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Future of Digital Commerce with Online Network for Digital Commerce

Abstract: *Open Network for Digital Commerce (ONDC) is a revolutionizing and ground-breaking initiative first announced in 2020 that is aimed to forever change the world of digital commerce by using new concepts like openness and inclusivity. It is designed to provide safe and secure interoperable digital transactions that go beyond geographical boundaries, enabling users to participate in businesses of all sizes and economies. It also provides standard formats and APIs to ensure cross-compatibility between different platforms, marketplaces, and logistics support. ONDC also puts a great amount of care and emphasis on data privacy, security, robust transactions, and encryption and also encourages user empowerment and allows an individual to manage their data and information to produce maximum trust and transparency between participants.*

This platform also aims to bring new opportunities by supporting merchants of all levels despite their scale and size and helping them get on online platforms. It will allow both consumers and sellers to engage and trade online regardless of the platform they are using. It is an initiative provided by the Department for Promotion of Industry and Internal Trade (DPIIT) under the Ministry of Commerce and Industry. It was implemented and registered as a non-profit company on December 31, 2021.

Keywords: *Digital Commerce, Open commerce, ONDC, Online Networks, Digital Market, Open Trade, Commerce Evolution*

I. INTRODUCTION

To understand Open Network for Digital Commerce (ONDC), this paper first focuses on a glimpse of its core – Digital commerce. Digital commerce can also be referred to as E-commerce which is a process where companies and individuals can buy or sell goods and services digitally (over the Internet). It can be operated in different types of target markets and can be achieved through computers, mobile phones, or any other smart devices with access to the Internet. Almost anything can be bought or sold through Digital commerce, and it is also an alternate or substitute for old Commerce models such as stores (and may include old models like B2B, B2C, C2C, and C2B). The roots of Commerce go back to the early 1960s, and back then, Electronic Data Interchange (EDI) was used as a

standard for transactions, but as time passed, it revolutionized and gained popularity as it is today [1].

It is very important for business and trade providing various features and advantages over old commerce models. First of all, it provides global reach to everyone in the world who can access the internet, which removes any geographical barrier for trade and commerce. It also makes services accessible to everyone in the world and very convenient & time saving without actually having to go visit the place. It saves money and enhances the customer experience and satisfaction which in turn results in giving a boost to commerce and trade.

ONDC is a global initiative that aims to promote an open network for commerce or exchange of goods and

services. It allows for even a small businessman or trader in an alley to go worldwide and compete with humongous commerce players like Flipkart, Amazon, Zomato etc. It encourages the participation of all and every commerce player no matter big or small to come on the same level and compete.

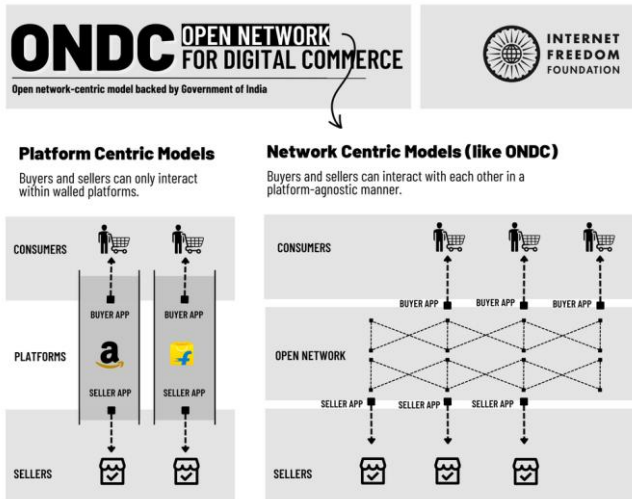


Fig.1 Traditional Digital Commerce v/s ONDC

(Source: <https://internetfreedom.in/ondc-an-explainer/>)

There were many reasons as to why ONDC was initiated. Firstly, a large part of the Indian economy is made up of small and medium-scale entrepreneurs who can't compete with large players like Amazon, Flipkart, etc., but still affect the economy. In order to stop depending on common and top players, ONDC was initiated. Hence, everyone gets a chance to show their skills and services and to empower and advertise the need and importance of businesses, which will lead minds to grow together and aspire to achieve something new and innovative. This, in turn, will end up strengthening the economy and increasing its potential [2].

