IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

# STUDY ON RETAIL PHARMACY DIGITALIZATION

***A Anusha[1], Cheni Jahnavi[2], Vaishnavi Biradar[3], N Vishnupriya[4], M Ajay Kumar[5], Dr. B Lakshmi[6], V Sai Kishore[7]**

*[1]MBA, Department of Pharmaceutical Management, NIPER Hyderabad, Telangana, India*

*[2]MBA, Department of Pharmaceutical Management, NIPER Hyderabad, Telangana, India*

*[3]MBA, Department of Pharmaceutical Management, NIPER Hyderabad, Telangana, India*

*[4]MBA, Department of Pharmaceutical Management, NIPER Hyderabad, Telangana, India*

*[5]MBA, Department of Pharmaceutical Management, NIPER Hyderabad, Telangana, India*

*[6]Assistant Professor, Department of Pharmaceutical Management, NIPER Hyderabad, Telangana, India*

*[7]Assistant Professor, Department of Pharmaceutical Management, NIPER Hyderabad, Telangana, India*

## Abbreviations:

1. EHR – Electronic Health Records
2. ROI - Return on Investment
3. POS – Point of Sale
4. IMS - Inventory management systems
5. AI - Artificial Intelligence
6. RFID – Radio Frequency Identification

## Abstract:

This study investigates India's current level of pharmacy digitalization. Primary research reveals that chemists have embraced digital technology widely, favoring digital payment and GST registration systems in particular. Distributor orders are the most common, but manual billing techniques are becoming less common. Secondary research highlights adoption hurdles in pharmacy digitalization by examining worldwide trends, problems, and upcoming technology.**(ProfRNDr Jan Pekar, n.d.)**

The pharmaceutical market in India is highly digitalized, however, there are still issues. The paper urges aggressive steps to remove obstacles and promote digital adoption to increase operational effectiveness. This study offers useful information to stakeholders navigating the changing digital pharmacy ecosystem.**(Rosenbaum et al., 2017)**

## Introduction:

Rapid technological breakthroughs are driving a fundamental upheaval in the retail pharmacy market. The old brick-and-mortar model is giving way to a new one in this digital age that is characterized by more efficiency, better client experiences, and higher financial returns. The retail pharmacy industry's pressing need for digitization is what's driving this paradigm change. Now more than ever, pharmacists must embrace digital technologies to be competitive and meet the growing need for easily accessible and efficient healthcare services.**(Mirzaeian et al., 2019)**

This study begins a thorough investigation of the urgent need for retail pharmacies to incorporate digital technologies into their daily operations. This study centers on the importance of Electronic Health Records (EHR), the improvement of inventory control systems, the incorporation of online prescription services, and the use of creative consumer interaction tactics. **(Fossouo Tagne et al., 2022)**This study attempts to uncover the complex web of benefits that digitalization brings to the fore by breaking down these essential elements. The backbone of every pharmacy, inventory management, is also getting a digital makeover. Sophisticated inventory control systems make sure that patients receive their prescriptions on time by streamlining procurement procedures, cutting shrinkage, and optimizing stock levels. **(Orsolini et al., 2015)**These systems give pharmacists access to real-time inventory status information, empowering them to anticipate stockouts and make well-informed purchase decisions. Inventory management is further streamlined with the use of RFID tags, automated dispensing devices, and barcode scanners, which lower errors and increase productivity.**(Liang et al., 2005)**

The digital revolution has brought forth an era of convenience and accessibility in the prescription services industry. Patients no longer need to make in-person trips to the pharmacy in order to refill prescriptions thanks to online prescription platforms. In order to provide patients more control over their health, these platforms also offer tailored medication management tools, instructional materials, and reminders for drug adherence. Pharmacies may broaden their patient base, improve patient convenience, and build more enduring client relationships by adopting online prescription services.**(Das et al., 2021)**

Retail pharmacies need to position themselves strategically in order to succeed in an environment that is marked by changing consumer expectations, heightened competition, and a quickly changing healthcare landscape. Comprehending the current level of digitalization in the industry, as well as the possible obstacles and revolutionary effects it might have on ROI and customer happiness, is imperative. Retail pharmacies looking to effectively traverse the digital landscape will have a road map thanks to the insights gained from this research.**(Rachmat Hidayat & Irsan Saleh, 2020)**

## Literature Review

The literature on the digitalization of pharmacies and healthcare services highlights how important technology is to changing customs. A major transition towards digitalization has occurred in the healthcare sector in recent years, mostly due to the demand for increased efficiency, accuracy, and better patient outcomes.**(Hussein et al., 2021)**

**Evolution of Pharmacy Digitization**

From traditional pharmacies to e-pharmacies: The digital transformation of the pharmaceutical industry.

The fast use of technology in recent years has resulted in a considerable transformation of the pharmaceutical sector. The way pharmacies run has significantly changed as a result of this digitalization, giving patients new, practical ways to get access to their prescription drugs and medical services.**(Strain & Cooper, 2007)**

- **Traditional Pharmacies:** Historically, pharmacies were mostly physical locations where patients would visit to pick up prescription drugs. Patients frequently had to wait in lengthy lines at these pharmacies, which usually had a little inventory of drugs.
- **E-Pharmacies:** E-pharmacies, or online pharmacies that let customers obtain prescription drugs from the comfort of their homes, have become more common as a result of the growth of the internet. Compared to traditional pharmacies, e-pharmacies usually offer a larger assortment of drugs, and customers can frequently have their prescriptions filled right away**.(Seymour et al., 2012)**

**Challenges in Traditional Pharmacy Practices:**

Numerous obstacles that traditional pharmacy procedures must overcome call for the incorporation of digital technologies. Manual record-keeping increases the risk of errors, inefficiencies, and inaccurate data because it frequently depends on paper-based methods. Another major issue is inventory management, where manual tracking methods frequently lead to instances of stockouts or overstock. Furthermore, pharmacists' capacity to offer comprehensive care is hampered by the absence of organized, easily available patient data. These difficulties jeopardize patient safety and satisfaction in addition to having an effect on operational effectiveness.**(Clark et al., 2020)** By adding automated processes, guaranteeing accurate record-keeping, improving inventory management, and enabling the smooth interchange of patient data across the healthcare continuum, the shift from traditional to digital pharmacy practices tackles these problems. As the healthcare industry develops further, comprehending and overcoming these challenges become imperative for pharmacies to remain competitive and deliver high-quality care.**(Al-Jedai et al., n.d.)**

**The Digital Transformation of Retail Pharmacies**

Technology breakthroughs and shifting consumer expectations are driving a rapid digital change in the retail pharmaceutical sector. Digital tools and platforms are being adopted by pharmacies more frequently in an effort to boost productivity, improve patient care, and offer a more seamless consumer experience**.(Alexander et al., 2017)**

**Driving Forces of Digitization**

Several key trends are fueling the digital transformation of retail pharmacies:

- **E-pharmacy growth:** E-pharmacies are providing patients with convenient online access to medications and healthcare services, leading to their growing popularity.
- **Mobile app adoption:** Pharmacy mobile apps are gaining traction, offering patients tools to manage prescriptions, refill medications, and access health information on their smartphones.**(Lopes & Alexandre, 2018)**
- **Telehealth integration:** Telehealth is being integrated into pharmacy services, enabling patients to consult with pharmacists virtually, eliminating the need for in-person visits.
- **Data analytics utilization:** Pharmacies are leveraging data analytics to improve inventory management, identify medication adherence issues, and target personalized marketing campaigns**(Bani Issa et al., 2020).**
- **Artificial intelligence (AI) applications:** AI is being used to develop chatbots for customer service, automate prescription refills, and personalize medication recommendations.

**Role of Market Research in Digitization Initiatives:**

Since market research offers a comprehensive awareness of the dynamics, wants, and preferences of healthcare professionals as well as patients, it is essential to the success of pharmacy digitization initiatives. Organizations can obtain important insights into the unique difficulties faced by traditional pharmacies and pinpoint areas for digitalization-based improvement by conducting thorough market surveys**.(Vinchurkar et al., 2018)** Targeted digital solutions can be developed by taking into account the special needs of pharmacists, such as expedited inventory procedures and effective prescription management. Market research helps to refine and optimize these solutions based on input from the real world, in addition to providing guidance for the initial design of technology. Organizations can customize their digitization efforts to meet the changing demands of the healthcare community by researching the market landscape, assuring higher adoption rates and sustainable impact.**(Chang et al., 2020)**

Market research also makes it easier to identify potential adoption barriers, such as healthcare professionals' reluctance to accept change or privacy and data security concerns. With this information, firms may create user-friendly interfaces, take proactive actions to address these problems, and put strong security measures in place. To put it simply, market research acts as a compass, directing pharmacy digitization activities toward solutions that truly satisfy end users' expectations while negotiating the intricacies of the healthcare sector.**(3.-Inventory-Management-in-Pharmacy-Practice, n.d.)**

**Global Trends in Pharmacy Technology: A Revolution Brewing Across Borders**

The winds of digital change are nothing new to the busy pharmacy industry. Pharmacies are adopting cutting-edge technologies on a global scale, revolutionizing the administration of pharmaceuticals and the provision of healthcare. **(Keshta & Odeh, 2021)**Let's examine some of the major themes driving this revolution:

**1. Automation Takes Center Stage:** The era of laborious, manual procedures is long gone. While cloud-based solutions provide agility and real-time data access even to smaller pharmacies, integrated point of sale (POS) systems smoothly integrate patient loyalty programs, inventory management, and transactions. Robotic dispensing devices allow pharmacists to focus more on patient care by delivering drugs with extreme precision and speed.**(Sonawane et al., 2024)**

**2. AI and Personalization Make Medicine Personal:** An increasingly individualized approach to medicine is being driven by advances in AI. Using patient DNA, pharmacogenomics customizes drug regimens to maximize efficacy and reduce adverse effects. Artificial intelligence-enabled virtual assistants serve as patients' digital companions by responding to inquiries, sending out reminders, and giving basic health advice. Predictive analytics systems foresee the requirement for medications, guaranteeing that pharmacies are always well stocked.**(ProfRNDr Jan Pekar, n.d.)**

**3. Telehealth Bridges the Gap:** Care is no longer impeded by distance. Expertise is brought closer to patients through video consultations with pharmacists and medical professionals, particularly in underprivileged areas. While telehealth platforms enable chronic disease care through remote monitoring, medication adherence support, and individualized counsel, online prescription refills are more convenient and cut down on in-person visits.**(Rosenbaum et al., 2017)**

**4. Blockchain Builds Trust and Transparency:** In the digital age, security and data privacy are crucial. Blockchain technology protects pharmaceutical supply chains, preventing fakes and guaranteeing patient security. Its open data sharing features help close trust gaps between patients, doctors, and pharmacists and may even expedite the filing of insurance claims.**(Mirzaeian et al., 2019)**

**5. Regional Shifts and Adaptations:** Different regional influences can be seen in the worldwide pharmaceutical technology landscape. Developed nations set the standard for robots, cloud-based solutions, and cutting-edge AI applications. Developing countries are paving their own route toward digitalization by embracing telemedicine platforms, low-cost point-of-sale systems, and mobile-based solutions. The regulatory environments in various places also influence how particular technologies are adopted and used.**(Fossouo Tagne et al., 2022)**

**Electronic Health Records (EHR) in Retail Pharmacies**

**Implementation and Integration:** With so many advantages for patients and pharmacists, electronic health records, or EHRs, are becoming more and more common in retail pharmacies. Nevertheless, there may be difficulties in putting EHRs into use and integrating them into pharmaceutical workflow.**( Orsolini et al., 2015)** Key considerations for EHR implementation in retail pharmacies:

- Compatibility with existing systems: Ensure the EHR integrates seamlessly with existing pharmacy systems, such as point-of-sale (POS) and inventory management systems.

- Workflow optimization: Redesign pharmacy workflows to accommodate EHR integration, minimizing disruptions to daily operations.
- Staff training: Provide comprehensive training to pharmacists and pharmacy technicians on EHR functionality and data entry procedures.**(Liang et al., 2005)**

Strategies for successful EHR integration:

- Phased implementation: Implement EHR in stages, starting with a pilot program to identify and address potential issues.
- Data migration: Carefully migrate patient data from existing systems to the EHR, ensuring data accuracy and completeness.
- Vendor support: Collaborate closely with EHR vendors to obtain technical assistance and guidance throughout the implementation process.**(Das et al., 2021)**

**Data Security and Privacy Concerns**: Data security and patient privacy are problems raised by the use of EHRs in retail pharmacies. To safeguard sensitive patient data, pharmacies are required to abide by stringent laws including the Health Insurance Portability and Accountability Act (HIPAA).

Key data security and privacy measures for EHRs in retail pharmacies:

- Access controls: Implement robust access controls to restrict unauthorized access to patient data.
- Encryption: Encrypt patient data both at rest and in transit to prevent unauthorized access.
- Auditing: Implement auditing procedures to track user access and identify potential security breaches.
- Training: Provide regular training to staff on data security protocols and HIPAA compliance.**(Rachmat Hidayat & Irsan Saleh, 2020)**

Additional measures to enhance data security:

- Regular software updates: Install security patches and updates promptly to address vulnerabilities.
- Physical security: Implement physical security measures to protect servers and workstations from unauthorized access.
- Incident response plan: Develop and implement a comprehensive incident response plan to address potential security breaches.**(Hussein et al., 2021)**

**Impact on Patient Care and Medication Management:** EHRs in retail pharmacies can significantly enhance patient care and medication management.

EHR advantages for patient care:

- Better access to patient health information: By enabling pharmacists to view a patient's allergy history, prescription history, and other pertinent medical records, they can enhance medication adherence and safety.
- Improved contact with healthcare professionals: By facilitating communication, electronic health records (EHRs) help pharmacists and other healthcare practitioners coordinate patient care more effectively.
- Personalized drug counseling: By using patient-specific data, pharmacists are able to offer customized drug counseling.**(Strain & Cooper, 2007)**

EHR advantages for medicine administration

- pharmaceutical reconciliation: By lowering the possibility of pharmaceutical errors and enhancing drug adherence, EHRs assist with medication reconciliation.
- Drug interaction warnings: To stop possible negative drug events, EHRs are able to produce drug interaction alerts.
- EHRs can monitor medication adherence by keeping track of prescription refills and identify patients at risk of non-adherence.**(Seymour et al., 2012)**

**Inventory Management Systems in Retail Pharmacies**

Inventory management systems (IMS) play a crucial role in the retail pharmacy industry, helping pharmacies optimize their stock levels to minimize stockouts and overstock, streamline ordering and restocking processes, and achieve cost efficiency and waste reduction.**(Clark et al., 2020)**

**Role in Minimizing Stockouts and Overstock**: Effective inventory management is essential for pharmacies to ensure they always have the necessary medications and supplies to meet patient demand while avoiding the costs associated with overstocking. IMS can help pharmacies achieve this balance by providing real-time insights into stock levels, sales trends, and supplier lead times.

Key features of IMS for minimizing stockouts and overstock:

- Par level and reorder point calculations: IMS automatically calculate par levels and reorder points based on historical sales data, ensuring pharmacies have sufficient stock to meet demand without overstocking.
- Real-time inventory tracking: IMS provides real-time visibility into inventory levels, allowing pharmacies to identify potential stockouts and take corrective action before they occur.
- Demand forecasting: IMS utilizes historical sales data and external factors to forecast future demand, helping pharmacies anticipate stock needs and prevent stockouts.**(Al-Jedai et al., n.d.)**

Benefits of IMS for minimizing stockouts and overstock:

- Reduced stockouts: IMS helps pharmacies avoid stockouts, ensuring patients have uninterrupted access to their medications
- Reduced overstocking: IMS helps pharmacies avoid overstocking, minimizing storage costs, expiration risks, and potential write-offs
- Improved patient satisfaction: Minimizing stockouts and overstock leads to improved patient satisfaction and loyalty**(Alexander et al., 2017)**

**Automated Ordering and Restocking Processes:** Automated ordering and restocking processes simplify and streamline inventory management, reducing the burden on pharmacists and pharmacy technicians. IMS can automate these processes, generating purchase orders based on inventory levels and reorder points.**(Lopes & Alexandre, 2018)**

Key features of IMS for automated ordering and restocking:

- Automatic purchase order generation: IMS automatically generates purchase orders for items reaching their reorder points, eliminating manual order entry.

