surged from near-zero pre-2020 to $7.1–7.4 billion in FY 2024-25, projected to hit $35–40 billion by 2030 (TATED, 2025; Datum Intelligence, 2024; MOHAN, 2025). Driven by urbanization, rising incomes, smartphone penetration, and demand for instant gratification, the market is oligopolistic, dominated by Blinkit, Zepto, and Swiggy Instamart (>90% share) via dark stores and AI investments (Indiratrade Blog, 2025; Bissell, 2025).

AI is central to operations, including hyper-personalization (collaborative filtering, reinforcement learning; Sharma, 2018), chatbots (Vasan, 2025), logistics optimization (vehicle routing; Katariya, 2025), and forecasting/inventory management (deep learning; N. Khan, 2025). Benefits include 30–50% forecast accuracy gains and 15–30% cost reductions.
Economically, Q-commerce boosts digital growth, SME integration, and jobs (400,000–450,000 by 2025; IBEF, 2025), but disrupts kirana stores ($1.28B displacement, ~200,000 closures; 5paisa Research, 2023). Consumers gain convenience and variety, though impulse buying rises (Shashidhar, 2024).

Labor studies expose gig-worker precarity: income volatility, safety risks, and poor social security (Nizamuddin, 2025; Nayak, 2025). Environmentally, last-mile emissions and packaging waste (~98,000 tons plastic, 2021) are concerns, offset partly by AI efficiencies but compounded by AI's energy demands (Johnson, 2023; Strickland, 2025).

Regulatory analyses cover DPDP Act 2023, Social Security Code 2020, and risks like bias/fraud (Press Information Bureau, 2025a/b). Future explorations include phygital retail, AR/VR, and drones, facing barriers (Gupta & Nair, 2021; Dev, 2025). Despite abundant fragmented reports, comprehensive multi-domain syntheses are scarce. This study bridges gaps via structured, rigorous analysis.

Objectives:

1. To identify and critically evaluate the core applications of AI in Quick Commerce, including personalization, conversational commerce, logistics optimization, inventory management, and demand forecasting.
2. To assess the economic contributions of AI-enabled Q-commerce, encompassing market growth, job creation, consumer welfare, competitive dynamics, and disruption to traditional retail.
3. To analyze societal implications, with particular focus on gig-worker welfare (earnings, conditions, and security), consumer behavior shifts, and emerging regulatory responses.
4. To investigate the environmental footprint of the sector, including transportation emissions, packaging waste, and AI's dual role in exacerbating and mitigating externalities.
5. To review the prevailing data governance and privacy framework, cybersecurity requirements, and key risks associated with AI adoption (fraud, bias, dark patterns, safety).
6. To explore emerging technologies and future trajectories for AI integration in Commerce and related retail models.

Research Methodology:

Primary Approach and Analytical Framework

The research employs a mixed-methods approach, combining a comprehensive qualitative synthesis and meta-analysis of existing literature. The qualitative synthesis involves reviewing academic papers, industry reports, government documents, and news articles to build a foundational understanding. This is complemented by the findings that establish relationships and measure impacts across various domains.

The analysis is structured around a multi-domain evaluation framework designed to assess the multifaceted impact of AI in Q-commerce. This framework covers four key areas:

- **Technical Outcomes**: Measuring direct improvements in operational efficiency metrics like forecast accuracy, delivery time, and stockout rates.
- **Economic Outcomes**: Analyzing market-level effects such as consumer surplus, platform unit economics, and market competition.
- **Labor Outcomes**: Focusing on the welfare of gig workers by examining changes in earnings, working conditions, job security, and safety.

- **Environmental Outcomes**: Modeling the environmental footprint, including last-mile emissions, packaging waste, and the impact of AI-driven optimizations.

Data Sources

A diverse range of data sources is utilized to provide a holistic view. This includes:

1. Proprietary and Public Platform Data: Financial filings (e.g., Zomato's Annual Report, Swiggy's DRHP), publicly accessible APIs (e.g.,Blinkit's Weather Union), and ethically scraped data on pricing and product availability.
2. Public Administrative Data: Accessed via official government portals.
3. Third-Party Datasets: Tomtom traffic Index and Ministry of Housing and Urban Affairs (MoHUA).