The purpose of this research paper is to study and analyze the core, underlying principles, and atomic elements that build ONDC to understand it better and why it is used over old commerce models.

II. LITERATURE REVIEW

This paper has already discussed the growth and rapid development of the internet and digital commerce and how that eventually led to the rise of ONDC, which provides a common essential platform that connects

buyers and all businesses on a global scale. This study aims to provide an overview of the study for ONDC.

The paper aimed to highlight and emphasize the importance and evolutionary journey of ONDC, how it involved various stakeholders and also the need of these networks to give a large entrance to new or existing businesses irrespective of any barriers to grow market reach. These networks offer great opportunities to expand market, gain more customers, new ideas and strategies.

ONDC provides user-friendly services and an easy-to-understand interface that leads to effective customer support, such as secure transactions, customized recommendations, and reliable logistics support. It provides great assistance to businesses, providing many features such as global coverage and market access, low transaction costs, convenience, efficiency, etc., which results in an increase in business competition and gives inspiration and motivation for new entrepreneurs to join the cause and compete.

Despite having numerous advantages, there are some drawbacks or limitations also such as security issues, privacy breaches, counterfeit products, etc. Also, it becomes critical that this study adapts to rapidly evolving technologies and customer expectations, as the main benefit of these types of networks is to provide convenience, wide area services, and effective prices to customers. This paper also went over the precautions and measures that needed to be taken to avoid the limitations to some extent. The current research requires more study and exploration: diving deep into topics such as how the use and effect of Artificial Intelligence or Machine Learning or using the concept of blockchains for the transactions affect the ONDC networks could become an important aspect for it to become successful.

ONDCs have completely overhauled the business structure and how the buyers and sellers interact in a global market. This literature provides a comprehensive examination and study of research on ONDC, making its benefits, challenges, and effects on society and commerce known to everyone. With the current pace of development in technology and commerce, future research and new strategies will play a key role in determining more challenges and unseen opportunities in this great field.

Walia et al. [3] also point out the development of ONDC and how it works. They examined the complete

history of e-commerce in detail and how it resulted in development of ONDC while also defining the design and methodology for the same. Their paper also provides a theoretical approach to determine the reliability of the study and what factors play an important role during the purchase phase in ONDC [3].

George et al. [4] also provide an in-depth knowledge of the world of trade and commerce, the objectives of ONDC, its limitations, challenges, methodology, and all the reasons for the need to shift from traditional commerce to digital commerce. They aim to define the structure of open networks, their goals, and prerequisites. The paper also provides a study on the generic building blocks of ONDC structure and guidelines for alternative strategies with a vision of making e-commerce accessible to more consumers and unlocking the fullest potential of digital technologies [4].

III. OVERVIEW OF THE OPEN NETWORK FOR DIGITAL COMMERCE

The key principle of ONDC generally focuses on interoperability, fairness and participation of everyone in the digital commerce ecosystem. ONDC works with many principles, like providing an open network for digital commerce so that all of the participants get equal and fair opportunities irrespective of their standards. It is made possible due to the use and emphasis on the practice of open standards that ensures ease of integration and compatibility across various platforms. It also provides transparency and interoperability, which gives access to all the participants for the necessary information and allows them to exchange data between different platforms, which results in greater connectivity and seamless communication [5].

ONDC makes use of strong security measures and encryption techniques to regulate and maintain user data to ensure the highest security possible. Being provided with a safe and secure open network for commerce, participants from all over the world share their ideas and knowledge, which increases the competition and gives rise to the concept of innovation. ONDC also prioritizes empowering users to make their unique choices and control and manage their data and preferences.