- Supplier integration: IMS can integrate with supplier systems to electronically transmit purchase orders, streamlining communication and reducing errors.
- Adaptive ordering: IMS can adapt ordering quantities based on real-time sales trends and demand fluctuations.**(Bani Issa et al., 2020)**

Benefits of IMS for automated ordering and restocking:

- Reduced ordering errors: Automation minimizes human error in the ordering process, reducing the risk of stockouts or overstock.
- Improved ordering efficiency: Automated ordering saves time and effort, allowing pharmacists to focus on patient care and other critical tasks.
- Reduced ordering costs: Automated ordering can optimize order quantities, potentially reducing shipping costs and storage requirements.**(Chang et al., 2020)**

**Cost Efficiency and Waste Reduction:** IMS can contribute to cost efficiency and waste reduction in retail pharmacies by optimizing inventory levels, minimizing ordering errors, and reducing product expiration.

Key features of IMS for cost efficiency and waste reduction:

- Inventory optimization: IMS helps pharmacies maintain optimal inventory levels, minimizing storage costs and reducing the risk of product expiration.
- Error reduction: IMS reduces ordering errors, preventing unnecessary purchases and minimizing waste.
- Expiration tracking: IMS tracks product expiration dates and alerts pharmacies to expiring items, allowing them to take action before expiration**.(Vinchurkar et al., 2018)**

Benefits of IMS for cost efficiency and waste reduction:

- Reduced inventory costs: IMS helps pharmacies optimize inventory levels, reducing storage costs and write-offs due to expired products.
- Reduced ordering costs: IMS minimizes ordering errors and optimizes order quantities, reducing unnecessary purchases and shipping expenses.
- Improved profit margins: By reducing costs and preventing waste, IMS contributes to improved profit margins for pharmacies.**(3.-Inventory-Management-in-Pharmacy-Practice, n.d.)**

**Online Prescription Services**

**Telehealth Integration:** Revolutionizing Healthcare Access

Online prescription services have revolutionized healthcare accessibility by seamlessly integrating telehealth consultations with prescription fulfillment. This integration empowers patients to receive medical advice and obtain necessary medications from the comfort of their homes, particularly beneficial for those with limited mobility or transportation challenges.

Key benefits of telehealth integration in online prescription services:

- Increased patient convenience: Patients can avoid the hassle of in-person doctor visits, saving time and effort.
- Improved healthcare access: Telehealth expands access to care for patients in underserved or remote areas.
- Enhanced patient engagement: Telehealth fosters stronger patient-provider relationships and promotes medication adherence.**(Keshta & Odeh, 2021)**

Examples of telehealth integration in online prescription services:

- Video consultations: Patients can connect with licensed physicians via secure video conferencing for medical assessments and prescription issuance.
- Virtual prescription renewals: Patients can renew their prescriptions without in-person visits, streamlining the refill process.
- Online prescription delivery: Medications can be discreetly delivered to patients' doorsteps, ensuring timely access to essential treatments.**(Sonawane et al., 2024)**

**Accessibility and Convenience for Patients:**

Enhancing Healthcare Experience**:** Online prescription services offer unparalleled accessibility and convenience for patients, transforming the way they interact with healthcare providers and manage their medications.

Key advantages of online prescription services for patients:

- 24/7 access: Patients can access healthcare services and obtain medications anytime, anywhere, eliminating the constraints of traditional pharmacy hours.
- Reduced travel burden: Online prescription services eliminate the need for in-person visits, saving patients time, travel expenses, and physical effort.
- Personalized care: Online platforms can provide personalized medication reminders, education materials, and support services to enhance patient care.**(Bani Issa et al., 2020)**

Examples of accessibility and convenience provided by online prescription services:

- Mobile app integration: Patients can manage their prescriptions, access medical records, and schedule consultations through convenient mobile apps.
- Automated refills and reminders: Online systems automatically refill prescriptions and send timely reminders to patients, ensuring uninterrupted medication adherence.
- Discreet delivery options: Medications can be delivered directly to patients' homes or workplaces, maintaining privacy and convenience.**(Lopes & Alexandre, 2018)**

**Regulatory Compliance and Legal Considerations:** Ensuring Patient Safety

Online prescription services must adhere to strict regulatory requirements and legal considerations to ensure patient safety and protect sensitive health information.

Key regulatory frameworks governing online prescription services:

- HIPAA (Health Insurance Portability and Accountability Act): Ensures the protection of patient privacy and the confidentiality of health information.

- DEA (Drug Enforcement Administration) regulations: Govern the dispensing of controlled substances through online platforms.
- FDA (Food and Drug Administration) guidelines: Address the safety and efficacy of medications dispensed online.**(Alexander et al., 2017**)

Legal considerations for online prescription services:

- Patient verification and authentication: Robust measures must be in place to verify patient identities and prevent unauthorized access to prescriptions.
- Prescription validation and authentication: Online pharmacies must ensure the authenticity and validity of prescriptions received electronically.
- Pharmacist supervision and oversight: Online prescription services must operate under the supervision of licensed pharmacists to ensure patient safety and compliance with regulations.**(Al-Jedai et al., n.d.)**

Online prescription services have transformed the healthcare landscape, providing patients with convenient, accessible, and personalized care. By integrating telehealth, enhancing accessibility, and adhering to strict regulatory frameworks, online prescription services are poised to revolutionize healthcare delivery and improve patient outcomes.**(Clark et al., 2020)**

**The impact of digitization on the role of the pharmacist**

The digitization of the pharmacy industry is transforming the role of pharmacists from traditional dispensers of medications to more proactive healthcare providers and patient advocates. This transformation is driven by several factors, including:

- The rise of e-pharmacies and online prescription refills
- The adoption of electronic health records (EHRs)
- The development of new technologies, such as telemedicine and artificial intelligence (AI)**(Seymour et al., 2012)**

As a result of these changes, pharmacists are now playing a more active role in:

- Managing patient medication lists
- Providing medication counseling and education
- Conducting medication reviews
- Monitoring patient adherence to medication therapy
- Collaborating with other healthcare providers to manage chronic conditions

In addition, pharmacists are increasingly being seen as valuable resources for patients who are seeking information about their medications and health conditions. They can also provide support and guidance to patients who are managing chronic diseases or taking multiple medication.**(Strain & Cooper, 2007)**

Here are some specific examples of how digitization is impacting the role of the pharmacist:

- Pharmacists are using EHRs to access patient medication history and other health information. This allows them to provide more comprehensive medication counseling and identify potential drug interactions.

- Pharmacists are using telemedicine to provide consultations to patients who are unable to come to the pharmacy in person. This is especially beneficial for patients who live in rural areas or who have difficulty traveling.
- Pharmacists are using AI to develop personalized medication recommendations and identify patients who are at risk of non-adherence. This can help to improve patient outcomes and reduce healthcare costs.**(Hussein et al., 2021)**

As digitization continues to transform the pharmacy industry, the role of the pharmacist is likely to evolve even further. Pharmacists will need to continue to develop new skills and knowledge in order to stay up-to-date with the latest technologies and provide the best possible care to their patients.

Here are some of the key skills and qualities that will be important for pharmacists in the future:

- Strong clinical skills
- Excellent communication and interpersonal skills
- Ability to work independently and as part of a team
- Ability to adapt to new technologies
- Commitment to patient care

Pharmacists who possess these skills and qualities will be well-positioned to thrive in the ever-changing landscape of healthcare.**(Rachmat Hidayat & Irsan Saleh, 2020)**

**Benefits of Digitization in the Pharmacy Industry**

- Increased convenience for patients: Patients can now order medications online or through mobile apps, which saves them time and effort.
- Improved access to medications: E-pharmacies can reach patients in rural or underserved areas who may not have access to a traditional pharmacy.
- Reduced costs: Digitization can help pharmacies to reduce costs by automating tasks and improving efficiency.
- Enhanced patient care: Pharmacies can use digital tools to provide patients with medication reminders, education, and other services.**(Das et al., 2021)**

**The Future of Pharmacy Digitization**

- The digitization of the pharmacy industry is still in its early stages, and there are many exciting opportunities for future growth. Some of the trends that are likely to shape the future of pharmacy digitalization include:
- The rise of artificial intelligence (AI): AI can be used to personalize medication recommendations, identify potential drug interactions, and improve fraud detection. [36]
- The growth of telehealth: Telehealth can be used to provide patients with virtual consultations with pharmacists.

- The adoption of wearable devices: Wearable devices can be used to collect data about patients' health, which can be used to improve medication adherence and patient outcomes.**(Liang et al., 2005)**

**Barriers to Digital Adoption in Pharmacies:**

**Roadblocks on the Path to Progress**

While the promise of digital solutions in pharmacies is undeniable, their widespread adoption faces formidable roadblocks. Let's delve into the main barriers hindering progress:

**1. Cost Concerns:** Implementing and maintaining digital solutions can be a significant financial burden, especially for smaller pharmacies. Hardware, software licenses, ongoing updates, and technical support add up, creating a cost barrier that disproportionately impacts smaller players.**(Orsolini et al., 2015)**

**2. Training and Expertise Gaps:** Transitioning to digital workflows requires upskilling both pharmacists and staff. Lack of technical training and familiarity with new systems can lead to resistance, decreased efficiency, and potential mistakes. This gap necessitates comprehensive training programs tailored to different staff levels.**(Fossouo Tagne et al., 2022)**

**3. Data Security and Privacy Fears:** Pharmacies handle sensitive patient data, making data security and privacy paramount. Concerns about data breaches, hacking, and unauthorized access can deter pharmacies from adopting cloud-based solutions or sharing information through digital platforms. Robust data security protocols and clear communication about data protection practices are crucial to building trust.**(Rosenbaum et al., 2017)**

**4. Regulatory Hurdles and Compliance Headaches:** Navigating intricate regulations surrounding data privacy, medication dispensing, and telehealth can be a complex and time-consuming challenge. Compliance requirements vary across regions, adding another layer of difficulty for pharmacies operating in multiple locations. Streamlined regulations and clear guidance would pave the way for smoother adoption.(**ProfRNDr Jan Pekar, n.d.)**

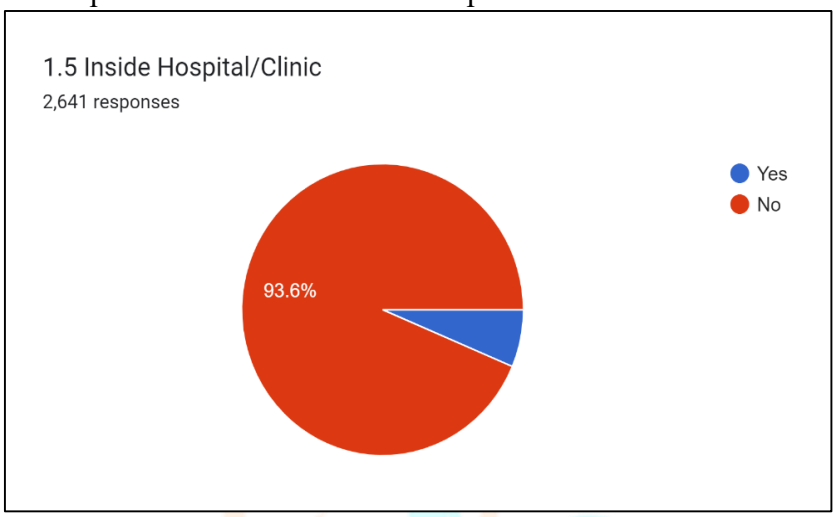
**Beyond the Obstacles:** Despite these challenges, it's crucial to acknowledge the efforts to overcome them. Several initiatives are gaining traction:

- **Government grants and subsidies:** Financial support can offset the cost burden for smaller pharmacies, encouraging broader adoption.
- **Online training programs and certification courses:** Upskilling opportunities make digital tools more accessible and build confidence among staff.
- **Enhanced data security measures:** Advanced encryption technologies and robust security protocols are continuously evolving to mitigate risk and build trust.
- **Harmonization of regulations:** Efforts to standardize regulations across regions can ease compliance burdens and encourage cross-border collaboration.**(Mirzaeian et al., 2019)**

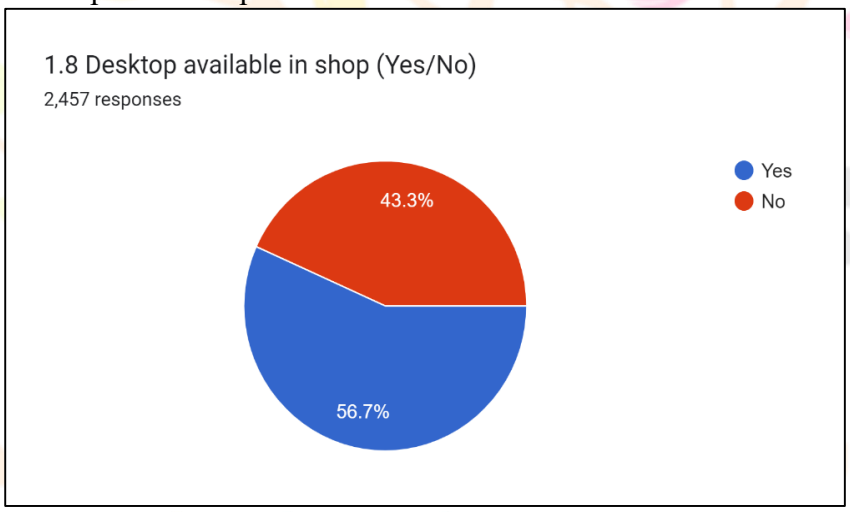
**Primary Research Results**

**Results:**

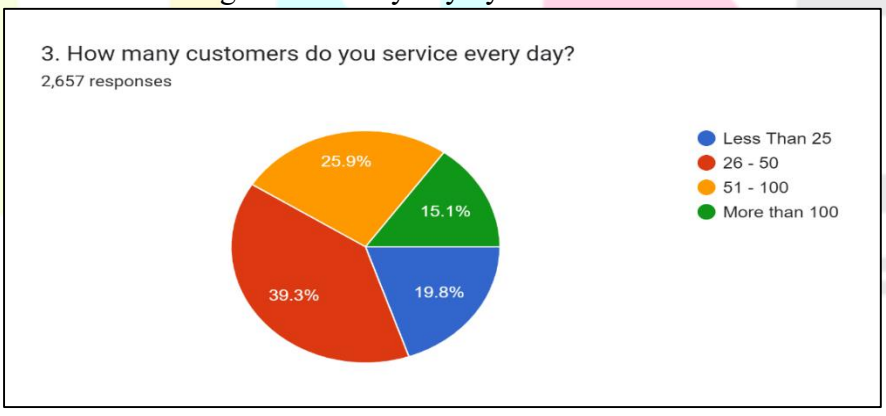
1. How many percent of pharmacies are inside the hospital/clinic.