Results/Discussions:

Core AI Applications in Indian Quick Commerce

AI is the operational backbone of Q-commerce, enabling platforms to achieve the speed, personalization, and efficiency that define the model. Five core applications stand out as transformative.

User Behavior Modeling and Personalization

AI algorithms analyze plenty of user data, such as their browsing history, how frequently they buy things, their locations, and other factors like the weather, to give them very personalized experiences. For example, Zepto uses a "cohort-based ranking" system to group users into groups like Entry level user, Mass user, and Premium user. This lets them customize search results based on their price sensitivity and preference of quality. Blinkit uses personalized recommendations and predictive shopping lists for example sections like "Did you forget?" to get people to buy again. (Sharma, 2018)

These systems use a sophisticated set of models, such as Collaborative Filtering (Matrix Factorization), Deep Learning, Reinforcement Learning (Contextual Multi-Armed Bandits like LinUCB), and Transformer models to deal with code-mixed "Hinglish" queries. The effect is substantial: Zepto's cohort-based ranking raised Orders per Day by 0.60%, Average Order Value (AOV) by 1.38%, and Gross Profit per Order by 1.85%. Blinkit's personalized widgets have conversion rates of up to 30%, and its "Did you forget?" feature alone increased user order rate by 5%. (Sharma, 2018)

Conversational AI Chatbots

AI-powered chatbots and voice assistants are smart shopping helpers that can understand what users need, how much they can spend using their past purchase history, and complex queries of users. Zomato's "Zomato AI" is a multi-agent system that helps people find and order food by suggesting dishes and giving them interactive widgets. These conversational AI agents are very important for getting India's many digital users who want's easy recommendation and don't want to spend much time in application or not tech savvy.

These systems are based on cutting-edge NLP models like Transformers and LLMs. They can boost conversion rates by four times, for example, 12.3% for users who chat with them places order after opening app vs. 3.1% for users who don't chat with them and place order. They also help people make decisions regarding what to order 47% faster. AI agents in customer service can answer 93% of questions on their own, which saves reduces operation cost by significant amount (Vasan, 2025) (Computer, 2024)

Order Batching and Logistics Optimization

AI is the core engine for optimizing last-mile delivery, which accounts for 40-50% of fulfillment costs. (Katariya, 2025) (Patel, 2025) AI Algorithms utilize real-time information about traffic, delivery locations, and rider availability to put nearby orders together for a specific delivery partner. This cuts down on the distance traveled, the amount of fuel used, and the costs of running the business, which gives riders more order to deliver within low time, equal to more earnings, while using less fuel, also reducing carbon emission.

We use the Hungarian Algorithm for order assignment and different versions of the Vehicle Routing Problem (VRP) for route optimization to solve this complicated optimization problem. Which boosts efficiency by great amount delivery times can be cut by up to 30%, operating costs can be cut by 15-25%, and fuel use can be cut by up to 20%. (Zendms Blog, 2025) (Elassy et al., 2024)

Inventory and Warehouse Management

AI is crucial for managing inventory well in the Q-commerce model, which is based on a network of "dark stores." AI-powered systems keep track of product movements in real time, predict when items will need to be re-stocked, and suggest replacements for items that are out of stock. This minimizes spoilage of items and gives user alternative item, recovering partial number of lost sales otherwise. AI also optimizes the physical layout of warehouses to speed up the picking process.

AI has made demand forecasting 30–50% more accurate by using time-series models like ARIMA and Prophet and deep learning models like LSTM. This has caused the stockout rate across the market to drop from 21% in 2020 to a projected 9% in 2025, and the stock waste rate dropped from 15% to 6% in the same time frame. Zepto reported that these AI powered optimization led to a 98% order fill rate and a 95% inventory accuracy. (N. Khan, 2025) (A. Khan et al., n.d.)