The use of techniques used by ONDC varies depending upon the context in which it is being used.

Some common technologies for ONDC are using decentralized structures such as blockchain to make the open system more secure to achieve impenetrable defense for transactions which also ensures integrity. The other common way is to use APIs (Application Programming Interfaces); they play a very important role in achieving interoperability between platforms for ONDC, allowing various services and applications to interact with each other without any flaws. Apart from these infrastructures, various others, like JSON, XML Formats, Smart Contracts, etc., are also used.

It can be stated that in comparison to traditional digital commerce platforms, ONDC is an upgraded and evolved version. In contrast to traditional commerce platforms, which were mostly centralized and were owned by a single person or group of people making the majority of decisions, ONDC is decentralized, which reduces the dependency on the intermediaries or middle-mans and makes it a more open ecosystem, which involves everyone. In contrast to traditional digital commerce platforms, ONDC involves more of a people approach rather than an individual approach as it works in a way where multiple stakeholders participate in decision-making (even those who are not a part of it) to make it a more transparent system. This emphasizes user empowerment and more Ideas for innovation, which builds trust between people [6].

“The Indian E-commerce industry has been on an upward growth trajectory and is expected to surpass the US to become the second-largest e-commerce market in the world by 2034. India’s e-commerce sector is expected to reach USD 111.40 billion by 2025 from USD 46.20 billion in 2020, growing at a 19.24% CAGR, with grocery and fashion/apparel likely to be the key drivers of incremental growth. The Indian online grocery market is estimated to reach USD 26.93 billion in 2027 from US\$ 3.95 billion in FY21, expanding at a CAGR of 33%. By 2021, total e-commerce sales are expected to reach US\$ 67-84 billion from the US\$ 52.57 billion recorded in 2020.” by IBEF [7].

IV. BENEFITS AND ADVANTAGES OF THE ONDC

ONDC provides the following benefits:

- Global Reach: ONDCs enable businesses to reach a global audience, breaking down geographical barriers and expanding their customer base beyond local markets.

- Cost Savings: They often provide

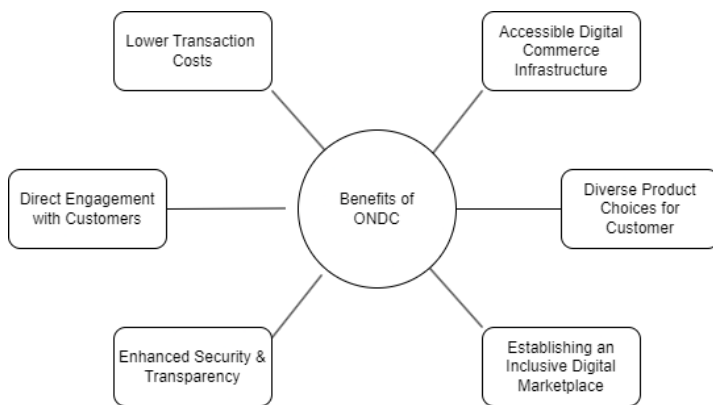


Fig.2 ONDC Benefits

- cost-effective alternatives to traditional brick-and-mortar stores. Businesses can save on rent, utilities, and other overhead costs.
- Convenience: Consumers benefit from the convenience of online shopping, allowing them to browse and purchase products or services from the comfort of their homes, 24/7.
- Diverse Product Offerings: ONDCs offer a wide variety of products and services from different sellers, giving consumers more choices and options.
- Price Transparency: Consumers can easily compare prices, read reviews, and make informed purchasing decisions, leading to competitive pricing.
- Efficiency: Streamlined processes, such as automated inventory management and order processing, improve operational efficiency for businesses.
- Data Insights: ONDCs collect vast amounts of data on customer behavior, which can be used for targeted marketing, personalization, and product development.
- Accessibility: They make it easier for small and medium-sized businesses to enter the market and compete with larger corporations.
- Lower Entry Barriers: The lower upfront costs and reduced need for physical infrastructure make it easier for entrepreneurs to start their own online businesses.

