Project Dissertation Report on

SUPPLY CHAIN MANAGEMENT AND ENABLING HYPERLOCAL DELIVERY AT E-PHARMACY

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This is to certify that **Piyush Kumar**, a student of Delhi School Management, Delhi Technological University has completed project work on **"Supply Chain Management And Enabling Hyperlocal Delivery At E-Pharmacy."** under my guidance and supervision.

I certify that this is an original work and has not been copied from any source.

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DECLARATION

I hereby declare that the Project Report entitled **"Supply Chain Management and Enabling Hyperlocal Delivery At E-Pharmacy."** has not been submitted previously from the basis for award of any degree. This work embodies the result of my original work conducted under the supervision of **Dr. Archana Singh** the information submitted is true and original to the best of my knowledge.

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EXECUTIVE SUMMARY

India's pharmaceutical industry will be worth $60 billion by 2022, making it the world's sixth biggest, because to an increase in chronic illnesses, increased per capita income, and higher healthcare spending. Retail pharmacies (about 800,000 offline pharmacies) are the most common distribution method in India, accounting for 85 percent of total pharmaceutical sales.

In India, E-Commerce has grown into a large business, but E-Pharmacy is still in its infancy. The growth of e-pharma will reach US$2.72 billion by 2023, thanks to an ageing population, increased internet penetration and smartphone use, as well as the convenience of obtaining pharmaceuticals online. The global addressable market for e-pharma was valued $9.3 billion in 2019, and is expected to grow at a CAGR of 18.1 percent to $18.1 billion by 2023. An expansion in the target audience as a result of more efficient last mile delivery via partnerships with local pharmacies and a trend toward a mix of offline and online channels for a better hyperlocal delivery ecosystem will drive this growth. Local pharmacies may make more money by cooperating with e-pharmacies, pharmaceutical corporations can learn more about medication sales, medical practitioners can reach a bigger audience, and the government can generate more money through taxes and compliance fees.

Market place, hybrid (offline/online) inventory driven, and hybrid (offline/online) franchise-led are the three basic operational models in this category, depending on how the supply chain is formed. Each of these models is lucrative in different ways and necessitates different amounts of asset investment. E-pharmacies can increase their margins by better optimizing these models. Discounts (up to 35%) might outweigh chain income, resulting in financial burn (of 30 percent). By purchasing directly from pharmaceutical firms and marketing other items and services (private label supplements, FMCG, and so on), the businesses hope to make more money (diagnostics, etc.). As the company grows, discounts are projected to decrease, and decreased shipping costs may assist accelerate the road to profitability.

Others may participate in India's online pharmacy business, in addition to the global retail e-commerce giants. Consolidation options for e-pharmacies include brownfield expansion by purchase by a big horizontal operator, greenfield development through the creation of a vertical arm by one of the e-commerce firms, and tie-ups with other corporations.

Hyperlocal enterprises that can use logistics, vertical players like e-grocers expanding their product lines, and conglomerates banding together to develop their own capabilities are all instances of this. In such a competitive environment, long-term viability will be determined by giving better value to the consumer, with quick delivery being an important component that may

be handled by entering the hyperlocal delivery ecosystem.

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Chapter 1: INTRODUCTION

1.1 INDIAN PHARMACEUTICAL INDUSTRY

The Pharmaceutical industry is a component of the bigger healthcare sector of a country and is majorly related to medications. It deals with various aspects related to medications like their research and development, manufacturing and their marketing. These different aspects are interrelated to each other's and comprises of different players like drug makers, drug marketersand also entities like biotechnology corporations.

The Global Pharma Industry is around $1.2 Trillion in Size (According to Global Use of Medicines report from the IQVIA Institute for Human Data Science). In India, the pharmaceutical sector was valued at US$ 33 billion in 2017. The country's pharmaceutical industry is expected to expand at a CAGR of 22.4 per cent over 2015–20 to reach US$ 55 billion. At the moment, retail accounts for 80–85 percent of the market. Even in 2020, the retail sector is expected to remain the market's mainstay. Hospitalization, on the other hand, will account for a significant 25 to 30% part of the market. The medical infrastructure in India is expected to grow considerably during the next decade. The structure and mixture of hospitals and care distribution centers will change dramatically, as will the infrastructure. As a result, the hospital component of the pharmaceutical industry is expected to rise by more than 20percent by 2022, reached Us$ 20 billion.
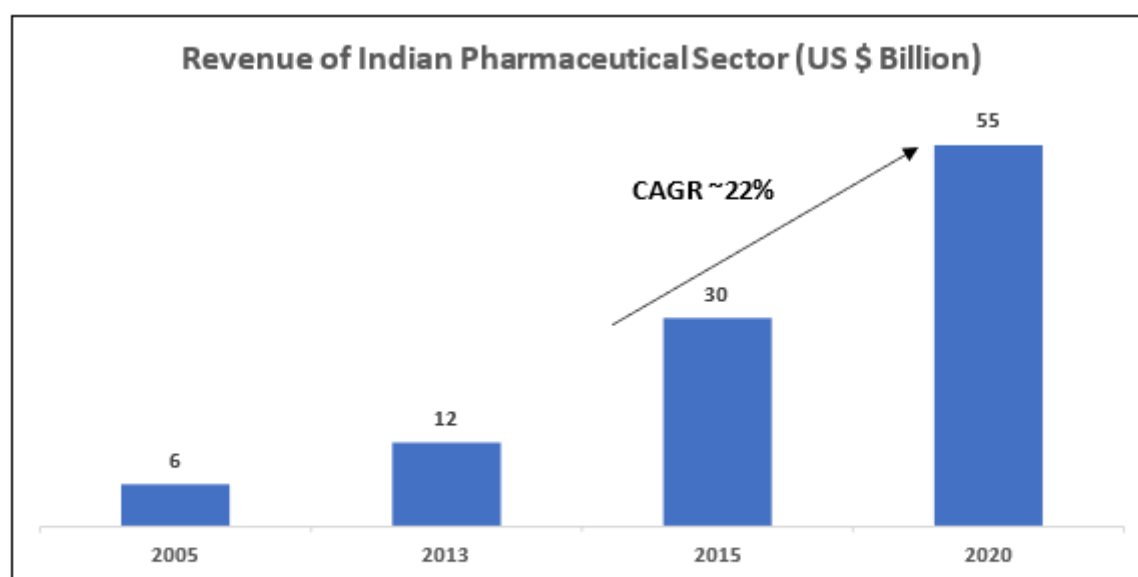

Fig 2.1: Growth and Revenue of Indian Pharmaceutical Sector

(Source: India Brand Equity Foundation, Frost & Sullivan)

With three broad groups of generic medications, over-the-counter drugs, and proprietary items, with three broad groups of the most profitable component of the Indian pharmaceutical industry is generic pharmaceuticals, which account for almost 70% of total sales.
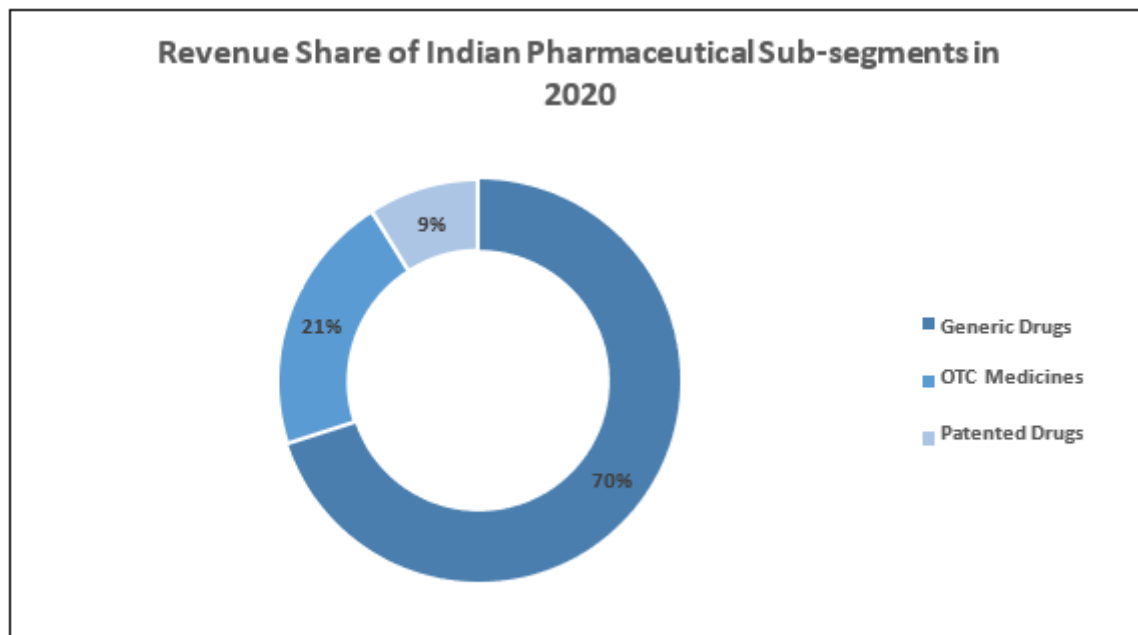
Fig 2.2: Indian Pharmaceutical Sub-segments

(Source: India Brand Equity Foundation, Frost & Sullivan)

The core objective of the industry is to make available the drugs that provide safety from infections, maintain health, and also help cure diseases. Since, the industry has a direct impacton the global population, it comes under the regulatory ambit of various Organisations like World Health Organisation, US Food and Drug Administration and Medicines and HealthcareProducts Regulatory Agency. The regulations are in the area of drug safety, their pricing and quality and also extend to patenting of drugs produced.