Demand Forecasting and Staff/Delivery Partner Scheduling

AI models analyze sales history, seasonal patterns, along with external factors like weather, holidays, and sporting events to make very accurate predictions about future demand. These predictions are very important for managing the availability of delivery partners and in-store staff.

Forecasting pipelines use a competition of models, such as ARIMA, Machine learning Models, as well as deep learning models such as DeepAR. As per report by swiggy, their advanced forecasting platform has cut down on forecasting mistakes by 15% to 30%. By reducing overstocking and waste, accurate demand forecasting cuts down overall inventory costs by 20% to 50%. (As-Siddeeqi, 2025)

AI Transformation of the Fulfillment Process

The combination of different AI technologies completely changes the whole Q-commerce fulfillment process. It creates a highly automated, predictive, and responsive system that works end to end. AI models creates hyper-personalized storefront and personalized recommendations for each user to increase their probability of order. Customers can interact to AI chatbots or voice assistants while placing an order. These chatbots and assistants make the ordering process smooth and conversational. After that AI Models help in each step of fulfillment process such as selecting dark store, reducing delivery time etc.

This full integration of AI into the fulfillment process leads to much shorter delivery times, much lower operational costs, less food and product waste because of better inventory management, and a better, more reliable customer experience. The whole supply chain becomes flexible and strong, able to quickly adjust to changes in demand and the real world.

Economic Impact Analysis

Contribution to Economic Growth

The AI-powered Quick Commerce (Q-commerce) sector has become a major driver of India's digital economy, exhibiting explosive growth and making a big difference in economic

activity. The market's Gross Merchandise Value (GMV) jumped from about US$0.7 billion in 2020 to an estimated US$7.4 billion in FY 2024-25. By 2030, the market is expected to be worth US$35-40 billion, being AI is the main driver of this growth which makes the whole value chain more productive and efficient. AI-driven demand forecasting has made predictions 30–50% more accurate, and logistics optimization has cut delivery times by up to 31% and fuel use by 14%. These efficiencies not only make the Q-commerce model possible, but they also lead to cost-effective solutions. (Presskila et al., 2025) AI's ability to analyze hyper-local demand patterns has helped the sector grow into Tier 2 and Tier 3 cities.

Job Creation for quick commerce

The Q-commerce sector creates a lot of jobs, especially in TIer-1 and Tier-2 cities. By the end of 2025, the sector is anticipated to create about 400,000 to 450,000 jobs in areas like logistics, dark store operations, technology, and customer service. (IBEF, 2025) For example, Swiggy Instamart was said to have created 5,500 jobs by 2024 and had 539,000 delivery partners who were active every month in the first quarter. During the same time, Blinkit's motorcycle fleet had 185,000 riders. (Acharya & Rajan, 2025)

However, this boom is adverse for traditional retail. Q-commerce is quick and easy, which has caused a big change in how people spend their money. It's estimated that $1.28 billion has moved away from local kirana stores. (5paisa Research, 2023) Reports claim that this competitive pressure may have led to the closing of about 200,000 Kirana stores. This shows a major market trend: when AI makes one area more efficient, it can make things harder and change things in another.

Consumer Welfare and Surplus

AI-enhanced Q-commerce has greatly improved the lives of consumers and created a increased propensity to spend, by offering convenience, saving them time. The main selling point of 10–30-minute delivery is that it meets the need for instant gratification in busy urban lives. This is known as "Temporal Utility Displacement," where people value time over money. Also, the range of products has widened. Platforms like Blinkit and Zepto now offer 3,000 to 5,000 SKUs, which include electronics, clothes, personal care items, and medicines in addition to groceries. This wider availability is particularly significant as services spread to Tier-2 and Tier-3 cities. AI-driven personalization makes shopping better by giving you personalized recommendations and smart search features that help you find products. Due to which, the AOV across platforms has raised to ₹450 to ₹625, which is a lot more than kirana stores.

