ISSN:3048-6505 (Online)
Shodh Samarth- Research Journal of Commerce, Management & Economics
Vol.2(2), August 2025, pp. 168-185

OPEN NETWORK FOR DIGITAL COMMERCE (ONDC) AND THE FUTURE OF E-COMMERCE IN INDIA: TOWARDS AN OPEN AND INCLUSIVE DIGITAL MARKETPLACE

Tushar Dhiman

Research Scholar, Faculty of Management Studies

Gurukula Kangri (Deemed to be University) Haridwar (Uttarakhand)

Email- tushardhiman.gkv@gmail.com

Pankaj Madan

Professor, Faculty of Management Studies

Gurukula Kangri (Deemed to be University) Haridwar (Uttarakhand)

Email- pankaj.madan@gkv.ac.in

Abstract

This research paper critically examines the transformative role of the ONDC in reshaping India's e-commerce ecosystem. Conceptualized as a digital public infrastructure, ONDC aims to democratize digital commerce by unbundling and decentralizing platform monopolies, thereby empowering micro, small, and medium enterprises (MSMEs), especially those traditionally excluded from mainstream e-commerce. The paper situates ONDC within the broader policy landscape of India Stack, Digital Public Infrastructure (DPI), and frameworks like the Open Credit Enablement Network (OCEN). Through a multidisciplinary lens, it evaluates ONDC's technological architecture, policy design, and operational mechanisms. The study delves into the socio-economic implications of ONDC, analyzing its potential to promote inclusivity, enhance consumer choice, and enable interoperability across diverse buyer and seller applications. It also investigates adoption challenges, infrastructural limitations, trust-building among stakeholders, and the readiness of small businesses to adapt to an open-network paradigm. Emphasis is placed on the empowerment of marginalized groups, including women and specially-abled entrepreneurs, in the context of India's MSME clusters. By triangulating secondary data, policy analysis, and conceptual frameworks, the paper provides a nuanced understanding of ONDC's potential and pitfalls. It argues that while ONDC promises to disrupt conventional digital marketplaces, its success hinges on effective policy alignment, user-centric design, digital literacy, and robust grievance redressal mechanisms. The research concludes by

suggesting a roadmap for sustainable implementation, advocating for collaborative governance and continuous capacity-building to ensure equitable participation. This study contributes to the growing discourse on open digital ecosystems and their role in shaping inclusive, resilient digital economies in the Global South.

Keywords: Open Network for Digital Commerce, E-Commerce, Digital Marketplace, Open Credit Enablement Network.

Introduction

The Indian e-commerce sector has witnessed an unprecedented surge over the last decade, driven by increasing internet penetration, digital payment systems, mobile adoption, and a growing middle-class consumer base. However, despite the rapid expansion, the digital commerce space in India has largely been dominated by a few tech giants, creating monopolistic tendencies that challenge the principles of inclusivity and equal access. Because of the ONDC- an initiative from the government- the digital commerce landscape is changing because it focuses on bringing open protocols and interoperable tools to everyone. The Department for Promotion of Industry and Internal Trade (DPIIT) has designed ONDC to help uncover the e-commerce sector and strengthen the position of all traders throughout the country. The ONDC framework seeks to eliminate the dependency on platform-centric e-commerce models by introducing a neutral and open network layer, where sellers and buyers can transact regardless of the specific platforms they use. This approach contrasts starkly with the traditional 'walled garden' ecosystems dominated by a handful of private entities, such as Amazon and Flipkart, which control both consumer interfaces and backend logistics. Scholars argue that this concentration of digital power has led to practices such as predatory pricing, algorithmic bias, and exclusion of small and medium-sized enterprises (SMEs) from the mainstream digital economy. ONDC, through its architecture and policy direction, aspires to reverse this trend by empowering Micro, Small, and Medium Enterprises (MSMEs) and promoting innovation and consumer choice.

India's ONDC project is built on the principles of Digital Public Infrastructure (DPI), similar in spirit to transformative initiatives like Aadhaar, UPI (Unified Payments Interface), and DigiLocker. These foundational layers of digital governance have already played a critical role in expanding financial and identity inclusion across the country. ONDC aspires to become the fourth pillar of this stack- an e-commerce infrastructure that is non-discriminatory, transparent, and accessible to all ecosystem participants. By leveraging APIs and open-source protocols,

the ONDC model ensures interoperability between different service providers- including logistics, warehousing, payments, cataloging, and order management- thereby facilitating a plug-and-play model for new entrants and existing players alike.

