Research Article

The last mile E-commerce logistics in Pakistan: Challenges and opportunities

Muhammad Younus[1,2*], Salman Allana[2], Max Kleynhans[3]

[1]*Department of Government Affairs and Administration, Universitas Muhammadiyah Yogyakarta, Yogyakarta, Indonesia.*

[2] *Founder & Chief Executive Officer (CEO), TPL Logistics Pvt Ltd (Rider YC WC22), Karachi, Pakistan.*

[3] *Product At Xneelo (Pty) Ltd, City of Cape Town, Western Cape, South Africa*

* Corresponding author: Muhammad Younus, mohammedyounusghazni@gmail.com

ABSTRACT

This research examines the critical challenges and emerging opportunities in the last-mile e-commerce logistics sector in Pakistan, a rapidly growing yet underdeveloped market segment. The study aims to analyze logistical inefficiencies, technological integration, and consumer expectations that influence the operational and strategic dynamics of last-mile delivery services. A mixed-methods approach was employed, combining quantitative surveys of e-commerce consumers and delivery service providers with qualitative interviews of industry experts. Key findings reveal that logistical bottlenecks, such as inadequate infrastructure, traffic congestion, and limited access to remote areas, significantly impede timely deliveries. Furthermore, the lack of standardized digital platforms and reliance on cash-on-delivery mechanisms exacerbate operational inefficiencies. On the other hand, the research identifies significant opportunities for improvement, including the integration of advanced logistics technologies such as route optimization and real-time tracking, along with the adoption of alternative delivery models like micro-fulfillment centers and crowd-sourced delivery networks. Additionally, consumer awareness and trust in digital payment systems have been steadily increasing, creating avenues for streamlined operations. The study concludes that addressing infrastructure deficits and leveraging technology-driven solutions can enhance efficiency, reduce costs, and improve customer satisfaction, positioning Pakistan's e-commerce logistics sector for sustainable growth. Recommendations for policy and industry practices are also proposed to optimize last-mile delivery performance.

Keywords: Logistics, last-mile, delivery rider, E-commerce

1. Introduction

The rapid growth of e-commerce in Pakistan has revolutionized the retail landscape, offering consumers unprecedented convenience and access to a diverse array of products. According to the Pakistan Telecommunication Authority (PTA), over 100 million internet users and increasing smartphone penetration have created fertile ground for e-commerce expansion. However, while the sector continues to thrive, last-mile logistics—the critical final step in the delivery process—remains a significant bottleneck. Efficient last-mile logistics is not only pivotal for customer satisfaction but also a determining factor in the

sustainability and scalability of e-commerce businesses. For a developing country like Pakistan, where infrastructure and logistical inefficiencies persist, navigating these challenges poses a unique set of complexities and opportunities.

Despite the promise of e-commerce, last-mile delivery in Pakistan faces several obstacles rooted in the country's socio-economic and infrastructural realities. Poorly maintained roads, traffic congestion, and fragmented urban planning in major cities like Karachi, Lahore, and Islamabad often result in delays and increased operational costs. Additionally, limited digital literacy and a lack of trust in online payment systems further compound these challenges. Rural and semi-urban areas, where approximately 64% of Pakistan's population resides, present an even more daunting scenario. Delivery services often grapple with incomplete or non-standardized address systems, low population density, and insufficient transportation networks, making last-mile logistics in these regions both cost-intensive and time-consuming.

On the business side, the high cost of delivery, particularly for cash-on-delivery (COD) transactions—preferred by over 60% of Pakistani online shoppers—poses a financial strain on logistics providers and e-commerce platforms. Moreover, a lack of integration between technological solutions and traditional logistics processes hampers efficiency. While the global e-commerce industry has seen remarkable innovation, such as the adoption of drones, autonomous vehicles, and smart lockers for deliveries, such advancements are yet to gain traction in Pakistan due to regulatory and infrastructural constraints. Consequently, the inefficiencies in last-mile logistics directly impact customer satisfaction, retention, and profitability, creating a pressing need for sustainable solutions.

The challenges in last-mile logistics, however, are not insurmountable and present numerous opportunities for innovation and growth. The proliferation of digital platforms, coupled with advancements in geographic information systems (GIS) and artificial intelligence (AI), offers potential for optimizing delivery routes, enhancing accuracy, and reducing operational costs. Additionally, public-private partnerships can play a transformative role in addressing infrastructural gaps, while community-based delivery models have the potential to improve accessibility in remote areas. E-commerce platforms can also benefit from diversifying payment options and incentivizing the use of digital transactions to reduce reliance on COD systems. Furthermore, leveraging the gig economy by engaging freelance delivery agents could enhance flexibility and efficiency in last-mile logistics operations.

This study aims to comprehensively explore the challenges and opportunities associated with last-mile e-commerce logistics in Pakistan. By analyzing the existing logistical frameworks and their limitations, the research seeks to identify actionable strategies to enhance the efficiency of last-mile delivery operations. Furthermore, it investigates how technological innovations, regulatory reforms, and stakeholder collaboration can be leveraged to address these challenges. The study is guided by the overarching objective of fostering a more resilient and customer-centric logistics ecosystem that aligns with the dynamic needs of Pakistan's e-commerce sector.

Ultimately, this research aspires to contribute to the ongoing discourse on e-commerce logistics in developing countries by offering a context-specific understanding of Pakistan's last-mile delivery landscape. By highlighting both the constraints and opportunities, the findings aim to inform policymakers, e-commerce businesses, and logistics providers, enabling them to devise innovative and sustainable strategies. In doing so, this study underscores the critical role of last-mile logistics in shaping the future trajectory of e-commerce in Pakistan and its potential to drive economic growth and inclusivity.

2. Literature review

2.1. E-commerce

E-commerce is the process of buying and selling goods and services over the internet, including retail shopping, digital services, and business-to-business exchanges. It has transformed traditional commerce due to its convenience, accessibility, and worldwide reach[1]. E-commerce transactions can be done on computers, tablets, cellphones, and other intelligent devices and operate in various market categories. E-commerce transactions make almost every good or service accessible, including books, music, airline tickets, and financial services like stock trading and online banking. E-commerce is a disruptive technology that transforms busy city centers and physical stores into zeroes and ones on the information superhighway[2]. Around 4.14 billion people are expected to make online purchases this year, and there are over 150 million Prime members who shop at Amazon locations. E-commerce enables startups, established enterprises, and multinational corporations to sell their goods globally.

An e-commerce website serves as an online storefront, making the deal between a buyer and a seller easier. It represents the product racks, salespeople, and cashiers of your online commerce channel. Businesses can develop their own e-commerce website on a dedicated domain, create a branded store experience on a website like Amazon, or do it all for a multi-channel strategy[3]. In summary, e-commerce is a transformative technology that allows businesses and individuals to sell goods and services globally. It is a crucial component of the larger field of electronic business, enabling businesses to reach a wider audience and expand their reach.

2.2. Logistics

Logistics is the planning, execution, and control of the flow of goods, services, or information from the point of origin to the point of consumption. It involves activities such as transportation, warehousing, inventory management, and supply chain coordination[4]. Effective logistics ensures timely and cost-effective delivery of products in e-commerce and other businesses. Inbound logistics involves strategic organizational tasks for upstream activities, such as moving and transporting information and goods from suppliers to production facilities for further processing and manufacture[5]. Outbound logistics transport goods from manufacturing facilities to the supply chain link, delivering them to customers or consumption locations. Reverse logistics involves moving products or goods from end users to the supply chain, such as refurbishing, repairing, exchanging, discarding, or recycling.

Third-Party Logistics (3PL) refers to contracting out operational or eCommerce logistics to a third-party logistics company, which handles everything from inventory control to product delivery. A 3PL provider frees business owners to focus on their core skills by taking order fulfillment procedures effectively[6]. Fourth-Party Logistics (FPL) assigns all logistics-related responsibilities to a single logistics partner, ensuring a higher level of supply chain management for each client. Overall, logistics plays a crucial role in the smooth operation of businesses and the delivery of products to customers.

