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Challenges and Opportunities for Pharmaceutical E-commerce in Finland

Master's thesis in International Business
Master's Degree Programme in International Business

Vaasa 2025

UNIVERSITY OF VAASA
School of …
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Title of the Thesis: Challenges and Opportunities for Pharmaceutical E-commerce in Finland
Degree: Master of Science in International Business
Programme: Master's Degree Programme in International Business
Supervisor: Emilene Leite
Year: 2025 **Pages:** 94

ABSTRACT:
This thesis explores the development of pharmaceutical e-commerce in Finland, focusing on how consumer behavior trends and regulatory factors shape its growth. Despite Finland's highly digitalized healthcare infrastructure, the pharmaceutical e-commerce sector remains underdeveloped compared to other Nordic countries. This study investigates the reasons behind this, assessing the opportunities and challenges that shape the pharmaceutical e-commerce sector in Finland.

This thesis combines a consumer survey with a regulatory study of Finland's pharmaceutical e-commerce sector. The Theory of Consumption Values (TCV) is used to analyze consumer motivations, including functional, conditional, emotional, social, and epistemic values. Survey findings reveal that consumers value convenience, safety, and accessibility of e-pharmacies in Finland, and trust in digital pharmaceutical platforms is high. Barriers such as limited consumer awareness, cost, and preference for in-person pharmacy experiences slow down wider adoption. The regulatory study highlights how Finland's legal environment ensures patient safety but restricts innovation and creates challenges for e-pharmacy business growth. Key challenges include price regulation, prohibition of online-only pharmacies, and limitations for competition in the market. However, upcoming discussions around over the counter (OTC) medicine reform and advancements in EU-level digital health integration could boost future opportunities.

This study addresses a gap in the current literature by offering a country-specific analysis of pharmaceutical e-commerce, complementing global and regional research. This thesis offers strategic recommendations for business, policymakers, and international stakeholders aiming to scale e-pharmacy operations in Finland and similar markets. By aligning evolving consumer expectations with regulatory adaptation, this thesis contributes to the development of more accessible, trusted, and scalable digital healthcare systems.

KEYWORDS: pharmaceutical e-commerce, e-pharmacy, Finland, digital health, consumer behavior, regulation, Theory of Consumption Values (TCV)

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Abbreviations

AI	**artificial intelligence**
B2B	**business-to-business**
B2C	**business-to-consumer**
CAGR	**compound annual growth rate**

DESI	**Digital Economy and Society Index**
E-COMMERCE	**electronic commerce**
EMA	**European Medicines Agency**
E-PRESCRIPTION	**electronic prescription**
EHDS	**European Health Data Space**
GDP	**Good Distribution Practice**
GDPR	**General Data Protection Regulation**
NRA	**national regulatory authorities**
OTC	**over the counter**
R&D	**research and development**
TCV	**Theory of Consumption Values**
WSC	**well-being services county**

1 Introduction

The pharmaceutical industry is one of the fastest growing industries globally, driven by factors such as an aging population, increased urbanization, rising disposable incomes, and government spending on healthcare (Hole et al., 2021). Globally, the pharmaceutical market was valued at €1.21 trillion in 2022 and has continued to grow since (Statista, 2023). Similarly, the global retail e-commerce industry is growing rapidly. In 2023, global retail e-commerce sales reached an estimated €5.56 trillion, and forecasts predict a 39% increase in this amount in the coming years, with estimates suggesting it will exceed €7.28 trillion by 2027 (Statista, 2024). This rapid growth in both industries highlights the increasing need to explore the intersection of pharmaceuticals and e-commerce to better understand evolving market dynamics and consumer needs.

Despite being such a rapidly growing industry, the pharmaceutical sector has historically been slower to adopt digital transformation due to the nature of its products and strict regulations. Therefore, the integration of e-commerce in both business-to-consumer (B2C) and business-to-business (B2B) segments has progressed more slowly compared to other industries (Almeman, 2024). While the pharmaceutical sector encompasses a broad range of activities, this study narrows its focus to pharmaceutical e-commerce, with an emphasis on pharmacies rather than the entire pharmaceutical sector. For the purposes of this thesis, "pharmaceutical e-commerce" is defined as the online sale and distribution of products by pharmacies, including prescription and over the counter (OTC) medications, as well as other health-related goods (Almeman, 2024).

The pharmaceutical industry has traditionally relied on brick-and-mortar pharmacies for the distribution of medications (Dranove & Barros, 2012). However, the growing digitalization of healthcare and the consumer demand for convenient access to medical products have driven the rise of pharmaceutical e-commerce (Almeman, 2024). While global pharmaceutical e-commerce represents a relatively small share of the overall e-commerce market, it is expanding rapidly due to advancements in technology, shifts in consumer preferences, and the growing emphasis on accessibility (McKinsey, 2021).

Pharmaceutical e-commerce represents a significant intersection between two dynamic industries: pharmaceuticals and digital retail, both of which are transforming global supply chains and consumer access to essential goods (McKinsey, 2021). Despite its potential, pharmaceutical e-commerce remains underexplored in many markets, particularly regarding country-specific regulatory and consumer behavior dimensions.

While prior research (e.g., Almeman, 2024; McKinsey, 2021) has examined global and regional trends in pharmaceutical e-commerce, country-specific studies remain limited. Research such as Punakivi (2019) explored consumer adoption in Finland, but recent digitalization trends, and consumer behavior changes post-COVID-19 highlight the need for updated country-specific analysis. This study aims to bridge this gap by providing a detailed examination of Finland's pharmaceutical e-commerce sector, focusing on consumer behavior and regulatory factors.

Globally, pharmaceutical e-commerce represents a small but growing share of the e-commerce market (Statista, 2024). Its expansion is driven by technological advancements, rising consumer demand for convenience, and the integration of healthcare systems with digital platforms (Almeman, 2024). However, the industry faces unique barriers, such as strict regulations, consumer concerns about data privacy, and the need to ensure the safety and authenticity of medications (European Medicines Agency, 2024; Almeman, 2024). For businesses, policymakers, and researchers, understanding these challenges is crucial to developing strategies that foster trust and regulatory compliance in pharmaceutical e-commerce (Helmy et al., 2023).

Existing research on pharmaceutical e-commerce primarily addresses global or regional perspectives, but often overlooks the specific challenges and opportunities presented by individual countries (Almeman, 2024; McKinsey, 2021). While this literature is important for understanding broader trends, it lacks the details of understanding how national contexts shape the development and adoption of pharmaceutical e-commerce. Regulatory frameworks and consumer behavior can vary significantly between countries,

which directly influences how businesses can scale their pharmaceutical e-commerce operations effectively across borders (European Commission, 2024; European Medicines Agency, 2024). By focusing on Finland as a case study, this research provides insights that can inform localized business strategies while contributing to international discussions on pharmaceutical e-commerce.

Europe provides a unique landscape for studying pharmaceutical e-commerce due to its diverse regulatory frameworks, consumer behaviors, and economic structures. According to the *European E-Commerce* report (2024), the European digital commerce sector is both resilient and complex, with regional disparities and a growing need for harmonization of laws and practices (Ecommerce Europe, 2024). Additionally, Europe's pharmaceutical e-commerce market is rapidly evolving with the rise in demand for convenient health care solutions and the shift toward online shopping (Technavio, 2024). However, examining the entirety of Europe would be too broad for this study. This study is delimited to Finland and does not attempt to generalize findings to all European markets. It exclusively examines consumer behavior and regulatory challenges, excluding aspects such as pharmaceutical logistics, supply chain dynamics, or direct financial performance of e-pharmacies.