Multiple researchers have emphasized that ONDC holds the potential to transform not just retail commerce but also adjacent sectors like food delivery, mobility, grocery supply chains, and even services like home repair and diagnostics. Moreover, ONDC's core value proposition lies in its ability to standardize transactions across heterogeneous digital platforms, thereby improving transparency, discoverability, and data portability. This will particularly benefit Tier-II and Tier-III cities and rural areas, where traditional platforms have limited reach and onboarding costs are prohibitive for local businesses. In this way, ONDC is aligned with the broader national objective of digital inclusion and economic empowerment, especially under the ambit of initiatives like *Atmanirbhar Bharat* and *Digital India*. However, the implementation of ONDC is not without challenges. As recent case studies and field research have shown, various seller-side frictions such as digital illiteracy, lack of working capital, supply chain inefficiencies, and resistance to change remain major bottlenecks. From the consumer perspective, establishing trust in a decentralized system where multiple parties are involved in a single transaction (e.g., buyer app, seller app, logistics provider, and payment gateway) also poses serious concerns about grievance redressal, data security, and service consistency. Therefore, while ONDC promises a radical overhaul of the current model, its success will largely depend on stakeholder adoption, effective regulatory oversight, and collaborative innovation among public and private actors. The global relevance of such open network models cannot be understated. As countries around the world confront similar challenges of platform monopolization and digital inequity, India's ONDC could emerge as a replicable framework for digital commerce reform. It also presents a unique case study in how governments can harness digital public infrastructure to regulate markets more equitably and foster inclusive economic growth. Comparative studies with earlier attempts at open network commerce, such as EINet in the United States, further highlight how India's approach is distinguished by its integration into a broader DPI framework and its grounding in grassroots entrepreneurship. The academic and policy discourse around ONDC is rapidly evolving, with scholars evaluating its structural design, impact on MSMEs, implications for consumer welfare, and its transformative potential in redefining the e-commerce value chain. Some view ONDC as a digital equivalent of the "Open Access" movement in energy or the "National Logistics Policy" in freight- creating common standards and breaking monopolies to increase

efficiency and equity across the system. As ONDC scales nationally, these conversations will become even more pertinent in shaping its governance, performance metrics, and global positioning.

This research paper aims to critically analyze the ONDC in the context of India's evolving e-commerce landscape. It explores ONDC's policy framework, technological architecture, and impact potential while highlighting the challenges of implementation, stakeholder adoption, and regulatory balance. Through a multidisciplinary approach, the paper contributes to understanding how open networks like ONDC can shape the future of digital commerce in emerging economies, especially in fostering inclusion, competition, and innovation.

Literature Review

Open Network for Digital Commerce is a government project built to change India's e-commerce environment by supporting online shopping for consumers and sellers, strengthening MSMEs by providing fair chances and providing competition to digital monopolies. ONDC wants to overhaul India's e-commerce sector by launching an open network platform that helps MSMEs grow and remain competitive (M N & Harshitha M, 2023).

The Indian government created the ONDC which strives to increase fairness in digital commerce, build interoperability, boost the strength of small businesses and offer more choices to consumers, depending on existing safe and effective systems used by parties involved (Islam et al., 2024).

ONDC aims to transform digital markets by being open to everyone, secure, easy to connect and focused on privacy, users' empowerment and support for all types of merchants. ONDC is built to change the way digital commerce works by emphasizing openness, inclusivity, the ability to link services and data privacy. Its purpose is to enable all users, merchants and businesses, large or small and found anywhere, to benefit from the digital economy (Malik et al., 2023).

The ONDC aims to broaden the access to digital commerce, restrict large monopolies, help small businesses use the internet, make all transactions possible with a common system and improve visibility for sellers to drive up GDP growth (Kumar M N & M, 2023). Promoting innovation, decentralization and inclusivity, as well as backing SMEs/MSMEs, developing digital infrastructure and offering online platforms to small merchants and consumers are the

primary purposes of the ONDC. In another case, ONDC mentioned here is an open-source e-commerce platform, much like UPI, that shares equal opportunities with Amazon and Flipkart for the ecommerce market (K. M. et al., 2022).

ONDC is working to give equal access to e-commerce, encourage inclusivity and help startups expand their markets. This report highlights the main difficulties sellers on the network face when taking up ONDC in India, including technical issues, awareness, the cost of adoption, competition and difficulties with scale and these problems are affecting its growth and ability to increase its market share (Manmadhan et al., 2024).

The ONDC is designed to support openness, inclusion, safe and easy data trading, higher protection for users' privacy, managing one's online data and helps sellers, no matter the size, transact smoothly online. ONDC is built to help digital commerce change and encourage openness, inclusion, interoperability and respect for users' data privacy. The mission is to boost user, merchant and business involvement in the digital world, no matter where they operate. ONDC was created in 2021 to level the playing field for e-commerce in India by encouraging small businesses, helping small startups and merchants and promoting a multi-party digital ecosystem where digital monopolies can be dismantled. The research points out that ONDC adoption by seller network nodes in India is hindered by technical problems, a lack of knowledge, high expenses, struggling against current competition and issues with expanding market share (Manmadhan et al., 2024).

The use of open architecture allows different parts of digital commerce to collaborate and work together without difficulty. They support innovation and allow companies to grow and also help save money, but at the same time risks like data security and privacy problems can arise. This article studies the pros and cons of open network architectures in relation to e-commerce, covering their effects on accessibility, interoperability, innovation, scalability and the economy (MBA, Department of Management Studies, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai, Tamil Nadu, INDIA & P, 2024). A framework for doing business across a network that spreads across different organizations so that remote computer users can purchase goods from a merchant server, with all transactions secured by a financial clearing house server that is separate and protected (Craig, J., 2005).

A public key infrastructure and electronic transactions can be successfully and safely used thanks to a network of Internet user and server types that includes smart tokens (Muftic, S., 1998). EINet is a network built for online trading that offers important security for

organizations to integrate and safely complete transactions. Single sign-on, user authentication and data integrity are features, making sure commercial business operations are secure (Rosenthal, 1994).

