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Challenges And Opportunities in Last-Mile Delivery for Quick Commerce

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Abstract

The rapid growth of quick commerce (Q-commerce) has changed consumer demands and shifted delivery from days to minutes. At the centre of it all is last-mile delivery, an essential and yet difficult part of the supply chain. In this paper, we explores the challenges faced by last-mile delivery for Q-commerce, including defining the opportunities it offers, with an emphasis in urban areas, where demand is higher and infrastructure constraints are stronger. Based on recent literature, industry reports, and examples such as Zepto the paper identifies logistical bottlenecks like traffic jams, delivery costs pressures, labour shortages, and technological limitations. At the same time, it also underscores positive developments, like micro-fulfillment centers, route optimization by AI, and more uptake of green delivery options. The research attempts to provide actionable recommendations to logistics providers, policymakers, and Q-commerce platforms, outlining strategic recommendations for optimizing last-mile operations in a highly dynamic and competitive market. The findings suggest that while last-mile delivery in Q-commerce presents significant challenges, it also opens avenues for innovation, collaboration, and sustainable growth.

Introduction

Our shopping habits have been radically transformed in recent years. We no longer have the patience to wait days for our deliveries—now, many of us want our groceries, snacks, and daily essentials delivered to our front door in 30 minutes or less. This change has given life to what's known as Quick Commerce (Q-Commerce), a new speedy retail concept that's all about delivering items at lightning speed, for example, within 10 to 20 minutes from the time they were ordered*(Chawla, 2022*). It is a model that seems tailor made for contemporary life — busy, fast, and always connected.

Q-Commerce riled through technology that enables micro-fulfillment centers near customers and a dense network of delivery riders. Urbanization, smartphone adoption and evolving consumer behavior . — particularly post-Covid-19 — have also catalyzed the trend*(Miao et al., 2022)*. Firms like Zepto, Blinkit and Swiggy Instamart are entering households, particularly in large cities, where consumers tend to look for speed and convenience

But for all the speed this model delivers, it also comes with complexities, particularly in last-mile delivery — the last leg of the delivery journey. Speed, cost, sustainability and labor concerns need to be managed simultaneously by logistics providers.This paper explores these questions by examining the **challenges and opportunities** that define last-mile

delivery in Q-Commerce. Using real-world examples from companies like Zepto, it highlights how logistics strategies must evolve to keep up with this fast-growing, high-pressure sector.