Components of the Industry

The pharma industry is very similar to other industries but yet very different. It has raw materials manufacturers, finished goods producers, Research & Development entities, marketing companies and consumers. But the industry has a lot more regulations and require more capital than other industries.

i. *Drug Manufacturing* – the manufacturers include Active Pharmaceutical Ingredients (API) and formulations manufacturers. They make: -

- API which are the raw materials used in the production of drugs
- Generic drugs Patented Drugs
- CRAM (contract research and manufacturing services) - entities providing services to carry out research and produce drugs under licenses from other companies

ii. *Drug Marketing* – here, the companies work towards augmenting the market reach of the drugs. A company may not be able to sell its products due to a lack of license or marketing network and that is the situation when these entities come to play their part.

iii.	*Biotechnology* – pharma companies usually rely on their in-house research centers or are dependent upon biotech companies that provide them with licenses to produce patented drugs.

Growth Drivers

iv.	*Aging Population* - The average human life span has improved globally with the courseof time. With increased longevity, come infections and diseases and this has promptedmore research on aging population to ensure proper health and avoid infections.

v.	*Changing lifestyles* – The people have a very hectic schedules nowadays, and consequently have unhealthy eating habits, no time to exercise and have a proper sleep.It has caused problems like high obesity, poor digestion, and various other issues. Thishas opened a big door of opportunity for the industry to produce drugs and supplementsto mitigate the impact of these problems.

vi.	*Increased income* – On average, the middle class has been growing in number in both the developing and developed nations. People now have relatively high disposable income and also have started to become more health conscious, with expectations of better healthcare solutions.

Despite representing nearly 18% of the world Population the size of Pharma Industry is a mere 1.5%. This shows the kind of untapped market that exists in India. This figure maybe an understatement because of availability of Ayurvedic Medicines which is hard to take into account if we talk about the remote sections of the society.

Apart from it, a very low Income per capita which a lot of analyst predicts will be go up in the near future is a positive sign inthis domain. Nevertheless, there are various challenges that the sector faces:

1.	Inconsistency in pricing and policy

    India's domestic pricing structure has been vulnerable to frequent and surprising changes, producing an uncertain investment and innovation climate. Major multinational corporations (MNCs) prefer to do business in countries where the wealthy are pampered by price controls. Attempting to lift the price cap on locally manufactured APIs is a fine idea, but the influence on the rest of the market will be determined by whether the locally acquired APIs are of equivalent quality to those accessible on the global market, and how much they cost.

2.	Innovative capabilities are in short supply.

    The administration must spend in research programs and individuals to improve India's innovation. Clinical trials should be promoted, and regulatory judgement should be devoid of subjectivity.

3. <u>External markets</u>

   India imports a lot of intermediate and active pharmaceutical ingredients (APIs) from other nations, with China accounting for over 80percent of the APIs used in India. As a result, supply disruptions and price shifts are a risk for the country. Infrastructure improvements would help to develop internal facilities that would help to stabilize supply.

4. <u>In the United States, generics</u>

   The prosperity of generic drug exports to the United States has come to a halt. One reason for this is price erosion. As a result of expanding buyer consolidation and increased competition in essential chemicals, this market is beginning to contract.

   India has the most FDA inspection since 2009; as a result, continued investment in raising quality standards could divert funds away from other areas of growth, slowing progress.

1.2 Rise of E-pharmacies

During the last ten years, the industry has made substantial progress. Some of the industry's major participants include Johnson & Johnson, Pfizer, and others. Biotech businesses such as Gilead Sciences, and Celgene Corporations have established a name for themselves.

In the realm of bioscience, there is a stronger emphasis on research. Continual technology improvements, combined with increased infrastructure, have aided in the prevention of major diseases like HIV and cancer.

The rise of e-commerce has represented a major transformation in this industry during the last decade. Growing internet availability, stronger digital payment infrastructure, have contributed to increased e-commerce adoption. Online transactions in the areas of mobile and electronics, fashion, and lifestyle have all increased significantly. Despite its enormous potential, the pharmaceutical industry is mostly untapped online. The rise in chronic and lifestyle diseases is drawing attention to the importance of ensuring that a significant segment of the Indian population has timely access to high-quality medicines.

1. Smartphone data rates and pricing have decreased:
   The number of mobile phone users across India are predicted to double by 2022, thanks to decreased smartphone pricing. Furthermore, since Jio's launch in 2017, data tariffs have dropped by 97 percent, resulting in increasing data use. Due to availability and accessibility of smartphones, 86 percent of urban consumers and 87 percent of rural users use their phones to access the internet.

2. Demographic change:
   According to the World Bank, India's number of people aged 65 and older increased by 3% to 80 million people between 2007 and 2017. As India's population ages, chronic diseases grow more common, and life expectancy rises, the market for healthcare products and services is expected to rise. With the elderly population in urban areas becoming more accustomed to online purchasing, it is expected that some may seek drugs from online pharmacies.

3. Boosting purchasing power
   Individual discretionary income has risen considerably in India, making healthcare products and services more accessible.

Benefits and Challenges – E-Pharmacies

Also, the benefits posed by E-pharmacy are immense across the value chain.

For Consumers: -

i. *Huge selection at low rates*: E-pharmacies can provide a broad array of pharmaceuticals and other fitness & wellbeing products and services at affordable prices since they can purchase from manufacturers and wholesalers.

ii. *Original products*: It is believed that 25% of therapeutic drugs offered in India are fake. This problem can be overcome by e-pharma companies purchasing items directly from manufacturers or authorized wholesalers.

iii. *Convenience*: E-pharmacies give consumers with various services such as buying medication, booking appointments, and buying services at their fingertip through well-designed apps/websites. They gain new clients through ease in this on-demand economy in every scenario.

iv. Consumer awareness and reach: E-pharmacies are best placed to educate customers about the negative effects of products/services, send medication reminders, and notify them to cheaper options, results in platform retention and a far larger reach.

v. More privacy: E-pharmacies enable customers to order medicine orders and have them delivered right while remaining anonymous. Customers who are concerned that their disease or condition will be revealed if they visit their neighborhood pharmacy can benefit from this.

For Pharmacies: -

i. *New Customer Retention:* By selling their product on the site, medical practitioners can acquire customers for a fraction of the price and make additional income.

ii. *Healthcare and e-prescription software:* Online medication services and medical records help doctors provide better care to their patients while minimizing the amount of paperwork they have to deal with.

For Government:

i. *Data analytics:* The administration will have access to all data created by e-pharmacies in terms of regional purchase patterns, which it will be able to use to make public health decisions.

ii. *Cash flow:* E-pharmacies provide the government with additional revenue through registrations fees and taxes.

Technology adoption has been far faster in other countries than in India, resulted in the domination of offline pharmacy as a distribution channel. Due to the vast network of offline locations, traditional retail pharmacies will coexist with internet pharmacies in the future. Nonetheless, e-pharmacies have the ability to facilitate a gradual but speedier shift from an unstructured to a

structured and organized market, as well as provide a diverse range of product complements that can improve access. Because unorganized retail pharmacies remain the principal distribution channel, supply chain efficiency is difficult to attain. This is a need that e-pharmacies can address, as eliminating multiple stages in the pharma distribution chain can improve efficiency. The e-pharmacy market is expected to grow quickly, however there are a number of challenges to overcome:

1. _Trust:_ Customers are still concerned about receiving counterfeit prescriptions and are unaware where their medications come from, thus internet pharmacies face a trust issue. While this is a perception problem, e-pharmacies make it significantly easier to track down the source of pharmaceuticals than physical pharmacies.

2. _On-time delivery and rapid resolution:_ Because clients will not have a physical firm to handle their difficulties, scheduled shipment and after-sales services are crucial.

3. _Accessibility:_ Going out to remote areas of cities remains a major challenge, with transportation playing a vital role in the industry's performance due to the importance of timely delivery of medicines.

4. _Regional languages:_ It's vital to provide mobile apps in a variety of regional languages to help smartphone buyers in tier 2/3 cities navigate the interface and place orders. This is crucial for expanding your reach.

5. _Data privacy_: Customers who use e-pharmacy platforms are essential for data protection, especially when it comes to patient records and prescriptions.

One of e-commerce industries, online pharmacy, has begun to acquire pace in India, with tremendous growth potential. EY estimates that the e-pharma market will reach Approximately usd2.7 billion by 2023, with additional revenue coming from diagnostic, other health supplements, and wellness services including health insurance. Global competitors have already made the shift from an online pharmacy to an one-stop shop for all health requirements, offering e-pharmacy, online consultations, healthcare, and diagnostics.

In any healthcare system, pharmaceutical medications are a valuable and necessary resource, thus receiving them swiftly is critical. This service is currently provided by typical retail pharmacies. However, e-commerce has exploded in India over the last decade, and the pharmaceutical industry has been quick to embrace the technology. E-pharmacies are online platforms that allow clients to buy pharmaceuticals without having to visit a physical pharmacy. Consumers benefit from these e-pharmacies, which has expanded demand for the concept globally.

The global e-Pharmacy industry was valued $29.3 billion in 2014, according to Transparency Market Research, and is expected to increase at a CAGR of 17.7% to $128 billion by 2023. North

America and Europe now dominate the worldwide e-Pharmacy market. However, the Asia Pacific region, which has unmet needs, offers the largest chance for the global e-Pharmacy market.

E-pharmacy is still in its early stages in India, but it has the potential to grow into a significant industry in the near future, much like other categories. According to the study, India's e-pharmacy market would increase at a CAGR of 63 percent from $512 million to $3.6 billion between 2018 and 2022. Furthermore, despite the fact that e-pharmacy currently represents for 1.5-2 percent of total pharma sales, due to rapid growth, penetration could reach over 10% by 2023. Increased Internet penetration in both urban and rural India, as well as an increase in the number of people with unmet medical requirements due to India's large population, are driving up demand. The e-Pharmacy model is predicted to account for 5-15 percent of overall pharma sales in India due to better adherence and access to medicines for a significant number of poor individuals.

More than 200 start-ups came up in this market at the time, with some of them obtaining significant funding. The key e-Pharmacy players in this industry include Zigy, Netmeds, Bookmeds, 1MG, mChemist, Medidart, Medlife, Pharmeasy, Savemymeds, Save On Medicals, and others.

1.3 Hyperlocal Delivery – Then and Now [2021 Future Trends]

Most of the businesses are looking for some kind of new ways to check that customers can get critical items since the start of the COVID-19 outbreak. As a result of self-quarantine and social distance standards, hyperlocal delivery businesses have sprung up.