2.3. Last mile

Last-mile logistics refers to the final leg of the delivery process, from a distribution center or fulfillment hub to the end consumer. It is a critical yet challenging section of the supply chain, as customer satisfaction relies on this factor[7]. Last-mile logistics is an evolving part of e-commerce, requiring consideration of factors such as traffic congestion, accessibility, and speed of delivery. The aim of last-mile logistics is to deliver packages economically, swiftly, and accurately as possible. Over 53% of the total shipping costs for a product are incurred in the final mile of delivery[8]. Inefficiencies can result in prohibitive costs, increasing overhead and reducing a company's earnings. The last mile of the journey from the site or transportation hub

to the end user's location is known as last-mile delivery. However, it is often the most expensive step in the process, accounting for more than half of total shipping expenses [9].

2.4. Delivery riders

Delivery riders are essential in e-commerce and food delivery services, ensuring fast and efficient last-mile delivery of goods to customers. They use motorbikes, bicycles, or vans to transport goods from one area to another, distributing everything from food to furniture. Delivery drivers are punctual, follow a route, and adhere to a time schedule. They pack, move, and deliver goods to customers or companies, reviewing orders before and after delivery to ensure completeness and accurate charges[10-11]. Delivery drivers also help load and unload goods from cars and take payments for delivered goods. They drive vehicles, operate trucks or forklifts, and create reports and paperwork related to their deliveries. They respect traffic regulations, maintain a spotless driving record, stick to designated routes, and arrive on time. Delivery drivers offer exceptional customer service by responding to inquiries and resolving complaints[11-13]. A valid driver's license, spotless driving record, and a high school diploma or equivalent are required for delivery drivers. They also handle loading freight, traveling to the designated place using navigational aids, and delivering packages.

2.5. Warehousing

When we discuss a warehouse solution, we're referring to a business that keeps goods on hand for a long time. A warehouse is a sizable storage facility or industrial building intended to contain enormous quantities of inventory[14]. You'll see forklifts, containers, and shelves stacked high and filled with much merchandise. Some companies specialize in B2B e-commerce or wholesale orders, and warehousing providers focus on wholesale fulfillment. While some large merchants rent space in a warehouse in cooperation with other e-commerce companies, others own warehouses or warehouses to keep excess inventory[15-17].

3. Research method

The study used a qualitative analytical method to examine current practices in logistics and e-commerce industries, focusing on strategies and initiatives for promoting novel payment solutions in online purchasing. The analysis involved interpreting textual information, searching for patterns, and analyzing data and materials after initial rounds. The study specifically focused on strategy formulation.
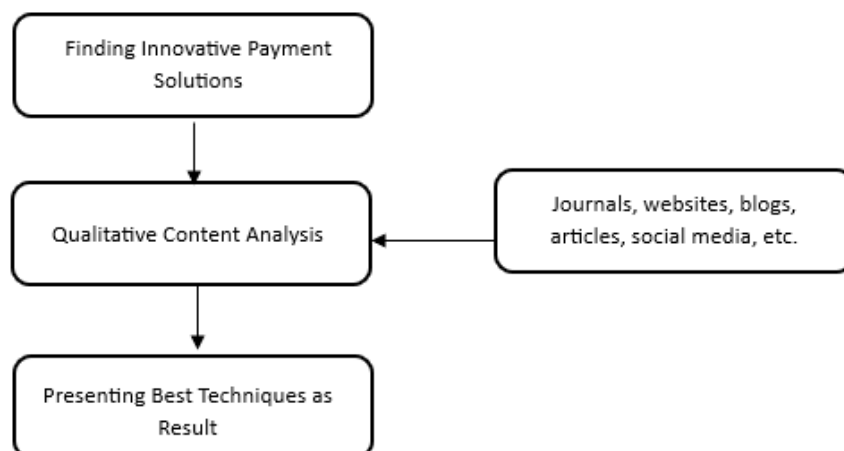
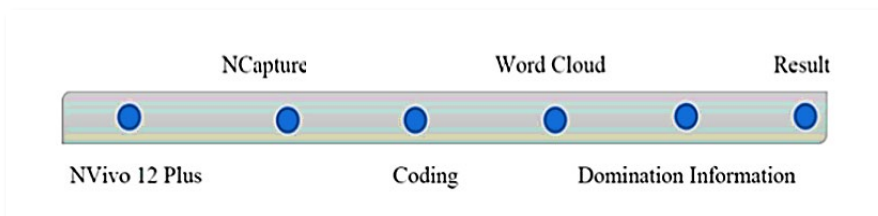

Figure 1. Research Working Flow

The NVivo 12 Plus software was used to process the collected data in order to identify the major theme that pervaded all of the materials analysed for this article. The results are then provided in detail. Data organisation, analysis, and visualisation are done with NVivo 12 Plus. The data was categorised using Nvivo 12 Plus in the following ways: (1) uploading research data to the Nvivo 12 Plus work screen; (2) classifying research data; (3) putting together variables and indicators for the study in accordance with the research concept used; (4) grouping analysis data into variables and indicators that were collected; and (5) going over and reinterpreting the coded data to make sure it is accurate.

Figure 2. NVivo Software Working Flow

The idea of e-government will be included into the descriptive analytical approach to make this plan efficient and simple to execute. Textual and graphical representation will be used in a thorough examination of the data to examine the important topics mentioned in the guidelines. Additionally, we included an indirect citation in the literature review. In this instance, grounded theory served as the study's methodology.

4. Results and discussion

4.1. Challenges from logistics operation

Un-submitted Amount Recovery from Rider: Recovering unsubmitted cash from riders is a persistent challenge. Riders may delay or fail to return collected cash to the company, leading to financial discrepancies. This issue strains operational efficiency and requires strict monitoring mechanisms, often leading to distrust between riders and management.

Aging of Parcels: Parcels that remain undelivered for an extended time due to operational inefficiencies or rider delays can result in customer dissatisfaction and logistical bottlenecks. This increases storage costs and negatively impacts the brand's reliability.

Parcels Damaged: Mishandling during transit or improper storage by riders often leads to damaged parcels. This not only incurs replacement or refund costs but also harms customer trust and brand reputation.

Parcel Stealing: Theft of parcels by riders or during transit undermines the integrity of operations. Such incidents necessitate increased security measures, audits, and rider background checks, escalating operational costs.

Rider Salary Structure is not Market Competitive: Non-competitive salaries make it challenging to attract and retain skilled riders. This results in high turnover rates and inefficiencies due to frequent recruitment and training cycles.

Mis-Handling of Rider from Staff: Poor treatment or lack of respect for riders by operational staff can lead to demotivation and lower job satisfaction. This ultimately affects their performance and commitment to fulfilling orders efficiently.

Order Load is Less Means Less Incentive for Riders: When order volumes are low, riders earn less in incentives, leading to dissatisfaction and lack of motivation. This scenario may compel riders to seek opportunities elsewhere, further impacting delivery operations.

Rider Problem with Company Policies (e.g., Penalty, KPI): Strict policies such as high penalties and unattainable key performance indicators (KPIs) frustrate riders, causing resentment. This can lead to non-compliance, decreased performance, or attrition.

Rider Late Departure from Warehouse: Delays in dispatching riders from warehouses due to disorganized loading or administrative inefficiencies result in missed delivery windows, affecting customer satisfaction and operational flow.

Rider Problem with Cashier (Availability, Slowness): Delays or unavailability of cashiers disrupt rider schedules, causing inefficiencies in the cash submission and reconciliation process. This results in longer waiting times and increased frustration among riders.

Policies May Drive Riders to Theft and Snatching: Overly harsh policies or financial pressures, such as low salaries or high penalties, may unintentionally push riders toward unethical behavior, such as theft or parcel snatching, to compensate for perceived injustices.

Mis-Handling of Merchants: Ineffective communication or mishandling of merchants by operations staff can lead to strained relationships, order delays, and dissatisfaction, which ultimately impacts overall logistics performance.

Pickup Issues of Merchants: Delays or errors in picking up parcels from merchants disrupt the supply chain and create a backlog. This also undermines the trust merchants have in the logistics service.