- Scalability: Businesses can easily scale up or down in response to changes in demand without the significant investments required in traditional retail.
- Cross-Border Trade: ONDCs facilitate cross-border trade, allowing businesses to tap into international markets without the complexities of establishing a physical presence in multiple countries.
- Customer Reviews and Ratings: Consumers can rely on feedback from other customers to make informed decisions, fostering trust in the platform and its sellers.
- Secure Payment Processing: Most ONDCs offer secure payment processing, protecting consumers' financial information.
- Search and Filter Options: Robust search and filtering tools help consumers find products quickly and efficiently.
- Environmental Benefits: Online shopping can have a lower carbon footprint compared to traditional retail due to reduced transportation and energy consumption.
- Job Creation: ONDCs create employment opportunities, not only in e-commerce but also in logistics, customer service, and technology sectors.
- Innovation: E-commerce platforms often drive innovation in digital payment systems, supply chain management, and customer experience.
- Market Insights: Sellers can gain valuable insights into market trends and consumer preferences through the data generated by ONDCs.
- Customer Loyalty Programs: Many ONDCs offer loyalty programs, discounts, and promotions encouraging repeat business.
- Reduction of Counterfeit Goods: Platforms can implement measures to reduce the sale of counterfeit or fraudulent products.

V. CHALLENGES AND CONSIDERATIONS FOR THE ONDC

Until now, the study saw and discussed various benefits and the potential of ONDC but being a revolutionizing concept, it also faces various challenges and obstacles that it needs to overcome in order to become the industry standard for commerce and trade.

As ONDC grows and starts attracting more participants, it will be important to put emphasis on performance and scalability; otherwise, the system will be rendered useless. This includes handling tasks like maintaining low network latency, high efficiency, and data protection. Due to the ginormous number of laws and regulations, it is extremely difficult for ONDC to comply, which requires very precise and careful attention and cooperation with relevant authorities. Also, achieving interoperability between different platforms and systems can be a much greater obstacle than it seems. There are many tasks and processes that need to be completed to achieve that goal, like establishing common data standards and protocols, etc.

As the number of participants grows, it will be inevitable to implement more secure and robust security measures against attacks such as hacking, data breaches, fraud, etc. Also, it is necessary to verify user's identity and carefully address their information protection techniques. As the ONDC grows, it is guaranteed that it will face resistance from dominant players in the already established traditional digital commerce system, which is very crucial for success. Then, there also arises a challenge to encourage users and spread awareness about ONDC, as people are not susceptible to change, and there will always be backlash.

“There are no local merchants beyond 400 cities, yet users have placed orders from 620 cities. We have not even done any promotion from our side to give it a push beyond some of the cities like Bengaluru, Meerut, and Delhi. But as people get more and more aware through social media and the efforts of sellers, we are seeing a gradual proliferation of consumers testing out ONDC,” said T Koshy, chief executive officer and managing director of ONDC [8].

ONDC being the new concept, it is very important to build and maintain the necessary skills and expertise to implement it correctly and achieve consensus amongst stakeholders within the ONDC system.

VI. CASE STUDIES AND APPLICATIONS OF THE ONDC

To date, almost 30000 merchants and over 46 Network Participants have joined the cause with ONDC, and many more are still counting. For example- Snapdeal, Microsoft, etc. One of the most famous platforms that is recognized for its seamless, effortless transactions and commerce features all over the world – PayTM Mall also joined ONDC [9]. They were the first app to go live on ONDC in September 2022, and it was done during a launch in Bengaluru. The vision of ONDC is to increase e-retail penetration from 4.3% to its unseen potential and to give boost growth to Indian start-ups. PayTM was identified as a “Buyer Network Participant” in categories under ONDC [10].