2. Availability of desktop in the shop can be seen below.

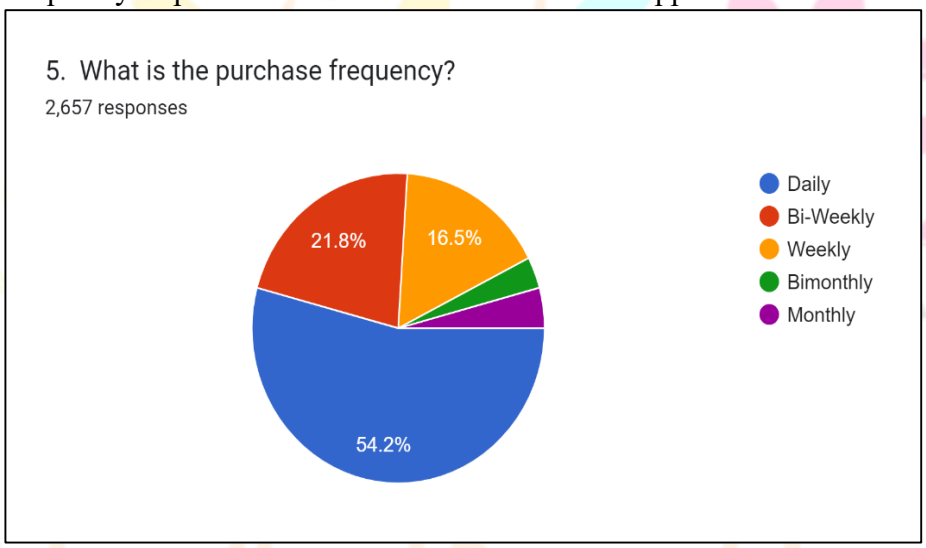



3. How many customers are being served every day by the chemists across the country.

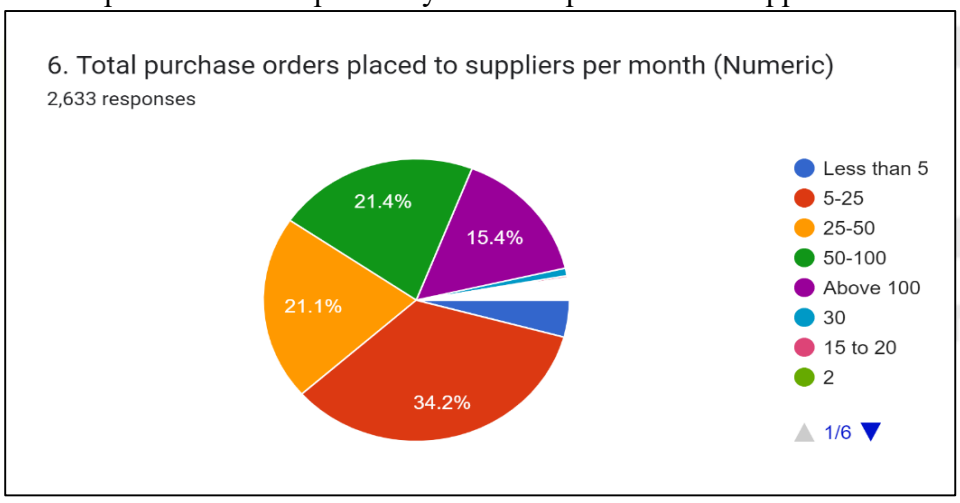


4. How many orders do the chemists across the country receives every day via phone

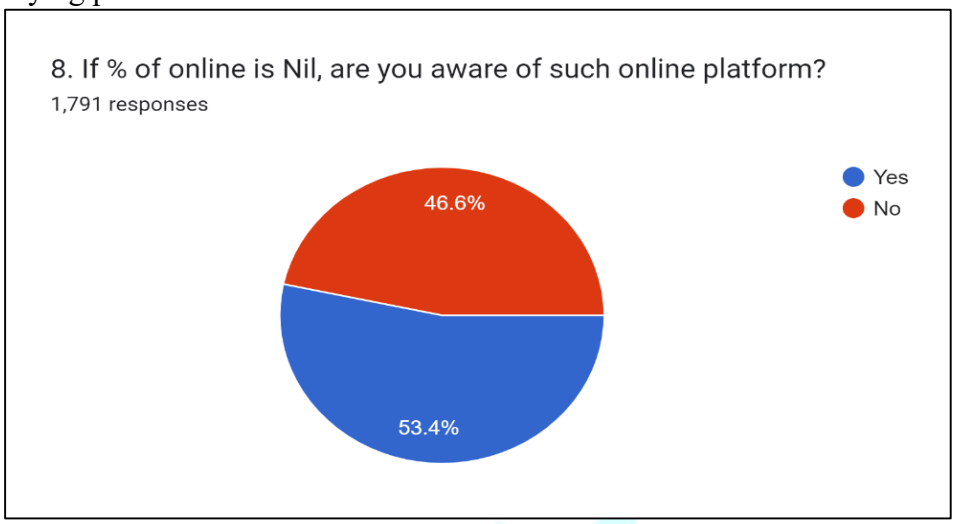

5. What is the frequency of purchases of the chemists from the suppliers?



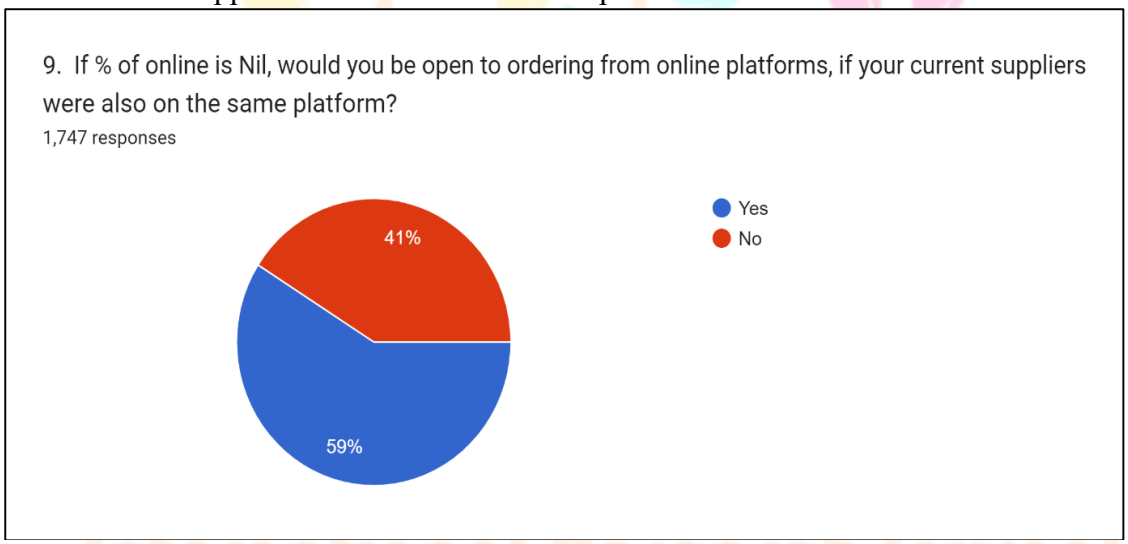

6. What are the total purchase orders placed by chemists per month to suppliers?



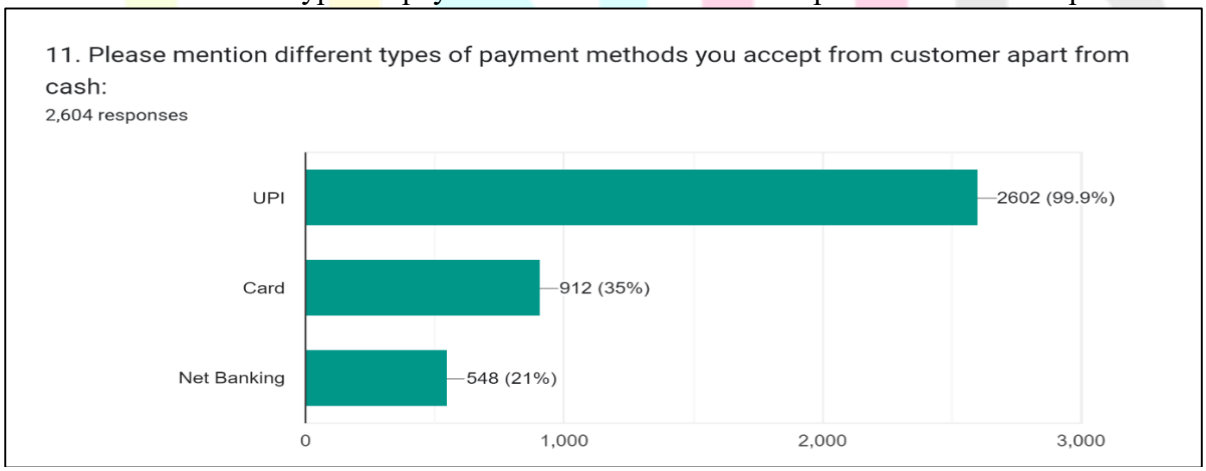
7. How many chemists across the country are aware of online pharmacy platforms given they have Nil or Zero % of online buying pattern.



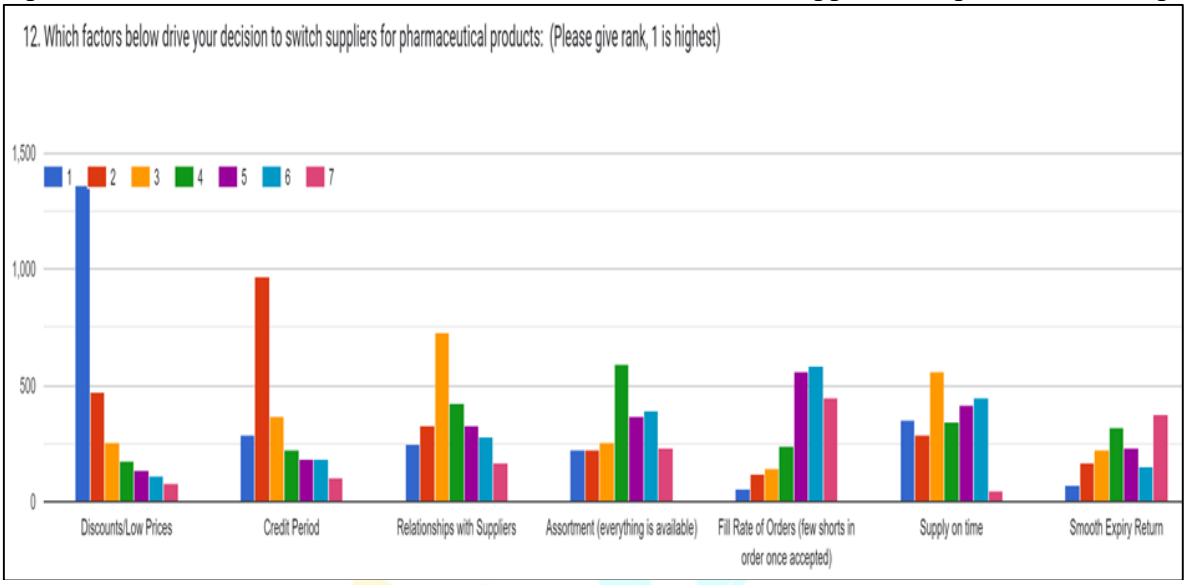

8. If % of online buying from suppliers was Nil of chemists, would they be open to ordering from online platforms, if their current suppliers were also on the same platform.



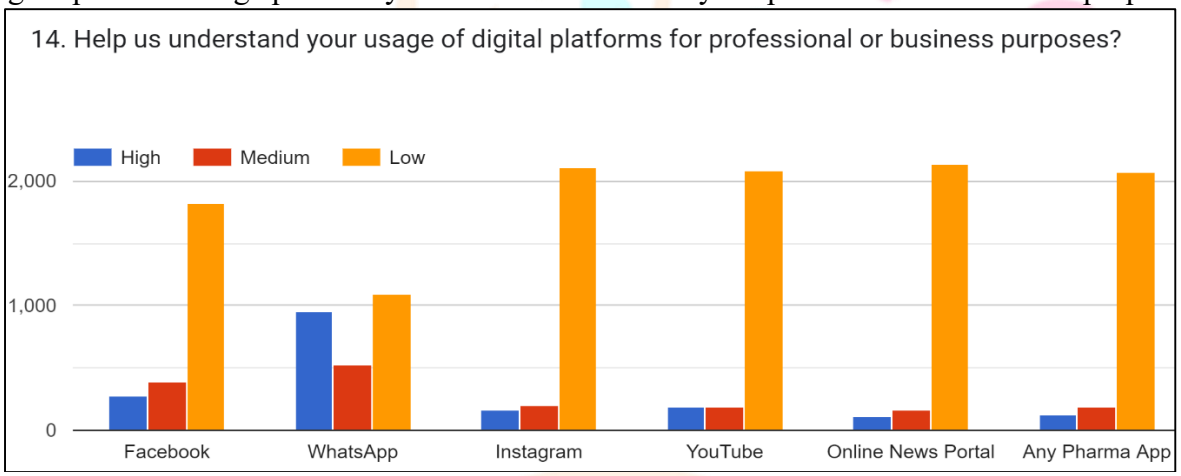

9. Results of the different types of payment methods chemists accept from customers apart from cash.



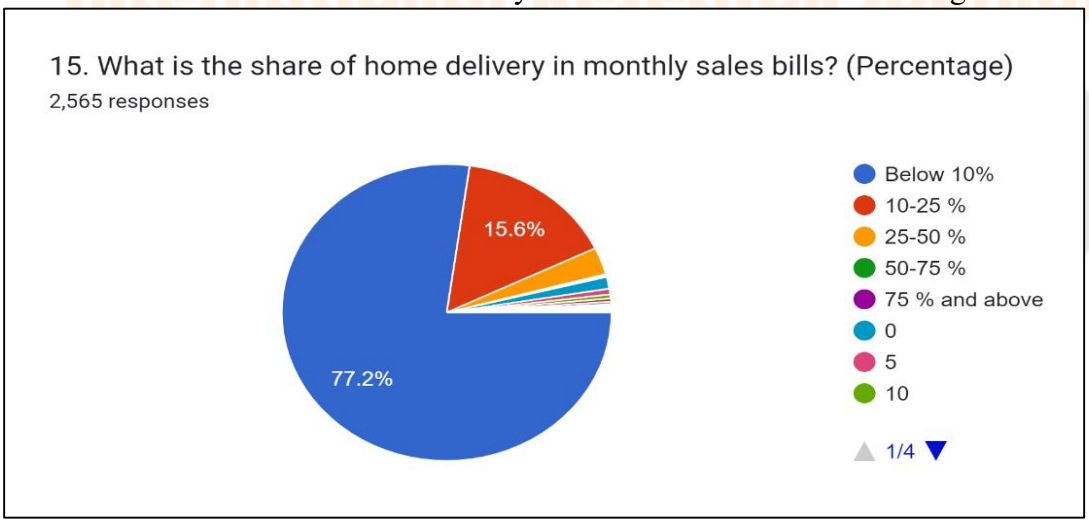
10. Graphs of the factors which drive chemists' decision to switch suppliers for pharmaceutical products.