Route Optimization Practical Implementation: Poor practical execution of route optimization algorithms results in inefficient delivery routes, increased fuel costs, and delays, negating the benefits of technology-driven solutions.

Orders Backlog Because of Less Riders: A shortage of riders, especially during peak seasons, leads to a backlog of undelivered orders. This creates dissatisfaction among customers and merchants while straining operational resources.

Orders Backlog Because of Rain: Adverse weather conditions, such as rain, significantly hinder rider mobility, causing order backlogs and delaying deliveries. This creates challenges in meeting customer expectations and maintaining operational efficiency.

4.2. Challenges from delivery riders

Cut off for Rider Enroute Load vs Time: Riders often face stringent cut-off times to load parcels for delivery, which can create stress and inefficiencies. If the parcels are delayed at the warehouse or the routes are poorly planned, it may lead to reduced delivery efficiency and lower customer satisfaction.

Snatching of Parcels from Rider: Parcel theft is a significant issue, especially in areas with high crime rates. This not only results in financial losses but also impacts customer trust and the rider's sense of safety.

Snatching of Cash Collected from Rider: When handling cash on delivery (COD) payments, riders are vulnerable to theft, posing both financial and psychological risks, as they often carry large sums.

Reporting Snatching to Police: Riders may hesitate to report snatching incidents to police due to lengthy procedures, fear of blame, or inadequate support from their companies, further exacerbating the problem.

Parcel Stolen from Rider: Riders may encounter theft while parcels are left unattended, leading to challenges in maintaining accountability and customer satisfaction.

Cash Collected is Misplaced by Rider Enroute: Misplacing COD cash enroute can result in disputes, financial losses for the rider, and operational inefficiencies for the company.

Forcefully Open Parcel Problem: Customers or others might force riders to open parcels, leading to potential disputes, safety concerns, and damaged items.

Route Closing Time Problem: Fixed route closing times may restrict deliveries, especially in areas with time-sensitive entry restrictions, reducing service efficiency.

What Rider Force We Should Use – Dedicated or Crowdsource: The choice between dedicated or crowdsourced riders depends on factors like cost, reliability, and operational scalability. Dedicated riders offer consistency, while crowdsourcing provides flexibility during peak demands.

Same Day 2nd Attempt Problem: Reattempting delivery on the same day increases operational costs and rider fatigue, often without guaranteed success.

Time Schedule of Delivery: Strict delivery schedules may be unrealistic due to traffic, weather, or unforeseen delays, putting pressure on riders and potentially compromising service quality.

Rider Health Problems: Long hours, physical strain, and exposure to environmental hazards contribute to health issues, reducing riders' productivity and overall job satisfaction.

Avg. Waiting Time on Order: Excessive waiting times at pickup points or customer locations reduce efficiency and can delay subsequent deliveries.

Rider Agent Authority: Riders with limited authority to address customer issues or make decisions face challenges in ensuring customer satisfaction and smooth operations.

Time Gap Taken Between Each Route: Unplanned or long gaps between delivery routes result in inefficiency and reduced daily parcel handling capacity.

Call Confirmation before Attempt: Calling customers before delivery consumes time and may not always yield timely responses, causing delays.

Parcel Lost/Missed Enroute: Lost or misplaced parcels lead to operational losses, customer dissatisfaction, and increased investigation efforts.

Riders per Parcel Vs Salary: Balancing the number of riders per parcel and their salaries is critical for ensuring profitability without compromising service quality.

Extra Amount Taken by Rider: Instances of riders demanding extra money from customers create trust issues and tarnish the company's reputation.

Fake Parcel Delivered: Delivering fake parcels, whether intentional or due to fraud in the system, affects customer trust and operational integrity.

Cash Submission Way for Riders: Efficient and secure cash submission methods are necessary to minimize risks of misplacement or theft and reduce administrative burdens.

COD Amount Spend by Rider: Riders using collected COD cash for personal expenses may disrupt cash flow and delay reconciliations.

Rider Faked Snatching Incident: Falsifying snatching incidents for personal gain poses a challenge to transparency and accountability.

Rider in Revenge Misplaced Cash and Orders Disgruntled riders may intentionally misplace orders or cash, resulting in significant operational and financial losses.

Increased Fuel Cost: Rising fuel prices directly impact rider earnings and operational costs, necessitating route optimization and fuel allowances.

Attempt Not Made Due to Weather Conditions: Adverse weather conditions hinder delivery attempts, leading to delays and customer dissatisfaction.

Attempt Not Made Due to Road Block: Roadblocks, whether temporary or due to construction, delay deliveries and require efficient rerouting strategies.

Attempt Not Made Due to Entry Banned: Restricted entry zones require alternate delivery mechanisms or permissions, impacting delivery timelines.

Attempt Not Made Due to Time Limit: Delivery restrictions in certain areas during specific hours necessitate precise route planning to avoid failed attempts.

Rider Misbehaved with Customer: Riders' unprofessional behavior can damage the company's reputation and lead to customer complaints.

Rider Faked Attempt of Order: Fake delivery attempts disrupt operational efficiency and customer trust, necessitating robust monitoring mechanisms.

Rider Mistakenly Delivered to Wrong Address: Wrong deliveries waste time and resources, requiring corrective efforts and customer reassurance.

Riders Having Criminal Records: Riders with criminal records pose risks to security and the company's reputation, emphasizing the need for stringent background checks.

Rider Needed to Have the Change: Lack of proper change during COD deliveries frustrates customers and complicates transactions.

Rider Having Problem Entering Military Garrison: Restricted access to certain zones, like military garrisons, delays deliveries and requires specialized permissions.

Rider Mobile Battery Drained: Drained phone batteries disrupt communication and navigation, leading to delays or failed deliveries.

Rider Wants Reimbursement of Parking Charges: Riders seeking parking charge reimbursements adds administrative burdens and operational costs.

Rider Leave Wanted: Frequent or unscheduled leave requests can disrupt delivery schedules and strain available resources.

Rider Limit to Carry Order Weight: Overloaded riders face health risks, reduced efficiency, and potential damage to parcels.

Parcels Damaged Because of Rain: Improper protection during rain leads to damaged parcels and customer dissatisfaction.

Customer Already Amount Confirmation: Pre-confirmation of COD amounts helps streamline transactions but requires system integration and real-time updates.

Riders with Incomplete Papers/License: Unlicensed riders risk legal issues, penalties, and potential harm to the company's reputation.

Rider Don't Have Smartphones: Riders without smartphones face challenges in using navigation apps, tracking systems, and communication tools, affecting efficiency and transparency.

4.3. Challenges from merchants

No Standard Way of Taking Customer Address: Merchants face difficulties in capturing accurate and standardized customer addresses, leading to delivery inefficiencies and misrouting. This challenge often stems from variations in how customers provide their addresses, especially in regions with informal addressing systems or incomplete data, resulting in delayed or failed deliveries.

Customer Issues with Merchants: Disputes or dissatisfaction between customers and merchants, such as discrepancies in product descriptions, quality, or pricing, create a strain on last-mile logistics. These issues often lead to returns or canceled orders, increasing costs and operational complexities for merchants.

Less Rates Because of Market Competitivenes: High market competition pressures merchants to offer lower prices, reducing profit margins. This financial constraint makes it challenging to invest in efficient last-mile logistics, impacting the quality of delivery services.

Out of Service Area: Merchants often struggle to serve customers in areas beyond the logistics provider's reach. This limitation restricts market potential and creates frustration among customers who expect seamless service regardless of their location.

Non-Service Area: Inaccessibility to non-service areas due to poor infrastructure or logistical constraints limits merchants' ability to expand their reach, leading to lost sales opportunities and customer dissatisfaction.

Problems with Sales Person or KAM Person: Merchants frequently encounter communication and coordination issues with sales or Key Account Managers (KAM), leading to misunderstandings or delays in resolving logistics-related problems, thereby impacting the overall efficiency.