(Shashidhar, 2024) (Bissell, 2025) The overall effect is a marked improvement in quality of life and access to goods for a large segment of the urban population.

Investment and Market Structure

The Indian Q-commerce market is having high investment, and it is almost an oligopoly. Investors in Q-Commerce includes both domestic and FDIs. Major companies have raised a lot of money to pay for aggressive growth and technology development. For instance, Zomato planned to put INR 1,500 crore into Blinkit, and Flipkart promised INR 3,249 crore to its "Minutes" network. As of early 2025, three companies control the market: Blinkit (Zomato) which has 45–46% of the market, Swiggy Instamart which has 25–27%, and Zepto, an independent unicorn, that has 21–30%. In FY24, these three made more than $1 billion in sales. (Indiratrade Blog, 2025) There have also been mergers and exits in the market. For example, Dunzo, an early player, left the industry mostly because of financial concerns. Setting up dark store networks and investing in AI technology requires a lot of money, which makes it hard for new businesses to enter the market. With big companies like Flipkart (Flipkart Minutes) and Amazon (Amazon Fresh/Now) entering the market, competitiveness is increasing in the market.

Impact on society and Gig Worker Welfare

Gig Worker Welfare

The spread of artificial intelligence-powered Q-commerce has led to a flourishing gig economy, but the jobs that these workers get are often insecure and promising. Algorithmic management makes platforms more efficient, but it also makes income unstable and makes work conditions more difficult. Earnings vary a lot; a standard delivery pays ₹26–₹32, and after paying for fuel and maintenance, the average monthly net income is around ₹22,700. (Nizamuddin, 2025) AI-driven order batching is meant to save money, but it also lowers workers' pay per delivery a group run for two drops might pay ₹45–₹50, which is less than two separate orders. Also, AI Algorithms put a lot of pressure on workers to meet 10-minute delivery goals, which makes things much less safe, and some accidents incidents were already reported due to this. 54% of workers say they are in unsafe conditions. (Nayak, 2025) There is little job security, on average, every 4 to 6 months, people switch such gig jobs and also, they can be fired at any time without a clear way to appeal. The Fair work India 2024 report shows that no quick commerce platform got more than 6 out of 10 on fair work principles that shows that this sector is not able to provide fair pay, fair conditions, and fair management.

Labor Regulations and Social Security

The laws in India that protect gig workers are advancing, but they still don't do enough to protect them from the risks associated with the Q-commerce model. The Code on Social Security, 2020, is the most important law. It officially defined “gig worker" and "platform worker" for the first time in November 2025. It says that aggregators must contribute 1– 2% of their sales into a social security fund that pays for insurance.(Press Information Bureau, 2025b) However the Code doesn't call them "employees” but creates a third category with fewer rights. It also leaves the implementation of specific welfare programs up to state-level boards, which result in fragmented protection. The main problem is that workers are still being called "independent contractors," which means they can't get basic labor rights like guaranteed minimum wage, paid time off, and statutory retirement funds (PF/ESI). Several states have emerged as policy labs to fill this gap such as Rajasthan

Platform-Based Gig Workers Act, 2023, was the first of its kind, and the Karnataka

Platform-Based Gig Workers Act, 2025, is a complete model that deals with algorithmic transparency and how to handle complaints. These state-level efforts, along with court actions, show a move toward more regulation, but a strong national policy to protect people's rights is still needed.

Changes in Consumer Behavior

AI-driven Q-commerce is transforming the way people shop and what they expect from it. It does this by meeting and increasing the demand for instant gratification. The promise of delivery in 10 to 30 minutes makes people buy things more quickly and encourages them to make unplanned, impulsive purchases, especially for products that don't require a lot of thought. AI-powered personalization engines are a big part of this change. They look at user data to give personalized suggestions, hints of scarcity, and instant rewards. This can lead to a cycle of compulsive consumption, creating "Dark Patterns" which is manipulative interface design which takes away consumer freedom to choose and finding right product more hard, To stop these kinds of things from happening, India's Department of Consumer Affairs (DoCA) has put out "Guidelines for Prevention and Regulation of Dark Patterns." but this has resulted in creation of consumer base which value only speed and convenience over necessity and money.