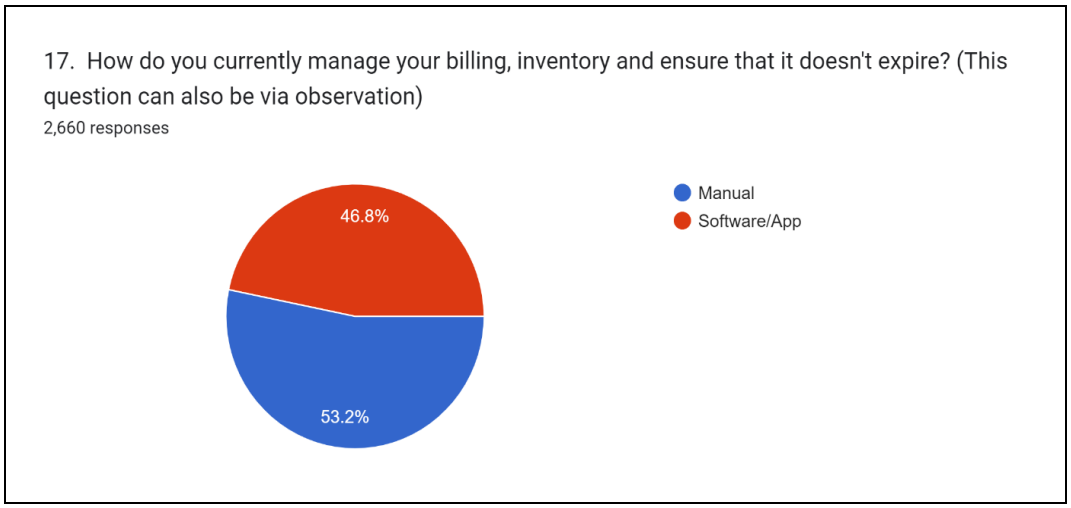

11. Digital platform usage pattern by chemists across country for professional or business purpose



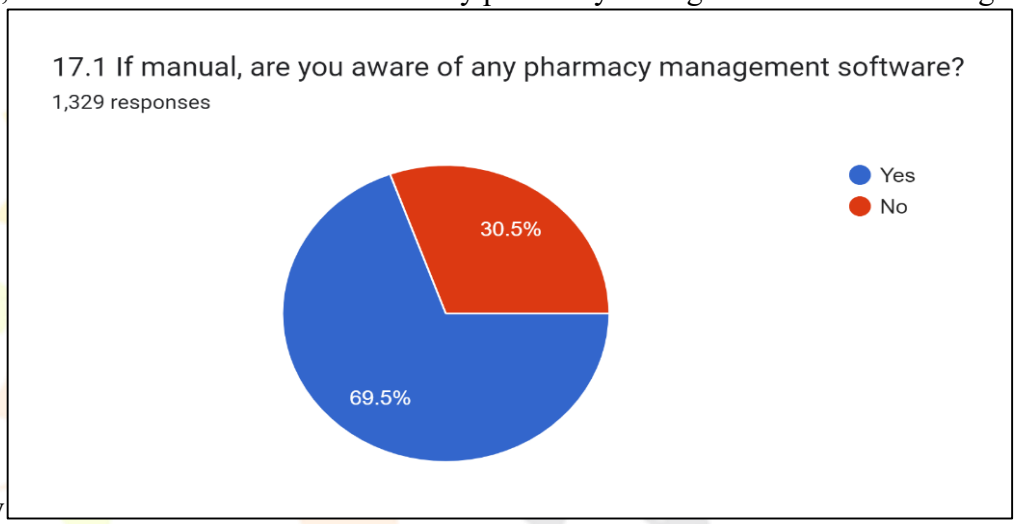

12. What % of revenue comes from home delivery of chemists across different categories



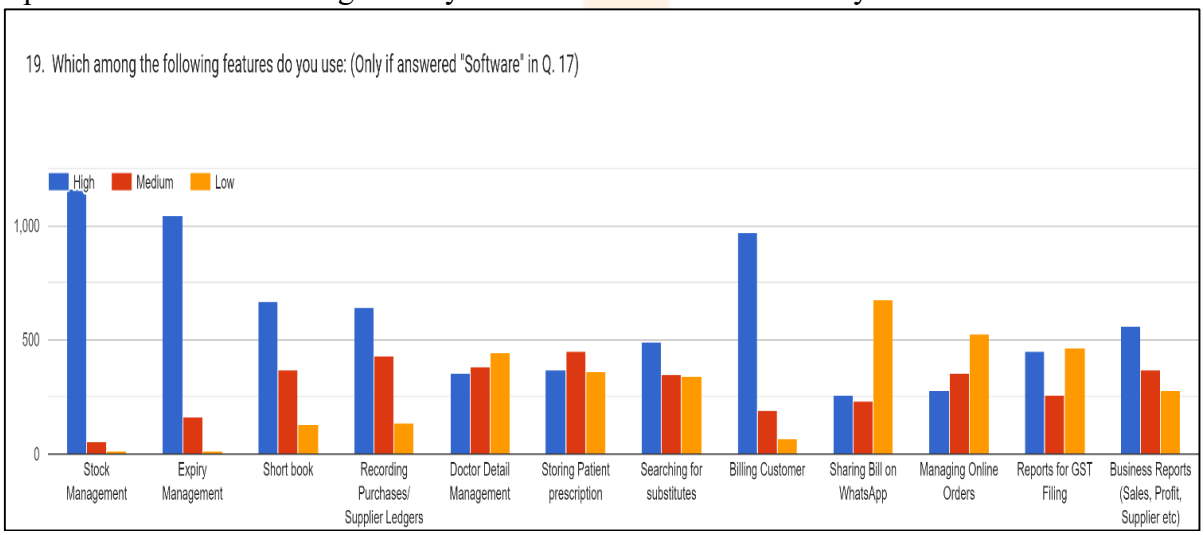

13. Which method i.e., Manual or Software do the chemists across the country use the most to manage their billing, inventory & ensure that it doesn't expire



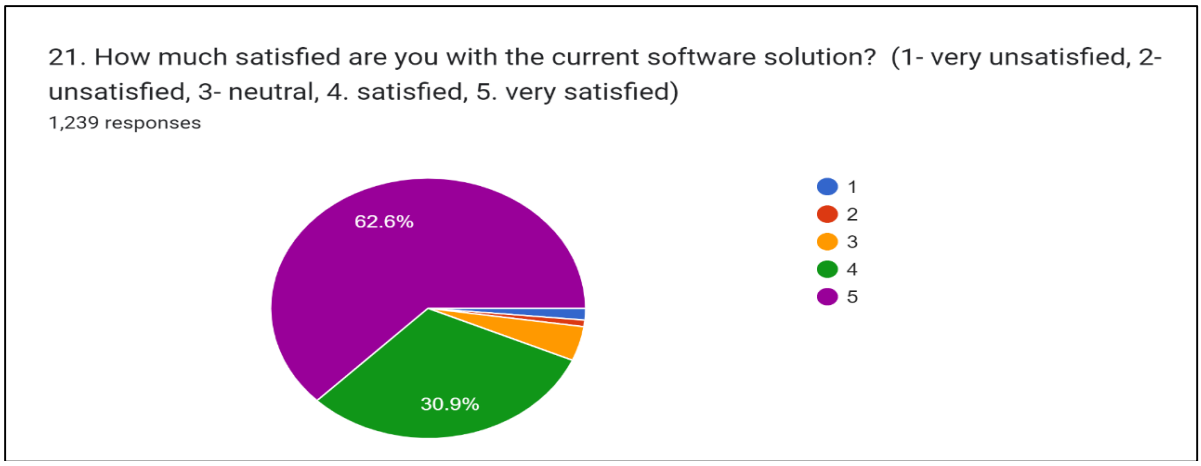

14. If method is manual, then what was the awareness of any pharmacy management software amongst chemists across the country



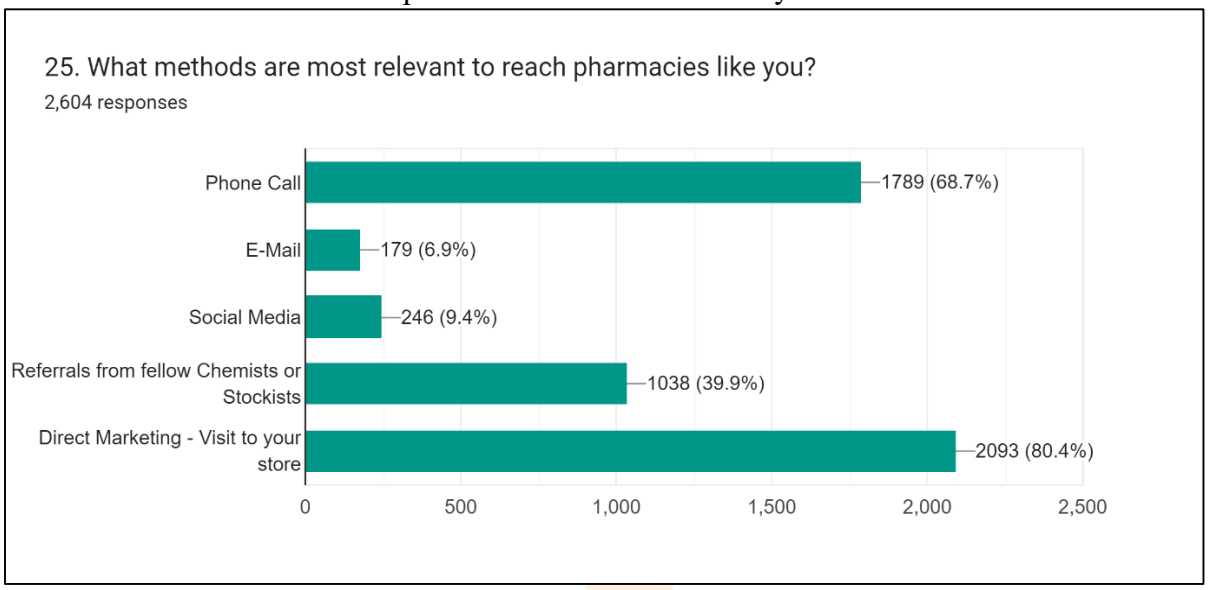

15. Top features that were being used by the chemists across the country



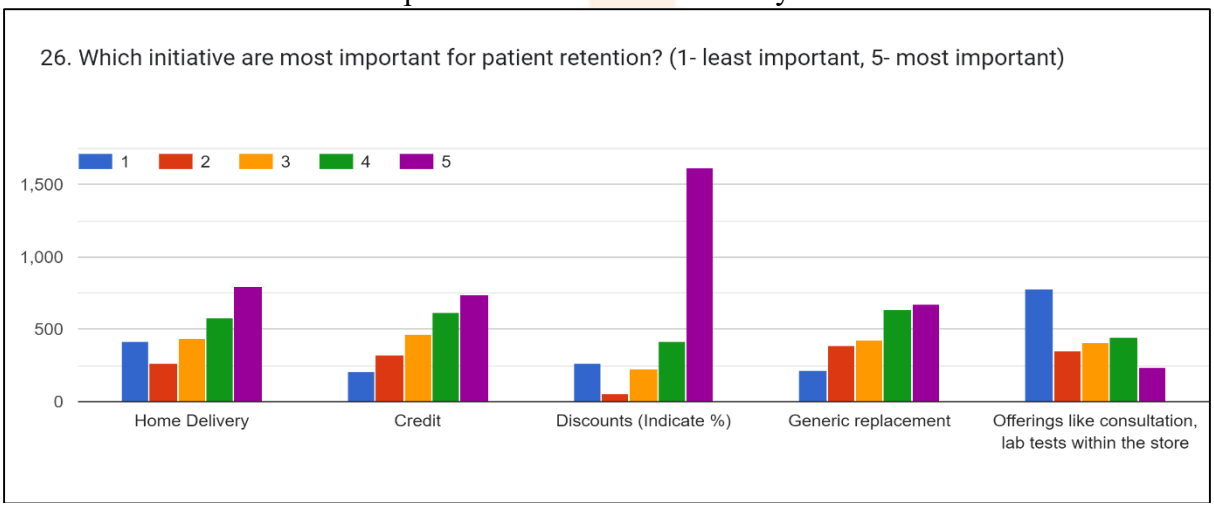

16. Satisfaction level of the chemists by current software solution




17. Most relevant methods to reach pharamcies across the country




18. Most relevant methods to reach pharmacies across the country




Below are the various graphs depicting the analysis of the data which we as interns have collected –

**Segmentation Approach:**

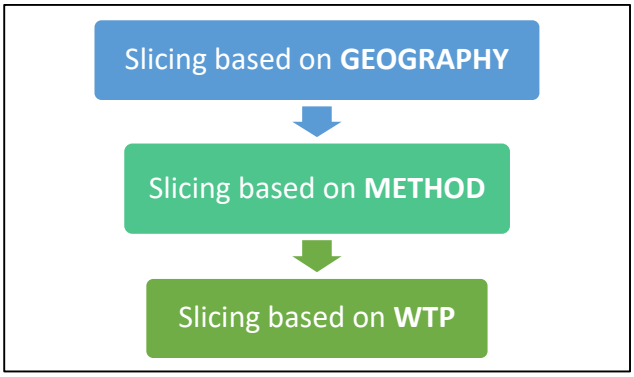
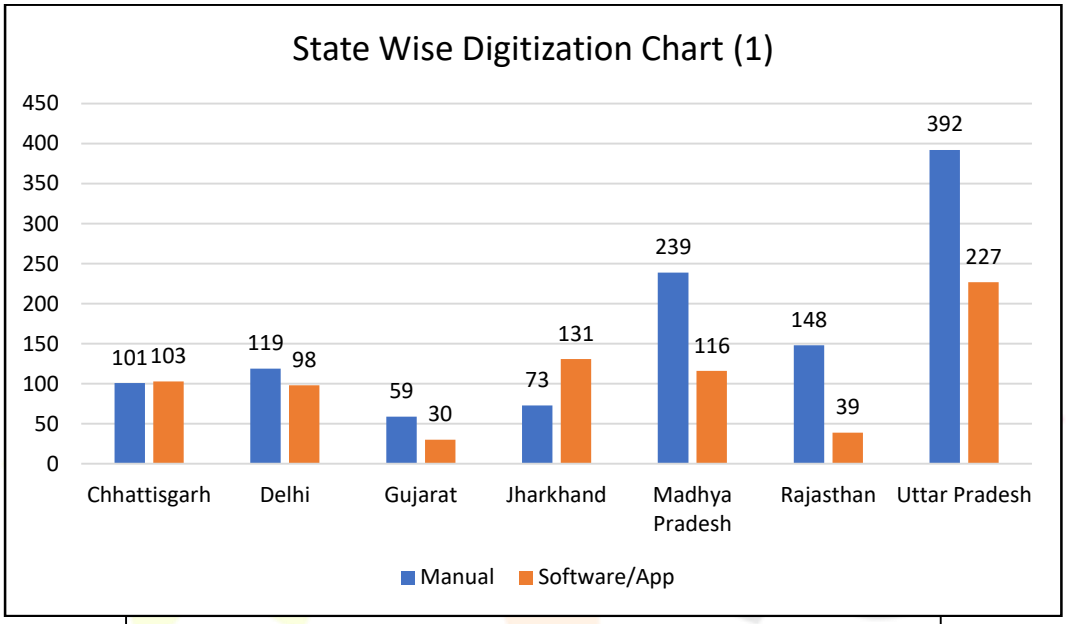
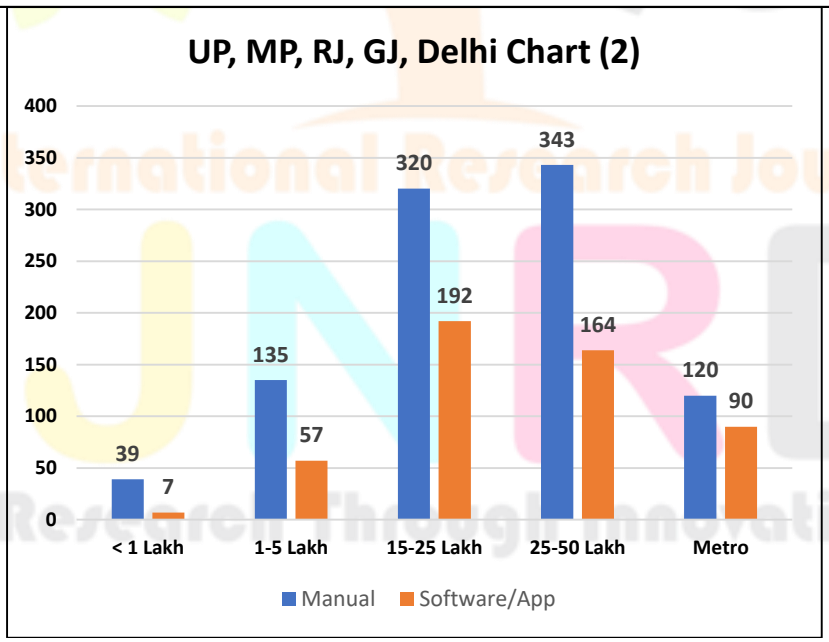
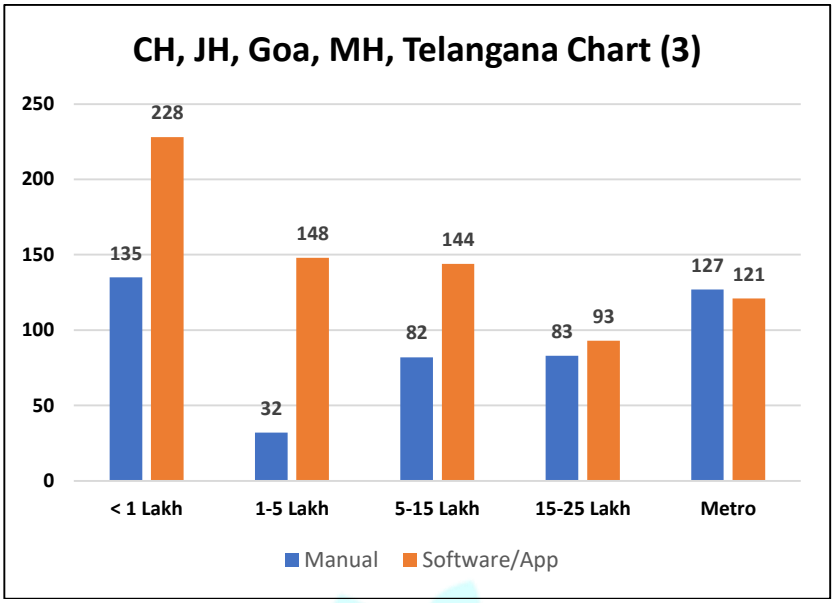



Fig (8): Segmentation approach employed across collected data

**Slicing based on GEOGRAPHY:**






- Depending on the **degree of digitization**, we separated the states.
- Among the states with a high level of digitization were **Goa, MH, Telangana, CH, and JH**.
- **Delhi, UP, MP, RJ, and GJ** were less digitized states.
- This is the outcome of our first slice
- The distribution of our samples among the **selected states is shown on this map**.
- Here, we **cut the second slice using the manual approach** of pharmaceutical management.