Speedy Payments of Orders: Delayed payments from customers or intermediaries can disrupt cash flow for merchants, hindering their ability to maintain smooth operations and invest in better last-mile delivery solutions.

New Options Required on Portals: Merchants need e-commerce platforms to offer updated and customizable options to enhance the logistics process, such as flexible delivery time slots or improved return mechanisms. The lack of such features can make managing orders more cumbersome.

Pickup Issues from Rider: Merchants face challenges when riders fail to pick up parcels on time due to scheduling conflicts or resource shortages. This delay disrupts the supply chain, causing late deliveries and dissatisfied customers.

Merchant Packed Incorrect Item in the Parcel: Packing errors by merchants lead to customer dissatisfaction and an increase in returns, which not only impacts operational efficiency but also damages brand reputation.

Partial Payment Received from Customer: Merchants face financial risks when customers only partially pay for orders, which complicates revenue tracking and cash flow management, adding another layer of difficulty to last-mile logistics.

Customer Already Paid Amount: Discrepancies occur when customers claim they have already paid for orders, leading to disputes that delay deliveries and strain merchant-customer relationships.

Merchant Issues with Sales Person: Merchants may face unresolved issues with sales personnel, such as lack of support or miscommunication, which can hinder the smooth resolution of logistics challenges.

Merchant Issues with Key Account: Merchants often experience coordination problems with key account managers, who play a critical role in managing high-priority clients and resolving logistical bottlenecks. Inefficiencies in this relationship directly impact the last-mile delivery process.

Unexpected Orders Load: Merchants frequently encounter unexpected surges in order volume during peak seasons or sales events, overwhelming their logistics capabilities and causing delays or errors in deliveries.

Urgent Deliveries Request: Merchants are under pressure to fulfill urgent delivery requests, often requiring them to expedite processes at a higher cost. This urgency can disrupt routine operations and lead to logistical inefficiencies.

4.4. Challenges from customers

Open Parcel Problem: Customers often demand to inspect their parcels before accepting delivery to verify the contents and ensure they match the order. This can delay the process and disrupt the delivery schedule.

Route Closing Time Problem: Delivery riders may face route restrictions or closures due to customer-specific rules or external factors, resulting in missed or delayed deliveries.

Average Waiting Time on Order for Customer: Customers frequently express dissatisfaction with prolonged waiting times for their orders, which can diminish trust and overall satisfaction with the e-commerce service.

Call Confirmation Before Attempt: Some customers require pre-delivery call confirmations, creating additional steps in the process and potential delays if contact cannot be made.

Invalid Addresses: Incorrect or incomplete address details provided by customers often lead to delivery failures, increased operational costs, and customer dissatisfaction.

Extra Amount Given by Customer: Handling situations where customers provide excess payment, particularly in cash-on-delivery orders, creates logistical and reconciliation challenges.

Fake Parcel Delivered: Delivering incorrect or counterfeit items damages the e-commerce company's reputation and leads to customer disputes and returns.

Cash Not Available: In cash-on-delivery orders, customers sometimes lack the required cash, leading to failed deliveries and increased re-attempt costs.

Customer Assumes Us as Merchants: Customers may misinterpret the role of delivery personnel as merchants, leading to confusion and unmet expectations about the service.

Out of Service Area: Customers in areas beyond the defined service zones face challenges in accessing e-commerce services, resulting in unmet demand.

Non-Service Area: Orders placed from explicitly non-serviceable locations lead to cancellations, dissatisfaction, and potential reputation damage.

Consignee Not Available: When customers are unavailable during delivery attempts, it results in missed delivery and additional re-attempt costs for the company.

Consignee Shifted: Customers who move to new locations without updating their address cause misdeliveries and logistical inefficiencies.

Fri/Sat Closed: Some customers' unavailability due to specific days being non-operational adds complexity to delivery scheduling.

Unable to Locate: Difficulty locating delivery addresses due to lack of detail or unclear instructions causes delays and inefficiencies.

Close on Arrival: Businesses or residences closed during delivery attempts necessitate rescheduling, leading to delays and cost increases.

No Such Consignee: Instances where no such recipient exists at the provided address cause failed deliveries and operational disruptions.

Reschedule on Consignee Request: Requests for rescheduling deliveries require flexibility but increase logistical planning burdens.

Refused to Accept: Customers occasionally refuse orders upon arrival, necessitating product return and investigation of reasons.

Consignee Wants to Open Parcel: Demands to inspect parcels before payment introduce operational challenges and potential disputes.

Delivery Location Closed: Closed delivery sites during operational hours force the postponement of delivery attempts.

Cannot Find Address, No Contact with Customer: Lack of customer responsiveness and unclear addresses result in failed deliveries.

Purchased Another Product: Customers cancel orders due to purchasing similar products elsewhere, causing order losses.

Wrong Size Order: Delivery of incorrectly sized products, often due to customer error, leads to returns and reduced satisfaction.

Change of Mind: Customers sometimes cancel orders due to altered preferences, impacting sales and inventory planning.

Parcel Open Request: Customers may insist on inspecting parcels before payment, which can delay delivery processes.

Parcel Damage: Damaged parcels result in customer dissatisfaction, returns, and additional costs for replacements or refunds.

Mistakenly Made Order: Customers may accidentally place orders they do not intend to receive, leading to cancellations or refusals.

Not Booked Any Order/Fake Order: False claims of unplaced orders increase administrative burden and operational inefficiencies.

Parcel Hold Request: Customer requests to delay deliveries to a later date create additional storage and scheduling challenges.

Too Much Price, Cash Not Available: Customers unwilling or unable to pay due to price dissatisfaction or lack of cash cause delivery failures.

Too Late Delivery, Poor Service: Late deliveries damage customer trust and satisfaction with e-commerce platforms.

Going Out of City: Customers unavailable due to travel cause missed delivery attempts and rescheduling.

I Don't Want This Item: Rejection of parcels at the time of delivery results in increased return logistics and financial losses.

I Am Travelling So I Am Not Home: Customers being out of town disrupt the delivery process, requiring rescheduling or cancellations.

Office Timing Issue: Deliveries scheduled outside customers' office hours fail, requiring re-attempts.

Purchased Items from Outlet/Shop: Customers who buy products from physical stores cancel online orders, causing inventory mismanagement.

Mistakenly Made Refused, Now Wanted: Customers who initially refuse parcels but later request them create unnecessary logistical loops.

Duplicate Order: Duplicate orders lead to customer confusion and increased operational costs due to returns or cancellations.

Extra Order Cancel: Customers canceling surplus orders result in inventory and financial planning disruptions.

Invalid Customer Number: Inaccurate contact information provided by customers leads to failed delivery communication.

Switched Off Customer Number: Inability to contact customers with switched-off numbers causes failed delivery attempts.

Change of Address: Customers updating their addresses post-order disrupt routing and scheduling efficiency.

Change of Contact Number:BUncommunicated changes in contact details complicate coordination with customers.

Self-Pickup Request: Requests for self-pickup require process adjustments and create logistical challenges.

Customer Don't Have the Change: Lack of exact cash by customers complicates cash-on-delivery transactions.

Reaching to Customers in Military Bases: Delivering to restricted or secure locations involves extra clearances and time.

Rider Has to Pay Parking Charges: Customers in areas requiring paid parking increase operational expenses for deliveries.

Customer Wants to Do Partial Payment: Requests for partial payments deviate from standard processes, requiring policy adjustments.

Doing Deliveries During Rain: Inclement weather affects delivery efficiency and timeliness, posing safety risks.

Rider After Rain Taking Holidays: Post-rain absenteeism among riders disrupts delivery schedules and capacity.

Rider After Rain Having Bike Issues: Weather-induced vehicle problems delay deliveries and increase maintenance costs.

4.5. Challenges from technological issues

Implementation of Route Optimization Software: The implementation of route optimization software poses a significant challenge in e-commerce last-mile logistics due to the complexity of integrating advanced algorithms with existing logistics systems. Ensuring the software adapts to dynamic factors such as traffic, weather, and package prioritization requires extensive customization and testing. Moreover, compatibility issues with legacy systems and the high cost of acquisition and training can impede smooth adoption. Resistance from stakeholders unfamiliar with the technology further adds to the challenge, delaying the realization of its efficiency benefits.