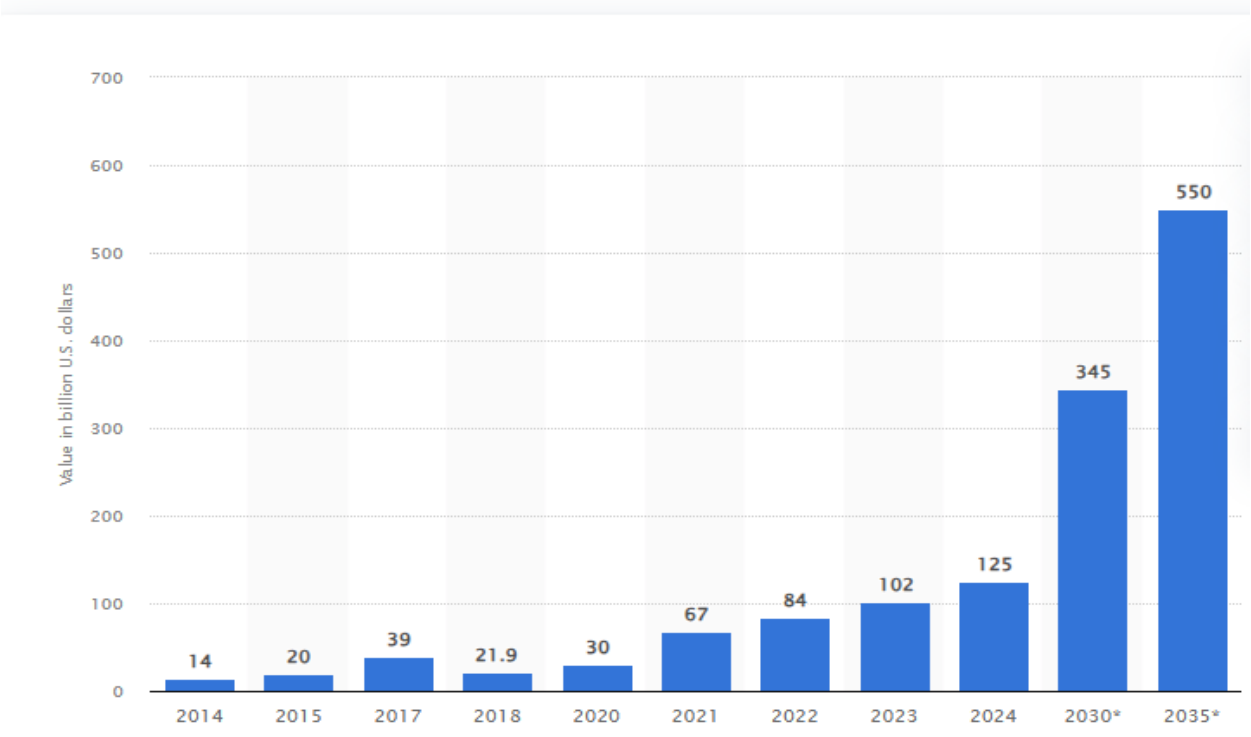
Literature Review

Quick commerce (Q-Commerce) is disrupting the retail and logistics spaces, and centers on ultra-fast delivery, often between 10 to 30 minutes. This model -— which capitalizes on urban micro-fulfillment centers, pinpoint-accurate delivery route mapping, and real-time technology — is a response to the modern consumer's increasing quest for speed and convenience. Q-Commerce features narrower delivery windows and is far more reliant on proximity compared to traditional e-commerce. Dark stores – small warehouses in urban areas [1] (*Ranjekar & Roy (2023)* examine quick commerce in India, focusing on business models, infrastructure needs, and key logistical challenges like inventory and delivery, providing scalable solutions for the market).
Bhatia-Kalluri (Bhatia-Kalluri, 2021) directly addresses the rise of quick commerce .Q-Commerce is emerging for a number of reasons: the ubiquity of smartphones, a growing demand for on-demand offerings and changed consumer expectations in the aftermath of COVID-19.

A population of more than 1.4 billion and a fast-growing economy, the number of online shoppers is predicted to increase to 427 million by 2027. Consequently, the booming e-commerce industry is estimated to be worth over 300 billion U.S. dollars by 2030.(A.Minhas, July 2024 E-commerce in India- Statistics & Facts)