ONDC is a not-for-profit organization whose network will make certain that items and services from many e-commerce platforms are available in search results used by all participating network apps. ONDC is thought to enable digital changes across the supply process, uniformity in operations, welcoming more suppliers, bolster logistics and boost consumer interest. If all goes as expected, in August 2022 when the ONDC is implemented, even popular e-commerce brands in India will need to follow the same standards as Android apps. New e-commerce sites would gain from improved findability, compatibility and a more inclusive system. If these powerful platforms are overcome, customers and suppliers can push for new ideas and help shape retail, food and mobility sectors (Dash et al., 2023).

The impressive rise and influence of e-commerce and digital platforms in India is thanks, in large part, to government programs like Digital India and rolling out 5G technology. Helping to develop this system is the ONDC which is innovate, inclusive and combines multiple platforms to make e-commerce work better for small and medium enterprises. The goal of ONDC is to decrease Amazon's and Flipkart's monopoly, encourage fairness and give everyone easier access to ecommerce in both rural and urban areas. Rising internet and smartphone use, as well as more investment, has given e-commerce a big boost, benefiting both small enterprises and kiranas. AI, AR, VR, blockchain and Web3 are bringing big changes to consumer tendencies and how businesses work. It is estimated that online shopping will play a big role in boosting GDP, growing employment and improving retail sales, reaching $350 billion by 2030. The industry has to face infrastructure issues, inflated advertisement prices, data safety challenges and staff shortages. On the whole, these changes turn India into a key global e-commerce destination, helping to level the economic field, inspire digital learning and boost innovation among all segments of society (Mahesh K. et al., 2022).

India's ONDC program aims to democratize digital trade. Even though the internet is widely used, many local kiranas and small enterprises are still not part of the digital economy. In order to lessen monopolies and make it easier for small businesses to join, ONDC seeks to provide an open, interoperable platform built on open protocols like Beckn. While tackling issues like trust, data privacy, and opposition from major companies, the platform fosters innovation, fair competition, and digital inclusion. In order to promote inclusive growth and revolutionize

India's digital economy, ONDC aims to increase e-commerce penetration from 8% to 25% (Dr. A.Shaji George & A.S. Hovan George, 2022).

The following table summarizes the main objectives of the Open Network for Digital Commerce based on the provided research papers. Each objective is described, and the relevant sources are cited.

Table 1: Author's Contribution in ONDC

Objective	Description	Authors Citation
Democratize Digital Commerce	ONDC aims to create an inclusive ecosystem for e-commerce, facilitating even the smallest startups and merchants to benefit from digital commerce.	(Islam et al., 2024) (Manmadhan et al., 2024)
Empower Small Businesses and Local Retailers	The initiative seeks to enhance interoperability, empower small businesses, and diversify consumer choices by streamlining transactions and data security.	(Islam et al., 2024) (Malik et al., 2023) (M et al., 2022)
Ensure Secure and Interoperable Transactions	ONDC provides standard formats and APIs for cross-compatibility between platforms, ensuring secure, robust transactions, and data privacy.	(Malik et al., 2023) (M et al., 2022)
Promote Inclusivity and Reduce Digital Monopolies	ONDC dismantles digital monopolies, creating a level playing field and fostering innovation and inclusivity in the digital market.	(Manmadhan et al., 2024) (M et al., 2022)
Support SMEs and MSMEs for Sustainable Growth	ONDC integrates small traders with big tech, providing equal opportunities and promoting sustainable digital economic growth.	(M et al., 2022) (HarshithaM, 2023) (N & Harshitha, 2023)
Create a Level Playing Field	The platform challenges major e-commerce players, assisting micro, small, and medium-sized businesses in joining online marketplaces.	(HarshithaM, 2023) (N & Harshitha, 2023)