In Finland, the pharmaceutical e-commerce market offers a unique perspective due to the country's advanced digital infrastructure, and transparent regulatory environment (MarketLine, 2024). Consumer behavior plays a central role in adoption of digital services such as e-pharmacies, with the perceived safety and reliability of digital platforms being critical factors influencing user acceptance (Fittler et al., 2022). Moreover, regulatory policies governing pharmaceutical e-commerce significantly shape businesses' ability to scale their operations while ensuring compliance with strict standards (Almeman, 2024; European Medicines Agency, 2024). As a member of the European Union, Finland provides a valuable case for studying how national and EU-level regulatory frameworks interact to influence the development of e-pharmacies.

The COVID-19 pandemic significantly accelerated the adoption of pharmaceutical e-commerce worldwide, including in Finland (MarketLine, 2024). Movement restrictions and the growing reliance on remote healthcare during the pandemic drove consumers toward online solutions, highlighting the critical role of e-pharmacies in ensuring access to essential medications (Fittler et al., 2022). However, despite this rapid growth, challenges remain, including the need to address consumer concerns about data privacy and counterfeit medications, as well as navigating complex regulatory frameworks (European Commission, 2024; Rauti et al., 2024). These challenges underscore the need for businesses to understand how local markets like Finland can serve as a foundation for developing scalable and internationally relevant strategies (Almeman, 2024).

This study addresses a critical gap in the existing literature, where much of the research on pharmaceutical e-commerce focuses on global or regional trends, offering limited insight into how specific national contexts, such as Finland, shape the industry's development (Punakivi, 2019; Sinn, 2017). By examining Finland as a case study, this research provides valuable guidance for businesses seeking to expand into similar markets, particularly in navigating the complexities of international regulations and diverse consumer behaviors.

Despite the growing body of research on e-commerce and consumer behavior, the intersection of these fields with pharmaceutical e-commerce remains underexplored. While existing studies provide valuable insights into global and regional trends, they often lack the specifics needed to understand the unique dynamics of individual markets, particularly smaller markets like Finland.

This gap in the literature and the growing importance of pharmaceutical e-commerce as a segment of both the healthcare and retail sectors underscore the need for this study. By examining the opportunities and challenges for pharmaceutical e-commerce in Finland, the research aims to bridge the gap between global theories and local practices. Through a combined focus on consumer behavior trends and regulatory factors, the

findings contribute to developing effective and scalable strategies for pharmaceutical e-commerce in Finland and comparable markets.

For pharmaceutical e-commerce platforms, this thesis identifies best practices for enhancing consumer trust, ensuring regulatory compliance, and driving sustainable growth. Academically, the thesis contributes to the literature on country-specific analyses of pharmaceutical e-commerce, offering valuable insights into the interplay between consumer behavior trends and regulatory frameworks. Additionally, the findings are designed to provide actionable recommendations for policymakers, businesses, and other stakeholders interested in advancing pharmaceutical e-commerce both in Finland and comparable markets.

1.1 Research Question and Objectives

This study is guided by the central research question:

> How do consumer behavior trends and regulatory factors shape the development of pharmaceutical e-commerce in Finland?

The objective of this thesis is:

1. To examine the opportunities and challenges for pharmaceutical e-commerce in Finland.

1.2 Structure of the Thesis

The thesis consists of six chapters:

1. Chapter 1 contains an introduction, briefly covering the thesis topic and identifying the research question.
2. Chapter 2 reviews the theoretical background on the pharmaceutical market, e-commerce trends, and consumer behavior theories.
3. Chapter 3 details the research methodology, including the use of a Finnish case study to explore consumer and regulatory aspects of pharmaceutical e-commerce.

4. Chapter 4 presents the findings and analysis. This chapter presents the results of the survey and secondary research, analyzing how Finland's consumer behavior and regulatory environment impact pharmaceutical e-commerce.
5. Chapter 5 interprets the findings, focusing on their implications for international business. It explores how insights from Finland can inform pharmaceutical e-commerce strategies in other markets, addressing scalability, compliance, and consumer trust.
6. Chapter 6 concludes with recommendations and suggestions for future research.

2 Theoretical Background

The pharmaceutical industry has traditionally relied on brick-and-mortar pharmacies for the distribution of medications (Dranove & Barros, 2012). However, the rise of e-commerce has introduced a new business model that is reshaping how pharmaceutical products are delivered to customers (Punakivi, 2019). To understand the evolution of pharmaceutical e-commerce, it is essential to first define what constitutes a business model and how it applies to both traditional and online pharmacies.

A business model described how a company creates, delivers, and captures value (Healy, 2016). It involves the design of products or services, the mechanisms for reaching consumers, and the financial structure that enables companies to generate profit (Sjödin et al., 2020). The concept of a business model originated from managerial practice and was particularly inspired by e-business strategies (Amit & Zott, 2001; Demil et al., 2015). Business models serve as a structural framework that defines how firms operate at a holistic, system-wide level (Amit & Zott, 2001; Clauss et al., 2019). Business models include three core aspects: value proposition, which defines the solutions offered and to whom; value creation, which refers to how businesses utilize resources and organizational processes along the value chain; and value capture, which involves revenue generation to sustain profitability (Baden-Fuller & Mangematin, 2013; Massa et al., 2017; Zott & Amit, 2010).

In today’s digital age, business models are increasingly influenced by digitalization, as companies utilize technologies like platforms, artificial intelligence, and cloud computing to improve how they generate and retain value (Bouncken et al., 2021). Digitalization allows businesses to develop innovative business models, opitimize processes, and establish new revenue streams (Bouncken et al., 2021). In addition to this, digitalization allows firms to transform their entire business structure, including products, services, technologies, and value flows (Clauss et al., 2019). This kind of innovation often goes beyond a company's own operations, leading to partnerships and

new ways of working that can change entire industries (Bouncken et al., 2019a; Hora et al., 2018).

Businesses that successfully integrate digital tools into their operations often achieve higher growth, while those that are slow to embrace digital strategies face the risk of decline (Bouncken et al., 2021). As business environments evolve, firms must continuously adapt their business models to maintain competitiveness, leveraging technological, process, and organizational innovations (McGrath, 2010; Clauss et al., 2019). Since business models are dynamic rather than static, companies must engage in business model reconfiguration, making incremental, radical, or holistic changes to sustain long-term success (Demil et al., 2015; Clauss et al., 2019). Digitalization is not just about new technology; it also requires business to change the way they operate to stay competitive in today's market.

With the pharmaceutical industry rapidly evolving with shifting customer needs, business model innovation is essential for keeping up with market changes and consumer demands. In the pharmaceutical industry, business models have evolved from a traditional pharmacy model, focused on in-person sales and consultation, to an e-commerce model, which leverages digital platforms to serve consumers remotely (McKinsey, 2021). According to Mehta & Taylor (2023), small improvements to pharmaceutical business models are no longer enough to meet the needs of modern consumers. Businesses need to adapt their strategies because, without major changes, they risk being replaced by new technology-driven companies that offer more convenient and affordable options to consumers (Mehta & Taylor, 2023). New players are changing healthcare by focusing on what works best for consumers, rather than expecting patients to adjust to old systems (Mehta & Taylor, 2023).

The traditional pharmaceutical model is centered around physical pharmacies, where medications are dispensed in person, and pharmacists provide direct customer service (Dranove & Barros, 2012). In this model, pharmacies primarily sell prescription and over

the counter (OTC) medications, along with medical supplies and wellness products, while also offering in-person consultations (Nordic Competition Authorities, 2021). The value of this model is created through personalized service and expert consultation, which build trust between pharmacists and customers and ensure safe medication use and adherence (Punakivi, 2019). The revenue model is based on medication sales, government reimbursements for prescription drugs, and additional health-related products (Apteekkariliitto, 2023). This model operates under strict national regulations that govern pharmacy operations, requiring licensed pharmacists to dispense medication and provide guidance to patients (Fimea, 2025; European Medicines Agency, 2020).