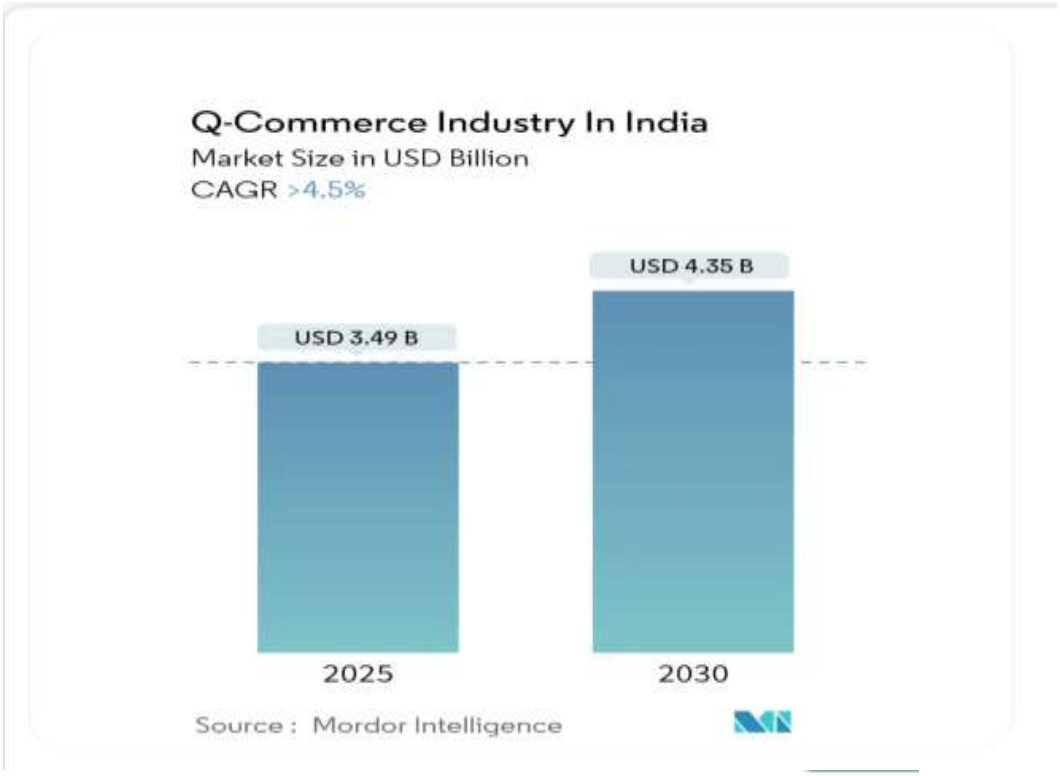
(Ivascu et al., 2022) address the impact of pandemic on consumer buying behavior. COVID19 led to an expansion in online grocery purchases by 80% in 2020 to USD 2.66 billion1(Patil et al., 2021, p2).

India’s e-commerce industry, valued at Rs. 10,82,875 crore (US$ 125 billion) in FY24, is projected to grow to Rs. 29,88,735 crore (US 345 billion) by FY30, reflecting a compound annual growth rate (CAGR) of 15% (Indian Brand Equity Foundation (IBEF) Page No.3)



Market size of e-commerce industry across India from 2014 to 2024, with forecasts until 2035 (Sources: Satista E-commerce report By A.Minhas)

In the world that consumers live in today, getting need based items like groceries, medicines, ready to eat food etc within hours rather than days is a near absolute time savior. This has driven high competition among the Q-Commerce players — especially in the crowded cities.*[2]* (*Naik & Kapdi (2025)* explore Indian consumer preferences and behavior in quick commerce, highlighting key factors that drive purchase decisions and loyalty. & [3]Joerss, Neuhaus & Schröder (2016) highlight how growing customer demands for speed and convenience are reshaping last-mile delivery, driving quick commerce growth and challenging traditional logistics.)



Study Period	2020 - 2030
Base Year For Estimation	2024
Forecast Data Period	2025 - 2030
Market Size (2025)	USD 3.49 Billion
Market Size (2030)	USD 4.35 Billion
CAGR (2025 - 2030)	4.50%

Source: Mordor Intelligence

But along with this rapid expansion has come some major hurdles. The last-mile delivery — the final leg of the logistics chain — is particularly complicated in Q-Commerce. Businesses must balance traffic gridlock, promised delivery times and increased expectations for cost-shaving. Additionally, matching services across geographies; efficiently managing delivery people and battling widely varied operating costs are real headaches.*[4]* (*Bajaj, Tuli & Srivastava (2010)* examine Indian retail management, emphasizing consumer behavior and logistics relevant to quick commerce and last-mile delivery.)

The existing challenges of fulfillment speed and environmental impact remain substantial barriers for Quick Commerce. However, those able to strategically re-engineer transportation routes utilizing machine learning, collaborate with community partners, and deploy renewable technologies may ascend above their competition. Additionally, alliances

forged between startups and established logistics firms demonstrate potential to jointly progress sustainable, data-driven distribution solutions.[5*](Kaur & Singh (2024)* highlight quick commerce as a major shift in retail, emphasizing technology and operations that enable ultra-fast delivery and its impact on traditional Indian retail supply chains.)