1. A Conceptual Model of ONDC:

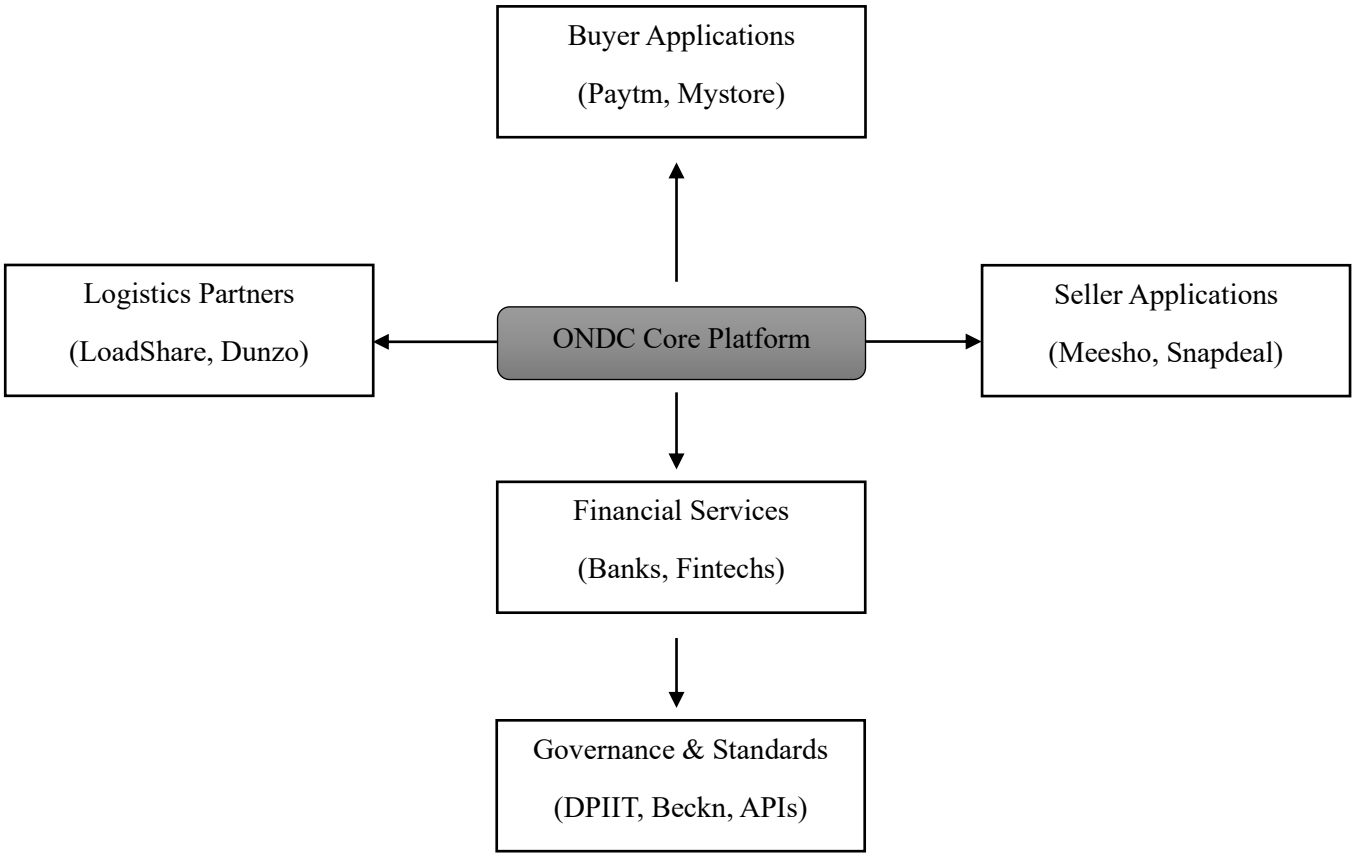

Figure:1 Conceptual Model of ONDC

The conceptual framework titled "ONDC and the Future of E-Commerce in India: Towards an Open and Inclusive Digital Marketplace" presents a holistic view of the Open Network for Digital Commerce as a decentralized digital infrastructure that redefines e-commerce in India. At the heart of the framework lies the ONDC Platform, functioning as the core layer that interconnects various ecosystem participants through open protocols and interoperable architecture. This central node facilitates seamless communication and transactions between five key components: Buyer Applications, Seller Applications, Logistics Partners, Financial Services, and Governance & Standards. Each of these components plays a critical role in building a transparent, inclusive, and efficient digital commerce environment. Buyer Applications such as Paytm, Mystore, and Magicpin allow consumers to browse and purchase goods and services listed by various sellers across the ONDC network. These applications act as front-end interfaces for users, offering product discovery, search, and checkout functionalities. On the supply side, Seller Applications like Meesho, Snapdeal, and GrowthFalcons enable businesses especially MSMEs to list their products, manage inventory,

and receive orders. The ONDC framework allows sellers to be visible across multiple buyer platforms, increasing their reach without needing to invest in proprietary e-commerce infrastructure. Complementing these components are Logistics Partners such as LoadShare and Dunzo, which provide delivery and fulfillment services. One of ONDC's key innovations is allowing buyers or sellers to independently choose logistics providers, enhancing flexibility and cost-efficiency. Additionally, Financial Services play a pivotal role by offering payment processing, credit, and financing solutions. Banks and fintech firms integrate into the ONDC network to support digital transactions and offer embedded financial services that empower small retailers with working capital and faster settlements. The backbone of the framework is Governance & Standards, which ensure that the system operates securely and fairly. Oversight by the DPIIT and the use of open protocols like the Beckn framework help maintain interoperability, privacy, and compliance. This component also drives policy alignment, ecosystem coordination, and scalability. Overall, the ONDC conceptual framework illustrates a modular and inclusive approach to digital commerce, allowing each stakeholder to participate independently while benefiting from shared infrastructure. It promotes innovation, competition, and empowerment of local businesses, aligning with India's vision for a digitally enabled, self-reliant economy under the broader goals of Digital India and Viksit Bharat @2047.

2. ONDC Platforms in India: An Overview

The ONDC is not a single platform but a network-based framework that enables interoperability across multiple e-commerce service providers. It is designed to separate the various functions of e-commerce- such as buyer interface, seller interface, logistics, cataloging, and payment allowing each participant to plug into the network independently. ONDC promotes decentralization and inclusion, especially of small businesses and non-traditional players in the digital economy.