E-commerce pharmacies utilize digital platforms to facilitate the sale and distribution of pharmaceuticals (Almeman, 2024). Unlike traditional pharmacies, these businesses sell prescription medications, OTC drugs, and wellness products through digital storefronts, often supplemented by remote consultations (Nordic Competition Authorities, 2021). The key value proposition of this model lies in convenience, accessibility, and competitive pricing, which appeal to consumers, particularly those in remote areas or with mobility limitations (Almeman, 2024). The revenue model is driven by direct-to-consumer e-commerce transactions, subscription services, and partnerships with healthcare providers (McKinsey, 2021). However, this model faces significant regulatory challenges, as compliance with online pharmaceutical sales regulations varies across countries, affecting how businesses operate across borders (European Medicines Agency, 2020). Unlike traditional pharmacies, online pharmacies eliminate geographical barriers and allow customers to access medications with minimal physical interaction, yet challenges related to trust, counterfeit drugs, and consumer hesitancy toward digital health services persist (Nordic Competition Authorities, 2021; Sinn, 2017).

The shift from traditional to e-commerce pharmaceutical business models highlights a fundamental change in consumer behavior, driven by the demand for convenience, accessibility, and cost efficiency (Almeman, 2024; McKinsey, 2021). However, the

transition also introduces challenges related to regulation, trust, and patient safety (European Medicines Agency, 2020). By analyzing consumer behavior and regulatory frameworks, businesses can better identify opportunities to grow their pharmaceutical e-commerce platforms (Nordic Competition Authorities, 2021).

2.1 E-commerce

To analyze pharmaceutical e-commerce further, a theoretical review of e-commerce is presented to provide a foundational understanding of its concepts and applications. Electronic commerce, commonly referred to as e-commerce, is defined as the process of buying and selling over the internet (Helmy, et al., 2023). Gupta (2014) provides a more comprehensive definition, describing e-commerce as the use of electronic communication and digital information processing technologies in business transactions to create, transform, and redefine relationships—either between organizations or between organizations and individuals—to drive value creation. Additionally, e-commerce refers to the utilization of electronic platforms to manage consumer orders, process payments, offer customer support, gather market data, and carry out marketing and promotional activities (Goyal et al., 2019). Furthermore, Goyal et al. (2019) highlight how from a business perspective, e-commerce encompasses more than just buying and selling products or services; it also involves managing a real-time communication system to provide pre-purchase information, post-purchase feedback, and ongoing customer support.

E-commerce originated in the 1990s when the internet became accessible for commercial activities, and retailers and online platforms like Amazon began selling directly to consumers (Risberg, 2023). Since then, e-commerce has become an increasingly important part of the retail sector and people's daily life, with people increasingly opting for online transactions over traditional methods to simplify, enhance, and improve their quality of life (Helmy et al., 2023). Helmy et al. (2023), referencing Irantaj (2018), highlight how e-commerce has transformed traditional business terminology, replacing concepts like brick-and-mortar and retail storefronts with online

shopping and e-stores. This shift has driven the growing popularity of online shopping in the business-to-consumer (B2C) sector, intensifying competition among e-retailers.

In 2023, e-commerce contributed to more than 19% of global retail sales, and projections suggest that by 2027, e-commerce will account for close to a quarter of total global retail sales (Statista, 2024). The significant growth of e-commerce is largely driven by consumer demand for convenience, speed, and flexibility in shopping (Vakulenko et al., 2019). Modern consumers now anticipate flexible and seamless service options, including personalized delivery choices and transparent operational processes (Vakulenko et al., 2019). Furthermore, the customer journey starts with online interactions but extends through the delivery and return phases, which highlights the need for a comprehensive approach by e-commerce stakeholders (Vakulenko et al., 2019). Technological advancements, such as automation and self-service technologies, have significantly reshaped the e-commerce landscape by increasing convenience and minimizing errors during the shopping process (Vakulenko et al., 2019)

E-commerce is an essential part of the modern retail business. According to Andam (2003), e-commerce offers numerous benefits for businesses, including operational efficiency, reduced transaction costs, enhanced market reach and access to global customer bases. Additionally, they highlight how e-commerce offers personalized interactions, 24/7 availability to improve customer service, and enables mass customization, which allows businesses to tailor products and services to individual consumer preferences, further enhancing the customer experience. However, Andam also emphasizes that the adoption of e-commerce comes with challenges. For example, high internet access costs and the limited availability of reliable infrastructure in certain regions pose significant barriers, particularly in developing countries. Security concerns, including data protection and transaction security, also deter some consumers from engaging in online transactions. Moreover, a lack of skilled human resources to develop and maintain e-commerce platforms hinders progress in this field. Regulatory and legal issues, such as the recognition of electronic contracts and cross-border taxation, further

complicate the adoption of e-commerce, especially in international contexts (Andam, 2003).

In addition to these challenges, e-commerce businesses face ongoing pressure to adapt to rapid changes in the business landscape, technological progress, and shifting customer preferences. Many new businesses encounter difficulties due to limited knowledge about designing and maintaining their websites effectively to draw in customers and stay competitive (Helmy et al., 2023). Helmy et al. (2023) emphasize that while much of the research in B2C e-commerce focuses on understanding consumer preferences to enhance satisfaction, it often overlooks the significant pressures on businesses to stay relevant in the dynamic landscape. Therefore, gaining a comprehensive understanding of the challenges faced by businesses, particularly in the B2C sector, and identifying potential solutions, is critical for fostering sustainable growth in the e-commerce environment.

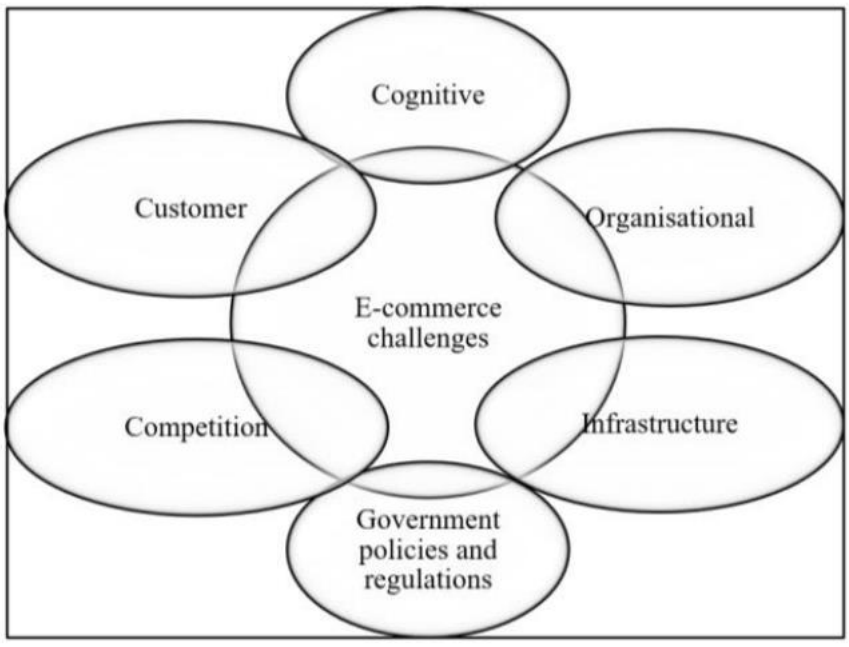

Figure 1. E-commerce challenges (Helmy et al., 2023)

Helmy et al.'s (2023) Figure 1 outlines the key challenges business face in the e-commerce environment face, which impact the firm's capacity to compete, their resource allocation, and strategic decision making. These challenges span several areas, including infrastructure, government policies, customer behavior, and market competition. Infrastructure-related obstacles, such as limited internet connectivity, slow network speeds, inadequate IT education, and financial constraints, create significant barriers for e-commerce businesses. Additionally, the lack of strong logistics systems, including reliable roads and transit networks, further exacerbates the difficulty of ensuring seamless operations.