The most challenging area of web business to break into is hyperlocal. Due to a number of factors, including technical improvements, the COVID-19 epidemic, and daring clients, the hyperlocal model is becoming a corporate reality.

Meaning of Hyperlocal Delivery

It is a service that connects customers with merchants and retailers within a certain limited area. Its primary aim is to cater to the needs of clients in that given area. Because of technical advancements, hyperlocal deliveries now include a wide range of services, including:

• meal delivery

• fruit and vegetable delivery

• grocery delivery

• Housekeeping, maintenance, salon services, pest control, and other services

A geographical border and a delivery timetable are two significant advantages of hyperlocal delivery.

Both nationally and globally, e-commerce is utilized. It is unable to meet the urgent needs and expectations of clients. It operates on a bigger scale to meet less urgent customer requirements.

A conventional e-commerce store will not be able to provide a customer with a hand sanitizer in a timely manner. In contrast, a local vendor can take this order and deliver the product to the consumer in as little as an hour or two, or perhaps the same day or the next day.

Why has hyperlocal delivery become so critical in the COVID-19 epidemic?

The hyperlocal business model has significantly reduced friction by providing local merchants with last-mile delivery skills. Local retail outlets that engaged in hyperlocal deliveries helped keep the supply chain running smoothly during these trying times.

Here are some of the reasons why, in the context of the coronavirus pandemic, hyperlocal delivery has become so critical.

Essential items are in short supply.

Local stores sell groceries, medications, medical equipment, hygiene items, and other basics. With lockdowns prohibiting people from shopping for groceries on a weekly basis, hyperlocal delivery has proven to be a game-changer.

Customers can have critical supplies delivered to their homes through hyperlocal delivery. It has evolved into the most practical means of fast procuring high-priority products, allowing businesses to remain competitive during COVID-19.

Retailers profit from a delivery business plan.

Because time is saved on short distances travelled, hyperlocal delivery has resulted in the usage of fewer delivery resources. It has enabled retailers to save money, time, and resources while providing more services to their customers.

'Near me' Google searches are increasing in number.

In cities and towns, the days of asking friendly neighbors for directions to the local shop, motel, or anything else are long gone.

The majority of individuals in cities and metro areas utilize Google to find local businesses that can assist them with their requirements. Consumers today seek a convenient combination of physical security and online accessibility. For many merchants, the 'phygital' business approach, in which local retailers embrace an online presence, is paying off handsomely.

Customer demand for hand-selected products, well-funded businesses, and on-demand delivery services has propelled hyperlocal e-expansion. commerce's large corporations and online behemoths have been encouraged to invest in hyperlocal firms as a result of these causes.

Future of Hyperlocal Delivery Post Covid-19

Retailers who use hyperlocal delivery models will be able to target their customers more precisely following the COVID-19 outbreak. In the approaching years, client demographics and psychographic segmentation will become increasingly common.

Some e-commerce and retail behemoths are moving toward the hyperlocal delivery model because of the consumer devotion that small neighborhood stores have. Hyperlocal delivery allows them to improve client contact and expand their customer base. Following the COVID-19 era, the future of hyperlocal delivery appears to be considerably brighter.

Last-mile delivery will be revolutionized by e-commerce behemoths.

Following the COVID-19 outbreak, e-commerce behemoths will re-examine last-mile delivery options. To create a strong supply chain foundation, they will build a mix of locally owned warehouses that are integrated with local stores.

Large electronic commerce companies will enter the hyperlocal services industry in the future, creating an ecosystem centered on an app-based hyperlocal delivery service. To reach minute locations, a collaborative and broad hyperlocal delivery network is created. They can buy retail stores in nearby cities and set up hyperlocal delivery networks.

For non-essential commodities, hyperlocal delivery will be investigated.

Several retailers want to expand this delivery to include apparel, cosmetics, and alcoholic beverages when the COVID-19 term ends. Businesses might build a hyperlocal delivery strategy instead of being exposed to enormous crowds in malls, fashion stores, or supermarkets.

Non-essential retail enterprises will gain from hyperlocal delivery as their online presence and client base grow. Businesses will have a once-in-a-lifetime chance to experiment with new technology and expand their customer base.

Rural towns will benefit from hyperlocal deliveries.

In underdeveloped rural areas, hyperlocal e-commerce businesses will emerge next. In the future years, rural e-commerce will be a billion-dollar industry for hyperlocal delivery.

Retailers will expand their storage space.

Retailers will consider expanding their storage facilities to ensure continuous product flows. Many retail companies have turned "black shops," servicing only internet consumers, as a result of the coronavirus pandemic. This paradigm will transform when the global population reaches the post-coronavirus phase.

Retailers may build separate storage rooms near their physical shops for hyperlocal deliveries and omnichannel systems like BOPIS (Buy Online and Pick Up In Store).

Artificial intelligence (AI) is gaining in popularity.

The hyperlocal delivery business model will increasingly leverage artificial intelligence (AI) technologies. Two factors influence the profitability of hyperlocal delivery businesses. The details are as follows:

- **Drop size:** the number of packages or products delivered at each stop;
- **Route density:** the number of parcels delivered each delivery run.

Real-time dynamic routing software is an AI solution that can considerably assist the hyperlocal delivery industry. It enables businesses to deliver on time and on budget, allowing for a quick turnaround. It examines a lot of parameters before developing optimal route plans, including pickup windows, delivery window preferences, no-entry time, waiting fees, tonnage, driver-route mapping, and so on.

This dynamic routing software allows businesses to assign hyperlocal orders which depends on driver proximity, service time limits, and capacity.

By improving network architecture, capacity planning, and demand forecasting, AI helps hyperlocal enterprises. Its findings aid them in determining how many cars are required for a given route and where they should travel.

It lowers the hyperlocal supply chain's operational expenses and complexity.

Autonomous vehicles and delivery robots

Logistics corporations will utilize delivery robots as hyperlocal marketplaces become more specialized and diverse. They seek to provide exceptional customer service by increasing the efficiency of deliveries. Companies like Postmates, Door dash, and Just Eat are already using this technology.

Upgraded delivery bots are being developed by logistics Organisations for hyperlocal delivery services. They're collaborating with IT research and development firms to assist retailers in meeting expanding customer needs.

It's a game-changer that allows businesses to streamline last-mile delivery.

Air Delivery drones

Hyperlocal logistics companies may work with aviation companies to develop delivery drones in the aftermath of the COVID-19 epidemic. The North Carolina Department of Transportation held a virtual public meeting to consider the use of cargo drones in response to the epidemic.

Drones are the appropriate technology tool for offering faster delivery options for time-sensitive medicines while simultaneously increasing social distance. Many retail behemoths, like Walmart, are teaming up with internet companies to launch drone deliveries in the United States.

Hyperlocal delivery: steady improvement will be accomplished.

Smaller merchants, in addition to several retail giants, are gradually incorporating this technology into their delivery operations. Though the future is uncertain and doubtful, there will be many more step forward in the hyperlocal delivery logistics arena that will make it more convenient and environmentally friendly.

Retailers will try to acquire new technologies slowly and steadily in the future. High costs, implementation difficulty and disinclination to new technologies are some of the challenges retailers faces. Suppliers of logistics technology should emphasize the robustness and scalability of their goods and services.

Locus' logistics software can help hyperlocal businesses better manage their logistical operations. By sending out information and cautions about current happenings on the ground, it aids logistical operations in making swift judgments. Its dynamic route recommendations assist hyperlocal firms in improving on-time delivery and lowering last-mile logistical costs.

The epidemic has increased health awareness, which has fueled the growth of the Indian healthtech business, which is estimated to reach $5 billion by 2023. The industry will grow at a CAGR of 39 percent over the next five years, according to a survey done by IAMAI and management consulting firm Praxis. Over the last decade, India has focused on integrating digital health technology to improve healthcare access. A growing emphasis on hyperlocal pharmacy is at the forefront of this. Hyperlocal drugstore is reinventing themselves as the leading healthcare site by joining the ease of an e-pharmacy with the amenities of a local medicine store.