Bug/Glitch/Issue on Live Portal/App: Bugs or glitches on live portals and apps disrupt the smooth functioning of e-commerce logistics, affecting order tracking, delivery schedules, and customer satisfaction. Such issues can lead to incorrect routing, delays in updates, or even system crashes, severely impacting operational efficiency. Identifying and resolving these problems in real-time requires a robust monitoring system and a dedicated technical team, which may not always be feasible for smaller businesses or during peak demand periods, compounding the logistical challenges.

Deployment of Changes to Live Portal/App: Deploying changes to live portals or apps is a critical yet risky process in e-commerce logistics. Improper deployment can lead to system failures, loss of data, or functional discrepancies that directly affect delivery operations and customer interactions. Balancing the need for rapid updates with thorough testing is challenging, especially under tight schedules. Additionally, lack of coordination between development, quality assurance, and operations teams often results in unanticipated issues post-deployment, requiring swift corrective measures.

Downtime Required for Deployment: The downtime required during deployment activities in live systems disrupts the continuous flow of logistics operations. This downtime can lead to missed delivery timelines, reduced customer satisfaction, and operational bottlenecks. Businesses must carefully plan deployment schedules to minimize disruptions, often opting for off-peak hours, which can strain development and IT teams. Inadequate planning or unforeseen issues during deployment can further extend downtime, compounding logistical inefficiencies.

Slowness in the Development Process: The slowness of the development process in e-commerce logistics technology can delay critical updates and enhancements required to address operational challenges or improve customer experience. Factors such as limited resources, lack of skilled developers, and lengthy testing cycles contribute to these delays. This can hinder a company's ability to adapt to market demands, implement innovative solutions, or fix existing issues, ultimately affecting the overall efficiency and competitiveness of last-mile logistics operations.

4.6. Solutions for delivery riders

Change in Salary Structure of Rider to Make It Market Competitive: By aligning rider salaries with market standards, companies can attract and retain skilled individuals. This approach reduces turnover rates and ensures rider satisfaction, directly impacting delivery efficiency and customer satisfaction.

Dedicated Desk of Operation to Facilitate Riders Regarding Discrepancy Problems: Establishing a dedicated operations desk helps resolve issues like open parcels, amount discrepancies, route challenges, or snatching incidents promptly. This support system builds rider trust and enhances operational smoothness.

Swapping/Transferring of Staff Between Hubs: Rotating staff across hubs provides firsthand exposure to diverse challenges, enabling better problem-solving and fostering a collaborative culture. It ensures uniform service quality and a deeper understanding of operational issues.

Dedicated Desk of HR/Finance to Facilitate Riders: A specialized HR/Finance desk addresses concerns like salary deductions, penalties, and attendance discrepancies. Quick resolutions boost rider morale and strengthen trust in the organization.

HR Should Take Exit Interviews from Riders: Exit interviews provide valuable insights into reasons for attrition. These insights can guide policy adjustments and retention strategies, reducing turnover and improving workforce stability.

HR Handover Policy for Ops Staff and Riders: Formalizing a handover process ensures smooth transitions, minimizing disruption in operations and maintaining service continuity during staff changes.

Before Salary Finalization Alert Riders About Absents, Penalty Deductions: Proactively notifying riders about penalties and absences increases transparency, reducing conflicts and fostering accountability among employees.

HR and Ops Awareness Session for Riders: Regular awareness sessions educate riders about salary structures, deduction policies, and penalties, clarifying expectations and minimizing misunderstandings.

Assign Small Existing Pickups to Delivery Riders for Pickup Incentive: Allocating small pickups provides additional earning opportunities, motivating riders and optimizing fleet utilization.

Rider Reward Policy: Recognizing top performers through rewards for attendance, behavior, success rates, and online statistics boosts morale, encourages healthy competition, and enhances overall productivity.

Rider Complaint Box: Providing an anonymous complaint box allows riders to voice concerns without fear, leading to actionable feedback for organizational improvements.

Rider Online Feedback Form: Online feedback forms offer a convenient way for riders to share suggestions and report issues, enabling continuous improvement in operations.

Early Arrival of Transit Shipment in the Morning: Ensuring shipments arrive early allows riders more time for deliveries, improving service efficiency and customer satisfaction.

Riders Can Submit Cash in Banks/Franchises: Allowing cash deposits at banks or franchise outlets simplifies cash handling, reducing risks of theft and operational inefficiencies.

A Fixed Number of Riders Employed Regardless of Load: Maintaining a steady workforce ensures readiness for peak demand while minimizing disruptions during fluctuations.

Include Rider Representatives in Operations Planning: Involving rider representatives in planning ensures their concerns are addressed, fostering collaboration and practical solutions.

Highlighting/Identifying Aging Orders: Tracking and prioritizing aging orders prevents delays and ensures timely resolution, enhancing customer experience.

Transit Flow Implementation: Streamlining transit flows reduces delays, optimizes resource allocation, and enhances delivery timelines.

Vehicle Inspection Devices: Regular vehicle inspections using dedicated devices ensure rider safety, reduce breakdowns, and improve delivery reliability.

Rider and Warehouse Constant Communication: Establishing real-time communication between riders and warehouses enables prompt issue resolution, improving operational efficiency.

Give Smartphones to Riders on Installments: Providing smartphones on easy installments equips riders with necessary tools for navigation and real-time updates, enhancing delivery accuracy and efficiency.

4.7. Solutions for technological challenges

Bug Tagging Way Standards

Kindly Note the Decided Way Regarding Bug Tagging, Please Check the Tagging Criteria and Approach to the Bug According to it.

1- Flow Blocker [L1]: "Most Critical Bug, Crashing/Stuck which stopping the Work"

2- Business Logic [L2]: "High Level Bug Missing Logic which must be there, Need to Add"

3- Work Around [L3]: "Medium Level Bug Exist But can do work from Other Source"

4- Cosmetic [L4]: "Small Level Bug Spelling or Styling Mistake"

5- Suggestion [L5]:"Low Level Bug More Like Improvement for User Experience"

Also We Have Done the Tagging of All Cards in the Bug List, According to it.

Daily Tech Meetings Standards

Each tech team member will briefly go through the following 3 points while referring to the task cards they are working on i.e. mention the card name or number.

| What did you accomplish yesterday? |

The purpose of this question is to relay information and share recent accomplishments. Was there a small task that turned out taking longer than anticipated or you were waiting on feedback?

| What will you do today? |

The point of this question is to show where you are going today and serves two purposes

1. It helps align the team around what others are doing, giving visibility and awareness

2. It can be a useful way to create accountability - when committing to doing something and sharing it with other you tend tobe more likely to complete the task.

| Any blockers in your way? |

Is there feedback on a requirement or assistance required from a team member or external party which is preventing you from completing the task, share it here.

Tech Sprint Planning Standards

Please note below Sprint Capacity and Task assigned according to Sizing of Task Cards

Web/App Developer Capacity

- No. of Web Developer: 03 Resources
- Sprint Working Days: 10 Days
- Sprint Development Hours Per Day: 08 Hours
- Sprint Development Capacity in Hours: (Resources * Working Days) * Per Day Hours => (03 * 10) * 08 => 30 * 08 => 240 Hours

Web Developer Tasks

1- Skipping Transit Flow Between Cities   - 24 Hours
2- Shipper Advice API Requirements   - 32 Hours
3- Complaint Management Feedback V2   - 32 Hours
4- Replicate Complaint Management Flow in Merchant Portal   - 40 Hours

5- Province Add-Edit Page GL-Code Change   - 16 Hours
6- Payment Verification Report Page Slowness   - 16 Hours
7- Payment Voucher Change   - 8 Hours
8- Daraz Scheduler Fix and Investigation   - 20 Hours
9- Create Bulk Booking API - Shopify Merchant Request   - 6 Hours
10- Changes Related to Overland   - 16 Hours

Actual Sprint Development Task in Hours: **210 Hours**

Release Confirmation

As discussed we are aligned for tomorrow release, i am intimating stakeholder regarding tomorrow release date with Release Start Time 01:00 AM and 30 Minutes to 1 Hour Downtime. Please Intimate Team before Starting and once done please intimate them to start work

-Task Stopping:

As Discussed in the Meeting as we are nearing towards the 30-Jul Release, Please don't Start any New Cards only Focus on Current in Progress Cards.
1- Help QA Team in the Testing of Current Cards and Fix issues if they Reported
2- Help Each Other on the Timely Completion of In Progress Cards, Please share with Shujaat who needed help in their Task.
3- And Lastly If have time Pick Cards from Bug List and work on it

-All Tech Team:

Please Note following points, these are critical

1- Before starting card, make sure your requirement is written in description. if missing then write what you understood. If story board is given even then write some brief in description.