Helmy et al. (2023) also describe how regulatory, and policy challenges are also a major concern, as ineffective government frameworks often lead to uncertainties in areas like online customer data security, consumer rights, and cross-border taxation. These issues undermine consumer trust and can hinder the growth of e-commerce platforms. Furthermore, customer challenges, such as limited affordability, awareness, and accessibility, reflect the need for businesses to address diverse consumer needs through tailored solutions. Finally, intense competition, characterized by low product differentiation, high buyer bargaining power, and price-based rivalry, compels e-commerce businesses to innovate continuously and deliver exceptional value to maintain a competitive edge. By outlining these multifaceted challenges, Figure 1 provides a comprehensive framework for understanding the barriers to success in e-commerce.

Manzoor (2010), groups e-commerce into seven different categories:

1. Business-to-business (B2B): Transactions between companies, often involving e-infrastructure (logistics and systems).
2. Business-to-consumer (B2C): Businesses selling directly to consumers through online platforms
3. Business-to-government (B2G): Transactions between businesses and government entities, such as licensing and procurement.

4. Consumer-to-business (C2B): Consumers selling goods or services to businesses, often via intermediaries like online platforms.
5. Consumer-to-consumer (C2C): Transactions between consumers, facilitated by platforms like eBay, Facebook marketplace, Vinted, etc.
6. Business-to-employee (B2E): Intra-business transactions offering products or services to employees.
7. Government-to-government (G2G): Online interaction between government bodies, such as data sharing systems like the Schengen Information System.

This thesis will focus specifically on B2C e-commerce, the segment where businesses sell products or services directly to consumers through online platforms.

2.1.1 Pharmaceutical E-commerce

Historically, pharmacy services were built on face-to-face interactions and manual processes. The shift toward a more efficient healthcare system is driving the digital transformation of the industry and with it, the growth of pharmaceutical e-commerce (Almeman, 2024). Pharmaceutical e-commerce can be defined as the online sales and distribution of pharmaceutical products (Wu & Dong, 2023; McKinsey, 2021). Unlike traditional pharmacy models, where direct, face-to-face interactions between customers and healthcare providers are central, pharmaceutical e-commerce leverages digital platforms, replacing in-person exchanges with technology-enabled services (Wu & Dong, 2023). In a B2C setting, e-pharmacies allow patients to order and receive prescription medications from the comfort of their homes, revolutionizing access to pharmaceutical products (MacDonald, 2021). This transformation aligns with broader trends in e-commerce and addresses consumer demand for greater convenience and accessibility in healthcare (Fittler et al., 2024).

The pharmaceutical e-commerce sector experienced significant growth driven by the impact of the COVID-19 pandemic (MacDonald, 2021). The pandemic acted as a facilitator for digitalization within the industry, as consumer habits shifted toward

preferring online purchases. Just ten years ago, obtaining a remote medical prescription was practically impossible in many markets, but the pandemic has accelerated the adoption of digital solutions in healthcare (Statista, 2024). The pandemic's movement restrictions and the growing need for remote healthcare significantly boosted the adoption of e-pharmacies, as consumers developed greater trust and reliance in online platforms for purchasing medications (Fittler et al., 2022). E-commerce giants such as Amazon and Alibaba reacted to the pandemic quickly and announced major investments in their online pharmacy business in 2020 and 2021 (MacDonald, 2021). Additionally, the pandemic accelerated the adoption of online pharmacy services across the Nordic countries in Europe (Nordic Competition Authorities, 2021).

McKinsey's (2021) report, *Pharmacy's New Era—in the Home*, highlights the evolving expectations of pharmacy customers, who now prioritize seamless, and retail-like experiences. The report attributes the growth of pharmaceutical e-commerce to these shifts and emphasizes the importance of convenience, home delivery, and technology-driven services in meeting consumer needs. Similarly, consumer trust in e-pharmacies has grown, with many viewing these platforms as safer and more convenient alternatives to traditional brick-and-mortar pharmacies (Fittler et al., 2022). Furthermore, Almeman (2024) underscores how advancements in digital technology, such as automation, computerization, and robotics, have driven global growth in pharmaceutical e-commerce. Together, these insights illustrate how technological advancements and evolving consumer expectations are reshaping the pharmaceutical e-commerce landscape, aligning it more closely with broader trends in e-commerce.

The literature on e-pharmacies has evolved significantly, with a focus on contemporary issues and the factors influencing consumer adoption. For example, Misra's (2024) highlights the role of demographics, discounts, recommendations, medicine availability, delivery options, payment terms, and price comparisons with physical pharmacies in shaping consumer behavior toward e-pharmacies. Furthermore, Misra (2024) explores the advantages, challenges, regulatory aspects, and legal implications of selling

medicines online. Additionally, Misra (2024) discusses consumer awareness, satisfaction, and motivations for adopting these platforms. Despite these contributions, Misra notes that the field remains underexplored, with limited theory-driven analyses of consumer behavior and regulatory frameworks.

Despite its potential, pharmaceutical e-commerce lags behind other e-commerce retail sectors, which shows that there are opportunities for growth and innovation (McKinsey, 2021). Helmy et al. (2023) present a comprehensive framework (Figure 1) for understanding the challenges faced by e-commerce platforms, which can also be applied to e-pharmacies. Regulatory and policy challenges are a significant concern for the pharmaceutical e-commerce sector, for it is a highly regulated market (Beg, S., & Hasnain, S., 2019). Ineffective government frameworks often lead to uncertainties in areas such as online customer data security, consumer rights, and product safety (Beg & Hasnain, 2019; Almeman, 2024). Additionally, customer-related challenges are particularly prominent in pharmaceutical e-commerce, including limited affordability, awareness, and accessibility to digital health solutions (Helmy et al., 2023; Almeman, 2024).

These challenges, highlighted by Helmy et al. (2023), form critical barriers to the growth of e-pharmacies. Among these, regulatory and customer-related challenges stand out as particularly significant in shaping the success and future development of pharmaceutical e-commerce. Regulatory and policy uncertainties create a complex landscape for e-pharmacies. At the same time, customer-related barriers highlight the need to understand consumer behavior more deeply and develop tailored solutions.

This study will focus specifically on these two aspects—consumer behavior and regulatory challenges. By addressing the sections highlighted in red from Helmy et al.'s (2023) framework in Figure 2, this study aims to investigate how regulatory frameworks impact market entry and operational constraints, while consumer behavior theories help explain adoption patterns and customer expectations in the Finnish market.

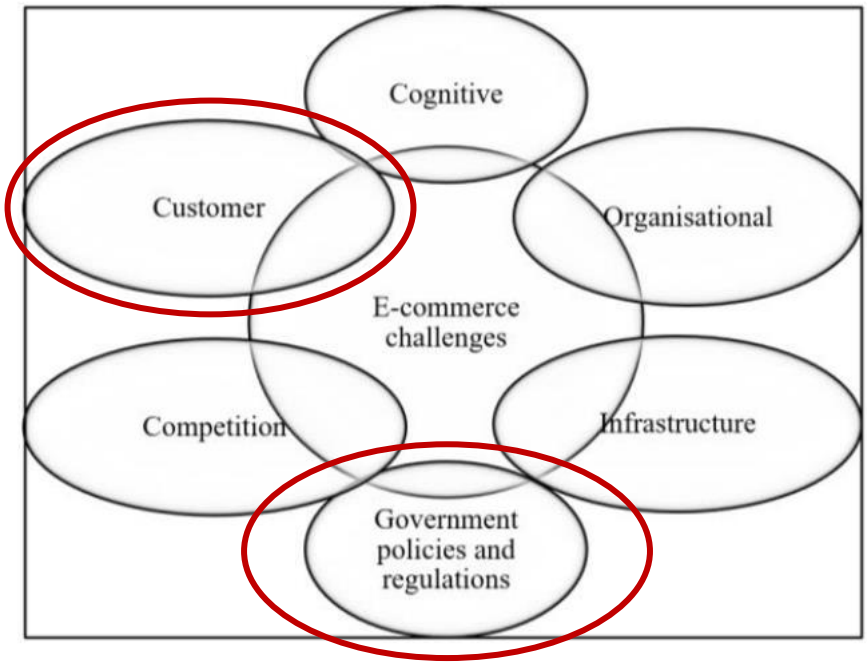

Figure 2. Modification of E-commerce challenges by Helmy et al. (2023)

2.2 Consumer Behavior in E-commerce

Consumer behavior is a complex field influenced by many factors, including location, timing, and social norms (Melnyk et al, 2022). Sheth (2020) explains that all consumption is shaped by when and where it occurs, and consumers develop habits regarding what they consume over time. Similarly, Melnyk et al. (2022) emphasize the role of social norms in shaping consumer choices, demonstrating how cultural and societal influences guide behavior. Furthermore, Kotler and Keller (2016) highlight how consumer behavior is driven by external factors, as well as psychological factors like motivation, perception, and attitudes, which all play an important role in decision-making. These internal and external influences interacting dynamically complicate the understanding of consumer behavior.