1.4 Supply chain management in E-pharmacy

The administration of products and services transportation is known as supply chain management, and it encompasses all actions that transform raw materials into finished items. It's an external interface that connects a company's logistics systems to clients, stakeholders, and other outsourcing partners in order to provide the best possible service to all customers. In India, the supply chain system is critical for getting products to customers. In the pharmaceutical sector, the importance of assuring medication availability at the correct time and in the right quantity grows even more. Only in this manner will people have access to healthcare. A typical pharmaceutical supply chain looks like this: -
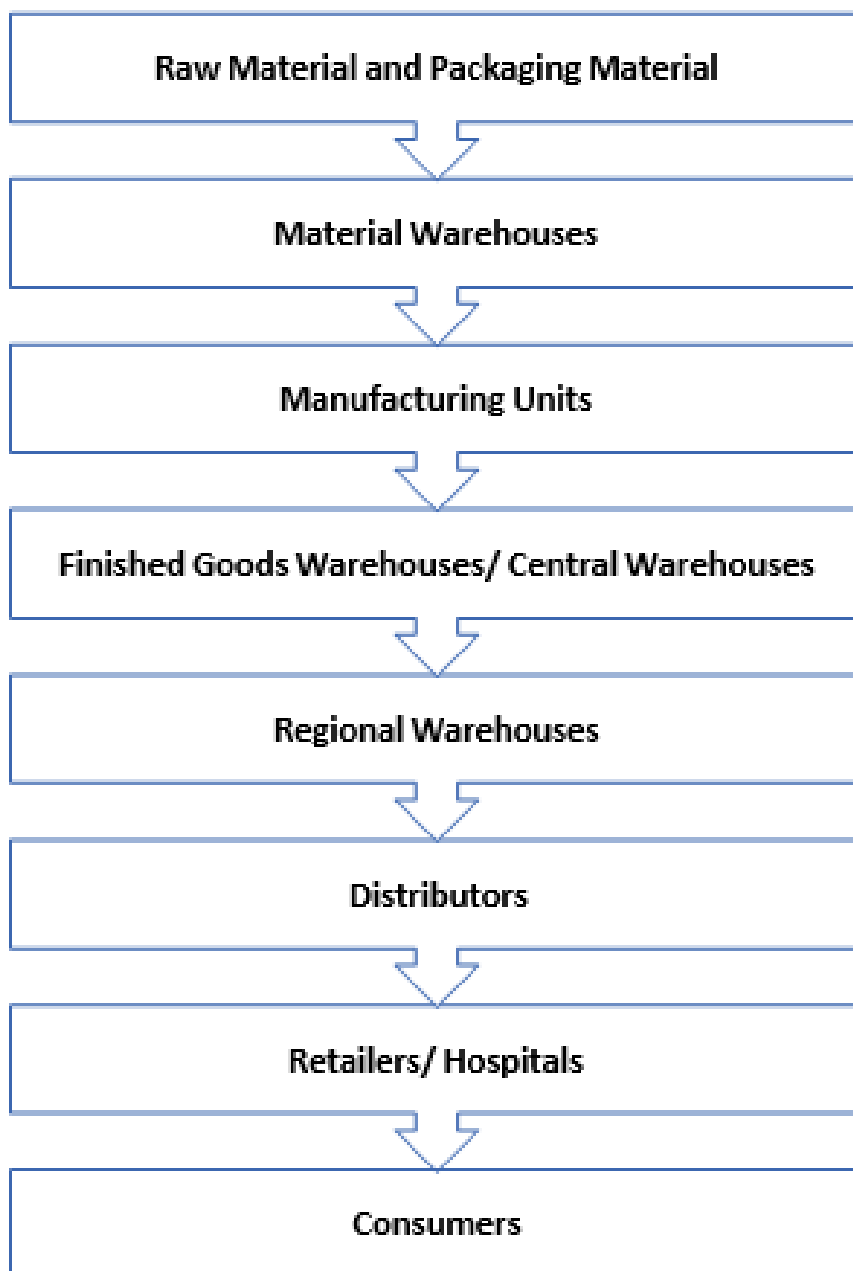
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│      Raw Material and Packaging Material      │
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│                  Consumers                    │
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Fig 1.1: Pharma Supply Chain

This is the model that has been used previously. Retail pharmacy, on the other hand, has a number of challenges: -

1. **<u>Low Industry Margins:</u>**

   Retail pharmacy is a fragmented and competitive market with minimal profit margins. Drug distributors buy fewer pharmaceuticals at higher prices, which reduces profit margins.

2. **<u>Industry's sustainability:</u>**

   The retail pharmacy industry's long-term future is under peril as a result of greater competition and a growing emphasis on price management. This industry could only succeed if it harnessed technology to boost productivity and supply clients with value-added services.

3. **<u>Drug Abuse:</u>**

   When drugs are sold without a prescription, they are abused widely.

4. **<u>Fraudulent and Inferior Drugs:</u>**

   The sale of counterfeit and substandard drugs, which increases the risk of adverse effects.

5. **<u>Tracking and documentation:</u>**

   Sales of drugs without a bill or invoice for the purchase have an influence on the tax collected. Poor prescription medicine sales paperwork hindered the drug recall procedure.

6. **<u>Inadequate Inventory Management:</u>**

   Customers must visit multiple pharmacies to acquire all of their medications because a single pharmacy cannot stock a large assortment of commodities.

   In order to get the drug to the customer, e-pharmacies have the advantage of avoiding a couple of the aforementioned stages. As a result, in order to optimize the overall process, new models and research into those models are required. These types can be used to give the user with the most efficient drug delivery possible. This type of optimization can also aid reverse logistics, which is a critical component of increasing service quality.
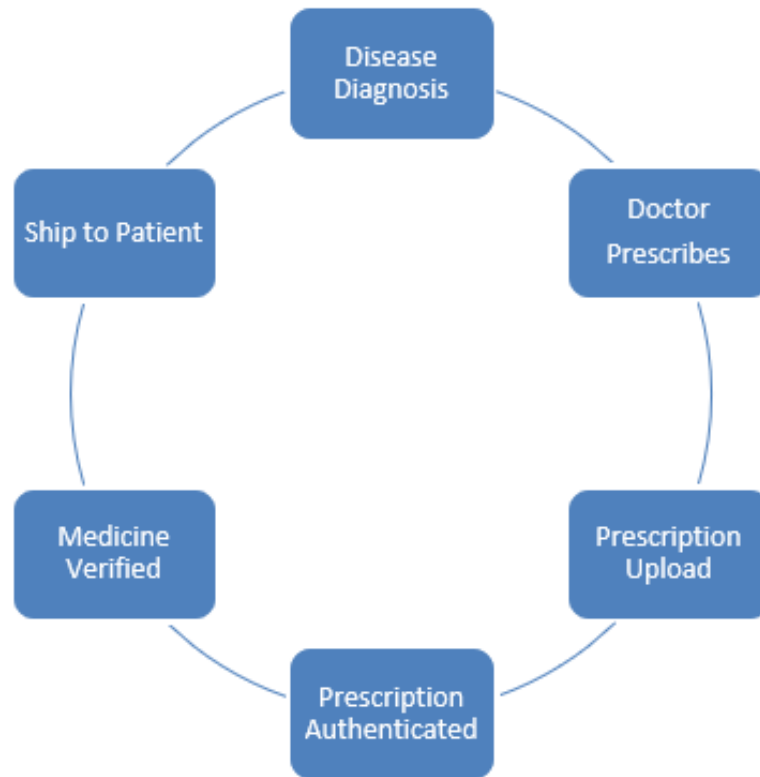
As a result, e-pharmacies can benefit from using a scientific approach to supply chain management to help them manage all aspects of pharmaceutical item stocking, including ensuring safety, stability, efficacy, availability, and drug quality maintenance, in order to provide better healthcare services.

Objective:

❖ To examine the present E-Pharmacy supply chain models in India.

❖ To compare and contrast the four major e-pharmacies in India in terms of geographic reach and business techniques.

❖ To determine the disconnect between the current model and the desires of customers.

❖ To see how e-pharmacies might benefit from the hyperlocal delivery paradigm.

CHAPTER 2: Literature Review

Despite their expanding popularity and client base, Indian e-pharmacies have recently suffered at the hands of an Indian court. Despite the fact that e-pharmacy accounts for only 3% of Indian pharmaceutical sales, organizations representing retail pharmacists, such as the All-India Organization of Chemists and Druggists, have been vocal in their opposition (AIOCD). With the emergence of Covid-19, customers faced a big challenge: the necessity for speedier drug delivery. Hand sanitizer, for example, may be purchased at any drugstore, but the same cannot be true about prescribed medications, as no one knows where they can be obtained. As a result, in order to avoid the delay in pharmaceutical supply, I attempted to work on a study project that focuses on hyperlocal pharmaceutical distribution in the shortest time possible to both urban and rural places.

Delivering healthier outcomes through e-pharma (Aseem Madan, 2020)

Because of Foreword's growing internet penetration, mobile-first customer behaviour, and enhanced digital payment infrastructure, India is fast adopting e-commerce. Fashion, mobile and electronics, lifestyle, consumer goods, and other industries have already erupted with online transactions. Despite its enormous potential, the pharmaceutical business is almost unrepresented online. A large section of India's population does not have timely access to high-quality medications. The rise in chronic and lifestyle illnesses has brought attention to the significance of timely access to high-quality treatments

Last mile access of medicines in e-pharmacy (**Jaisani, 2020**)

The main goal of this programme is to provide high-speed Internet to every part of the country, including small towns and distant villages. Its goal is to make government services and communication with officials more accessible to citizens. This programme aims to benefit the country's economic development as well as the lives of its residents.

Hyperlocal players have a strong logistical network in cities and could be a suitable fit for online pharmacies' last-mile deliveries. These players are likely to grow in scale and have a large consumer database as we move toward an on-demand economy. Given how frequently women receive births, a profession in medicine is a natural path for them. About 125,000 delivery executives work for the top two players. Some businesses collaborate with internet pharmacies to meet delivery requirement.

E-Pharmacy impacts on society and pharma sector in economical pandemic situation **(Himani Singh, 2020)**

Four months ago, nobody knows about covid-19 but now this virus has spread to almost every country. Pharmacy services act as a pillar at this pandemic situation for the public health. At this time covid-19 disease is almost spreading all over the world and society. Majorly Pharmacy services act as a pillar at this pandemic situation for the public health. China is the first country where covid-19 outbreak started and some current data of consumer behavior and their habits are showed that society take some safe and preventive measures during lockdown and social distancing time which increase growth of ecommerce demand is inevitable. This review paper focus on the basic issues and challenges related to online pharmacy. (Himani Singh, 2020)

Hyperlocal on-demand delivery business model in rural India **(Biswas, 2019)**

In 2008, the first smartphone launched and amplified our internet using activity by 100 folds. Now internet penetration in India is at an astonishing 87%. As on-demand economy rises, the need for traditional business models is getting lesser. New players with new innovative offerings are emerging in the market. By 2020, the Indian hyperlocal market is expected to touch $2030 million. As a large amount of investors are showing interest in these business models and can see a significant investment to grow and capture the e-market. (Biswas, 2019)

Strategic Issues in Pharmaceutical supply Chain **(Singh, 2016)**

The management of pharmaceutical supply chains has become more complex because it involves the life-saving interest of human being. This paper basically aims to find the gaps in the study by reviewing research papers on some strategic issues of supply chain management in this sector. The share of these firms in the global market is also not that much. So on the basis of an extensive review of pharmaceutical supply chains, research gaps were identified in different areas such as inventory management, new product development, process development, capacity planning etc. Based on a review, gaps are identified and research agenda is proposed. (Singh, 2016)

Development of Web Based Online Medicine Delivery System for COVID-19 Pandemic **(Mohammad Monirujjaman Khan, 2021)**

Indians spend a significant amount of income on medicine. A reliable and fast online medicine delivery system is not ubiquitous. Due to COVID-19, medicine scarcity is also an important issue. In this pandemic time, it is not risk free to go out to buy medicine from the pharmacies. An online web-based ecommerce web application has been developed in this paper. This platform consists of a dynamic web application built in Hypertext Preprocessor (PHP) based Laravel framework. It is hosted on a dedicated "Virtual Private Server". This system is very fast as compared to normal systems and very well optimized for searching engines. With the help of the developed platform, drugs will be available at one's doorstep very fast, safely and reliably. (Mohammad Monirujjaman Khan, 2021)

CHAPTER 3: Research Methodology

The data has been collected from both primary and secondary sources. This was done in orderto study the existing supply chain models existing in the e-pharmacy space and the competitive analysis of different e-pharmacies as well as to gauge the customer journey in this space.