What existing scholarship shows is both the disruptiveness and innovativeness of the Q-Commerce model. Much dialogue revolves around shopper patterns or business development, granting meager examination to the logistical infrastructure—notably the last-leg conveyance division. This underscores an obvious necessity for more profound investigation into the transport difficulties, expense results, and strategic choices forming this rising market border. Meanwhile, the cost challenges of quick delivery are considerable, as are the technological requirements of optimizing routes in a way that satisfies customers accustomed to swift satisfaction of their retail whims while maintaining profitability. Retailers must carefully weigh the benefits of speed against the expenditures required to support it through strategic delivery partnerships and intelligent automation if this model is to prove viable in the long term.

Objectives:

1. Will Q-Commerce live up to its promises as it explodes in size?
2. What are some of the operational and infrastructure challenges to come?
3. How can businesses change in order to meet consumer needs yet still be efficient and also ethical?

4. Research Methodology

This research employs a qualitative exploratory methodology to assess the challenges and prospects of Challenges and Prospects of Last-Mile Delivery - Quick Commerce, specifically considering the Indian urban context. Quick commerce is a new and quick-growing model of commerce so we could not easily capture its complexity with just quantitative methods.

Both primary and secondary sources were used to collect the data.

Google Forms was used to gather responses from people who work directly in rapid commerce logistics operations in order to obtain primary data. Logistics staff, warehouse managers, and delivery executives were the main responders. The form received five to eight responses in total. The questionnaire looked at a number of topics, including labor, technology integration, delivery expectations, urban infrastructure, and the model's urban performance, in addition to the delivery timetable in connection to the rapid commerce model.

Secondary data was collected from various sources including various peer-reviewed research papers, academic journals ,credible internet sources,industry reports and news articles .These secondary data provided useful background information and solidified an understanding of trends, growth developments and innovations in the industries circular frameworks. This part of the research will explain and describe only one company example - Zepto - not to do a company case study but as a way to illustrate the operational practices for consistent planning of the industry.

5.Findings

However, the study shows that while Q-Commerce promises unusual speed and ease, success in last-leg delivery depends on a number of active factors. The operational difficulty of making sure deliveries happen on time in cities is an interesting finding. Organizations like Zepto rely heavily on secret shops that are strategically placed across cities. This greatly cuts down on delivery times but requires careful planning of stock, space, and staffing. The weather and the limitations of the spot can also make quick drop-offs less flexible. Local government rules also make it hard to find the best ways. Even though technology helps make planning easier, people are still needed to make sure that customers are happy and that promises are kept.

It was also found that tight shipping times are one of the biggest problems these companies have to deal with.

It was also discovered that one of the biggest operational issues these businesses face is the pressure to deliver on time. The logistical burden of having to deliver within a 10- to 15-minute timeframe is enormous, particularly during evening rush hours or in inclement weather like snow or severe rain. In addition to navigating congested streets and erratic traffic, delivery workers frequently have to meet inflated performance goals that provide little opportunity for mistakes or delays. Over time, this kind of high-pressure workplace may have an effect on employee job satisfaction levels as well as the caliber of customer care rendered.

The challenges of last-mile transportation have been exacerbated by the unplanned urban development of Indian towns and cities, which has resulted in zoned clusters with poor connection between them. For delivery executives in particular, the lack of adequate road infrastructure and directional signage within areas makes navigating challenging.

Another area of concern is Q-Commerce's pricing structure. Maintaining a high stock turnover, hiring a sizable personnel, and managing numerous tiny shops all contribute to the high operating costs associated with tendering ultra-speedy transport. On other days, managing demand during peak hours drives up prices. The long-term viability of this business model is called into doubt because many companies continue to offer free or inexpensive delivery in order to compete, despite the logistical difficulties that come with fast commerce. On the other hand, the investigation found a number of encouraging opportunities.

Real-time shipment tracking, artificial intelligence-optimized routes, and predictive inventory controls are examples of technological advancements that have improved accuracy and reduced delays. Additionally, when consumers show a willingness to pay for accelerated service and have increased faith in Q-Commerce platforms, new opportunities for innovative pricing strategies and value-added offers present themselves.