2- Create checklist of what is to be done

3- if you add any screenshot. please view it yourself once if it is clear enough or not

4- Before you move card to next queue make sure above mentioned points are at-least clear.

Hardware & Networking Related Issues;

For Hardware Related Issues on Laptop, Desktop, Barcode Scanners, Printer etc, or Networking Related Issues Like Internet Connectivity, Mobile Data or Internet Service Payment. Please Report it to the HR and Admin Team. Use Medium of Email for Communication Regarding the Issue.

Portal & App Related Issues

For Issues Related to Portal and App Report it Directly to Product and Tech Team.

Use Medium of Email for Communication Regarding the Issue.

If urgent and not getting a response, write a complaint on Operations Chat.

Use SLACK also as an official medium for complaints about portals and apps.

4.8. Solution for operations challenges

Riders Whistle Blower Policy

We think we should introduce the 'Whistle Blowing Policy'. So we can motivate employees who are working in any capacity to voice their concerns to a Security Department about any fraudulent, immoral,

unethical or malicious activities, which are against the policy of the Company or may have an adverse impact on the financial or reputational loss to the Company. In Return we can give the Whistle blower a fixed Price Money or we can give relative Price money depending on the amount of loss which is recovered through his information. Lastly, the Security Team will assure that all reports under this Policy would remain strictly confidential and only Security Team will have the access of whistle blower names so any acts of revenge and threats against the Whistle Blowers can be prevented. In that way a proper way of reporting issues will be created and also now employees have the motivation of identifying loop holes.

Cash Collection Reporting SOP

As it was agreed that Cash Collection receipt must be issued by Cashier or Branch head , please ensure all riders must collect cash receipt from cashier or branch head and keep safe custody of it for 40 days to avoid any dispute between cashier and rider. You are also requested to designate a person in every branch and head office who will convey the rider regarding short cash submitted by rider on a particular day as rider does not have the access to Cashier/ branch head short cash email. You may talk directly to a rider or designate a person where the branch manager is doing the job of cashier to avoid any conflict of interest.

All Cashiers and Branch Heads will ensure the issuance of cash collection receipt to every Rider along with stamp and signature on receipt. If you don't have a stamp please coordinate with Finance Officer however you will issue the receipt from today irrespective of whether you have a stamp or not.   Please also circulate a short cash received report even if short cash is zero. Finance Officer will coordinate with you. Please also send an email if you don't issue a cash receipt. The Finance Team will arrange a cash collection stamp for the cashier or branch head.

Each City should generate the Summary of Cash submission report and it should be circulated by the cash collection person and the person who is recording the cash voucher in the system should reconcile it, furthermore the cashier should issue the receipt to the rider for receiving of cash to avoid any dispute between cashier and rider. Below the format of Cash submission report, your day end delivered amount should match with this rider wise sheet showing cash received and cash deposited in bank and short excess cash received. This rider wise cash submission report should be the part of your daily Close of day email sent by you all to the Finance Team.   For any query do call the Finance Team. Kindly make sure to make this report and send it to us on a daily basis in your daily Close of day email.

Rider Hiring SOP

Our Rider Should Have an Android Mobile Phone (Version 5 or Greater). As you all know the nature of our Operation Process. So, without a mobile phone Rider can't perform its daily job and meet its KPI of timely updation of Order Status as well as Live Tracking Service will not be available for Customers/Consignee. Kindly don't hire Riders without Mobile Phones, Manual Updation of Delivery in Run Sheet and then Feed it in a System like Data Entry is Strictly prohibited. Following things are needed to be shared with HR, Please make sure the submission of all documents as vetted by Security Department, Following are the required documents for hiring all Riders (**Temporary** / **Permanent** / **Daily Wages**) in XYZ Pvt Ltd nationally

1. CNIC of the personal.

2. 2 x References having CNICs.

3. Driving License.

4. Promissory Note of **Rupees 150,000/-** . (Template of Promissory Note will be provided shortly.)

5.   Signed blank Cheque in favour of XYZ Pvt Ltd.

6.   Police Verification from Present Address Police Station.

7.   All Riders Will be interviewed by the Security Head on recommendation of the Operation Department.

8. All supporting Documents (CV, Education, Experience Letter & 1 CNIC for Life insurance)

9. 2 Passport Size pictures of the personal.

Note: In case of any missing Documents, approval of the Security department is compulsory.

Please be advised that the cut-off date for sharing of Hiring / Payroll data to HR will be 25th of every month. Therefore, you are requested to compile and provide the following by day end of 25th and no documents and/or requests will be catered afterwards. (In case the 25th is a holiday, the last working day before 25th). This is to address a certain issue we are facing while onboarding newly inducted riders in our HR System & Rider Portal. It has been observed that the hiring intimation is often conveyed after 4 to 5 days and in some cases more than a week. The problem with this late intimation is that the **INCENTIVE CALCULATION STARTS AFTER THE EMPLOYEE CODE IS ISSUED & UPDATED IN RIDER PORTAL BY HR**. Thus all the deliveries made by that rider prior to updating of employee code are removed and are not accounted for incentive by our Rider Portal. For which we receive numerous requests afterwards.

To avoid any incentive loss of our Riders, it is imperative that you all should ensure following;

- Intimate HR the very 1st day Rider joins.
- Share a copy of Rider's CNIC for code generation.
- Ask HR to get the employee code on priority.
- No deliveries should be done, unless employee code is updated on Rider Portal.

No request for prior incentive and/or backdated joining will be catered - email/intimation date will be considered as date of joining. Then Operation Team have to do following things

- Create Rider ID from Command and Control > Riders > Add Riders Page
- After Creation Share Login Credential with him.
- Install Drive4Rider App from PlayStore on Rider Android Phone.
- Add Rider Name in Live Tracking Link from Command and Control > Riders > Manage Riders Page.
- Riders will be provided Sim and Fuel Card which Operation will get from HR.
- Helmet, Uniform and Employee Card will be given to the Rider, which Operation will get from Admin.
- Lastly Operation Staff will Train Rider about Using of Drive4Rider App (Operation Staff which will Train Riders will be Nominated Person from Each City and The Nominated Person will be Trained by us)

Monthly Data Sharing

Data to be shared with the HR department on a monthly basis for payroll processing.

- Complete Hiring Forms – verified by Security Dept. (Incomplete forms will be reverted back and salary of respective hire will not be processed)

- Bank Account Details of new Hires (IBAN Numbers are mandatory)

- One Time Deduction or Reimbursements (If Any)

- Recoverable from Employees

- Fuel Card & Sim Card Allotment sheets

- Manual Attendance Sheet (where applicable)

- Names for Hold Salary / Resignations can be intimated till disbursement day via email.

Daily Wager Rider Hiring SOP

To cater load branches are utilizing Daily Wagers on a regular basis. To minimize the risks to the business and to have controls, Hiring SOP for Daily Wagers is being implemented hereby.

- All branches are hereby required to share details of their current daily wagers with the National Fleet Manager.

- All existing and newly hired daily wagers are required to fill out the attached employment form.

- Daily Wager's valid CNIC and Driving License copy is mandatory to be attached with the form.