3.1 Secondary Research: - Extensive secondary research is done in order to know aboutthe existing models in e-pharmacies. This helped in understanding the current landscape. The same was done for major competitors in the e-pharmacy space which has seen the rise around200 start-ups within few years. The data has been collected for Medlife, Netmeds, 1mg and PharmEasy majorly on their geographic reach, e-commerce model followed and value-added services provided by these players. The further research concentrated on the emerging trends in this space and the upcoming challenges.

3.2 Primary Research: - The primary research has been done by collecting data from individual consumers in order to gather insights regarding the needs of the consumer. This research was then analysed to access whether it aligns with the emerging trends or not. Furtherinsight has been used to suggest improvements in the e-pharmacy model in order to increase the efficiency while meeting the expectations of the consumer.

Present E-Pharmacy model

The data has been collected from both primary and secondary sources. This was done in order to study the existing supply chain models existing in the e-pharmacy space and the competitive analysis of different e-pharmacies as well as to gauge the customer journey in this space.

Extensive research is done in order to know aboutthe existing models in e-pharmacies. This helped in understanding the current landscape. The same was done for major competitors in the e-pharmacy space which has seen the rise around 200 start-ups within few years. The data has been collected for Medlife, Netmeds, 1mg and PharmEasy majorly on their geographic reach, e-commerce model followed and value-added services provided by these players. The further research concentrated on the emerging trends in this space and the upcoming challenges.

The existing business model in the e-pharmacy space are - pure marketplace, hybrid –inventory and hybrid – franchise.

	Pure Marketplace	Hybrid - Inventory	Hybrid – Franchise
Operating Model	•After aggregating a large number of pharmacies, the company adds offline pharmacies to its network. Once the order is submitted, the company and pharmacy verify the prescription. The order is then dispatched by the company's in-house logistics team pharmacies or a third-party logistics partner.	• Companies that follow this approach employ warehouses and strategic partnerships with pharmacies. • A portion of the inventory comes from the manufacturer, while the rest comes from local pharmacies. After an order is placed, a pharmacist verifies the prescription before dispatching the products to the fulfilment center, where they are packaged and shipped for delivery.	The franchisee validates the prescription when the order is submitted online, then orders the products. The order is supplied to the consumer once the items are delivered to the distributor (from a distributor, which might also be an online pharma firm).
Advantages	• Ability to supply additional associated services. • Data analytics can be used to target different products/services based on consumer purchasing trends.	• They have complete control over the process, from procuring pharmaceuticals to validating prescriptions; and, thanks to hyperlocal pharmacy partners, they can fill orders swiftly. Customers can also choose to pick up products from a local drugstore partner.	• The franchise pays for operating costs, has an online and offline presence, and buys straight from the manufacturer, assuring authentic items and larger profits.
Disadvantages	•They have less control over the quality and authenticity of the things they sell, and they don't have a physicality for customers to see, which might cause trust concerns.	•Inventory management requires working capital. •When compared to a platform, it requires more assets. •Lower profit margins than a franchise-based business.	• Franchisee selection influences investment and growth quality; franchisees may also make orders through other platforms. • As the franchisee is the face of the company, customer service is likely to have an influence on the brand.

Source: ey-e-pharma-delivering-healthier-outcomespdf-pdf-free.html
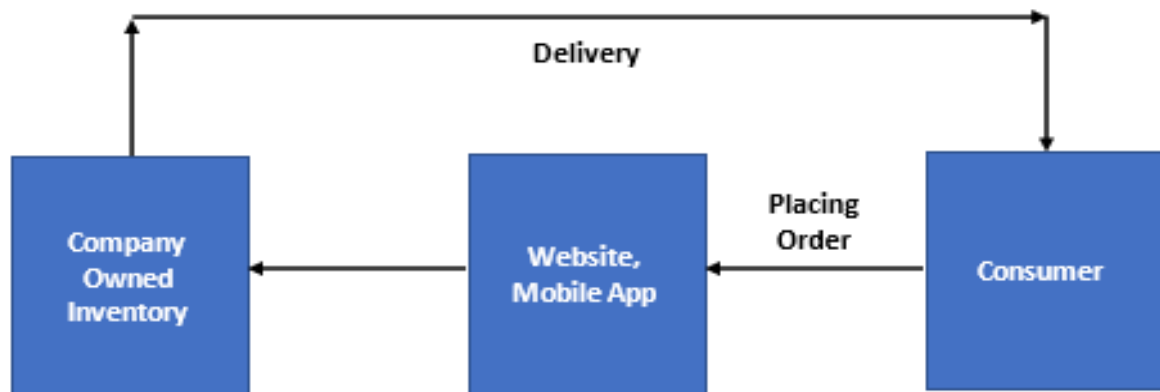
Table 3.1: Comparison of E-Pharmacy Model
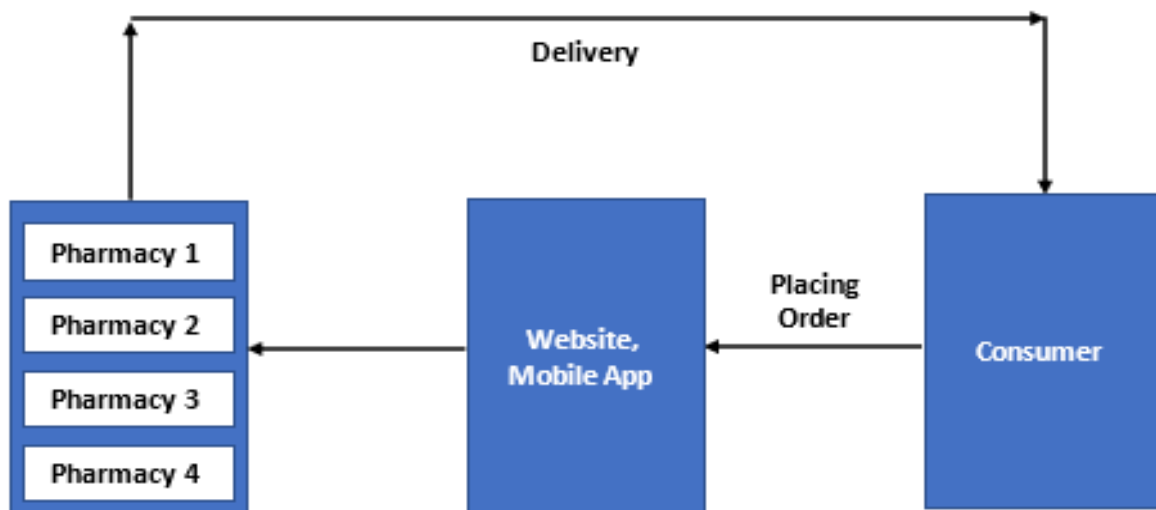
Fig 3.1: Inventory Model of E-Pharmacy

Fig 3.2: Marketplace Model of E-Pharmacy

CHAPTER 4: ANALYSIS AND RESULTS

4.1 Secondary Research Analysis - Competitive Landscape

The extensive secondary research allowed to analyze the existing models used by e-pharmacies and their geographic reach. Details of the same has been represented below.
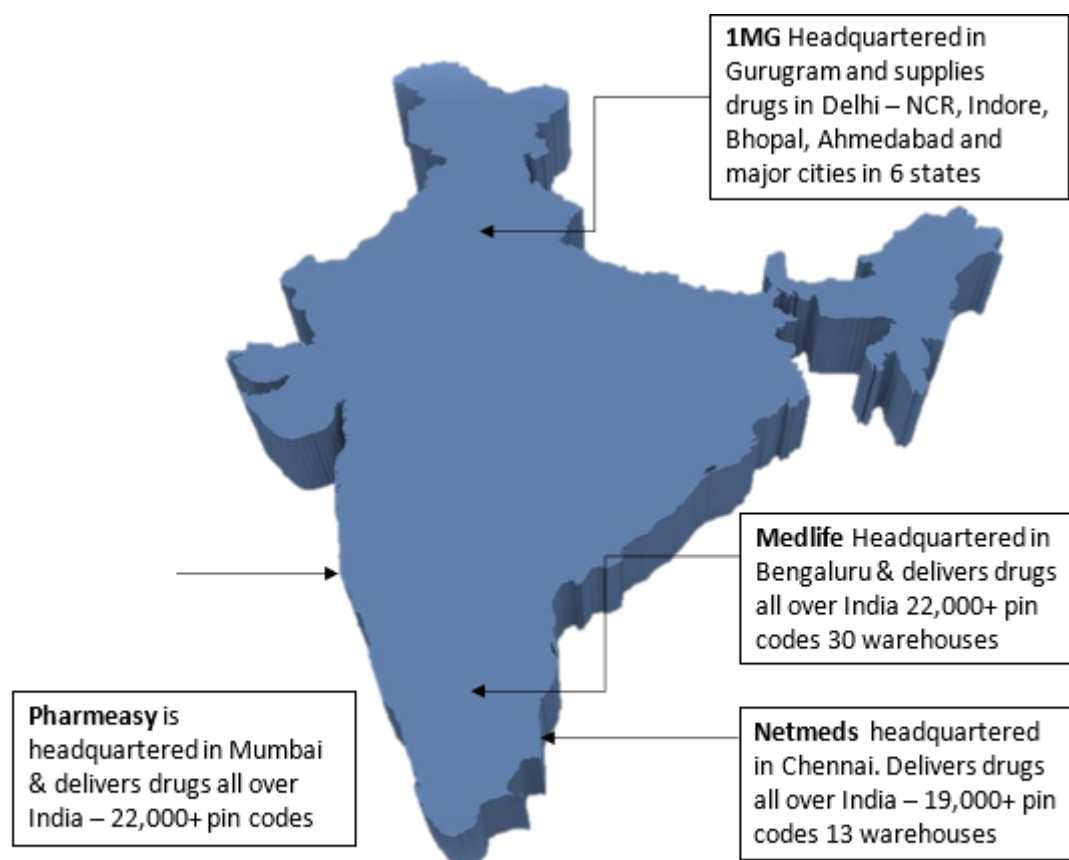