Environmental Impact Analysis

Transportation Issues

The last-mile delivery fleet, which is mostly made up of two-wheelers, is the most obvious source of environmental problems caused by Q-commerce. It adds to noise, congestion, and air pollution in cities. The carbon footprint for each order is big, but it depends on the type of vehicle, for example EVs reduces about 40% carbon emissions on an average compared to petrol but we need to also consider carbon emission required to produce electricity. The rapid rise in delivery demand, which is expected to increase the number of delivery vehicles in cities will make traffic worse and could add more than 10 minutes to daily commutes due to traffic jam. While companies like Zomato promise to switch to electric vehicles (EVs) by 2030, the huge number of vehicles needed for 10-minute deliveries is a big problem for city infrastructure and air quality.

Packaging and Product Waste

Packaging is a big environmental problem for Q-commerce that is often overlooked. According to research, packaging can make up as much as 45% of the greenhouse gas emissions in the e-commerce lifecycle (Johnson, 2023). In 2021, India's e-commerce industry dumped approx. 98,000 tons of plastic packaging waste in 2021, which is 73% more than before the global covid pandemic (K, 2024). This includes things like paperboard, corrugated boxes, and different kinds of plastics. Even though there are laws such as the Plastic Waste Management (EPR) Rules, it's hard to enforce them, and the infrastructure for recycling is still underdeveloped in India. Along with packaging, product waste is a big issue. Q-commerce can lead to a lot of spoilage and food waste, especially with perishable products. This not only costs money, but it also hurts the environment by wasting resources and making extra delivery trips to restock.

AI as a tool for fixing above problems

AI-driven growth causes environmental problems; however AI is also an important tool for fixing them. The same algorithms that make order fulfillment faster also make them more efficient, which could benefit the environment. Dynamic routing and order batching greatly cut down on the total number of vehicle-kilometers traveled by finding the best delivery routes in real time and clubbing few orders into one trip. This reduces fuel consumption and emissions. Research shows that optimizing routes can lower fuel use by as much as 20% as explained in

earlier sections. (Japesh, 2025). AI-powered inventory systems have helped reduce overall stock wastage in the sector from 15% in 2020 to a projected 6% in 2025.

Energy Consumption of AI Systems

A big but often ignored environmental cost of the AI-enabled Q-commerce boom is the huge amount of energy which AI systems need to run. Though AI has very huge implications, Q-Com platform also often use significant part of AI training process to remain ahead of competition, which also adds up in carbon footprint. (Strickland, 2025)

Data Governance and Privacy Framework

Laws in India

The Digital Personal Data Protection (DPDP) Act, 2023, and the Digital Personal Data Protection Rules, 2025, are the main laws in India that protect the privacy of Q-commerce data. This framework replaces the old IT (SPDI) Rules, 2011, and establishes comprehensive system for processing all digital personal data based on consent. It works with the Information Technology Act of 2000 and all of its rules and guidelines.
(Press Information Bureau, 2025a)

Core Principles of DPDP framework

The DPDP framework is based on a few fundamental principles that have a direct effect on AI applications. According to "Lawful Purpose and Consent," data processing must be based on a user's "free, specific, informed, unconditional, and unambiguous" consent, which must be obtained via clear affirmative action from users. Another aspect of DPDP which is, “Purpose Limitation" that says that data can only be used for the specific purpose for which consent was given. This stops AI models from getting too big. Third aspect, "Data Minimization" says that platforms can only collect personal data when it is absolutely necessary for the stated purpose. This goes against the "collect-it-all" approach to data for AI training. This framework also tells that "User Rights" are very important because they give people the right to easily access, change, delete, and withdraw their consent at any time. (Press Information Bureau, 2025a)