- 2 Valid CNIC Copies of references are mandatory as well, to be attached with the form.

- Scanned Copy/Picture of the form and CNIC and License Copies are to be shared via email with National Fleet Manager, keeping HOD Ops & Security in loop for record keeping.

- Rider Portal IDs are to be created having Serial Numbers for Each Location i.e. (**DL_KHI_001**, **DL_LHE_001**, **DL_ISB_001**)

- Employment Form along with CNIC Copies is to be shared before the departure.

- The National Fleet Manager will share a written approval, as confirmation of compliance of the hiring policy.

- No Daily Wager should be on route without approval of the National Fleet Manager.

In case of non-compliance of any of the above points, respective Branch Manager will be held responsible for all the loss (at actual) caused by the daily wager on will or accidental.

Attendance Policy

1. All employees should follow roster timings provided their Supervisor / Department Head.

2. All employees are required to use the Face-ID Machine daily for their Sign-In and Sign-Out.

3. Any Sign-In after 15 minutes of start of roaster/shit will be considered as Late-In.

4. Any Sign-Out before 15 minutes of the end of roaster/shift will be considered as Early-Out.

5. Any Sign –In after 11:00 am will be considered Half Day.

6. Any Sign –In after 01:00 pm will be considered Absent.

Please refer to below table for understanding;

Morning Shift					
Sign-In Time	9:00 AM		Sign-Out Time	6:00 PM	
Remarks	From	To	Remarks	From	To
Early In	7:00 AM	8:59 AM	Absent	Before	2:00 PM
On Time	9:00 AM	9:15 AM	Half Day	2:01 PM	4:00 PM
Late In	9:16 AM	11:00 AM	Early Out	4:01 PM	5:45 PM
Half Day	11:01 AM	1:00 PM	On Time	5:46 PM	6:00 PM
Absent	1:00 PM	Onwards	Late Out	6:01 PM	Onwards

The attendance allowance will for all locations will be calculated using below structure;

100 % System Attendance Rs. 2,000/-

80% System Attendance Rs. 1,500/-

50% System Attendance Rs. 1,000/-

Below 50 % Zero

(This will be other than LWOP)

7. On every THREE Late-In ONE-day gross salary will be deducted.

8. In case of failure to mark Sign-In / Sign-out, intimation should be made to respective HOD. HOD is to intimate the Human Resource Department for Sign-In / Sign-Out adjustment within 2 working days.

9. In case no intimation is made to HR Department or any intimation without HOD approval within the stipulated time, the employee will be marked for Leave Without Pay (LWP) by system.

10. An employee may be allowed short leave for a maximum of TWO hours to attend to urgent matters, maximum 2 times in a month.

11. Short Leaves between TWO to FOUR hours will be counted as half-day casual leave.

12. Any leave beyond FOUR hours will be treated as Full Day Absence and adjusted accordingly in the casual leave balance.

13. In case of any emergency or inability to get prior approval to go on a leave, one shall be bound to inform his/her Department Head either on telephone or through any other means identifying such emergency.

14. If an employee is found absent without having a prior intimation and/or approval from respective Department Head shall then be considered "Absent" for the day and "Leave Without Pay" shall be marked.

15. ANY EMPLOYEE WHO IS ABSENT FOR 3 CONSECUTIVE DAYS, WILL BE CONSIDERED AS TERMINATED

Commission and Incentive Policy

This document serves as an addendum of the Sales Commission Policy introduced on 1st January 2021. In this document the management has introduced Commission Incentive for Overland Sales (for both Sales

Persons and Other Individuals) and Second Tier Incentive on the basis of Quarterly Sales Targets' achievement. Newly introduced commission(s) will be effective from July 1st, 2021. However, all the sales persons and individuals will remain entitled for the Commission of COD clients already tagged to their names. The complete commission policy is hereby reproduced for a better understanding, as follows:

OTHER INDIVIDUALS (Commission & Incentive Structure)

Key Notes:

- Payout will be on a quarterly basis, via payroll of the following month.
- Individuals will take in loop the product team to tag any newly on-boarded merchant/client to their name.
- For COD business, only the business generated on and after 1st May 2021, by Individuals' respective
- merchant/client, will be subjected to commission
- For Overland business, only the business generated on and after 1st July 2021, by Individuals' respective
- merchant/client, will be subjected to commission
- Business generated from existing clients will not be subjected to commission
- The commission amount will be subjected to Income Tax deduction as per the prevailing tax rates of the Country.

    Commission Policy for COD Business:

- Commission rate is 1.5%
- The percentage will be applicable on the Actual Service Charges billed to merchant/client

Commission Policy for Overland Business:

- Effective from 1st July 2021, below commission structure will be applicable.
- The percentages will be applicable on the Contribution Margin (C.M = Revenue – Direct Cost)

Table 3.

Leave Policy For Riders

New Leave policy will be applicable w.e.f 1st January, 2021

- Death in Immediate Family 3 Days Paid Leaves (Once every 3 months)
- Hospitalization of self/family 3 Days Paid Leaves (Once every 3 months - upon providing documents)
- Wedding 3 Days Paid Leaves (Once a year)
- Maternity 2 Days Paid Leaves (Once a year)
- Corona 14 Days (upon providing medical reports)
- Severe Accident as per doctor's recommendation & approval of Management
- Any other case Upon discretion of management
- Any other leave or any leave exceeding the above sanctioned limits, will be marked as

Leave without Pay.

NOTE: While on leave the employee cannot engage himself in any other employment or business, this would be regarded as a gross misconduct and shall be liable to termination of service. Any Leave application should be approved by HOD.

5. Conclusion

This study explored the challenges and opportunities in the last-mile e-commerce logistics sector in Pakistan. The findings revealed that while the e-commerce industry is expanding rapidly, last-mile delivery faces significant challenges, including inadequate infrastructure, high delivery costs, traffic congestion, and limited technological adoption. Additionally, factors such as inconsistent address systems and security concerns exacerbate inefficiencies. However, there are substantial opportunities for improvement, such as leveraging digital platforms, integrating innovative logistics solutions like drone deliveries, and fostering public-private partnerships to enhance infrastructure. The growing internet penetration and mobile payment systems provide a strong foundation for scaling last-mile delivery solutions effectively.

To address the challenges, policymakers and industry stakeholders should prioritize investments in smart logistics infrastructure, develop standardized address systems, and promote environmentally sustainable practices. Collaboration between e-commerce platforms, logistics providers, and government agencies is vital to ensure efficiency and cost-effectiveness. Training and capacity building for logistics personnel can also enhance service quality. Future research should investigate the potential of emerging technologies, such as artificial intelligence and blockchain, in optimizing logistics networks. Additionally, comparative studies with other developing economies could provide insights into best practices. Examining consumer preferences for last-mile delivery services can further guide tailored strategies, ensuring long-term growth and sustainability in Pakistan's e-commerce ecosystem.