1MG Headquartered in Gurugram and supplies drugs in Delhi – NCR, Indore, Bhopal, Ahmedabad and major cities in 6 states

Medlife Headquartered in Bengaluru & delivers drugs all over India 22,000+ pin codes 30 warehouses

Netmeds headquartered in Chennai. Delivers drugs all over India – 19,000+ pin codes 13 warehouses

Pharmeasy is headquartered in Mumbai & delivers drugs all over India – 22,000+ pin codes

Fig 4.1: Geographic Reach of E-Pharmacies

(Source: Frost & Sullivan)
(The map of India is used only for representation purpose)

Medlife and Pharmeasy are the two e-pharmacies having the largest reach of all the e-pharmacies, delivering drugs with over twenty-two thousand pin codes from across country. With almost thirty warehouses' facilities to Netmeds', Medlife has the most reach among its competitors. In India, Netmeds provides drugs to more than 19,000 pin codes.

1 MG supplies prescription medicines and drugs in Indore, Bhopal, and Ahmedabad. It also serves the Delhi-NCR area, as well as the major cities of Gujarat, Karnataka, Rajasthan, Tamil Nadu, Telangana, UP, and West Bengal. It sells over-the-counter, non-prescription, and health-related products all over India.

These e-pharmacies have made a strong push towards value added services in order to diversify their revenue streams. E-pharmacy players have begun to offer a variety of value-added services such as doctor/clinic appointments, online consultations, health blogs, medicine reminders and refills, and partnerships with diagnostic centres, among others. This is assisting them in attracting a growing number of clients.

	Online Consultation	Tie up with Diagnostic laboratories	Appointments with Doctors /Clinics	Health blog
Medlife	✓	✓	✓	✓
Pharmeasy	✓	✓		✓
Netmeds	✓			✓
1mg	✓	✓		✓

Fig 4.2: Value-Added Services by E-Pharmacy

(Blue colored box denotes that the e-pharmacy player provides corresponding service)
(Blank box denotes that the e-pharmacy player doesn't provide corresponding service)

Medlife has been the best in terms of value-added services, providing a wide range of services such as doctor appointments, laboratory affiliations, record maintenance, a health blog, and chat. Pharmeasy, on the other hand, provides value-added services such as online consultations, home sample collection, laboratory affiliations, drug reminders and refills, and a helpline. This allows them to have higher engagement rates and diversify their revenue streams to compensate for discount losses. Such services assist in changing the attention away from the items and services offered to the customer experience, which will eventually determine their loyalty to a company rather than keeping discounts at the forefront of their decision.

	Medlife	Pharmeasy	Netmeds	1mg
e- pharmacy model	Inventory-led model	Market place-led model	Inventory- led model	Market place-led model
Description	Medlife has also expanded by adopting the franchise model. The value-added services include consultation appointments with doctors. It also provides e-consultations, laboratory services, app-based healthcare services, private label generics, and an ayurvedic brand.	PharmEasy has prescription reminders, subscription, prescription records on an online basis, free E- Doctor reference and discussion, sample collection is done directly from home for tests.	Netmeds has grown through acquisitions and the implementation of a franchise model. Netmeds plans to open offline storefronts to serve the tier II, III, and IV markets. To increase online sales, Netmeds is trying to improve its technological platform and warehouse.	Acquisitions have helped 1 MG grow. Users may interact with medical stores, doctors, and pathology laboratories through its website and app, which now includes homoeopathic medication, a diagnostics and imaging testing marketplace, consultations, corporate health services, and insurance partnerships.

Source: ey-e-pharma-delivering-healthier-outcomespdf-pdf-free.html

Despite bypassing a few steps in the conventional supply chain these e-pharmacies have been making losses due to the discounts being offered to on board customers on to the platform

4.2 Primary Research Analysis

The data has been collected from 80 consumers all of whom reside in metro or tier-1 cities. The data collection was done using the questionnaire floated, with focus on obtaining valuableinsights regarding the needs of the consumers.

The data had a good mix of both genders with 60% males and 40% females with majority of them (>90%) being less than 25 years old. The awareness regarding the e-pharmacies stood 100% which is consistent with the fact that the internet penetration and adoption of e-commerceamong urban youth is high. This result is consistent with the high marketing and promotional spend (discounts etc.) being done by the e-pharmacies to generate awareness and acquiring customers.
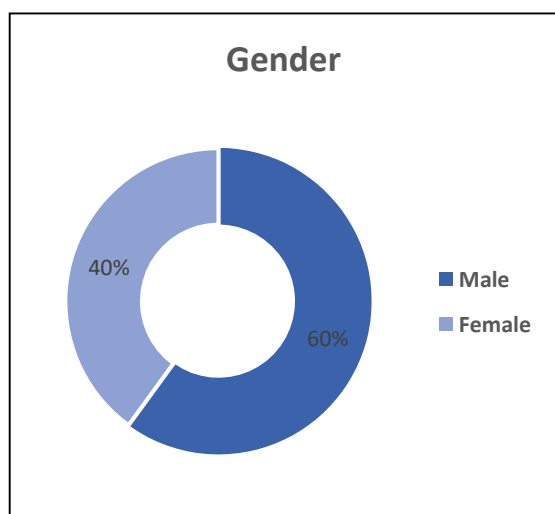
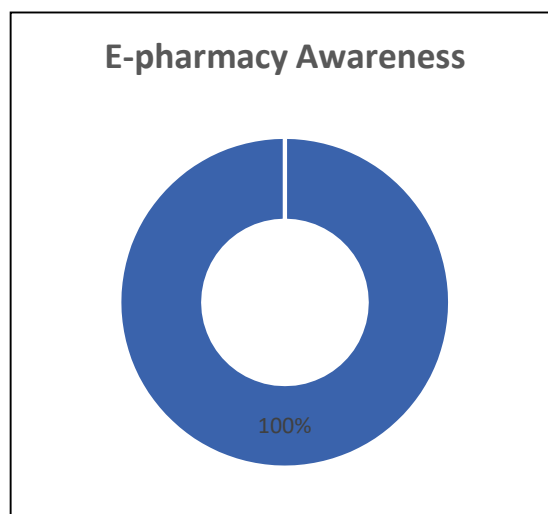Fig 4.4: Gender Representation

Fig 4.5: Awareness of E-pharmacies

Majority of the respondents in this age group buys a medicine only after prescription from the doctor however, a significant chunk of respondents buys medicine based own discretion. Onekey point to note is that despite the e-pharmacy awareness being high majority of therespondents prefer to buy medicine from the traditional medical store/chemist, with 95% of therespondents prefers to buys the medicine offline. This is consistent with the fact that the penetration stays low (~1-2%) for e-pharmacies in India.

The further questions were focused on the factors which compels a person to buy from e- pharmacy instead of the offline channels. The respondents were supposed rank the reasons in their priority order with 1 being the most compelling while 6 being the least compelling. The results obtained were mix however, 2 parameters which stand out were convenience and

discounts, these were ranked either 1st or 2nd by the majority of the respondents and same has been depicted as follows: -
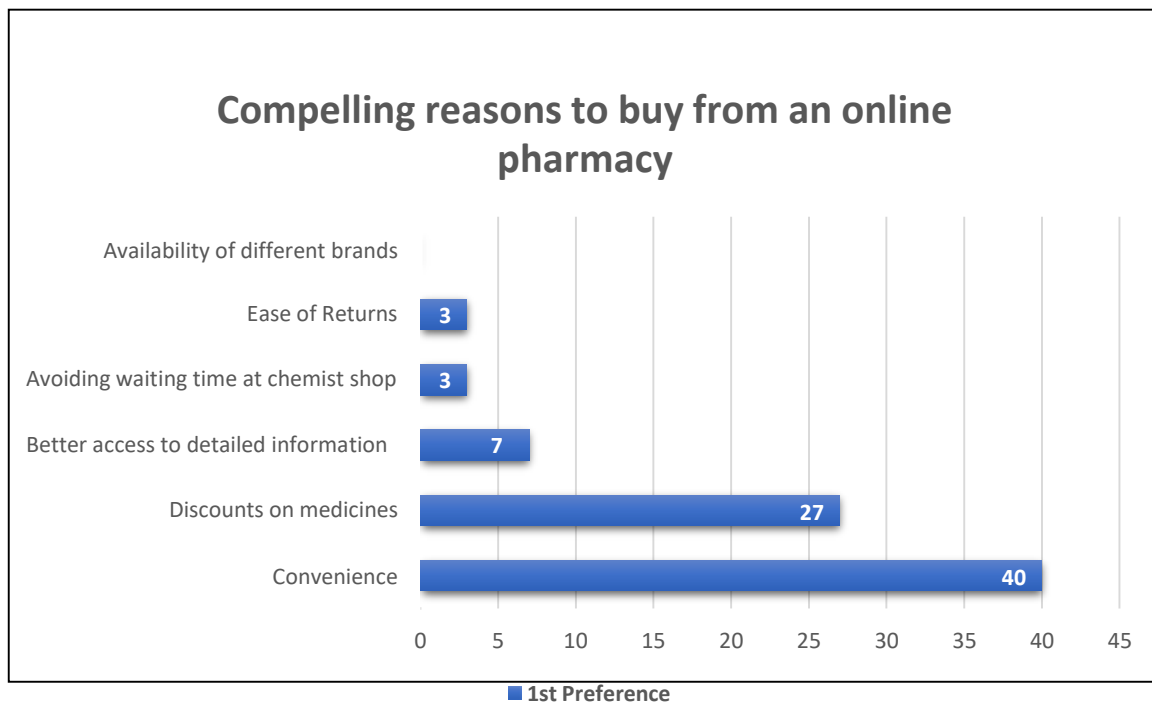

Fig 4.6: Reasons to buy from E-Pharmacies

	Perception of E-pharmacy
Perception of E-pharmacy	1
[Discounts on medicines]	0.65367377
[Availability of different brands]	-0.08844738
[Convenience]	0.75106834
[Avoiding waiting time]	0.638987895
[Better access to detailed information]	-0.035850115
[Ease of return]	-0.03184325

Correlation between the perception and different reasons to go for E-pharmacy

Correlation is an important technique for understanding the relationship among the constructs identified. From the table, it is found that the correlation between Perception of E-pharmacy and convenience is 0.751. This showsthat there is a positive correlation between Perception of E-pharmacy and convenience. It shows that there is a significant impact of people perception on convenience for online sores. Correlation between perception and discount on medicines is 0.651. This shows that there is a positive correlation between perception and discounton medicines. Correlation between perception of e-pharmacy and waiting time is 0.638. This shows that there isa positive correlation between perception of e-pharmacy and waiting time. The above picture also shows that thecorrelation between perception and availability on different brands is -0.088. This shows that there is not muchimpact of different brands on the buying perception of respondents.