**Slicing based on METHOD:**

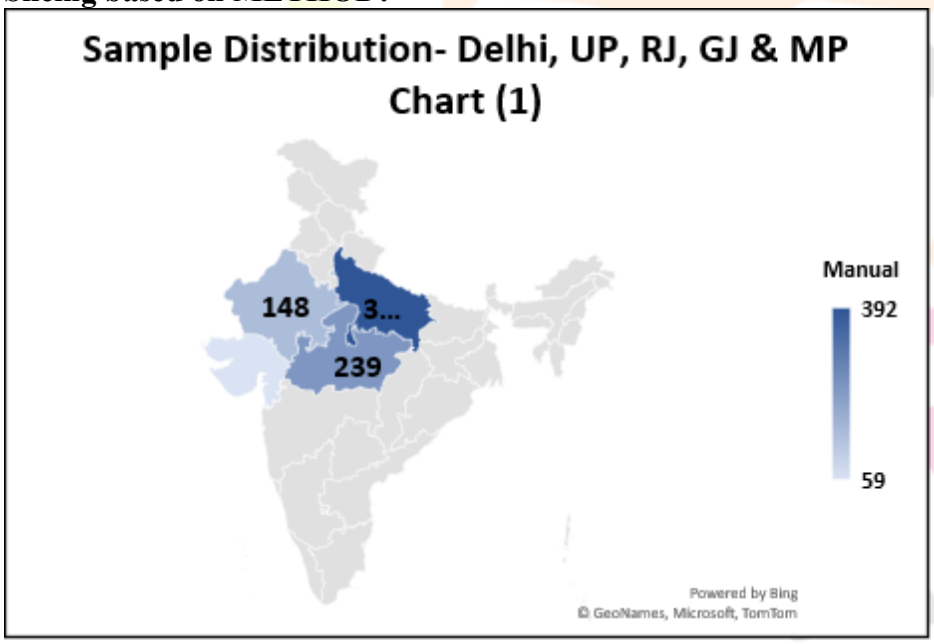



Fig (9): Top states using manual method for pharmacy operation management

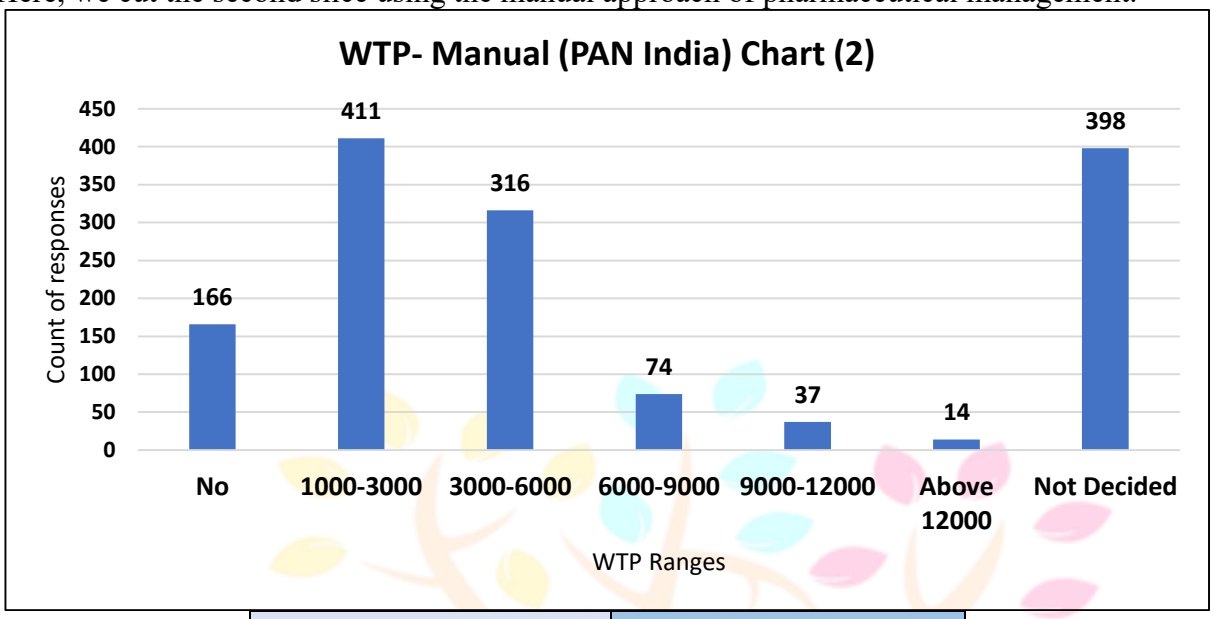
| States | Manual Users |
|---|---|
| Delhi | 119 |
| Gujarat | 59 |
| Madhya Pradesh | 239 |
| Rajasthan | 148 |
| Uttar Pradesh | 392 |

| | |
|---|---|
| **Grand Total** | **957** |

Table (2) – No of Manual users across DL, GJ, MP, RJ, UP

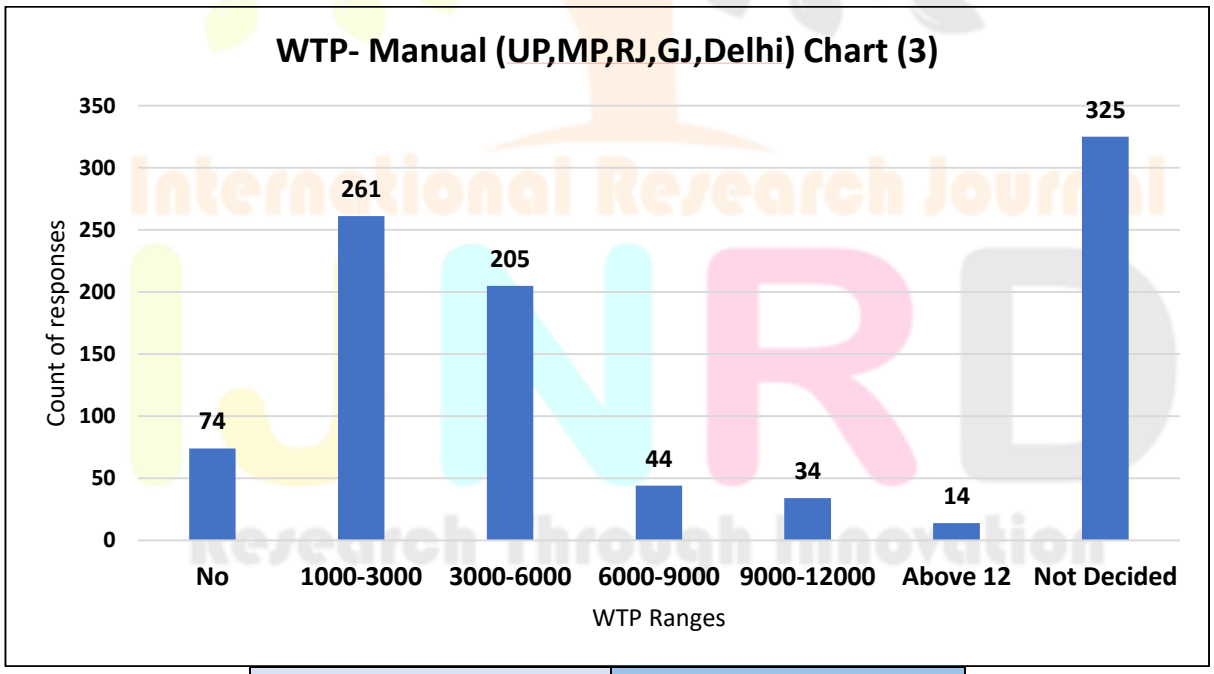
- The distribution of our samples among the selected states is shown on this map.

- Here, we cut the second slice using the manual approach of pharmaceutical management.




| | |
|---|---|
| **N** | **1416** |
| **Mean** | **5296** |
| **Median** | **4000** |

Table (3) – Shows the Mean & Median WTP across pan India




| | |
|---|---|
| **N** | **957** |
| **Mean** | **4809** |
| **Median** | **3575** |

Table (4) – Shows the Mean & Median WTP across UP, MP, RJ, GJ, Delhi

**Final Sample Hierarchy:**

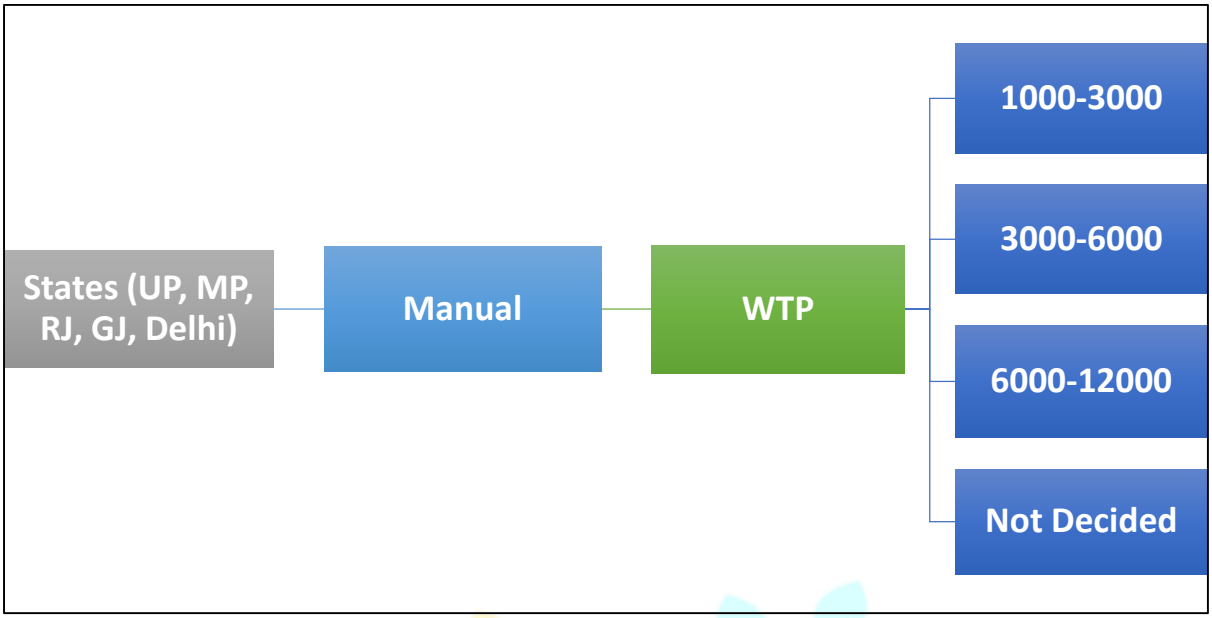
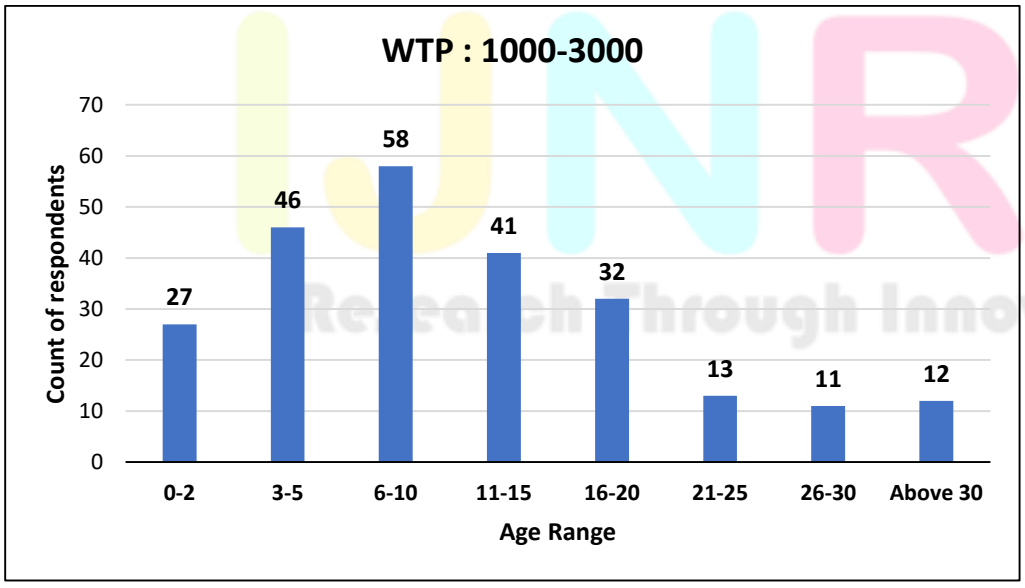