6.Conclusion

By meeting the needs of contemporary consumers for speed and convenience, Quick Commerce has drastically changed the retail and logistics industries. However, there are a number of operational, social, and environmental issues associated with this ultra-fast delivery paradigm, especially in the last-mile sector. According to the study, businesses still face challenges with unstable workforces, delivery pressure, and a lack of sustainable practices, even though they have successfully implemented innovations like micro-fulfillment centers and sophisticated delivery monitoring systems.

The demands for safer delivery standards, improved support networks, and more equitable working circumstances are reflected in the opinions of delivery partners. Simultaneously, operational flexibility and customer happiness show this model's substantial expansion potential. In order to create a Quick Commerce ecosystem that is more robust and inclusive, companies need to balance speed, efficiency, worker welfare, and environmental sustainability.

This study offers a preliminary investigation of the changing dynamics of last-mile delivery in Q-commerce, specifically in urban settings in India. Even while the results provide valuable insights, more study is required, particularly on a bigger scale, to create long-term plans that take into account the wider effects of this rapidly expanding industry as well as the current operating requirements.

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[10]Shah, J. (2009). *Supply Chain Management: Text and Cases.* Pearson Education India.

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[11]A.Minhas, July,2024 E-commerce in India – Statistics and Facts

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(https://www.ibef.org/download/1744282263_E-Commerce-February-2025.pdf)

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[14] (Miao et al., 2022)

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[16] (Ivascu et al., 2022) *address the impact of pandemic on consumer buying behavior*.

Annexure:1

Questionnaire

Questionnaire for Logistics Personnel in Quick Commerce
This survey is part of a research study titled *"Challenges and Opportunities in Last-Mile*

1. **Name (Optional)**

_____

2. **Designation/Role**

Mark only one oval.

Delivery Executive WarehouseSupervisor Logistics Manager
Other:

3. **Company/Platform**

Mark only one oval.

Zepto Blinkit
SwiggyInstamart

4. **WorkExperienceinQ-Commerce(inyears)**

Mark only one oval.

Less than 1

1-3

3-5

More than 5

5. **How many deliveries do you manage or complete in a typical shift?**

Mark only one oval.

1-10

11-20

21-30

MoreThan 30

6. **On average, how long does it take to deliver an order?**

Mark only one oval.

Lessthan10min 10–20 min
20–30 min

More than 30 min

7. **What are the most common reasons for delivery delays?**

Mark only one oval.

Traffic congestion
Incorrect addresses
Weather conditions
App/system issues

8. **Have you received any training related to route optimization or emergency handling?**

Mark only one oval.

Yes No

9. **Do you think your work environment is safe and supportive?**

Mark only one oval.