Despite these there are several challenges that the customer faces and these are: -

1. Order placement and delivery

   a. Customer feedback about orders being approved and then revoked a day or two later.

   a. Delivery delays were a major source of concern.

   b. Consumer health risks connected with any disruption in chronic drug supply, particularly for those who live farther from the supply chain.

   d. Order manipulation or alternative substitution

   a. Inaccurate pricing and products missing from the order.

2. Customer support

   a. Delays and refusals in refund processing.

   b. Unavailable or unresponsive customer service representatives.

   c. Order updates and tracking are not available.

   d. Agent cancellation of orders.

3. Trust

a. Storage issues, as there is no physical location where the product can be purchased.

b. Consumers may be deceived without adequate background checks because the e-pharmacies site allows people who are not licensed as doctors or diagnostic providers to sign up.

4. Order rejection

a. A prescription is not necessary in most brick-and-mortar locations, and consumers prevent having one because getting one requires paying a premium for a consultation. It is not feasible to place a purchase online under such circumstances.

5. Enhanced data security

a. Personal information about patients is easily manipulated, and information can be used to register fake prescriptions and get access to or edit the medical record. As a result, long-term success depends on data privacy.

The last part of the primary research focused on the delivery time. People generally want a medicine as soon as they have the prescription or it is an emergency, in such cases it is very important to provide the medicines in timely manner. During the finding, the consumer typically wishes to have the medicine within few hours of ordering and the same can be seen as follows:
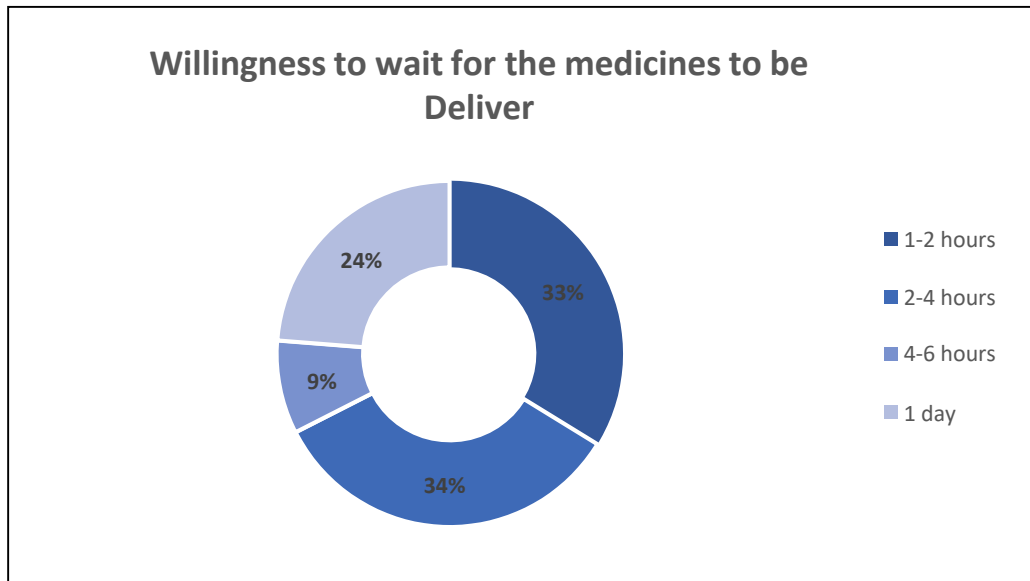

Fig 4.8: Waiting time for the delivery desired by the respondents

It is evident from the data that the respondents expect short delivery time with less 25% people willing to wait for more than a day to get their medicines delivered. This poses a different kindof challenge for the e-pharmacies. They now need to optimize their supply chain further to takeon the traditional retail stores.

Such optimization pushes for the need to build a hyperlocal ecosystem where the delivery can happen within few hours at majority of the places. This reduction in delivery time can help thee-pharmacies to penetrate the market better and to even the remote areas of the country. Further,it will help them tackle the challenges posed by the offline retail channels.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

In India, e-pharmacy is growing at the same time as the country's pharmaceutical industry. It has obvious and practical advantages for both clients and enterprises. Meanwhile, the rise of e-Commerce and retail has been recognised as complementary and stimulating each other. E-pharmacy has the ability to bring significant value to India's current retail industry if technology is applied wisely and under strict regulatory oversight.

Furthermore, Web transactions are well connected to address key known problems in pharmacy retail, such as monitoring authenticity, misuse prevention, medicine traceability, drug usage without a prescribed medication, tax loss, and valuation services for consumer awareness in healthcare, all of which are key development areas in this sector.

Consumers gain from e-commerce for a multitude of reasons, the most significant of which being the ease with which they may get drugs. The e-Pharmacy idea benefits consumers immensely, and it has the ability to reach a vast number of people who are currently unable to obtain healthcare. This will lead to a considerable integration of online and offline, resulting in a hyper - local delivery environment that will give a superior customer experience.

It is vital that the country's regulatory system be designed with the greater interests of the country's customers in mind. If technology exists to reduce the prices of intermediary medications, it must be permitted to be exploited to its full capacity, since it will lower the retail value of many pharmaceuticals and assist the middle class, who is the group most affected by price increases.

With numerous e-pharma companies already in operation and several e-commerce companies aiming to extend their capabilities, a number of possibilities, including mergers, might emerge. Additionally, by adding pharma delivery to their services, existing hyperlocal enterprises may be able to make better use of their distribution infrastructure. Leading e-commerce businesses or large conglomerates with the correct equipment, retail chains, and financial power are likely to disrupt the e-pharmacy sector from the ground up. However, for such a move to be effective, a deeper grasp of this industry's technical nature and accompanying compliances is required.

Recommendations

Consumers have several concerns regarding the adoption of E-pharmacies such as order placement and delivery, customer support, order rejection, Lengthy process for returning medicine, Lack of regulatory mechanism, increased chances of fraud, data privacy concerns. To mitigate these challenges few practices can be adopted and these are: -

1. **With the assistance of marketing and commerce**
   To market their products and services, e-pharmacies may set up modest kiosks in malls and other high-traffic areas. They may also run marketing efforts in different cities and towns to educate clients about the simplicity and convenience of the online process and to attract them to switch from offline to online retail by offering discounts. Basic online ordering skills are generally lacking in Tier 2 and beyond cities. An offline to online marketing strategy would be more effective in these markets, with Kirana businesses being targeted and provided the training and equipment to help customers place orders via an app.

2. **E-Prescription services,**
   To solve the multiple uses of a single prescription, a centralized e-Prescription service platform could be effective in tracking patients' purchasing habits, where the physician would upload the prescription and pharmacies would utilize it to authenticate drug sales. Failure to monitor e-Prescriptions can lead to drug misuse, addiction, and self-medication, all of which can be harmful to patients' health.

3. **Regional language mobile applications**
   Because 90 percent of Indians do not understand English, the ability to create marketing and apps in regional languages may determine who performs in the market and obtains client acceptance. As the internet becomes more generally embraced in India's semi-urban areas, the number of internet users utilizing indigenous Indian language is expected to rise. Building confidence and encouraging more online transactions requires customizing the app to engage with clients in their native languages across numerous contact points, such as the smartphone app and customer care.

Other recommendations include: -

i. A separate licensing and register for e-Pharmacy players should be formed to encourage trust.

ii. Scheduled drug dispensing must be performed by a licensed pharmacist or under the supervision and guidance of a registered pharmacist, and must be accompanied by a valid prescription from a Qualified Medical Practitioner.

iii. After receiving the actual medication and a scanned copy of the actual prescription, the e-Pharmacy can only execute prescription pharmaceutical orders.

iv. A digital audit trail (containing the patient's address and name) should be established to avoid abuse and assure tracking in the event of a medicine-related adverse event.

v. Appropriate steps must be taken to ensure that the integrity, quality, and effectiveness of the medications are maintained during packing, transportation, and delivery.

vi. The logo, license number, and contact information of pharmacists must be clearly displayed on the website/mobile application for the purpose of resolving patient concerns and grievances.

vii. The long-term success of e-Pharmacy activities will be influenced by a new optimization technique based on machine learning methods to automate processes, supply chains, and solve business difficulties.

viii. Integration of the value chain of demographics, disease, diagnostics, doctor consultation, and drug distribution would be a huge value differentiator, resulting in specialized firms capable of running a PAN India operation