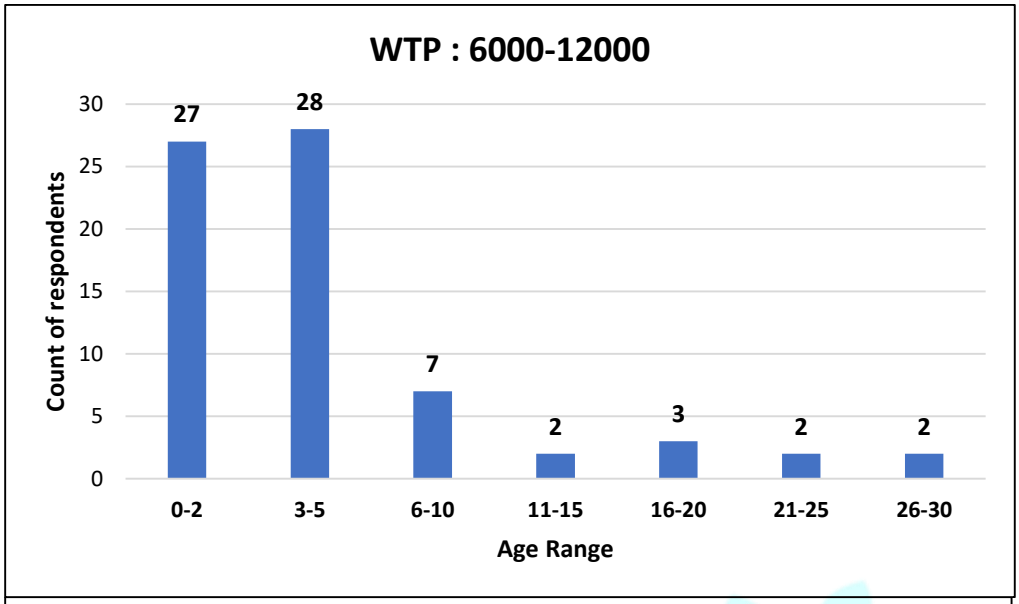

Fig (10): Final sample hierarchy with willingness to pay amount

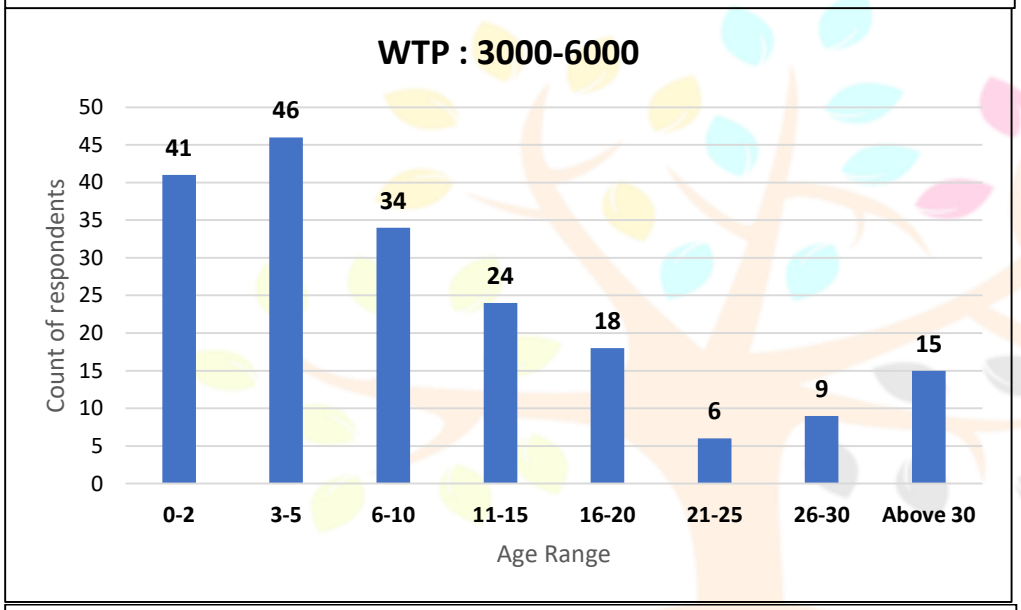
**Not Decided Cohort - Pop Stata:**

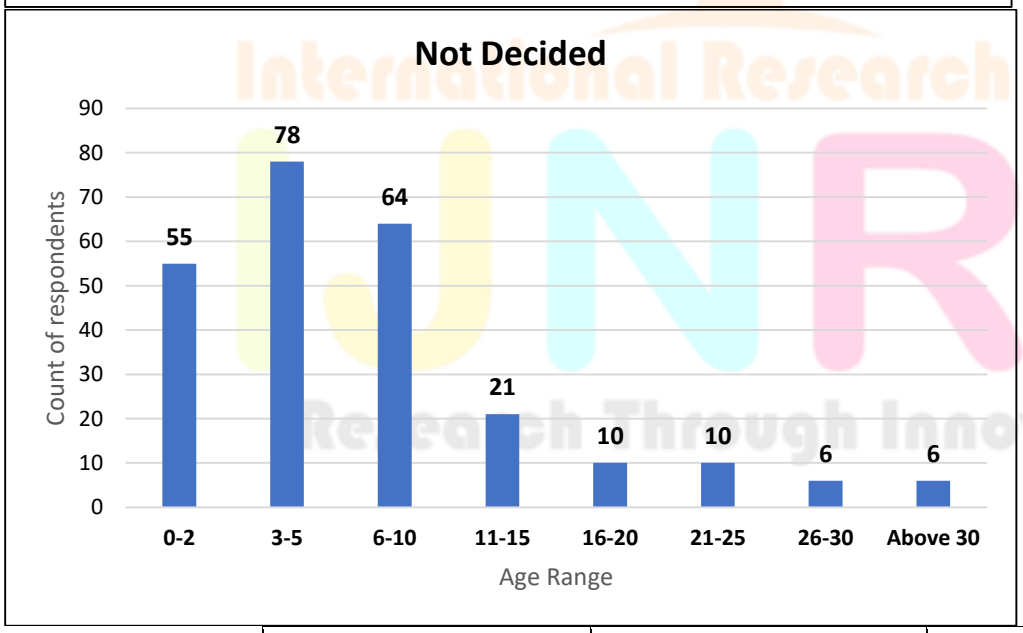
| Pop Stata | WTP 1000 - 3000 | WTP Above 12000 | WTP Not Decided | No | 3000-6000 | 6000-12000 | Grand Total |
|---|---|---|---|---|---|---|---|
| **< 1 Lakh** | 11 | | 21 | | 7 | | **39** |
| **1-5 Lakh** | 86 | | 20 | 5 | 20 | 4 | **135** |
| **15-25 Lakh** | 51 | 14 | 68 | 53 | 97 | 37 | **320** |
| **25-50 Lakh** | 51 | | **210** | 14 | 33 | 35 | **343** |
| **Metro** | 62 | | 6 | 2 | 48 | 2 | **120** |
| **Grand Total** | **261** | **14** | **325** | **74** | **205** | **78** | **957** |

Table (5) – Population wise statistics of not decided cohort





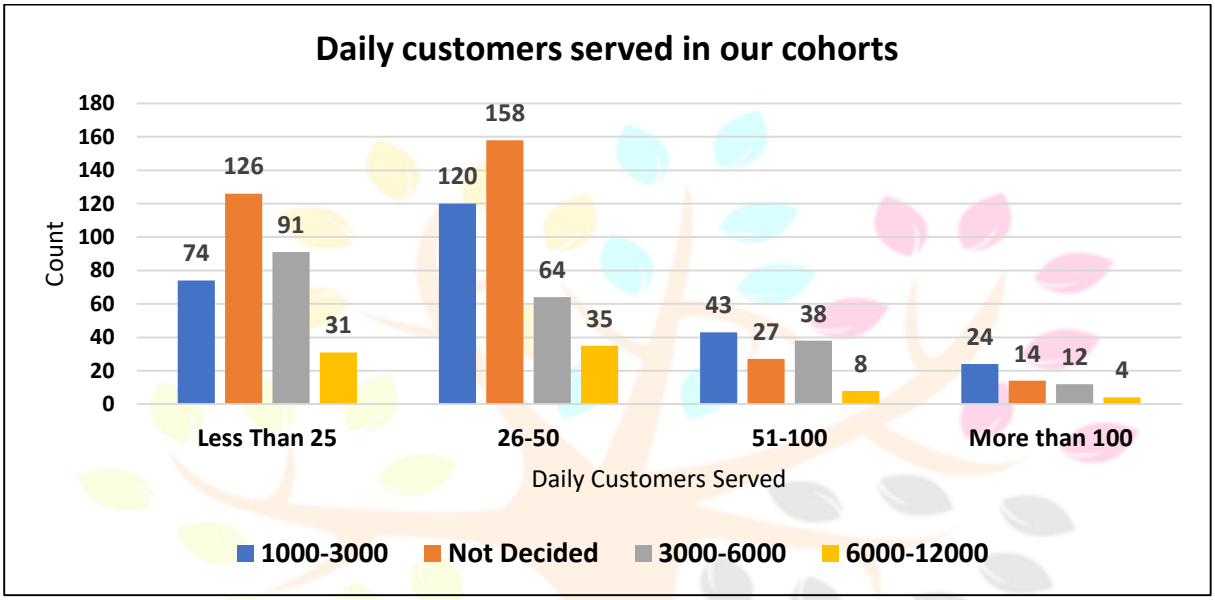

| Correlation | Business Age | WTP |
|---|---|---|
| Business Age | 1 | |
| WTP | -0.147914542 | 1 |

Table (6) – Correlation between business age and WTP

- **First generation pharmacies (0-10) are willing to pay** for an app/software of this kind to help them manage pharmacies.

- **Pharmacies slightly older (>10)** are having less WTP for this kind of app/software.

- The **correlation table provides statistical support for the aforementioned claim**. Additionally, it reveals a negative association between the variables.




- **Not decided segment majorly follows under 50 customer segments.**

- **Hypothesis** on reasons for why they haven't yet been digitized include:

- **H1**: The current market price is out of the buyer's price range, which may act as a barrier to acquisition.

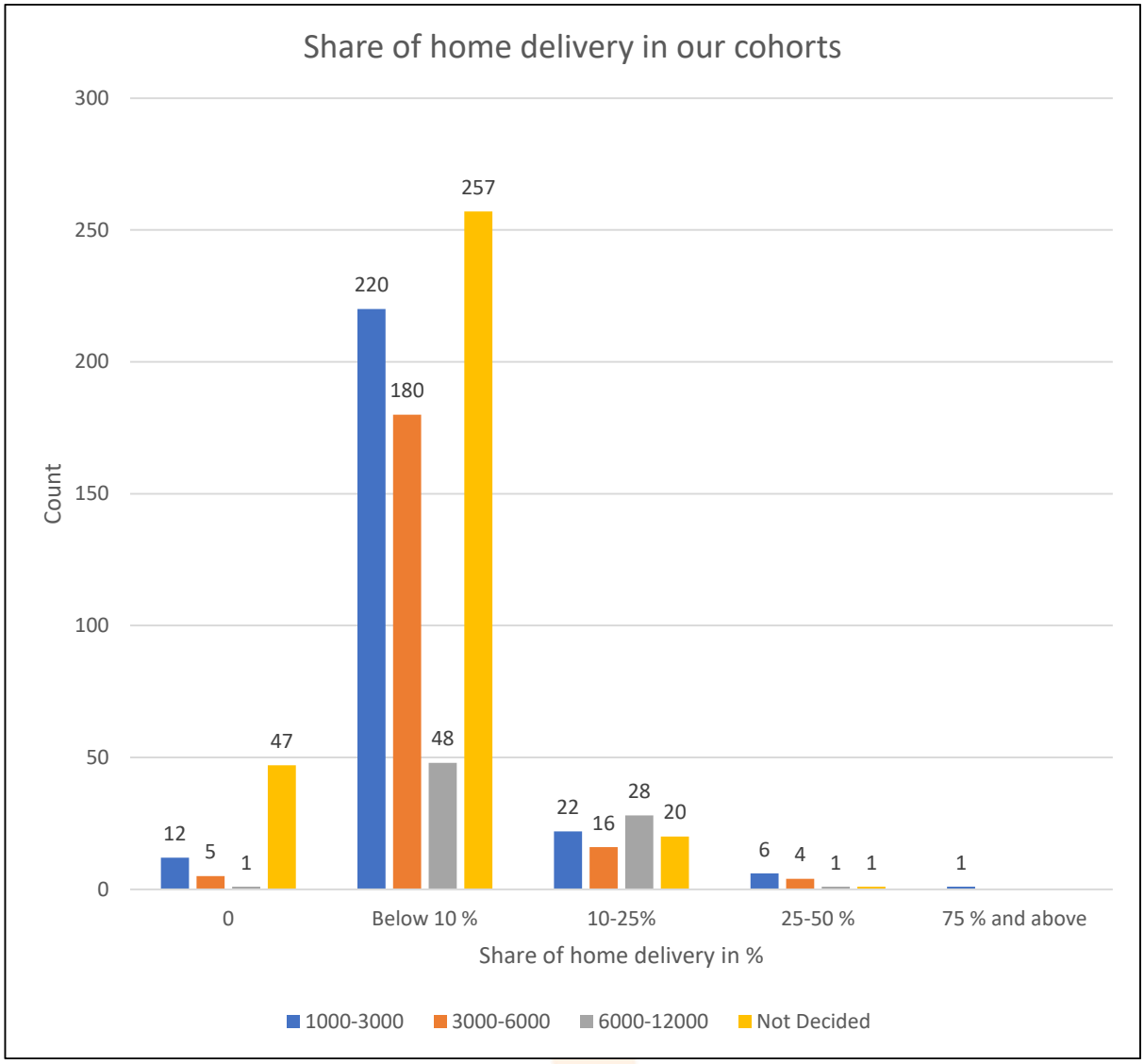
- **H2**: Perhaps because they appreciated our features, they are now willing to be digitized.

| **Correlation** | **Daily Customers Served** | **WTP** |
|---|---|---|
| **Daily Customers Served** | 1 | |
| **WTP** | **-0.02289** | 1 |

Table (7) – Correlation between Daily Customers Served & WTP

- A correlation table has been used to statistically validate this **because nearly no link exists among the variables**.

- WTP is **not driven by patient footfall** it is driven by market factors as also shown in the bar graph.




- We can clearly see that the major sample falls under **below 10% category** of share in total revenue from home delivery.
- We can use this data in **Marketing communication.**
- Like, how software can help you reinforce your efforts.
- Improve your customer retention by 20% with the help of these features, etc.

| **Correlation** | **Share of home delivery in monthly sales bill (%)** | **WTP** |
|---|---|---|
| **Share of home delivery in monthly sales bill (%)** | **1** | |
| **WTP** | **0.119169** | **1** |

Table (8) – Correlation Share of home delivery in monthly sales bill (%) & WTP

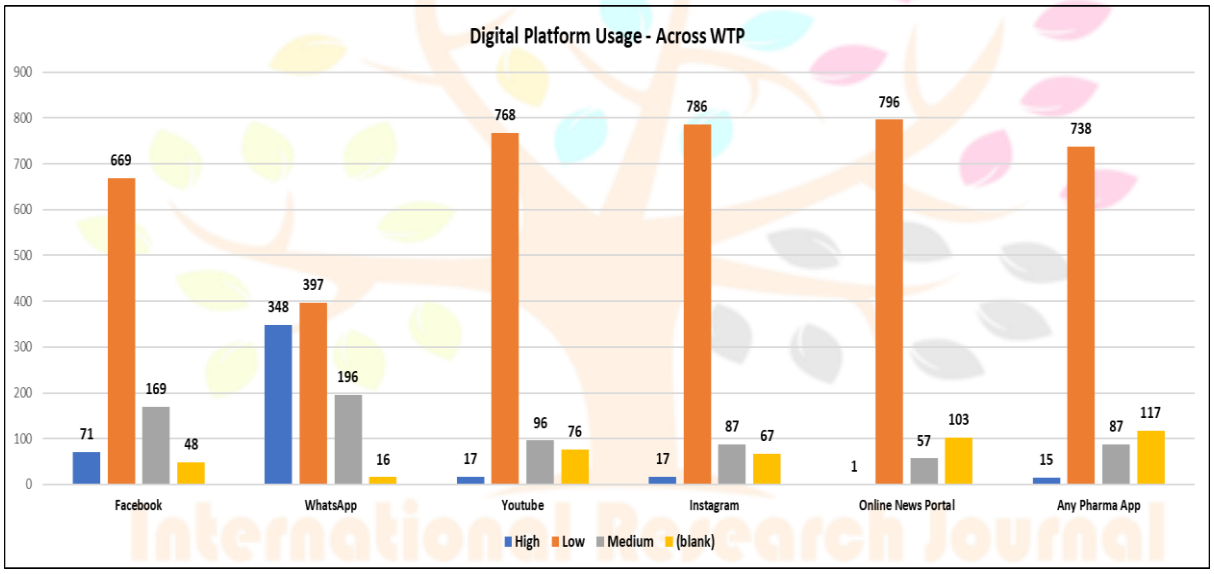
| **Self-Pickup %** | **Not Decided** |
|---|---|
| **0** | 24 |
| **5** | 1 |
| **10** | 5 |
| **20** | 5 |
| **30** | 5 |

| | |
|---|---|
| **40** | 2 |
| **50** | 15 |
| **60** | 1 |
| **65** | 1 |
| **70** | 5 |
| **75** | 4 |
| **80** | 5 |
| **100** | **112** |
| **Grand Total** | **185** |