Yes No

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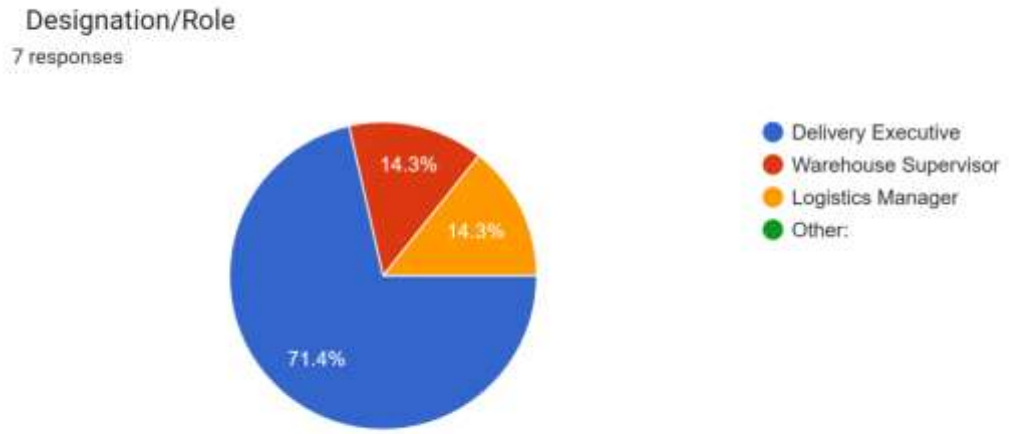
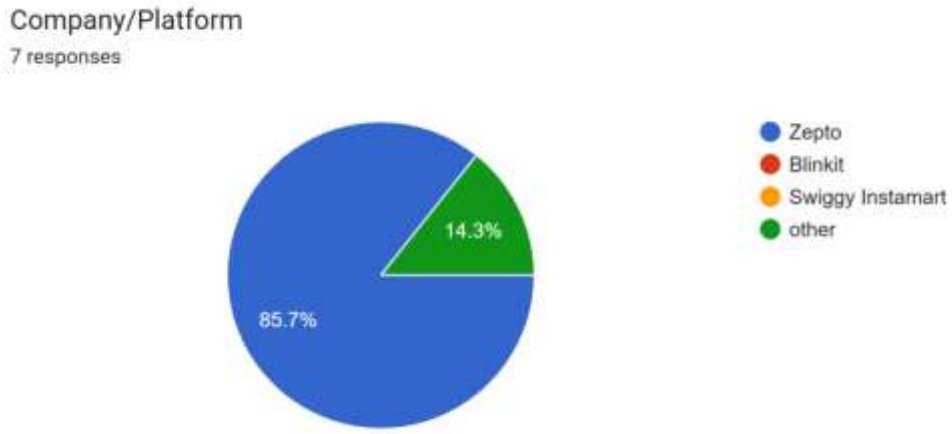
Google Forms

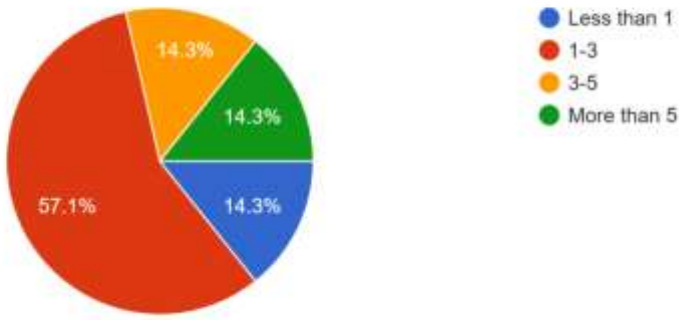
Annexure:2 Questionnaire Response





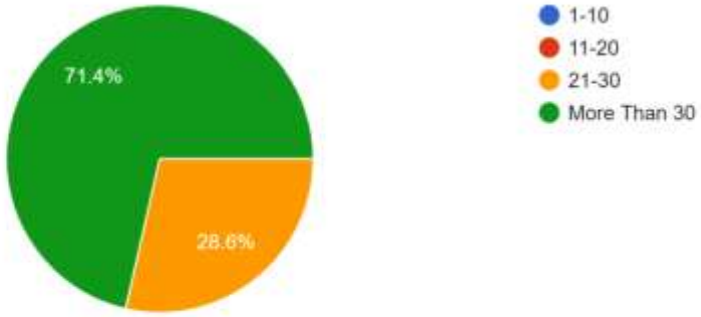
Work Experience in Q-Commerce (in years)

7 responses



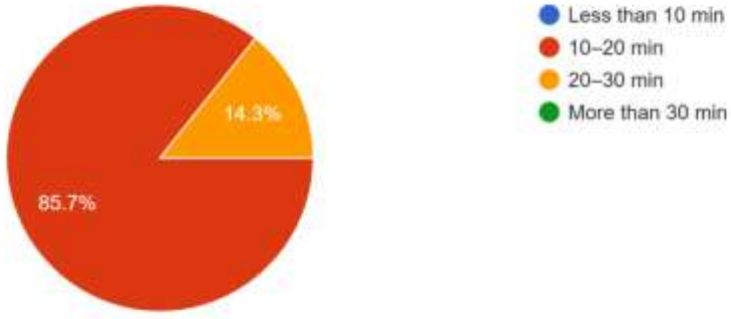
How many deliveries do you manage or complete in a typical shift?