O-Commerce platform Obligations

As "Data Fiduciaries," Q-commerce platforms have plenty of responsibilities. Before collecting data, they must give a clear, plain-language notice that explains what data will be collected and why. As "reasonable security safeguards," they must put in place "appropriate technical and organizational measures" to stop data breaches. These measures could include encryption and access controls. If there is a breach, they have to notify both the Data Protection

Board of India and each affected user "without delay." They also have to send a full report to the Board within 72 hours. A strict "Data Retention and Erasure" policy must be followed. This means that data must be deleted once it has served its purpose or after three years of inactivity for large platforms. Platforms are also fully responsible for making sure that their third-party vendors (called "Data Processors") follow the guidelines. Large platforms that are called "Significant Data Fiduciaries" (SDFs) have more responsibilities, such as hiring a Data Protection Officer (DPO) and doing Data Protection. Impact Assessments (DPIAs) on a regular basis. (Press Information Bureau, 2025a)

Cybersecurity Issues

Along with the DPDP Act, Q-commerce platforms must also follow the CERT-In (Indian Computer Emergency Response Team) Directions of April 2022. These directions mandates CERT-In to be notified of a wide range of cybersecurity incidents, such as attacks on AI/ML systems, within a strict 6-hour window of being noticed. Also, all ICT system logs must be kept secured for 180 days and stored in India. To ensure that the forensic investigations have correct timestamps, all of the company's systems must also be in sync with the National Physical Laboratory's time source. (Cert-IN, 2022)

Challenges and Risks of AI Adoption

Fraud and Adversarial Abuse

Q-commerce platforms are easily targeted by frauds. Account Takeover (ATO) through credential stuffing and phishing is a major risk. For example, 5,529 fake orders were placed on Myntra. There is a lot of payment fraud, and UPI-related fraud went up 85% in FY24. This includes scams using fake QR codes and large-scale rings that use hacked bank accounts. "Friendly fraud," or chargeback abuse, is also common. This is when real customers falsely dispute transactions. (Scott, 2024) For example, there was a ₹5.5 crore refund fraud scheme against Meesho. Fake accounts can also be utilized to misuse promotions and referrals on platforms. The Times of India, 2024. (The Times of India, 2024) A major risk for businesses is using fake or synthetic reviews to change consumer's view. This is why the Bureau of Indian Standards (BIS) created the IS 19000:2022 standard for online reviews. Mitigation using AI/ML models for real-time fraud detection, such as supervised classifiers, anomaly detection, and graph neural networks. It also means finding the right balance between precision and recall so that real users aren't blocked.

AI Algorithm Bias and Fairness

AI models may retain biases and make it more acute, which can lead to inaccurate outcomes. In dynamic pricing, algorithms can cause price discrimination by charging varying amounts to different users based on their behavior. Recommendation and search algorithms could make "filter bubbles" (Areeb et al., 2023) and favor a platform's own private-label products, which might restrict consumer choice and raise concerns about competition. For gig workers, algorithmic management can cause unfair assignments of delivery, performance ratings and incentives. This is often AI biased. There are now ways to reduce the problem, such as checking algorithms for fairness on a regular basis to see if they have different effects on different demographic groups. The Telecommunication Engineering Center (TEC) has put out a voluntary standard for fairness assessment. Reports say that platforms like Zepto and Zomato have started having outside audits of their algorithms to reduce bias.

Safety and Security Risks

There are risks in both the real world and the digital world. The main business model of 10-minute delivery puts a lot of stress on delivery personnel. AI-optimized routes and tight deadlines make driving challenging and risky, cause's fatigue, and increases the risk of accidents. This has been pointed out as a big problem for the health of workers. For customers, safety risks can occur by not doing enough background checks on delivery workers, leading to impersonation or misconduct. The huge amounts of personal, financial, and behavioral data that Q-commerce platforms collect make them easy targets for data breaches.. (G, 2024) A breach not only violates privacy but also encourages further fraud, as stolen credentials can be used for account takeovers and identity theft.