Table (9) – % of Self Pickup & Not decided cohort frequency

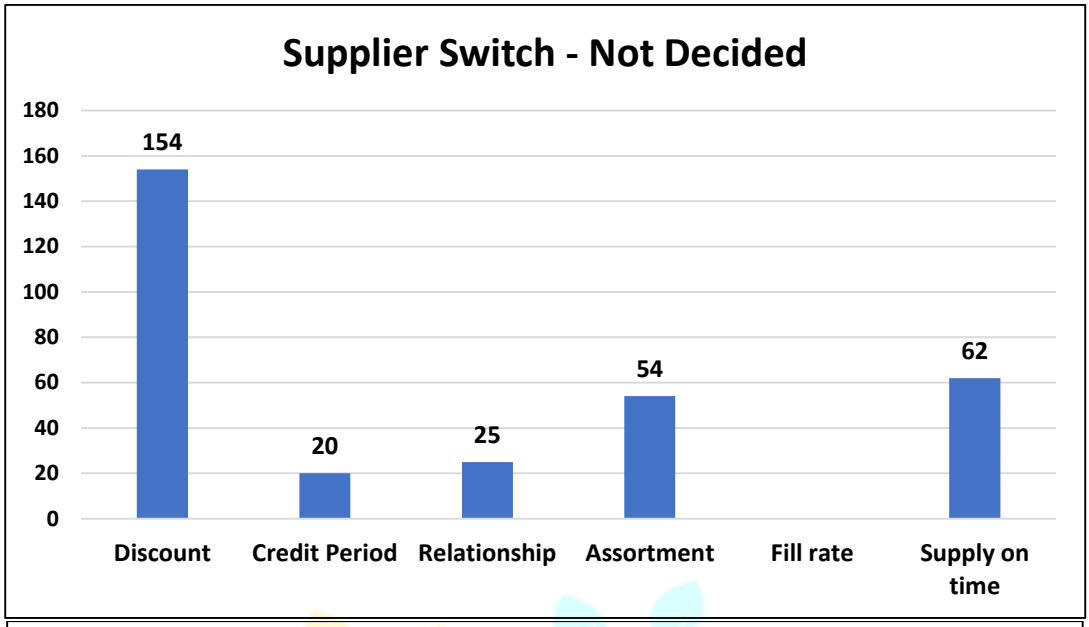
- This table represents the % of self-pickup from wholesale in **our Not decided cohort**. It will help us personify this cohort.

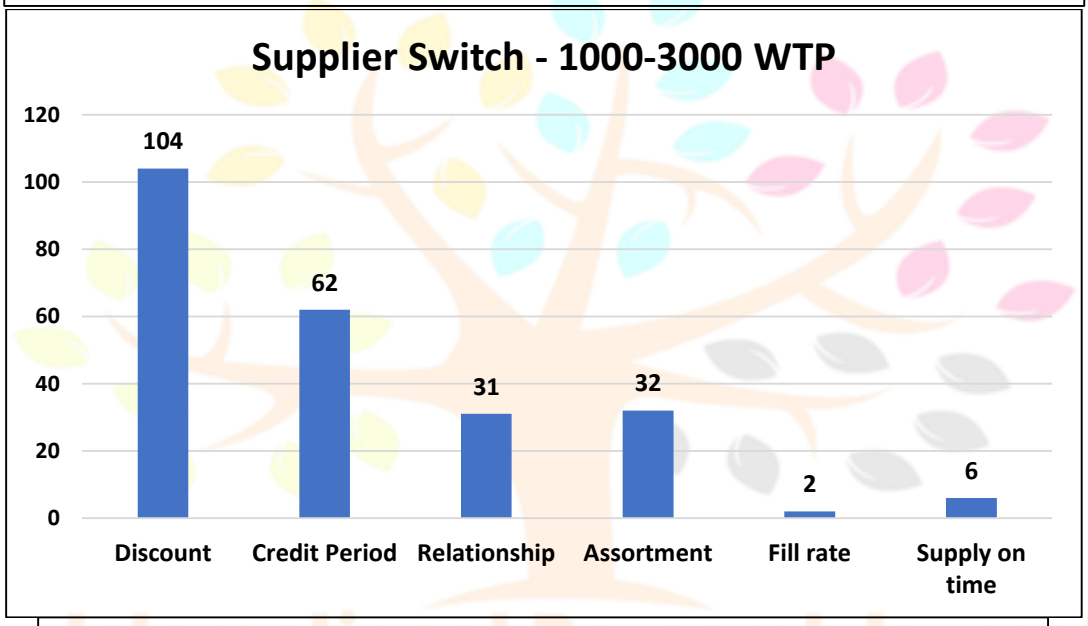
- **112 Pharmacies go for 100% self-pickup** from wholesalers/distributors, which means they may be small pharmacies in terms of scale of operation, revenue & staff, etc.

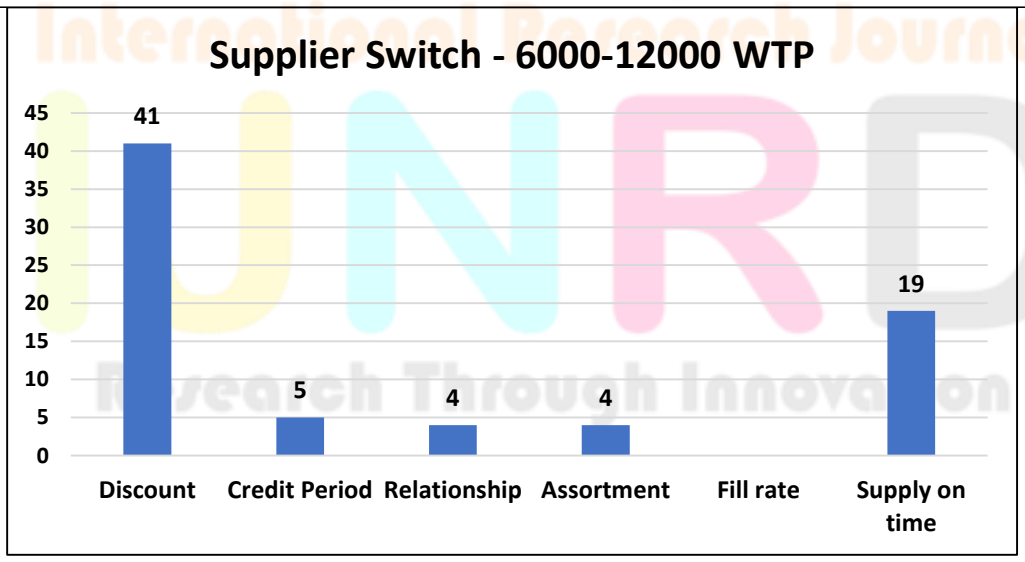


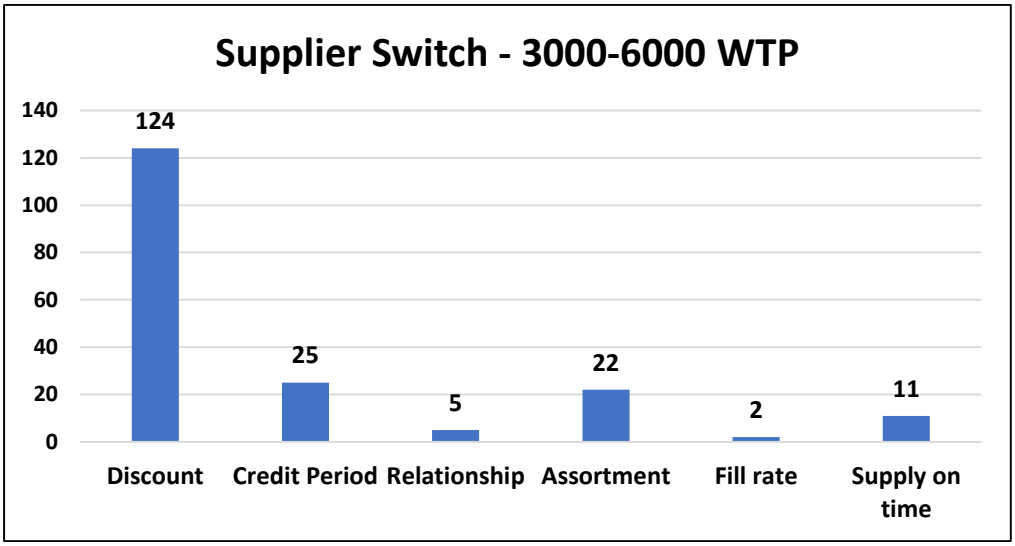

- It is clearly visible from the graph, that **WhatsApp has the majority share** in terms of digital platform usage across our sample.

- **High** Usage – WhatsApp dominating.
- **Med** Usage – WhatsApp & Facebook
- **Low** Usage – Equally Distributed
- Most chemists across different cohorts have low usage of digital platforms.
- WhatsApp is promising among chemists in the **"Not Decided"** segment.

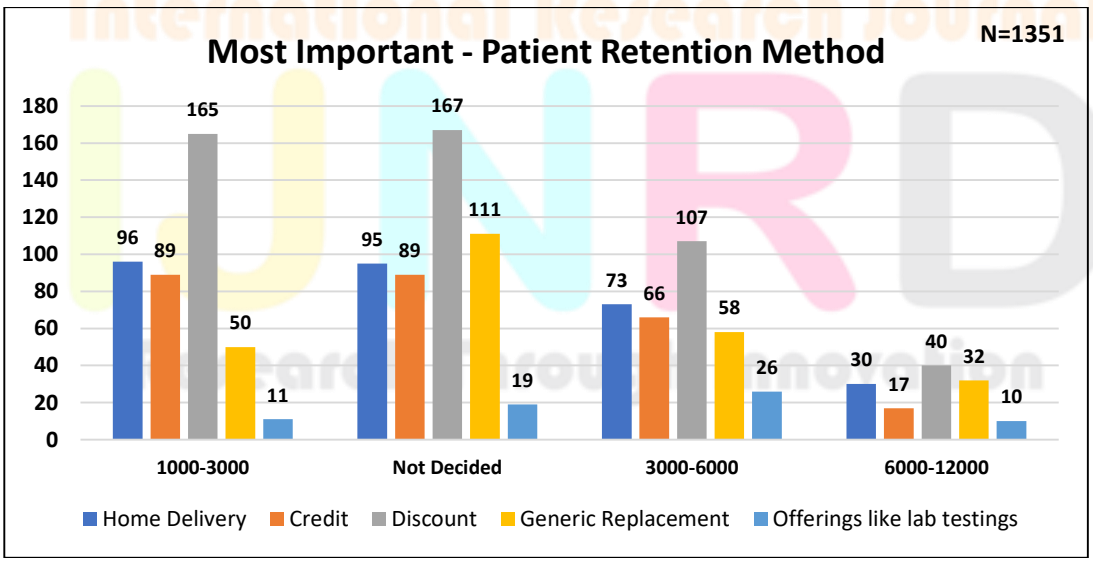

Supplier Switch - Not Decided
180
160
140
120
100
80
60
40
20
0
154
20
25
54
62
Discount
Credit Period
Relationship
Assortment
Fill rate
Supply on time

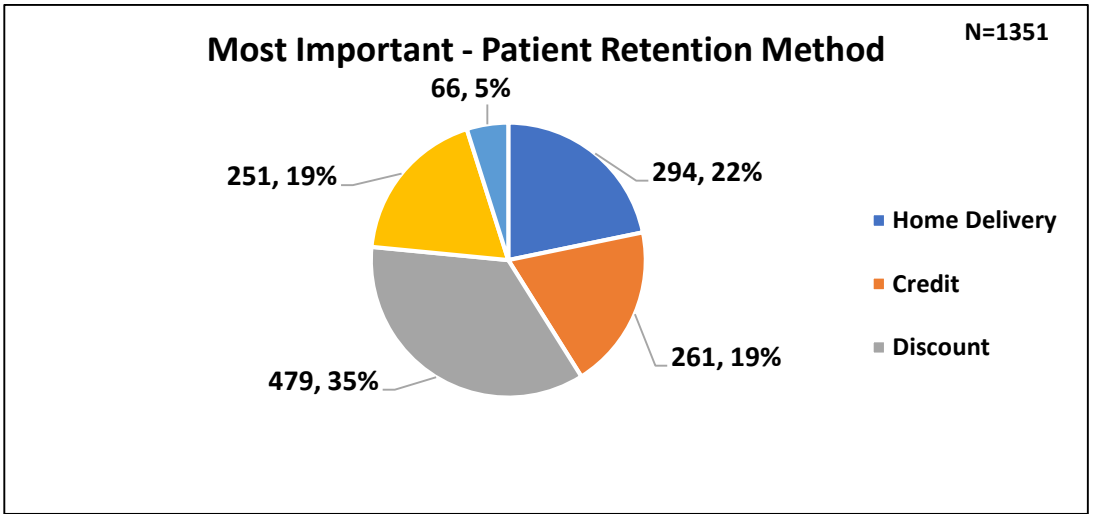

Supplier Switch - 1000-3000 WTP
120
100
80
60
40
20
0
104
62
31
32
2
6
Discount
Credit Period
Relationship
Assortment
Fill rate
Supply on time


Supplier Switch - 6000-12000 WTP
45
40
35
30
25
20
15
10
5
0
41
5
4
4
19
Discount
Credit Period
Relationship
Assortment
Fill rate
Supply on time



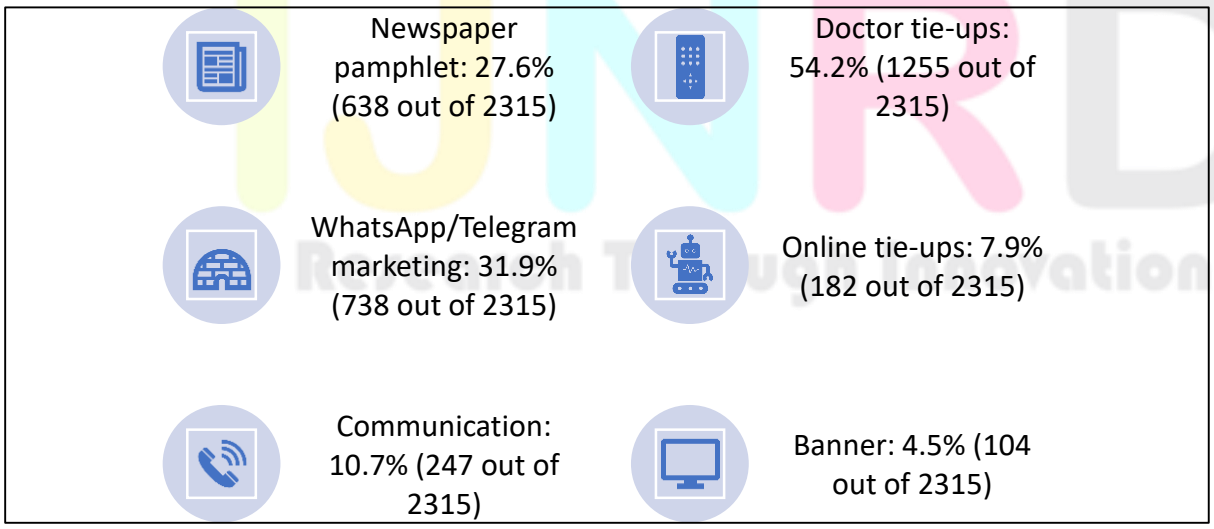

- Discount is the most favored factor, followed by Credit period, Relationship, Assortment, Supply on time, and Fill rate.
- This suggests that the cohorts **are price sensitive**.
- **Trade Terms:**
- The credit period is directly proportional to the relationship.
- Discount is inversely proportional to relationship.
- **50%** of users in **3000-6000** cohort would not prioritize their relationships with their supplier, if some other supplier provides them with a good discount.
- This indicates the above cohort is:
- Opportunistic & Market driven.
- **1000-3000 & not decided cohorts** shows a similar pattern where they are prioritizing credit period & relationships. This may be because they don't have fast rotation, hence, they will need a credit period to operate.