To implement ONDC infrastructure, the player addresses their challenges and benefits by opening their channels to the public, making it interoperable and inclusive, and collaborating with the ONDC system and integrating with it.

ONDC has much potential to benefit various sectors by encouraging interoperability, inclusivity in Digital commerce. It can benefit various E-commerce platforms by reducing transaction and hidden costs, improving cross-platform connectivity, and further expanding their reach. It also benefits Financial Services and Government services as ONDC provides a transparent structure giving all necessary details to the user to build trust. Also, it benefits Small and medium businessmen by providing a playing field that is spanned all over the world, which will bring more users and feedback to create even more authentic and innovative ideas [11].

By changing almost all the traditional concepts in digital commerce, ONDC is sure to bring a change in Society as well as the Economy. It can greatly impact the economy as it can reduce transaction costs to the bare minimum due to the openness of ONDC, Increasing the global reach and access to the worldwide market, giving rise to innovation and a rise in Entrepreneurship. India has the 3rd largest online shopping base globally, with 14 crore e-retail shoppers as of 2020, behind China and the US [12].



Fig.3 PayTM being the first ONDC partner (Source: <https://inc42.com/buzz/paytm-mall-becomes-the-first-app-to-go-live-on-oncds-soft-launch/>)

For comparative studies, this paper takes an example of two fictional ONDCs to understand better the role of ONDC in commerce and their impact:

ONDC A: "TradeCart"

- Platform Focus: ‘TradeCart’ primarily focuses on B2B (business-to-business) transactions, connecting manufacturers and wholesalers with retailers.
- Size and User Base: ‘TradeCart’ has a user base of over 50,000 businesses, primarily in the textile and fashion industry. It operates in North America, Europe, and Asia.
- Features and Functionality: ‘TradeCart’ offers advanced inventory management tools, real-time order tracking, and customizable online storefronts. It provides analytics for demand forecasting and trend analysis.
- Payment and Transaction Processing: ‘TradeCart’ supports multiple payment gateways and offers competitive transaction

fees. It ensures secure transactions with end-to-end encryption.

- Security and Trustworthiness: ‘TradeCart’ employs robust security measures, including regular security audits and data encryption. It has a dispute resolution system and buyer/seller protection.
- Customization and Integration: Businesses can customize their ‘TradeCart’ profiles and storefronts. It offers seamless integration with popular ERP systems and shipping providers.
- Customer Support and Assistance: ‘TradeCart’ provides 24/7 customer support and an extensive knowledge base for users.
- Cost and Pricing Structure: ‘TradeCart’ offers tiered pricing plans, with higher-tier users gaining access to premium features. Transaction fees are competitive, with discounts for high-volume users.

ONDC B: "FlipMart"

- Platform Focus: ‘FlipMart’ caters to both B2B and B2C markets, offering a wide range of products from various industries.
- Size and User Base: ‘FlipMart’ boasts a massive user base of over 100 million registered users worldwide. It operates globally, with localized versions for multiple languages and currencies.
- Features and Functionality: ‘FlipMart’ provides a user-friendly interface, advanced search capabilities, and a comprehensive mobile app. It offers a wide array of products, from electronics to clothing, with user-generated reviews.
- Payment and Transaction Processing: ‘FlipMart’ supports numerous payment options, including digital wallets and cryptocurrencies. Transaction fees are minimal for sellers, while buyers can benefit from cashback rewards.
- Security and Trustworthiness: ‘FlipMart’ employs AI-driven fraud detection and conducts thorough seller verification. It offers a money-back guarantee for buyers in case of disputes.
- Customization and Integration: Sellers on ‘FlipMart’ can customize their storefronts and run targeted ad campaigns. It has an open API for third-party integrations.
- Customer Support and Assistance: ‘FlipMart’ provides 24/7 multilingual customer support and an active user forum.
- Cost and Pricing Structure: ‘FlipMart’ offers free basic seller accounts with optional paid upgrades for enhanced visibility. Transaction fees are competitive and depend on the product category.