Buyer Applications (Buyer Apps)

Buyer applications are digital platforms that enable consumers to access the ONDC network to search, compare, and purchase products or services. These apps are built on open protocols that allow them to interact with multiple seller apps and service providers. Unlike traditional e-commerce platforms, buyer apps on ONDC do not control the entire value chain; instead, they

act as access points where users can discover sellers registered through various seller-side platforms. This democratizes consumer access to products and services from across the country. For instance, a consumer in Delhi using the Paytm app (an ONDC buyer app) can purchase handmade products from a seller registered in Tamil Nadu via a different seller application. Other notable buyer apps include PhonePe's Pincode, which emphasizes hyperlocal commerce, Magicpin, which connects users to local retail outlets and restaurants, and Craftsvilla, which provides access to curated ethnic fashion and lifestyle products through the ONDC framework. These apps play a crucial role in creating a more competitive and inclusive digital marketplace by removing the dominance of centralized platforms.

Seller Applications (Seller Apps)

Seller applications are platforms responsible for onboarding and enabling sellers- particularly small retailers, MSMEs, local businesses, and service providers- to list their offerings on the ONDC network. These apps assist sellers with critical tasks such as catalog creation, order management, transaction processing, and integrating logistics and payment gateways. The goal is to empower sellers who traditionally lack digital capabilities or reach by providing them with tools and interfaces that are ONDC-compliant. A seller onboarded via one app can be discovered by customers using any buyer app connected to the network. GoFrugal, for instance, offers software solutions to help retailers manage inventory and sales efficiently while being ONDC-ready. eSamudaay enables local entrepreneurs to build community commerce hubs. SellerApp and Ushop focus on simplifying the onboarding process and providing analytics to improve visibility and sales. These seller-side platforms play a vital role in democratizing digital commerce by giving sellers more autonomy, visibility, and access to a wider customer base without depending on dominant e-commerce platforms.

Logistics Providers

In the ONDC ecosystem, logistics providers form a critical pillar of the infrastructure by ensuring that goods are picked, transported, and delivered reliably across India. Unlike traditional e-commerce models where logistics is typically controlled by the platform, ONDC decouples this function, allowing independent logistics partners to integrate and serve various sellers and buyers on the network. These providers handle essential services such as last-mile delivery, real-time tracking, return management, and even cash-on-delivery (CoD) where applicable. Shiprocket is one of the early logistics platforms integrated with ONDC, offering

national shipping options and catering to small businesses. LoadShare collaborates with local courier services, making it easier to reach rural or semi-urban areas. Delhivery, a leading logistics aggregator, and Shadowfax, known for its hyperlocal delivery capabilities, have also joined the network. Their participation reduces barriers for smaller sellers who previously lacked the logistics support required to fulfill e-commerce orders. This open logistics framework enhances efficiency, cost transparency, and regional accessibility in digital commerce.

Network Participants and Gateways

Network participants and gateways form the core technical backbone of ONDC. They ensure that all communications, transactions, and data exchanges between buyer apps, seller apps, and logistics partners are conducted smoothly and securely. These participants are responsible for verifying compliance with ONDC protocols, maintaining data standards, and matching transactions in real-time. ONDC Ltd., a non-profit Section 8 company, has been established by the Government of India to manage and govern the network. It provides policy guidance, monitors interoperability standards, and ensures that no single platform can dominate the system. Additionally, the Beckn Protocol Foundation has contributed significantly by developing the open-source protocols on which ONDC is built. The adoption of these protocols ensures that the network is modular, extensible, and neutral, thereby fostering trust and innovation. Gateways also manage registry services and support the onboarding of new participants, making them essential for the growth and scalability of the network.

Domain-Specific Platforms

While ONDC began with a focus on retail commerce, it is rapidly expanding to include domain-specific verticals like food delivery, groceries, mobility, healthcare, and professional services. This diversification reflects the network's broader ambition to transform all facets of digital transactions. For example, in the food delivery domain, companies like Magicpin and Dunzo have enabled restaurants and food sellers to participate in ONDC, offering a lower-cost alternative to aggregators like Swiggy and Zomato. In the grocery sector, apps like Paytm and Spicesmart allow kirana stores to list their inventories online, making them visible to a wider customer base. Pilot programs for mobility services such as taxi aggregators and auto-rickshaw booking are being tested in cities like Kochi and Bengaluru. In the coming years, ONDC plans to expand into healthcare, insurance, and educational services, creating a truly inclusive digital

service economy. These vertical expansions will further reduce digital inequality and promote access to essential services across socio-economic groups.

The ONDC framework is fundamentally reshaping digital commerce in India by enabling a decentralized, inclusive, and interoperable network of platforms. Buyer and seller applications empower consumers and businesses alike, logistics providers ensure seamless fulfillment, and network gateways maintain integrity and compliance. The domain-specific expansions demonstrate ONDC's potential to go beyond retail and address deeper societal needs. Unlike traditional e-commerce models that operate as closed ecosystems, ONDC allows multiple entities to compete and collaborate simultaneously, reducing monopolistic control and enhancing consumer choice. By opening up digital commerce to local businesses, artisans, small traders, and underserved regions, ONDC is paving the way for a more equitable digital economy in India.