7 responses



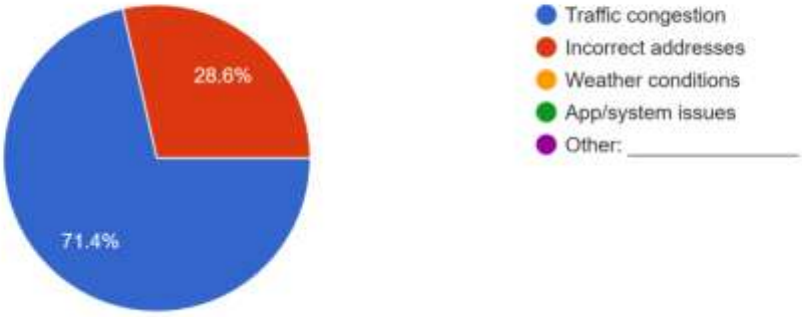
On average, how long does it take to deliver an order?

7 responses



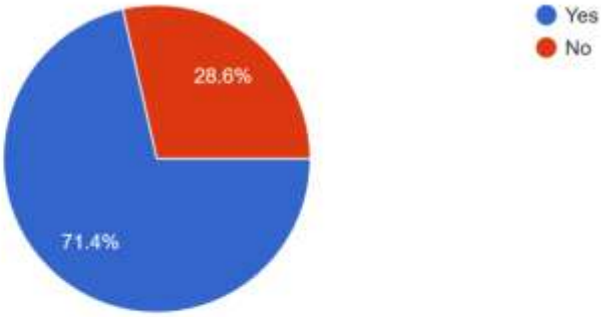
What are the most common reasons for delivery delays?

7 responses



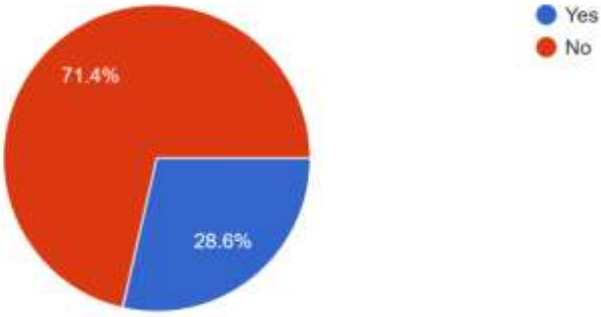
Have you received any training related to route optimization or emergency handling?

7 responses



Do you think your work environment is safe and supportive?

7 responses



Annexure :3

Questionnaire Summry

Combined Survey Summary

Question	Option	Percentage	Count (out of 7)
1. Designation/Role	Delivery Executive	71.40%	5
	Warehouse Supervisor	14.30%	1
	Logistics Manager	14.30%	1
	Other	0%	0
2. Company/Platform	Zepto	85.70%	6
	Swiggy Instamart	14.30%	1
	Blinkit / Other	0%	0
3. Work Experience in Q-Commerce (years)	Less than 1	14.30%	1
	1–3	57.10%	4
	3–5	14.30%	1
	More than 5	14.30%	1
4. Deliveries per shift	21–30	28.60%	2
	More than 30	71.40%	5
	1–10 / 11–20	0%	0
5. Average Delivery Time	10–20 min	85.70%	6
	20–30 min	14.30%	1
	<10 min / >30 min	0%	0
6. Common Reasons for Delivery Delays	Traffic congestion	71.40%	5
	Incorrect addresses	28.60%	2
	Others	0%	0
7. Biggest Challenge in Last-Mile Delivery	Safety and physical strain	71.40%	5
	Time pressure	28.60%	2
	Others (traffic, customer issues etc)	0%	0
8. Received Training (Route optimization / Emergency handling)?	Yes	71.40%	5
	No	28.60%	2
9. Is Work Environment Safe and Supportive?	No	71.40%	5
	Yes	28.60%	2