Rozenkowska (2023), referencing Hoyer et al. (2012), highlights the importance of understanding how consumers buy, use, and dispose of things, as this knowledge enables the development of more effective sales strategies. Over the years, researchers from disciplines such as economics, psychology, sociology, and anthropology have

contributed to understanding consumer behavior and its motivations (Rozenkowska, 2023). Foundational theories in this field include the Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975), the Theory of Planned Behavior (TPB) by Ajzen (1985, 1991), Self-Determination Theory by Gilal et al. (2018), and the Theory of Consumption Values (TCV) by Sheth et al. (1991).

Unlike economic analysis, which is built on fixed assumptions to create decision-making models, consumer behavior research draws from a variety of theories and methodologies to explain why people act the way they do (Antonides, 2017). Due to the complexity of consumer behavior, no single theory can capture all aspects, which requires researchers to balance broad theories with the ability to explain specific behaviors (Antonides, 2017).

In the context of e-commerce, consumer behavior has evolved significantly with technological advancements and the increasing preference for online transactions (Helmy et al., 2023). Many consumers favor B2C e-commerce platforms because they offer convenience, a wide range of products, affordable prices, and frequent promotions (Sukendi et al., 2021). Additionally, the growth of e-commerce has made cross-border shopping easier, creating new opportunities for both local and international retailers (Hallikainen & Laukkanen, 2018). However, not all consumers shop online equally; while some embrace e-commerce, others remain hesitant, which is why it is important for researchers and businesses to investigate these differences in consumer behavior (Hallikainen & Laukkanen, 2018).

E-commerce platforms are more than just tools for transactions; they serve as essential channels for businesses to interact and communicate with customers (Sullivan & Kim, 2018). Rising consumer expectations have increased the complexity of online systems, requiring businesses to adapt their strategies to meet these demands and build trust (Sullivan & Kim, 2018). For businesses, it is crucial to keep up with emerging trends in consumer behavior in order to stay relevant (Hallikainen & Laukkanen, 2018). This

understanding of consumer behavior in e-commerce provides valuable context for introducing the Theory of Consumption Values, which offers a structured framework for analyzing the various drivers of consumer decisions.

2.2.1 The Theory of Consumption Values

The Theory of Consumption Values (TCV), proposed by Sheth et al. (1991), describes consumer choice behavior though five key consumption values. TCV is summarized in Figure 3:

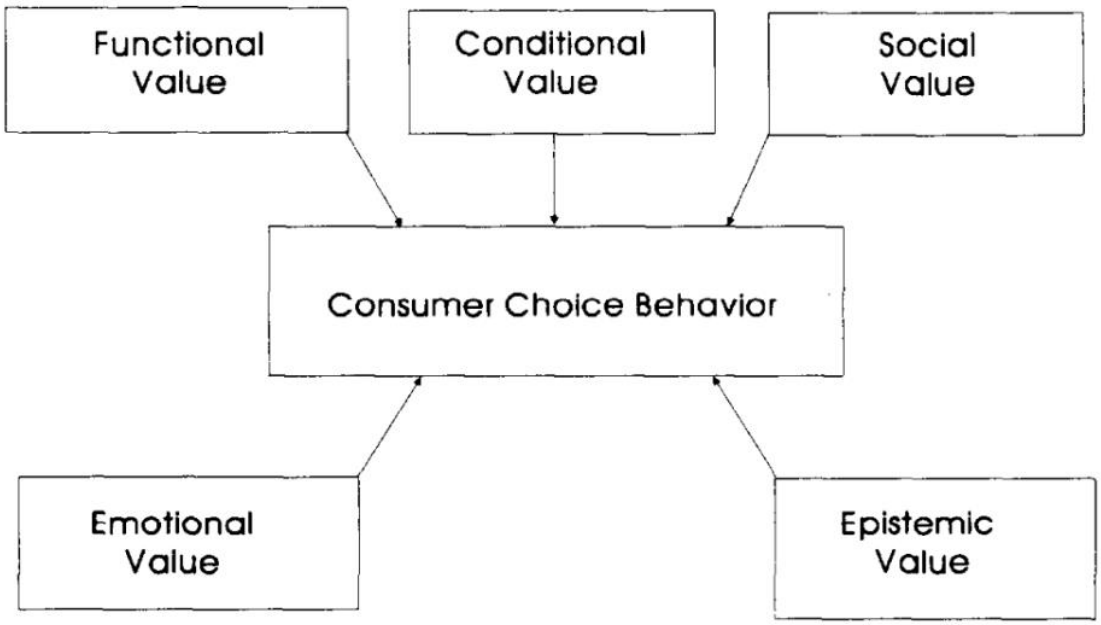

Figure 3. The five values influencing consumer choice (Sheth et al., 1991)

1. Functional Value: This refers to the utilitarian performance and practical benefits of a product or service. This is often the primary driver of choice in economic utility theory. Attributes like reliability, durability, and price are critical in shaping this value (Sheth et al., 1991).
2. Conditional Value: This reflects the utility dependent on specific situational or contextual factors. For example, certain products or services may gain relevance during emergencies, seasonal events, or unique circumstances. Conditional value

highlights how external circumstances shape consumer priorities (Sheth et al., 1991).

3. Social Value: This refers to the value a product gains from being linked to certain social groups or stereotypes. Products tied to positive social status or demographics often have high social value. For example, branded goods may be chosen for their ability to enhance social image (Sheth et al., 1991).
4. Emotional Value: This refers to the feelings that a product or service elicits, such as joy, nostalgia, or excitement. Emotional value is particularly relevant in advertising, where emotional appeals are used to create strong brand associations (Sheth et al., 1991).
5. Epistemic Value: Epistemic value is related to curiosity, novelty, and the desire for knowledge. Consumers might choose a product because it offers a new experience or satisfies their curiosity. This value often drives trial behavior in innovative products, such as new technologies and is relevant in markets where consumers actively seek variety or change (Sheth et al., 1991).

Sheth et al. (1991) argue that these values independently and differentially influence purchasing decision across various product categories. Empirical findings highlight the significant roles of emotional and social values in shaping consumer preferences, offering implications for marketing and public policy. The research draws on existing theories from economics, sociology, and psychology.