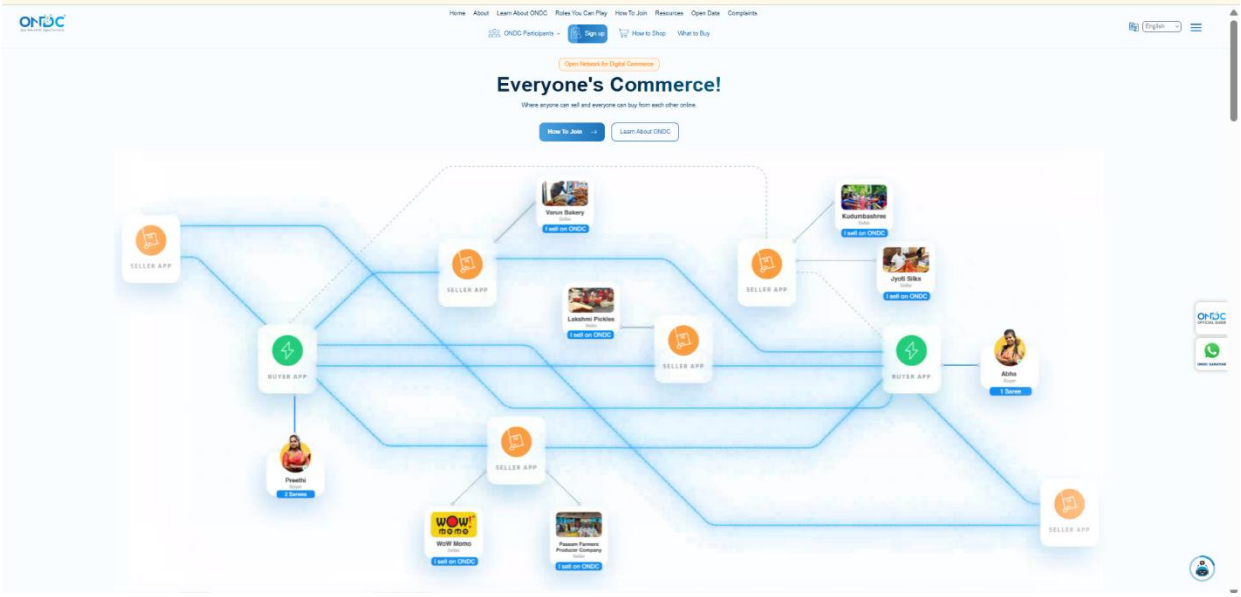

Figure 2: ONDC Platform in India https://ondc.org

The ONDC is a flagship initiative launched by the Government of India in 2021 under the aegis of the DPIIT. It is envisioned as a game-changing intervention to democratize the e-commerce ecosystem in India. Unlike conventional e-commerce platforms that are centralized and often monopolized by a few large corporations, ONDC seeks to establish an open, inclusive, and interoperable digital marketplace. It is designed to function similarly to how the Unified Payments Interface (UPI) revolutionized digital payments by creating a common protocol that enables seamless interaction across diverse platforms. ONDC is incorporated as a not-for-profit

Section 8 company and aims to enable the participation of small and medium enterprises (SMEs), local retailers, start-ups, and consumers on a level playing field, reducing dependency on dominant e-commerce players. The core philosophy behind ONDC is to unbundle the e-commerce value chain and allow various stakeholders buyers, sellers, logistics providers, payment gateways, and others to operate independently while still being connected through a common set of open protocols.

The ONDC platform facilitates interoperability through a decentralized architecture based on open-source protocols, notably the Beckn protocol. This framework enables sellers to list their products and services without being tied to a particular buyer-facing platform. In this model, a buyer using one app can purchase goods listed on a completely different seller app, creating a seamless cross-platform experience. This drastically enhances competition, fosters innovation, and reduces entry barriers for smaller businesses. Sellers can maintain ownership over their data and operations, and buyers benefit from greater choices, transparency in pricing, and ease of use. The platform supports various domains such as grocery, food and beverage, fashion, electronics, mobility, and even financial services, making it a comprehensive digital commerce solution. It also incorporates logistics integration, allowing consumers to select logistics partners at the time of checkout, enhancing delivery efficiency and customer satisfaction.

As of early 2024, ONDC has made significant progress in scaling its network. It has extended its presence to over 800 cities and towns in India and onboarded more than 370,000 sellers across multiple sectors. According to data available on the official ONDC website (https://ondc.org), the platform fulfilled over 7.1 million orders in February 2024 alone, with a cumulative order volume exceeding 16 million by January 2024. This growth is fueled by a robust ecosystem of buyer and seller applications, logistics providers, and financial institutions. Buyer-side platforms such as Paytm, Magicpin, and Mystore allow consumers to access products from multiple seller-side platforms like Meesho, Snapdeal, and GrowthFalcons. Logistics players such as LoadShare and Dunzo support deliveries, while banks and fintech companies provide credit and transaction infrastructure. This layered and modular architecture not only enhances operational flexibility but also ensures resilience and adaptability as the digital commerce landscape evolves. ONDC offers substantial benefits for all stakeholders. For sellers, particularly SMEs and local kirana stores, it provides an opportunity to digitize their business without incurring heavy commissions or being constrained by platform-specific rules. For buyers, it offers a richer and more diverse shopping experience, better pricing, and the

ability to shop across platforms using a single interface. For technology service providers and fintechs, ONDC opens up new avenues to integrate value-added services such as inventory management, invoicing, payments, and logistics. In its essence, what ONDC offers is an open and inclusive e-commerce system that fits Digital India's vision and promotes the objective of Viksit Bharat @2047. Looking ahead, ONDC plans to expand into new sectors such as travel, hospitality, and cross-border trade, while also focusing on increasing rural participation through tools like the e-Grameen app. As it matures, ONDC is poised to redefine the future of e-commerce in India by empowering consumers and businesses alike with transparency, affordability, and choice.