Using this hypothetical comparison, ‘TradeCart specializes in B2B transactions within the textile and fashion industry, while ‘FlipMart’ is a larger platform catering to both B2B and B2C markets with a more extensive product range. Each platform has its unique strengths and features, making them suitable for different business models and industries.

It can also affect the Social aspect of Life, as it can empower small businessmen, craftsman, artisans, etc., by giving them exposure to worldwide recognition. Indian customers believe that ONDC will be game-changer for the e-commerce space. A survey was commenced by e-commerce enablement platform ‘Shiprocket’ revealed that users don’t face any critical

problems while using ONDC apps but ‘wish’ if the process was faster and ‘more responsive’ and 88% of respondents in the survey said that they have never shopped for anything from ONDC [13]. Also, it impacts society as ONDC is transparent so there are close to minimal chances of frauds and thefts, which result in greater trust establishment.

VII. FUTURE DIRECTIONS AND OPPORTUNITIES FOR THE ONDC

ONDC is an ever-evolving initiative, and there are advancements beyond what a normal person could see that can shape the future and help in the development of trade. Some of those advancements can be to integrate newer technologies with the ONDC infrastructure, such as AI, IoT, etc., to improve security, efficiency, and interoperability. To deal with evolving threats and cyber crimes, ONDC should focus on strengthening its security to the utmost standards, such as robust encryption, decentralized management systems, etc. In the future, it may also succeed in overcoming barriers and borders so that maximum innovation and cooperation can be achieved.

The development comes months after CEO Thampy Koshy told Inc42 that the network plans to venture into the financial products and services segment soon.

“The open protocol has established a working committee of fintech industry experts. Their objective is to define a standard/protocol for the onboarding and integration of sellers and industry players. Additionally, the committee will decide which fintech players will be onboarded,” the ONDC chief had said [14].

There are almost infinite trends and opportunities for innovation that present itself at the right time. ONDC could use these trends and innovations to achieve an even higher level of commerce such as integrating Augmented or Virtual reality (AR/VR), using Voice as a medium using ML models, Influence Marketing etc.

In ONDC, the most important factor is collaboration and team-play, as various types of people are gathered in a single place for innovation to achieve success and development. It is important to collaborate with government entities to comply with the rules and regulations regularly and also get their support through awareness campaigns, incentives, etc. There can be

many collaborations to further achieve success in the cause, like financial institutions, other technology or digital trade platforms, and international collaboration in order to remove the geographical barriers, and for worldwide innovation.

VIII. CONCLUSION

In this paper, ONDC and its effects on various institutions, different sectors of society, and different traditional digital commerce platforms were discussed. The challenges faced by ONDC, along with its benefits and applications, have also been explored.

ONDC holds a great amount of unmatched potential to revolutionize digital commerce by promoting interoperability, inclusivity, and openness. ONDC aims to provide users and consumers with a seamless and secure commerce experience using standardized formats, tools, and environments. It also empowers Small Businessmen and connects people all over the world, no matter their status, location, and background, to join a level playing field and achieve a common goal of making Digital commerce safer and secure and giving an enhanced experience to the customer. It also impacts transparency and trust between participants through an emphasis on data protection, secure transactions, etc.

Also, the rise of ONDCs gave rise to various new challenges and circumstances such as Issues related to consumer privacy, data security, and fair competition have come to the forefront. As these platforms become embedded in our daily life with the passing of time, the regulatory and ethical dimensions of their operation must be carefully addressed to make sure that a fair and secure digital commerce ecosystem is maintained.

As of now, there are no known or valid statistical records of ONDC affecting a business by records. So, in the future, we can use those records to prepare a more thorough and analytical study to statistically show side by side study of ONDC with traditional digital commerce.

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