Building on the work of Sheth et al. (1991), TCV has been applied in various studies on consumer behavior across different contexts, including e-commerce. The theory has shown strong predictive validity in consumer behavior studies (Lin and Huang, 2012). Recent research highlights the significance of these values in shaping online purchasing behavior (Misra, 2024). For example, emotional and social values have been identified as key drivers of virtual product purchases among younger consumers (Mäntymäki & Salo, 2015), while functional and emotional values have been found to play a critical role in determining online shopping intentions (Punj, 2011). The TCV framework has been

studied across diverse domains, such as the online gaming sector (Teng, 2018) and food consumption (Choe & Kim, 2018), which highlights its adaptability. In recent years, some studies in the pharmaceutical e-commerce field have also used the TCV framework. Chakraborty & Paul's (2023) study uses the theory of consumption value to explain consumer behavior toward healthcare apps. Additionally, Misra's (2024) study uses TCV to study purchase intention toward e-pharmacies in India. In line with this research, this study also applies TCV to the context of e-pharmacies, examining how consumption values influence consumer behavior in this sector.

2.3 Pharmaceutical E-commerce: a Perspective from TCV

Pharmaceutical e-commerce is meeting consumer demands for better convenience and more accessibility (Almeman, 2024). Studies show that customer acceptance of e-pharmacies is increasing, particularly post COVID-19 pandemic (Almeman, 2024; Fittler et al., 2022). However, since pharmaceutical e-commerce is a relatively new but quickly growing sector, new studies and theoretical approaches must be implemented to gain more knowledge of the field. TCV offers a strong framework to analyze the shifting dynamics of consumers by exploring how functional, emotional, social, epistemic and conditional values influence customer behavior in e-pharmacies.

According to TCV, consumers seek both functional and hedonic values while shopping (Sheth et al., 1991). Functional value refers to the utility derived from the practical attributes of a product or services (Sheth et al., 1991). In the context on e-pharmacies, this value is typically reflected in aspects like product safety and price (Misra, 2024). Additionally, the convenience offered by e-pharmacies, including features like fast home delivery and user-friendly interfaces, enhances their functional appeal (Yang & Lin, 2017). In conclusion, safety and reliability, pricing, and perceived convenience are key factors that define functional value of e-pharmacies for consumers.

In the context of e-pharmacies, conditional value is similar to functional value. However, it focuses on the perceived utility of a product or service *in specific situations or contexts*

(Sheth et al., 1991). For e-pharmacies, this is particularly relevant in scenarios where consumers face urgent healthcare needs, such as during medical emergencies or when physical access to pharmacies is restricted. The ability to provide fast delivery, emergency supplies, or specialized products tailored to unique health conditions enhances conditional value (Chakraborty & Paul, 2023). Therefore, this value can be strengthened by e-pharmacies catering to health-conscious consumers by, for example, promoting preventative healthcare practices or having 24/7 availability to place orders or quick home delivery options.

Epistemic value comes from the novelty, curiosity, or knowledge a product of serviced provides (Sheth et al., 1991). Chakraborty & Paul (2023), referencing Laroche et al. (2001), Pura (2005) and Bettiga & Lamberti (2017), describe how epistemic value in online services is a key factor influencing consumer decisions to use or avoid services or buy or not to buy products. In the context of e-pharmacies, epistemic value could stem from consumer curiosity about the brand, guiding them toward exploring new offerings.

Emotional value represents the positive feeling or sentiments evoked by a product or service (Sheth et al., 1991). Studies have shown that the convenience of online transactions and the ability to receive products without visiting physical stores generate positive emotional responses (Misra, 2024). Additionally, the simplicity and convenience offered by healthcare apps can evoke positive emotional responses from consumers (Chiu et al., 2020). Therefore, for e-pharmacies, this could include the comfort consumers experience when accessing medications easily and efficiently, especially during critical health situations. For example, personalized customer service could enhance emotional value among e-pharmacy users.

Social value is the perceived benefit derived from a product or service’s association with social groups or the enhancement of an individual's social self-concept (Sheth et al., 1991). In the e-pharmacy context, social value could be linked to the trust consumers

place in platforms endorsed by healthcare professionals or supported by strong customer ratings and reviews.

Consumer trust is particularly critical in e-commerce, where online consumers are more vulnerable to risks, especially when product or service quality is uncertain (Sullivan & Kim, 2018). Hallikainen and Laukkanen (2018), referencing Chang, Cheung, and Tang (2013), highlight that concerns about the trustworthiness of online stores are among the most significant factors distinguishing buyers from non-buyers. In the context of pharmaceutical e-commerce, trust is even more critical, as consumers must share sensitive health data and rely on the authenticity of products that directly impact their well-being (Sampene & Wiredu, 2024).

Therefore, analyzing how regulatory frameworks in the pharmaceutical e-commerce sector impact consumers and consumer trust is critical. The pharmaceutical market is a highly regulated market (Beg, S., & Hasnain, S., 2019), and the regulatory landscape is complex, as it aims to balance consumer access to medications with the need to safeguard against risks (Almeman, 2024). Much of the existing literature on regulations focuses on illegal pharmacies and the risks of unsafe medications, but now research on users' privacy concerns and personal data leaks is also surfacing (Beg, S., & Hasnain, S., 2019). Both areas are important to address, as they collectively ensure the safety, trust, and overall reliability of pharmaceutical e-commerce platforms for consumers.

The Theory of Consumption Values (Sheth et al., 1991) provides a structured approach to analyzing consumer motivations, but its applicability to pharmaceuticals is limited by the industry's reliance on trust and regulatory constraints, which are not always accounted for in traditional consumer behavior models. Therefore, this study combines TCV with an assessment of regulatory frameworks to offer a more comprehensive view. By incorporating regulatory frameworks into TCV analysis, this study acknowledges how trust-building mechanisms and legal protections shape consumer behavior in

pharmaceutical e-commerce, ensuring a more holistic understanding of the highly regulated industry.

2.4 Previous Studies

In the Finnish context, recent advancements in digital infrastructure and the growing acceptance of online healthcare services make the country an ideal setting to explore these dynamics (MarketLine, 2024). However, there is a notable lack of up-to-date, country-specific analyses that examine the dual challenges posed by regulatory frameworks and consumer behavior. For example, while studies have explored broader European trends, few have delved into how Finland's regulatory environment interacts with consumer trust in the e-pharmacy sector. The most relevant research in this area (e.g., Punakivi's 2019 study from Finland, *Acceptance and use of online pharmacies and the online customer journey for the purchase of OTC medicines*) is now outdated, given the rapid digital transformation accelerated by the COVID-19 pandemic.

Furthermore, the pharmaceutical e-commerce sector faces unique challenges that distinguish it from other industries. Unlike general e-commerce, which primarily focuses on convenience and cost, pharmaceutical e-commerce is subject to stricter regulations, heightened consumer safety concerns, and a need for solid systems to ensure compliance. These factors are combined with the complexities of cross-border operations, especially within the European Union, where businesses must navigate both EU-level policies and country-specific rules (European Medicines Agency, 2024). This regulatory diversity creates barriers for pharmaceutical e-commerce platforms aiming to scale internationally, emphasizing the importance of studying Finland as a case study with broader applicability.

3 Research Methodology

3.1 Research Approach

This study adopts a descriptive research design, utilizing a qualitative approach to achieve its objectives. A descriptive approach is appropriate when the goal is to identify patterns and trends rather than test causal relationships or establish statistical correlations (Saunders, 2023). According to Saunders (2023), descriptive research is particularly useful for answering 'Who', 'What', 'Where', 'When', or 'How' questions, making it well-suited for this study's research question "How do consumer behavior trends and regulatory factors shape the development of pharmaceutical e-commerce in Finland?". While descriptive research is often a precursor to explanatory research, in this study, it serves to provide an accurate profile of the pharmaceutical e-commerce landscape in Finland, rather than testing specific hypotheses.

This study follows an inductive research approach, as it seeks to explore and describe trends in consumer behavior and regulatory frameworks in Finnish pharmaceutical e-commerce. Rather than testing predefined hypotheses, this thesis identifies patterns and trends in consumer attitudes toward e-pharmacies. While the Theory of Consumption Values (Sheth et al., 1991) helps explain why consumers make purchasing decisions, it does not fully account for the strict regulations that shape the pharmaceutical industry. Since buying medicine online involves more than just personal preferences, such as safety concerns and legal requirements, this study combines TCV with an analysis of regulations to provide a more complete understanding of pharmaceutical e-commerce opportunities and challenges in Finland.