Findings & Discussions

The ONDC represents a paradigm shift in India's e-commerce landscape by attempting to dismantle centralized platform monopolies and foster an open, interoperable digital ecosystem. The findings of this study underscore the transformative potential of ONDC in enhancing inclusivity, transparency, and competitiveness in digital commerce. Through an analysis of policy documents, stakeholder insights, and the technological architecture of ONDC, several key themes emerge.

Firstly, ONDC's unbundled architecture comprising buyer apps, seller apps, logistics providers, and payment gateways creates a level playing field for small and medium enterprises (SMEs) by reducing entry barriers and dependence on large e-commerce intermediaries. This design allows businesses, regardless of scale, to digitally participate in commerce using open protocols. MSMEs, street vendors, and other informal sector players can leverage this infrastructure to access wider markets without hefty commissions or algorithmic biases favoring dominant sellers. Secondly, ONDC has strong potential to promote socio-economic inclusion. By integrating with Digital Public Infrastructure (DPI) components such as Aadhaar, UPI, and OCEN, the network can facilitate financial inclusion, credit access, and digital identity verification—particularly benefiting women entrepreneurs, rural sellers, and specially-abled individuals. The interoperability of services and transparent discovery mechanisms offer consumers more choice and encourage innovation among service providers.

However, the findings also reveal several operational and behavioral challenges. Digital literacy gaps, especially among rural and first-time users, could impede adoption. Trust and grievance redressal mechanisms remain underdeveloped, and the absence of a single dominant

interface raises concerns about user experience and accountability. Furthermore, onboarding MSMEs at scale will require targeted capacity-building, digital skilling programs, and policy incentives. ONDC holds significant promise to democratize e-commerce in India, but its success depends on collaborative governance, a robust regulatory framework, and continuous stakeholder engagement. The findings suggest that while ONDC is a bold step toward inclusive digital commerce, its long-term impact will hinge on addressing infrastructural, behavioral, and institutional barriers through iterative policy design and participatory implementation.

Conclusion

The emergence of the ONDC marks a pivotal moment in India's journey toward democratizing digital commerce and empowering underserved economic segments. As a public digital infrastructure initiative, ONDC aims to disrupt entrenched platform-centric models by introducing an open, inclusive, and interoperable network that aligns with the broader vision of Digital India and the India Stack ecosystem. This study has critically examined ONDC's policy rationale, architectural design, and socio-economic implications through a multidisciplinary lens. It finds that ONDC has the potential to significantly enhance the participation of) in the digital economy by reducing dependency on dominant e-commerce intermediaries, fostering fair competition, and enabling access to a wider customer base. Additionally, the integration of ONDC with initiatives like the Open Credit Enablement Network (OCEN) can unlock new avenues for credit and financial inclusion, especially for marginalized and underbanked communities, including women and specially-abled entrepreneurs. However, the implementation of such an ambitious framework is fraught with challenges. Issues of digital literacy, trust, institutional readiness, and technological adaptability among small sellers need urgent attention. Without effective capacity-building, onboarding support, and sustained policy incentives, the risk of replicating existing digital divides within a new framework remains high. Moreover, the absence of robust grievance redressal mechanisms and standardization across network participants could undermine user trust and slow adoption. Therefore, the success of ONDC will require more than just technological innovation it will necessitate a strong commitment to collaborative governance, responsive policy frameworks, and inclusive stakeholder engagement. The government, civil society, private players, and technology partners must work in tandem to build a resilient and equitable digital commerce environment. In sum, ONDC is not merely a technological intervention but a socio-economic opportunity to reimagine e-commerce through the lens of

equity, access, and innovation. If implemented thoughtfully, it can serve as a model for open digital ecosystems across the Global South, contributing to more inclusive, sustainable, and decentralized digital economies.

References

Banerjee, C. A., & Basu, S. (2022). A Brief Overview of Supply Chain Management and The Emergence of Quick Commerce in The Backdrop of Covid-19 Pandemic. *The Management Accountant Journal*, *57*(10), 49-52.