- For respondents with a willingness to pay (WTP) between 1000-3000, the preferred factors are Discount, Home Delivery, and Credit.
- Similarly, for respondents with a WTP between 3000-6000, the preferred factors are Discount, Home Delivery, and Credit.
- For respondents with a WTP between 6000-12000, the preferred factors are Discount, Generic Replacement, and Home Delivery.
- In the Non-Decided category, the preferred factors are Discount, Generic Replacement, and Home Delivery.
- 6000-12000 cohort is focusing more on providing lab solutions in pharmacy which indicates that they are vertically integrating in their industry.
- They are also focusing on generic replacement to increase profitability as well by providing more customer services. They are also focusing on customer retention.

**How do you drive awareness of your pharmacy store?**



**Buyer persona:**

| | **N = 261** | **N= 205** | **N= 78** | **N= 325** |
|---|---|---|---|---|
| | **S1 (1000-3000)** | **S2 (3000-6000)** | **S3 (6000-12000)** | **S4 Not Decided** |
| **KEY MEASURES** | | | | |
| **Segment size measures (Out of 1416)** | Estimated at around 18% people across the country who currently use Manual method | Estimated at around 14% people across the country of this cohort. | Estimated at around 5.5% people across the country of this cohort. | Estimated at around 23% people across the country of this cohort. |
| **Segment growth** | They seek solutions that can help them maximize cost efficiency due to their limited budget and smaller scale of operations. | They aim to grow their businesses and capitalize on market opportunities | They are focused on expanding their businesses and increasing profitability by vertically integrating in their industry | They aim to overcome their unorganized and small-scale nature by seeking opportunities to improve their operations and overall business structure |
| **Proportion of the overall market (out of 2668)** | 15% of all consumers | 12% of all consumers | 4% of all consumers | 15% of all consumers |

Table (10) – Key measures for buyer persona

| **DESC-RIPTION** | **(Delhi, GJ, MP, RJ & UP) N = 957, 35.8% of overall sample** | | | |
|---|---|---|---|---|
| **Geographic spread** | N = 261, 27% Major sample of this cohort reside in Madhya Pradesh | N = 205, 21% Major sample of this cohort falls in UP followed by Delhi | N = 78, 8% Sample equally distributed in MP & UP and is absent in GJ, RJ | N = 325, 34% Major sample of this cohort resides in UP & RJ |
| **Pop- strata** | More than 1 lakh to metro cities | 15 lakhs to metro cities | 15 lakhs to 50 lakhs | 25 lakhs to 50 lakhs |
| **Demographic description** | Small businesses, 0-10 years old with a majority falling within the 6–10-year range | Growing businesses, opportunistic, 0-10 years old with a majority falling within the 0–5-year range. | Growing businesses, focusing on customer retention, 0-5 years old | Unorganized, small, low customer share, 0-10 years old |
| **Psychographic description** | Less digitized, use WhatsApp, focus on credit and relationships | Less digitized, use WhatsApp, focus on discounts | Less digitized, use WhatsApp, focus on discount | Less digitized, high use of WhatsApp, focus on credit, discounts, and relationships. |

Table (11) – Description for buyer persona

| **COMMUNI-CATION** | | | | |
|---|---|---|---|---|
| **Main media choices** | **Limited Digital Adoption**: They have low digital adoption and rely on manual methods, with WhatsApp being their primary digital communication tool | **Limited Digital Adoption**: They have a relatively low level of digital adoption and rely on manual methods, with a moderate use of WhatsApp. | **Limited Digital Adoption:** They have a lower level of digital adoption and reliance on technology, with WhatsApp being their primary digital communication tool | **Limited Digital Adoption:** They have a low level of digital adoption overall, but there is a high reliance on WhatsApp for communication purposes. |
| | WhatsApp - 37%, followed by FB 17% | WhatsApp - 26%, followed by FB 10% | WhatsApp - 36%, followed by FB 6% | WhatsApp - 45 %, FB- Nil, remaining factors were used in a medium or low frequency |
| **Outreach methods prioritized by pharmacies (our approach)** | **Direct marketing- 80%**, Phone call- 69% and referral from fellow chemist- 40% were dominating factors that pharmacies were willing to prioritize as an outreach method. | Similar distribution pattern has been observed across all the cohorts | Similar distribution pattern has been observed across all the cohorts | Similar distribution pattern has been observed across all the cohorts |

Table (12) – Communication for buyer persona

| **CONSUMER BEHAVIOR** | | | | |
|---|---|---|---|---|
| **Main consumer needs** | -Affordable pricing- Reliable customer service and support | - Discounts and cost-effective options- Reliable and timely delivery services- Opportunities for business growth and expansion | - Discounts and cost-effective options- Quality generic replacements- Innovative solutions such as lab services | - Cost-effective options- Generic replacements- Reliable and timely supplier support |
| **Price sensitivity** | This segment is highly price-sensitive due to their limited budget. They prioritize cost savings and value for money when making purchasing decisions. They are likely to compare prices and seek discounts to maximize their cost efficiency | While they are focused on business growth, this segment remains price sensitive. They prioritize cost savings and discounts in their purchasing decisions. They are likely to consider switching suppliers if they can obtain more attractive discounts | This segment remains price-conscious, but they also value the overall value proposition. They seek discounts and cost-saving measures, but they may be more willing to invest in solutions that support their business expansion goals and offer additional benefits or innovative services. | This segment is price-sensitive and emphasizes providing discounts and cost-effective options to attract and retain customers. They prioritize affordability and value for money in their purchasing decisions. |
| **Retailer preferences** | They are likely to prefer suppliers who offer competitive pricing, discounts, and flexible credit terms. Suppliers who prioritize customer service and offer home delivery services may also be preferred | They are likely to prefer suppliers who offer attractive discounts, cost-saving solutions, and efficient home delivery services. Suppliers who can support their business growth objectives may be preferred. | They are likely to prefer suppliers who offer a combination of attractive discounts, cost-saving measures, and innovative services. Suppliers who can support their business expansion goals, provide excellent customer service, and offer additional benefits such as lab solutions may be preferred. | They are likely to prefer suppliers who offer competitive pricing, credit period, and support their organizational improvement efforts. Suppliers who can provide cost-effective solutions, generic replacements. |

Table (13) – Consumer Behavior for buyer persona

## Methodology

This report employs a comprehensive methodology integrating primary research and secondary research to elucidate the imperative of pharmacy digitization and its impact. The following methods were employed:

Primary Research:

We conducted market research on pharmacy needs around digitization. It also involves an investigation into the unique challenges faced by pharmacies in the era of digital transformation and other related aspects.

Secondary Research:

A rigorous examination of existing literature and industry reports provided valuable insights into the landscape of retail pharmacy digitization.

Systematically collecting information for the study from reliable sources. Beginning in October 2022, a search for the journal articles was conducted. All papers released between 2008 and 2022 were included in the article. Duplicate papers and Irrelevant material were eliminated during the method of screening. The terms "Pharmacy Digitisation ", "Digital tools, customer relationship, trends, and opportunities in the Pharmacy digitisation were highlighted in the search results.

Mendeley and Google Scholar were two of the search engines used. Step by step, the articles were selected. Reading the article's title, abstract, and full text are the first three steps in the selection process. All of the titles discuss the importance of medical devices and its opportunities and its challenges.

**Conclusion:**

The pharmaceutical industry is embracing digital technology in a significant way, according to our thorough analysis on pharmacy digitization in the Indian market. With the incorporation of digital technologies into their everyday operations, the bulk of Indian pharmacists have experienced a substantial transformation. The industry's dedication to modernity is demonstrated by the widespread use of digital payment systems and the requirement for GST registration.

According to our main study, the majority of pharmacies rely on distributor orders, with only few still doing invoicing and store administration by hand. Even though there aren't many orders for home delivery, there aren't many business uses of social media, with Facebook and WhatsApp being the most popular. This illustrates how highly digitalized and modernized the pharmaceutical industry is.

Secondary research was conducted to augment our primary research. This research examined the wider global context, tracing the development of pharmacy digitalization, obstacles in conventional procedures, and new developments in pharmacy technology. Important topics such online prescription services, inventory management systems, Electronic Health Records (EHR), and the effect of digitalization on pharmacists' roles were all explored in the study.

Although the digitization of pharmacies has made great progress, our study also highlights the difficulties that the sector still faces. There are still obstacles in the way of digital adoption, which must be removed in order to make the shift to a more digitally advanced future smooth.

Observing the digital revolution occurring in retail pharmacies, it is clear that the pharmaceutical industry is going through a revolution. Pharmacies are becoming more than just places to fill prescriptions; they are becoming tech-driven centers that value accuracy, efficiency, and client happiness.

Our study emphasizes the necessity of ongoing investigation and preventative actions to address current issues and enable a broader implementation of digital solutions in pharmacies. Through this approach, the

pharmaceutical sector may augment its competencies, optimize its workflow, and eventually deliver superior services to meet the dynamic demands of the digital age. In the era of digital transformation, stakeholders seeking to navigate the ever-changing pharmaceutical business will find great value in the study on pharmacy digitalization.

**Bibliography**

1. *3.-Inventory-Management-in-Pharmacy-Practice*. (n.d.).

2. Alexander, E., Butler, C. D., Darr, A., Jenkins, M. T., Long, R. D., Shipman, C. J., & Stratton, T. P. (2017). ASHP Statement on tele pharmacy. In *American Journal of Health-System Pharmacy* (Vol. 74, Issue 9, pp. e236–e241). American Society of Health-Systems Pharmacy. https://doi.org/10.2146/ajhp170039

3. Al-Jedai, A., Qaisi, S., & Al-Meman, A. (n.d.). *INTERNATIONAL PERSPECTIVES ON PHARMACY PRACTICE Pharmacy Practice and the Health Care System in Saudi Arabia* (Vol. 69, Issue 3).

4. Bani Issa, W., Al Akour, I., Ibrahim, A., Almarzouqi, A., Abbas, S., Hisham, F., Griffiths, J., & Bani Issa, W. (2020). *Chief Nursing Information Officer, Clinical Resource Nurse, Ministry of Health and Prevention*.

5. Chang, Y., Iakovou, E., & Shi, W. (2020). Blockchain in global supply chains and cross border trade: a critical synthesis of the state-of-the-art, challenges and opportunities. *International Journal of Production Research*, *58*(7), 2082–2099. https://doi.org/10.1080/00207543.2019.1651946

6. Clark, J. S., Burns, L. L., Cowan, D., Evans, M. A., Fleming, J. W., Lanza, J. F., Lassiter, J., MacDonald, N., McBride, A., Ourth, H., Shane, R., Stubbings, J. A., Swarthout, M. D., Vest, T., Wright, B., & Maroyka, E. M. (2020). ASHP Practice Advancement Initiative 2030: New recommendations for advancing pharmacy practice in health systems. *American Journal of Health-System Pharmacy*, *77*(2), 113–121. https://doi.org/10.1093/ajhp/zxz271

7. Das, S., Dey, R., & Nayak, A. K. (2021). Artificial intelligence in pharmacy. In *Indian Journal of Pharmaceutical Education and Research* (Vol. 55, Issue 2, pp. 304–318). Association of Pharmaceutical Teachers of India. https://doi.org/10.5530/ijper.55.2.68

8. Fossouo Tagne, J., Yakob, R. A., Mcdonald, R., & Wickramasinghe, N. (2022). Barriers and Facilitators Influencing Real-time and Digital-Based Reporting of Adverse Drug Reactions by Community Pharmacists: Qualitative Study Using the Task-Technology Fit Framework. *Interactive Journal of Medical Research*, *11*(2), e40597. https://doi.org/10.2196/40597

9. Hussein, R., Whaley, C. R. J., Lin, E. C. J., & Grindrod, K. (2021). Identifying barriers, facilitators and behaviour change techniques to the adoption of the full scope of pharmacy practice among pharmacy professionals: Using the Theoretical Domains Framework. *Research in Social and Administrative Pharmacy*, *17*(8), 1396–1406. https://doi.org/10.1016/j.sapharm.2020.10.003

10. Keshta, I., & Odeh, A. (2021). Security and privacy of electronic health records: Concerns and challenges. In *Egyptian Informatics Journal* (Vol. 22, Issue 2, pp. 177–183). Elsevier B.V. https://doi.org/10.1016/j.eij.2020.07.003

11. Liang, H., Laosethakul, K., Lloyd, S. J., & Xue, Y. (2005). Information Systems and Health Care-I: Trust, Uncertainty, and Online Prescription Filling. *Communications of the Association for Information Systems*, *15*. https://doi.org/10.17705/1cais.01502

12. Lopes, V., & Alexandre, L. A. (2018). *An Overview of Blockchain Integration with Robotics and Artificial Intelligence*. http://arxiv.org/abs/1810.00329

13. Mirzaeian, R., Sadoughi, F., Tahmasebian, S., & Mojahedi, M. (2019). Progresses and challenges in the traditional medicine information system: A systematic review Mirzaeian et al. Progresses and challenges in the traditional medicine information system. *Journal of Pharmacy & Pharmacognosy Research*, *7*(4), 246–259. http://jppres.com/jppreshttp://jppres.com/

14. Orsolini, L., Francesconi, G., Papanti, D., Giorgetti, A., & Schifano, F. (2015). Profiling online recreational/prescription drugs' customers and overview of drug vending virtual marketplaces. *Human Psychopharmacology*, *30*(4), 302–318. https://doi.org/10.1002/hup.2466

15. ProfRNDr Jan Pekar, R. (n.d.). *STRATEGY AND PLANNING AND IMPLEMENTATION AND IMPACT FOR THE PHARMACEUTICAL INDUSTRY WITH AND BY INDUSTRY 4.0*. https://ssrn.com/abstract=3955697

16. Rachmat Hidayat, & Irsan Saleh. (2020). The Importance of Inventory Management in Pharmaceutical Practice. *Open Access Indonesia Journal of Social Sciences*, *3*(1), 1–9. https://doi.org/10.37275/oaijss.v3i1.22

17. Rosenbaum, M. S., Ramírez, G. C., Edwards, K., Kim, J., Campbell, J. M., & Bickle, M. C. (2017). The digitization of health care retailing. *Journal of Research in Interactive Marketing*, *11*(4), 432–446. https://doi.org/10.1108/JRIM-07-2017-0058

18. Seymour, T., Frantsvog, D., & Graeber, T. (2012). Electronic Health Records (EHR). In *American Journal of Health Sciences-Third Quarter* (Vol. 3, Issue 3). http://www.cluteinstitute.com/

19. Sonawane, S., Mahajan, V., Saxena, S., Shashikant Mohan, A., Kharade, J., & Surgonda Patil, P. (2024). International Journal of INTELLIGENT SYSTEMS AND APPLICATIONS IN ENGINEERING An Evaluation of the Adoption of Digital App-Based Pharmacy Delivery Services. In *Original Research Paper International Journal of Intelligent Systems and Applications in Engineering IJISAE* (Vol. 12, Issue 10s). https://orcid.org/0009-0008-4723-4230

20. Strain, J., & Cooper, R. (2007). Ethical issues in the use of electronic health records for pharmacy medicines sales. *Journal of Information, Communication and Ethics in Society*, *5*(1), 7–19. https://doi.org/10.1108/14779960710822656

21. Vinchurkar, K., Patidar, A., & Balekar, N. (2018). Impact Factor: RJIF 5.22 www.pharmacyjournal. In *International Journal of Research in Pharmacy and Pharmaceutical Sciences* (Vol. 3, Issue 5). https://www.researchgate.net/publication/328307444