Consumer Manipulation and Dark Patterns

There are higher chances that platforms will use AI to make "dark patterns," which include user interface (UI) and user experience (UX) designs that trick people. These designs can trick or nudge people into making choices that help the business, like signing up for a service, buying something they didn't plan to, or sharing more information than they meant to. Some examples are urgent purchase for discount, using ambiguous language, or making it hard to cancel a service. In response to this threat, the Central Consumer Protection Authority (CCPA) of the Indian government has released the "Guidelines for Prevention and Regulation of Dark Patterns, 2023." These guidelines makes such tricks illegal and punishable. This

regulatory action says that platforms must make sure that their AI-driven personalization and UI designs are unambiguous and do not limit consumer freedom.

Future Scope

AI in Brick-and-Mortar Retail (Phygital Experiences)

Adding AI to physical stores, which is often called "phygital," could make shopping a great experience. For Q-commerce, this could mean AI-powered kiosks in stores for quick ordering or dark stores that act as small, automated pickup points. It promises to improve the accuracy of inventory by monitoring shelves in real time, reducing shrinkage, and cutting the cost of labor at checkout.

But India is not completely ready for this technology. Almost 90% of retailers use AI for back-end operations, but customer-facing automation is still in its early stages, with only a few pilot cashier less stores. There is no proof that it will be profitable, and there is a lot of confusion about how the DPDP Act applies to in-store computer vision. People are expected to be careful and slow to adopt new technology until 2030, and fully autonomous stores probably won't become common until the second half of the decade.

Augmented Reality (AR) and Virtual Reality (VR) Shopping

AR and VR could make online shopping a lot more effective for specific products by letting customers visualize how furniture would look in their homes or "try on" clothes and makeup. This could make consumers satisfied about their purchases and lower the number of returns.

This technology is still newly developed and is under experiments in India. There isn't much public data on user engagement or ROI is available for AR features on big platforms like Lenskart and Flipkart, which suggests that it's still a new thing. The high price of VR headsets and the fact that mobile AR hasn't been proven to be useful are major issues. (Gupta & Nair, 2021) AR/VR shopping is expected to remain a unique application through 2030, pending breakthroughs in user experience and demonstrated business Impact.

Autonomous/Drone Delivery

Drone delivery is perhaps the most emerging of the new technologies in India, mostly because the DGCA's liberalized Drone Rules of 2021 and 2022 make it easier for businesses to use them. Active commercial pilots are already in place, and businesses make thousands of deliveries every day in cities like Gurugram.

The possible effect is revolutionary for some use cases, allowing for super-fast delivery of high-value, low-weight, or time-sensitive items like medicines and electronics. This could lead to a new premium service level for Q-commerce. However, economic feasibility is still a big problem. The high cost of a drone ($10,000 to $50,000) is hard to justify against the low cost of human delivery partners in India, and only 6% of consumers are willing to pay more for it.

Drone delivery is set to be rolled out commercially between 2025 and 2028, with a focus on B2B and high-value B2C markets. This is because the government plans to spend $1 billion on drone infrastructure. However, everyday Q-commerce is unlikely to be widely used by 2030 because of high unit costs. (Dev, 2025)

Conclusion:

Artificial Intelligence is the primary driver of the Quick Commerce revolution in India. It has made its operations more efficient and allowed for hyper-personalization, which has made it a billion-dollar market. This AI powered revolution, is changing shopping experiences, boosting the economy, and bringing in a lot of money into India's digital economy. But this quick progress creates complicated choices. Consumers benefit from convenience and speed brought by gig economy, but its work force face a lot of problems, such as income instability, algorithmic management, and a lack of full social security. So, the effect on society is mixed, making both opportunities and risks.

As India works toward its economic goals for 2030, the long-term success of the Commerce sector will depend on whether policymakers can create a smart and flexible set of rules. The Digital Personal Data Protection (DPDP) Act of 2023 and the Code on Social Security of 2020 are important first steps, but strong enforcement and a focus on fairness in algorithms and workers' rights are even more important. In the end, the real test of this AI-powered change's success will be whether its huge benefits are fairly shared among consumers, businesses, and workers.

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