Dash, B., Sharma, P., Ansari, M. F., & Swayamsiddha, S. (2023). A Review of ONDC's Digital Warfare in India Taking on the e-Commerce Giants. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4323963

Dr.A.Shaji George & A.S. Hovan George. (2022). *Open Network for Digital Commerce (ONDC): Democratizing Digital Commerce and curbing digital monopolies in India*. https://doi.org/10.5281/ZENODO.6799694

George, A. S., & George, A. S. H. (2022). Open Network for Digital Commerce (ONDC): Democratizing Digital Commerce and Curbing Digital Monopolies in India. *Partners Universal International Research Journal*, 1(2), 92–102. https://doi.org/10.5281/zenodo.6799694puirj.com

Islam, M. I. U., Lone, U. M., Bhat, I. A., Aamir, S., & Salau, A. O. (2024). Open Network for Digital Commerce in India: Past, Present, and Future. *Open Information Science*, *8*(1), 20240005. https://doi.org/10.1515/opis-2024-0005

Jaiswal, L. B., & Kumar, B. (2024). Open Network for Digital Commerce (ONDC): In Depth Analysis to Revolutionize the E-Commerce Industry in India. *ANWESH: International Journal of Management & Information Technology*, *9*(2).

K. M., M., Aithal, P. S., & K. R. S., S. (2022b). Open Network for Digital Commerce -ONDC (E-Commerce) Infrastructure: To Promote SME/ MSME Sector for Inclusive and Sustainable Digital Economic growth. *International Journal of Management, Technology, and Social Sciences*, 320–340. https://doi.org/10.47992/IJMTS.2581.6012.0223

Kadaba, D. M. K., Aithal, P. S., & KRS, S. (2023). Government initiatives and digital innovation for Atma Nirbhar MSMEs/SMEs: To achieve sustainable and inclusive economic

growth. *International Journal of Management, Technology, and Social Sciences (IJMTS)*, *8*(1), 68-82.

Kumar M N, V., & M, H. (2023). An Evaluation of Open Network for Digital Commerce (Ondc) Implementation for MSMEs in India. *International Journal of Trendy Research in Engineering and Technology*, *07*(01), 43–45. https://doi.org/10.54473/IJTRET.2023.7108

Kumar, V. M. N. (2023). An Evaluation of Open Network for Digital Commerce (ONDC) Implementation for MSMEs in India. *MET Management Review*, 10(2), 53–67. https://doi.org/10.34047/MMR.2020.10207

M N, V. K. & Harshitha M. (2023). An evaluation of Open Network for Digital Commerce (ONDC) implementation for MSMEs in India. *MET Management Review*, *10*(02), 53–67. https://doi.org/10.34047/MMR.2020.10207

Mahesh K., M., Aithal, P. S., & Sharma K. R., S. (2022). *Open Network for Digital Commerce -ONDC (E-Commerce) Infrastructure: To Promote SME/ MSME Sector for Inclusive and Sustainable Digital Economic growth*. https://doi.org/10.5281/ZENODO.7141841

Mahesh, K. M., Aithal, P. S., & Sharma, K. R. S. (2022). Open Network for Digital Commerce -ONDC (E-Commerce) Infrastructure: To Promote SME/ MSME Sector for Inclusive and Sustainable Digital Economic Growth. *International Journal of Management, Technology and Social Sciences (IJMTS)*, 7(2), 320–340. https://doi.org/10.47992/IJMTS.2581.6012.0223

Malik, N., Dahiya, M., & Ahlawat, H. (2023). Future of Digital Commerce with Online Network for Digital Commerce. *MR International Journal of Engineering and Technology*, *10*(2). https://doi.org/10.58864/mrijet.2023.10.2.2

Manmadhan, M., Kurian, G. S., & Ravi, N. (2024). Challenges in Democratizing E-commerce in India through Open Network for Digital Commerce: A Seller Network Node Perspective. *2024 15th International Conference on Computing Communication and Networking Technologies (ICCCNT)*, 1–8. https://doi.org/10.1109/ICCCNT61001.2024.10724232

MBA, Department of Management Studies, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai, Tamil Nadu, INDIA, & P, Dr. E. (2024). Examining the Benefits and Drawbacks of Open Network Architectures in E-Commerce. *International Journal of Innovative Research in Information Security*, *10*(03), 156–163. https://doi.org/10.26562/ijiris.2024.v1003.07

Observer Research Foundation. (2023). Digital Public Infrastructure – Lessons from India. https://www.orfonline.org/research/digital-public-infrastructure-lessons-from-india

Reserve Bank of India. (2024). India's Digital Public Infrastructure is Transforming Country's Economic Landscape. *ThePrint*. https://theprint.in/economy/indias-digital-public-infrastructure-is-transforming-countrys-economic-landscape-rbi/2196480/ThePrint

Rosenthal, D. (1994). EINet: A secure, open network for electronic commerce. *Tenth Annual Computer Security Applications Conference*, 219–226. https://doi.org/10.1109/CSAC.1994.367305

Seth, A., et al. (2023). A Governance Framework for Digital Public Infrastructure: Learning from the Indian Experience. *ThinkTwenty (T20) India 2023*. https://t20ind.org/research/a-governance-framework-for-digital-public-infrastructure-learning-from-the-indian-experience/

Tiwari, R., Rastogi, S., Kothari, R., Dungarwal, L., Bhootra, D., & Preksha, J. (2024). The Impact of Open Network Digital Commerce (ONDC) on India's E-Commerce Ecosystem. *International Journal of Research*, 11(3). https://ijrjournal.com/index.php/ijr/article/view/1314

Vaidehi, R., Reddy, A. B., & Banerjee, S. (2021). Explaining Caste-based Digital Divide in India. *arXiv preprint arXiv:2106.15917*. https://arxiv.org/abs/2106.15917arXiv