A key component to the growth would be fast delivery which can be enabled by going 'hyperlocal' to enhance last mile delivery network. The same can leveraged as follows: -
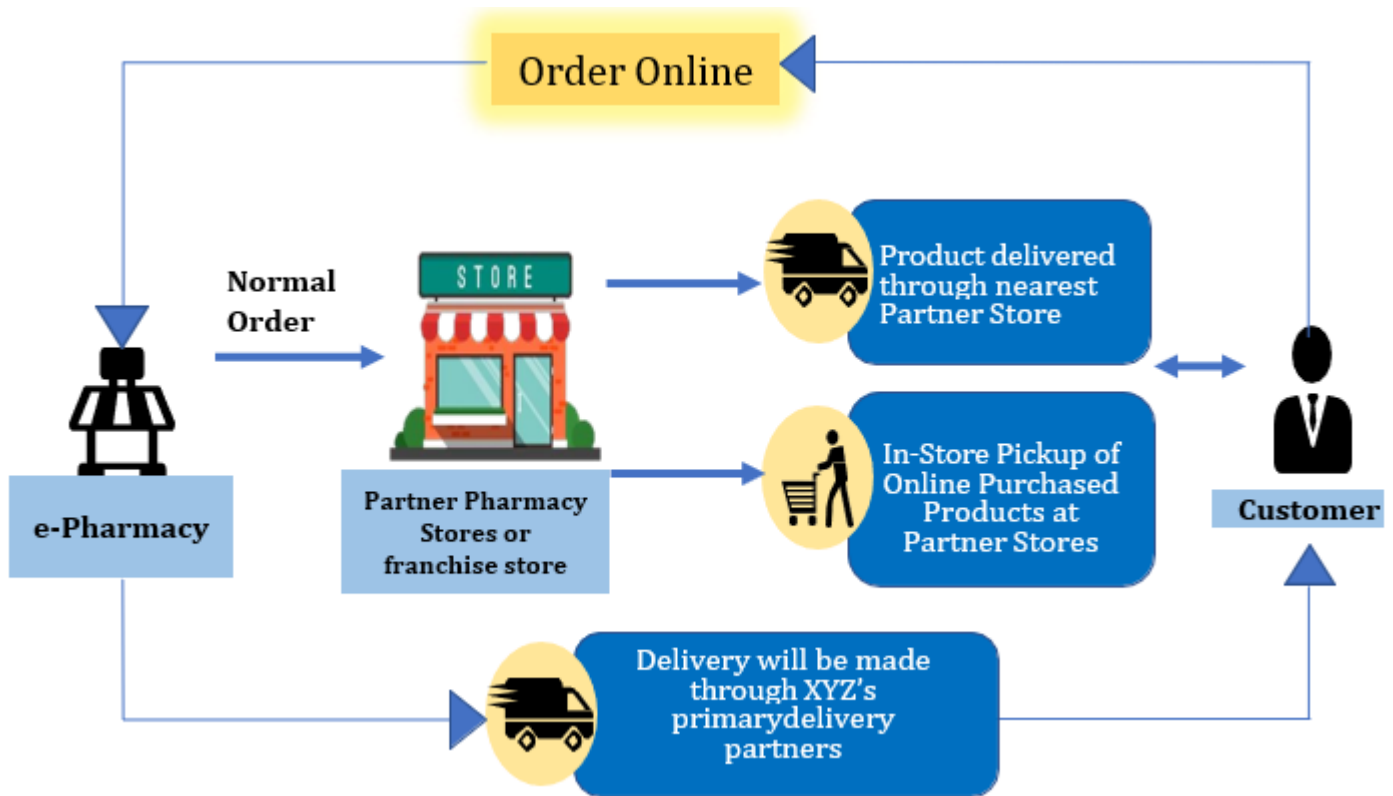

Fig: Hyperlocal delivery model

The consumer selects the medicine from a diverse catalogue on e-pharmacies app, once the order has been accepted and the order can be fulfilled directly by the e-pharmacy or through the partner pharmacy store depending upon the distance as well as the delivery time. This partner store can directly deliver the order or the customer would have the choice to pick up the order from the partner store. This will enable fast deliveries by the integration between online and offline channels. Customers will have a unified experience at multiple-touchpointswith the benefits of both online and offline sales channels.

Given that most e-pharmacies are currently expanding their distribution network and channels in order to reach as many clients as possible, as established location - based platform already do, having tie-ups and accessibility to food delivery networks may be more sensible
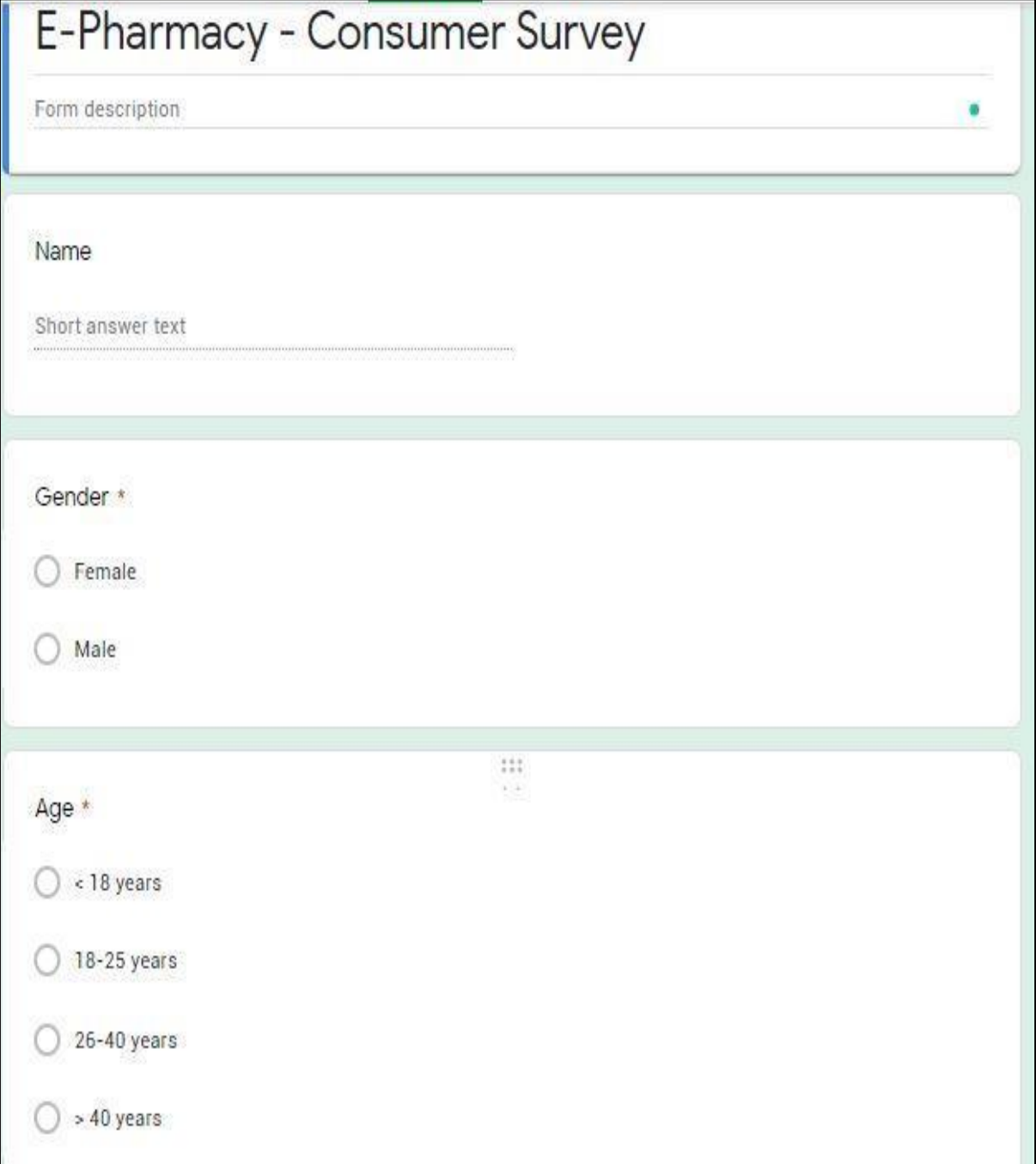
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- *www.netmeds.com, www.medlife.com, www.1mg.com, www.pharmeasy.com*

Primary Research:

Questionnaire in the form

The following google form was floated to the respondents:

E-Pharmacy - Consumer Survey

Form description

Q 1. Name

Short answer text

Q 2. Gender *

○ Female

○ Male

Q 3. Age *

○ < 18 years

○ 18-25 years

○ 26-40 years

○ > 40 years

Q 4. You recognise yourself to be living in a *

○ Metro city

○ Tier 1 City

○ Tier 2 City

○ Other Cities

Q 5. Employment Status *

○ Student

○ Employed

Q 6. Are you aware of Online Pharmacies? *

Online pharmacies like netmeds, 1mg etc.

○ Yes

○ No

Q 7. What indulges you to buy medicines? *

Check all that applies

☐ Doctor's prescription

☐ Pharmacist's recommendation

☐ Self Prescription

☐ Based on advice from someone else

Q 8. What is your preferred source of buying medicines? *

○ Medical Store/Chemist

○ Online Pharmacy (like netmeds, 1mg)

Q 9.

What would compel you to buy from an online pharmacy? *

Rank in order 1 to 6 (1 most compelling and 6 being the least compelling)

	1	2	3	4	5	6
Discounts o...	○	○	○	○	○	○
Availability o...	○	○	○	○	○	○
Convenience	○	○	○	○	○	○
Avoiding wai...	○	○	○	○	○	○
Better acces...	○	○	○	○	○	○
Ease of Retu...	○	○	○	○	○	○

Q 10.

Perception of E-Pharmacy

1. Very Good

2. Good

3. Neutral

4. Bad

5. Very Bad

Q 11.

What the problems perceived by you regarding E-pharmacies?

Check all that applies

- [ ] Time Consuming Ordering Process
- [ ] Long Delivery time
- [ ] Poor Returns
- [ ] Fraudulent products
- [ ] Lack of regulations
- [ ] Data privacy concens

Q 12.

How long are you willing to wait for your medicines to be delivered? *

- ◯ 1-2 hours
- ◯ 2-4 hours
- ◯ 4-6 hours
- ◯ One day

Any key feature you would like to see on an online pharmacy?

Long answer text