This thesis is based on a consumer survey designed to assess consumer attitudes toward e-pharmacies in Finland, their adoption behavior, and key trust-related concerns. Surveys are a widely used research method in the social and health sciences, allowing researchers to gather data from large populations that are difficult to access through other means (Punakivi, 2019). This method is particularly effective for generating

generalizable insights about consumer adoption, perceptions, and preferences in e-pharmacy use (Punakivi, 2019).

The second qualitative component of research is a case study approach. The case study approach focuses on the Finnish pharmaceutical e-commerce market to provide an in-depth understanding of its regulatory landscape. Qualitative research is particularly effective for addressing “how” and “why” questions in complex contexts (Hennink, Hutter, & Bailey, 2020). Lincoln (2021) emphasizes that the case study method is widely used for descriptive research. Similarly, Saunders (2023) describes case study research as particularly useful for in-depth exploration of real-world contexts, especially when regulatory and institutional frameworks are involved. By analyzing existing regulations, compliance challenges, and their impact on consumer adoption, the case study provides essential context to complement the survey findings.

By integrating these two methods, this study develops an in-depth understanding of the pharmaceutical e-commerce landscape, ensuring contextual depth. This approach enhances the descriptive nature of the research by triangulating different data sources to capture a well-rounded understanding. By utilizing a questionnaire to assess consumer trends and case study analysis to explore regulatory frameworks, this study provides a structured yet flexible approach to understanding pharmaceutical e-commerce opportunities and challenges in Finland.

3.2 Data Collection

To understand consumer behavior, a semi-structured questionnaire was developed based on prior studies and theories relevant to e-commerce and pharmaceutical adoption. Surveys provide a structured and efficient way to gather standardized data, making them particularly useful for analyzing consumer preferences and behaviors (Saunders, 2023).

The survey begins with an introduction explaining its purpose as part of a master's thesis at the University of Vaasa, assuring respondents of confidentiality and providing an estimated completion time of 5–10 minutes. The questions are divided into sections to address specific research objectives. The demographic section includes gender, age, education, level of health consciousness, and residence in Finland to ensure a representative sample. Separate sections for users and non-users of e-pharmacies are next introduced. Most questions use a 5-point Likert scale to measure consumer perceptions, with additional multiple-choice and yes/no questions to assess consumer preferences. The survey was piloted with a small group to identify spelling and clarity issues and evaluate its functionality and completion time. Feedback from the pilot group was used to refine the questionnaire. The survey was conducted via online platforms (Google Forms) and distributed through social media, university networks, and Wolt company networks. A copy of the survey is provided in the Appendix.

The regulatory analysis component of the research relies on secondary data analysis. According to Saunders (2023), secondary data analysis is particularly valuable for descriptive research, as it provides historical and contextual insights without requiring hypothesis-driven investigations. The secondary data sources used are listed below in Table 1.

Table 1. Secondary data sources used in regulatory analysis

Secondary data source	**Link**	**Type of Secondary Data**	**Relevance to Study**
Apteekkariliitto. (2023). *The Association of Finnish Pharmacies Annual Review 2023.*	Link to annual review	Industry Annual Report	Provides industry-level insights into pharmacy operations, regulatory developments, and strategic priorities relevant to the growth of e-pharmacies in Finland.

Directive 2001/83/EC of the European Parliament and of the Council of 6 November 2001 on the Community code relating to medicinal products for human use.	Link to Directive	EU Directive	Sets the overarching legal framework for medicinal products for human use across the EU.
eCommerceDB. (2024). *eCommerce market Finland.*	Link to Report	Market Data/ Industry Database	Provides quantitative data and market insights on Finland's overall e-commerce landscape.
European Commission. (2013). *Guidelines of 5 November 2013 on Good Distribution Practice of medicinal products for human use (2013/C 343/01).*	Link to Guidelines	EU Guideline	Provides specific guidance on how medicinal products should be distributed under EU law.
European Commission. (2024). *European Health Data Space Regulation (EHDS).*	Link to European Commission	Framework Regulation/ EU Regulation Proposal	Focuses on digital health sharing across EU countries
European Medicines Agency. (2024). *Buying medicines online.*	Link to EMA	EMA Regulatory Website / Consumer Guidance Document	Offers general guidance on safe online medicine purchases.
European Medicines Agency. (2024). *Data protection and privacy at EMA.*	Link to EMA	EMA Institutional Policy Document	Explains how EMA handles personal data in line with GDPR.
Fimea. (2011). Medicines Decree	Link to Legislation	National Legislation/ Regulatory Decree	Specifies the detailed regulatory provisions for the handling, distribution, and sale of medicinal products in Finland.
Fimea. (2023). *Fimean selvitys itsehoitolääkkeiden myynnistä apteekkien ulkopuolella.*	Link to Fimea	Policy Report/ National Regulatory Analysis	Discusses the potential reform of OTC medicine sales outside pharmacies.
Fimea. (2019). *Good distribution practice of medicinal products.*	Link to Fimea	National Guideline	Finnish adaptation of EU GDP guidance,

			specifically for domestic implementation.
Fimea. (2025). *Lailliset apteekin verkkopalvelut.*	Link to Fimea	National Regulation	List of legal e-pharmacy practices in Finland.
Helsingin Sanomat. (2023). *Apteekkilupien määrästä voidaan luopua – Hallitus suunnittelee apteekkiuudistusta.*	Link to News Article	News Article	Reports on the Finnish government's plan to reform pharmacy regulations.
Helsingin Sanomat. (2023). *STM aikoo purkaa apteekkien hinnoittelua säätelevän tukkuportaan – Lääketaksaa ei kuitenkaan vielä romuteta.*	Link to News Article	News Article	Covers proposed changes to wholesale pricing regulation in Finland's pharmacy sector.
Kanta. (2024). *MyKanta.*	Link to Website	Official Government Health Service Website	Finland's national digital health service platform.
Karanikolos, M., Tynkkynen, L. K., & Keskimäki, I. (2024). *Finland: Health system summary.*	Link to Policy Report	International Policy Report	Comprehensive overview of Finland's healthcare system structure, funding, governance, and recent reforms.
MarketLine. (2024). *Healthcare providers industry profile: Finland*	Link to Report	Industry Report	Comprehensive overview of Finland's healthcare provider sector, including market structure, key players, regulatory environment, and industry trends.
Medicines Act (395/1987). (1987). *Provisions for the regulation and distribution of medicinal products in Finland.*	Link ton regulation	National Legislation/ Legal Framework	Core legal framework governing the manufacturing, distribution, sale, and advertising of medicines in Finland.

Ministry of Social Affairs and Health. (2023). *STM asettaa työryhmän valmistelemaan joidenkin itsehoitolääkkeiden myynnin vapauttamista.*	Link to Policy	Government Announcement/ Policy Development Document	Details the Finnish government's initiative to explore deregulating the sale of certain OTC medicines outside of pharmacies.
Nordic Competition Authorities. (2021). *Joint Nordic Report: Online pharmacy markets in the Nordics.*	Link to report	International Policy Report / Comparative Regulatory Analysis	Comparative overview of online pharmacy regulation across different countries, (Denmark, Iceland, Norway, Sweden, Finland) including competition policy implications.
Pharma Industry Finland (PIF). (2024). *Distribution of pharmaceuticals.*	Link to Website	Industry Website	Overview of how pharmaceuticals are distributed in Finland, including the role of pharmacies, wholesalers, and logistics providers.
Remomedi. (2025). *Innovative telepharmacy solutions.*	Link to Website	Company Website	Example of telepharmacy company in Finland.
Statista. (2024). *Pharmacies - Finland.*	Link to Database	Statistical Database	Data on the Finnish pharmacy market, including revenue, user penetration, and projected growth.
Treet. (2025)	Link to Website	Company Website	Example of a Finnish digital pharmacy startup.
Wolt. (2025). *Pharmacy partnerships and delivery solutions.*	Link to Website	Company Website/ Business Service Overview	Describes how Wolt supports pharmacies through logistics, real-time delivery tracking, and secure order fulfillment.