Conflict of interest

The authors declare no conflict of interest

References

1. Naumov, V., & Pawluś, M. (2021). Identifying the optimal packing and routing to improve last-mile delivery using cargo bicycles. Energies, 14(14). https://doi.org/10.3390/en14144132

2. Mackert, J., Steinhardt, C., & Klein, R. (2019). Integrating customer choice in differentiated slotting for last-mile logistics. Logistics Research, 12(1). https://doi.org/10.23773/2019_5

3. Kapser, S., & Abdelrahman, M. (2020). Acceptance of autonomous delivery vehicles for last-mile delivery in Germany – Extending UTAUT2 with risk perceptions. Transportation Research Part C: Emerging Technologies, 111, 210–225. https://doi.org/10.1016/j.trc.2019.12.016

4. Mangano, G., & Zenezini, G. (2019). The Value Proposition of innovative Last-Mile delivery services from the perspective of local retailers. IFAC-PapersOnLine, 52(13), 2590–2595. https://doi.org/10.1016/j.ifacol.2019.11.597

5. Verri, F. A. N., Marcondes, C. A. C., Loubach, D. S., Sbruzzi, E. F., Marques, J. C., Júnior, L. A. P., De Albuquerque Maximo, M. R. O., & Curtis, V. V. (2020). An Analysis on Tradable Permit Models for Last-Mile Delivery Drones. IEEE Access, 8, 186279–186290. https://doi.org/10.1109/access.2020.3030612

6. Kedia, A., Kusumastuti, D., & Nicholson, A. (2020). Locating collection and delivery points for goods' last-mile travel: A case study in New Zealand. In T. E. & T. R.G. (Eds.), 11th International Conference on City Logistics, City Logistics 2019 (Vol. 46, pp. 85–92). Elsevier B.V. https://doi.org/10.1016/j.trpro.2020.03.167

7. Lee, T. H., & Chen, A. H. (2021). Last-mile logistics of covid vaccination - The role of health care organizations. New England Journal of Medicine, 384(8), 685–687. https://doi.org/10.1056/NEJMp2100574

8. Yuen, K. F., Cai, L., Lim, Y. G., & Wang, X. (2022). Consumer acceptance of autonomous delivery robots for last-mile delivery: Technological and health perspectives. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.953370

9. Ehrler, V. C., Schöder, D., & Seidel, S. (2021). Challenges and perspectives for the use of electric vehicles for last mile logistics of grocery e-commerce – Findings from case studies in Germany. Research in Transportation Economics, 87. https://doi.org/10.1016/j.retrec.2019.100757

10. Cagliano, A. C., Mangano, G., & Zenezini, G. (2020). Technological trends in last-mile contexts: A European perspective. 8th International Conference on Information Systems, Logistics and Supply Chain: Interconnected Supply Chains in an Era of Innovation, ILS 2020, 356–364. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85085914435&partnerID=40&md5=cdd70678489d02e314 c6f966fc87a1d2

11. Schomakers, E.-M., Klatte, M., Lotz, V., Biermann, H., Kober, F., & Ziefle, M. (2022). Analysis of the potential of a new concept for urban last-mile delivery: Ducktrain. Transportation Research Interdisciplinary Perspectives, 14. https://doi.org/10.1016/j.trip.2022.100579

12. Ko, S. Y., Cho, S. W., & Lee, C. (2018). Pricing and Collaboration in Last Mile Delivery Services. Sustainability, 10(12), 4560. https://doi.org/10.3390/su10124560

13. Jiang, L., Zang, X., Dong, J., Liang, C., & Mladenovic, N. (2021). A variable neighborhood search for the last-mile delivery problem during major infectious disease outbreak. Optimization Letters, 16(1), 333–353. https://doi.org/10.1007/s11590-020-01693-x

14. Wu, H., Shao, D., & Ng, W. S. (2015). Locating self-collection points for last-mile logistics using public transport data. In H. T.-B., M. H., M. H., L. E.-P., C. T., C. D., & Z. Z.-H. (Eds.), 19th Pacific-Asia Conference on Knowledge Discovery and Data Mining, PAKDD 2015 (Vol. 9077, pp. 498–510). Springer Verlag. https://doi.org/10.1007/978-3-319-18038-0_39

15. Wang, X., Yuen, K. F., Wong, Y. D., Li, K. X., & Tran, T. M. T. (2020). Co-creating E-commerce last-mile logistics with consumers: A conceptual framework and future research agenda. In Key Challenges And Opportunities For Quality, Sustainability And Innovation In The Fourth Industrial Revolution: Quality And Service Management In The Fourth Industrial Revolution - Sustainability And Value Co-creation (pp. 177–202). World Scientific Publishing Co. https://doi.org/10.1142/9789811230356_0010

16. Baldi, M. M., Manerba, D., Perboli, G., & Tadei, R. (2019). A Generalized Bin Packing Problem for parcel delivery in last-mile logistics. European Journal of Operational Research, 274(3), 990–999. https://doi.org/10.1016/j.ejor.2018.10.056

17. Mangano, G., Zenezini, G., & Cagliano, A. C. (2021). Value Proposition for Sustainable Last-Mile Delivery. A Retailer Perspective. Sustainability, 13(7), 3774. https://doi.org/10.3390/su13073774

18. Comi, A., & Savchenko, L. (2021). Last-mile delivering: Analysis of environment-friendly transport. Sustainable Cities and Society, 74. https://doi.org/10.1016/j.scs.2021.103213

19. Muñoz-Villamizar, A., Solano-Charris, E. L., Reyes-Rubiano, L., & Faulin, J. (2021). Measuring Disruptions in Last-Mile Delivery Operations. Logistics, 5(1), 17. https://doi.org/10.3390/logistics5010017

20. Burlando, C., & Vella, A. (2021). E-COMMERCE AND THE LAST MILE IN URBAN GOODS DISTRIBUTION : CRITICALITIES AND THE NEED FOR CHANGE. International Journal of Transport Economics, 48(2), 141–161. https://doi.org/10.19272/202106702001

21. Mortara, M., Ponte, D., & Zubaryeva, A. (2020). Towards the definition of a sustainable business model for last mile logistics: Case study of city of Trento. 15th International Conference on Ecological Vehicles and Renewable Energies, EVER 2020. https://doi.org/10.1109/EVER48776.2020.9242547

22. Behroozi, M., & Ma, D. (2020). Crowdsourced delivery with drones in last mile logistics. In H. D. & Z. C.D. (Eds.), 20th Symposium on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems, ATMOS 2020 (Vol. 85). Schloss Dagstuhl- Leibniz-Zentrum fur Informatik GmbH, Dagstuhl Publishing. https://doi.org/10.4230/OASIcs.ATMOS.2020.17

23. Tundys, B., & Niedzielski, P. (2021). Value Creation for Stakeholders in the Implementation of "Last Mile" Deliveries in Cities. In S. M. (Ed.), TranSopot Conference, 2019 (pp. 47–63). Springer Science and Business Media B.V. https://doi.org/10.1007/978-3-030-50010-8_5

24. Correia, D., Teixeira, L., & Marques, J. L. (2021). Last-mile-as-a-service (LMaaS): An innovative concept for the disruption of the supply chain. Sustainable Cities and Society, 75, 103310. https://doi.org/10.1016/j.scs.2021.103310

25. Caspersen, E., & Navrud, S. (2021). The sharing economy and consumer preferences for environmentally sustainable last mile deliveries. Transportation Research Part D: Transport and Environment, 95, 102863. https://doi.org/10.1016/j.trd.2021.102863

26. Bates, O., Friday, A., Allen, J., McLeod, F., Cherrett, T., Wise, S., Piecyk, M., Piotrowska, M., Bektas, T., & Nguyen, T. (2018). Ict for sustainable last-mile logistics: Data, people and parcels. In P. B., E. S., V. C., & I. A. S. (Eds.), 5th International Conference on Information and Communication Technology for Sustainability, ICT4S 2018 (Vol. 52, pp. 49–67). EasyChair. https://doi.org/10.29007/67nl

27. Macioszek, E. (2019). Freight Transport Planners as Information Elements in the Last Mile Logistics. In S. G. (Ed.), 15th Scientific and Technical Conference on Transport Systems Theory and Practice, TSTP 2018 (Vol. 844, pp. 242–251). Springer Verlag. https://doi.org/10.1007/978-3-319-99477-2_22

28. Švadlenka, L., Simić, V., Dobrodolac, M., Lazarević, D., & Todorović, G. (2020). Picture Fuzzy Decision-Making Approach for Sustainable Last-Mile Delivery. IEEE Access, 8, 209393–209414. https://doi.org/10.1109/access.2020.3039010

29. Wu, Y., Ding, Y., Ding, S., Savaria, Y., & Li, M. (2021). Autonomous Last-Mile Delivery Based on the Cooperation of Multiple Heterogeneous Unmanned Ground Vehicles. Mathematical Problems in Engineering, 2021, 1–15. https://doi.org/10.1155/2021/5546581

30. Ha, N. T., Akbari, M., & Au, B. (2022). Last mile delivery in logistics and supply chain management: a bibliometric analysis and future directions. Benchmarking. https://doi.org/10.1108/BIJ-07-2021-0409