World Health Organization (WHO). (2023). *National regulatory authorities for medical products: Ensuring quality, safety and effectiveness*.	Link to Policy Report	International Policy Report	Global framework for the role and responsibilities of national regulatory authorities in overseeing medical product safety, quality, and effectiveness.
Yle. (2025). *Ilman reseptiä saatavien lääkkeiden tulo ruokakauppoihin riippuu tällä hetkellä yhdestä asiasta.*	Link to News Article	News Article	Covers ongoing discussions and political developments around the potential deregulation of OTC medicine sales in Finland.
Yliopiston Apteekki. (2025). *Verkkoapteekin toimitusehdot (Online Pharmacy Delivery Terms).*	Link to Website	Company Website/ Service Terms & Conditions	Outlines the operational policies, delivery conditions, and service limitations of Finland's largest online pharmacies Yliopiston Apteekki.

3.3 Data Analysis

The survey data is analyzed to identify trends in consumer behavior. As Saunders (2023) notes, descriptive research requires a clear understanding of the phenomenon before data collection to ensure meaningful interpretation. Since this study does not aim to establish causal relationships, inferential statistical methods such as regression or correlation analysis are not used. Instead, the focus is on summarizing and visualizing consumer preferences, concerns, and behaviors to provide a clear picture of the Finnish pharmaceutical e-commerce landscape.

The data from the regulations, industry, market and new reports are analyzed to identify patterns and emerging trends, as well as opportunities and challenges in the Finnish

pharmaceutical e-commerce sector. The analysis focuses on the role of Finland's regulatory environment in shaping the development and growth of e-pharmacies, as well as its broader implications for pharmaceutical business strategies. The sources are analyzed to identify key regulatory requirements, compliance challenges, and their implications for pharmaceutical e-commerce in Finland.

3.4 Research Context

This study focuses on Finland as the primary case to explore the challenges and opportunities in the pharmaceutical e-commerce sector. Finland offers a unique context as a highly digitalized country that lags behind many of its Nordic peers in liberalizing the pharmacy market (Nordic Competition Authorities, 2021). Finland ranks among the most digitalized countries in Europe, based on the Digital Economy and Society Index (DESI), yet its online pharmacy market remains underdeveloped compared to countries like Sweden and Denmark (Nordic Competition Authorities, 2021).

The Finnish online pharmacy market has been in operation for approximately a decade but is still relatively small, with a market size estimated between €10–20 million, accounting for less than 1% of the overall e-commerce market (Nordic Competition Authorities, 2021). This limited development is largely attributed to strict regulations that tie online pharmacy operations to physical pharmacy licenses, effectively barring online-only pharmacies from entering the market (Apteekkariliitto, 2023). This restrictive regulatory framework has constrained competition and innovation, making Finland an ideal case to examine how regulatory reforms could unlock market potential.

Despite these limitations, Finland’s advanced digital infrastructure and growing consumer trust in e-services position it as a promising market for pharmaceutical e-commerce (Punakivi, 2019). The rapid adoption of e-prescriptions, which became mandatory in 2017, has laid a strong foundation for digital healthcare services, including e-pharmacies (Nordic Competition Authorities, 2021). Furthermore, the COVID-19

pandemic significantly accelerated the demand for online pharmacy services, suggesting a lasting shift in consumer behavior towards digital channels.

The findings from Finland's case study are locally significant and also hold broader implications for international business. As highlighted in the Nordic Competition Authorities (2021) *Joint Nordic Report,* cross-border e-commerce is limited in the Nordic pharmaceutical markets due to differences in regulations. Understanding Finland's regulatory and consumer landscape can provide valuable insights for businesses looking to expand into other regulated markets, especially within the European Union, where harmonization of policies remains a challenge. Additionally, Finland's experiences may inform best practices for developing online pharmacy markets in other countries facing similar regulatory and logistical barriers.

3.5 Ethical Considerations

Ethical guidelines were followed throughout the research process to ensure integrity of this thesis. For the survey, informed consent was obtained from all participants, with assurances of confidentiality and anonymity. Data collected adhered to GDPR standards, ensuring protection of personal data.'

3.6 Limitations

This study acknowledges several limitations that may affect the generalizability and scope of its findings. First, the focus on Finland means that the results may not be directly generalizable to other markets without similar regulatory and technological contexts. Finland's specific combination of digital infrastructure and strict pharmacy regulations creates a unique environment that may not align with conditions in other countries. Second, the survey component of the thesis relies on voluntary online responses, which may introduce sampling bias by overrepresenting individuals who are more digitally engaged and excluding certain demographics, such as older populations or those with limited internet access. Third, the analysis of regulatory frameworks is based primarily

on secondary data sources, which may limit the ability to capture real-time policy changes or emerging trends that could impact the pharmaceutical e-commerce landscape. For example, the latest Apteekkariliitto (The Association of Finnish Pharmacies) annual review is from 2023. Lastly, while descriptive research is sometimes seen as merely observational (Saunders, 2023), this study ensures that its findings contribute to a broader understanding of industry challenges and inform business and policy decisions.

4 Findings

4.1 Research Findings from the Survey

The survey received 112 responses. It offers valuable insights into consumer engagement with online pharmacies in Finland. The survey indicates that 46.1% of respondents have purchased medicine or health products from an online pharmacy or mobile application (e.g., Wolt, Treet) in Finland, while 53.9% have not. This suggests that, although online pharmacy adoption is growing, a slight majority of consumers have yet to use online pharmacy channels for their healthcare needs. The majority of respondents belong to the 25-34 age group (77.4%), followed by 18-24-year-olds (11.3%), with older age groups representing a much smaller proportion: 35-44-year-olds: 4.3%, 45-54 years-olds: 3.5%, 55+ years-olds: 3.5%. This shows that the data skews heavily towards younger demographics (Millennial and Gen Z), who are generally more tech-savvy and therefore more likely to engage with digital health services, including e-pharmacies.

In terms of gender distribution, 56.5% of respondents identify as female, 41.7% as male, and 1.7% as non-binary or prefer not to say. Respondents were asked to rate their level of health consciousness on a Likert scale from 1 to 5. The results indicate that 47.8% rated themselves as 4 out of 5, 40% rated themselves as 5 out of 5, 10.4% rated themselves as 3, and only 0.9% rated themselves as 2 or 1. This suggests that nearly 88% of respondents consider themselves highly health-conscious, a factor that could significantly influence their willingness to engage with health-related digital services.

The survey shows that respondents are highly educated, with the majority holding advanced degrees. 49.6% have a master’s degree or higher, 37.5% have a bachelor’s degree, 11.3% completed high school, 1.7% selected “Other”. The high level of education among respondents may indicate a greater familiarity with digital platforms, trust in online services, and access to financial resources, all of which contribute to the likelihood of engaging with e-pharmacies. Overall, the survey respondents represent a

younger, highly educated, and health-conscious consumer group, with a near-even gender distribution and a moderate level of e-pharmacy adoption.

In the survey design, respondents were directed to different sets of questions based on their response to the question: "Have you ever purchased medicine or health products from an online pharmacy or mobile app (e.g., Wolt, Treet) in Finland?". If respondents answered "Yes", they proceeded to the "Users" section of the survey, which explored their frequency of online pharmacy use, motivations for choosing e-pharmacies, satisfaction with service aspects (e.g., delivery speed, pricing, product availability), and trust perceptions. This section aimed to analyze the experiences and behaviors of individuals who actively engage with e-pharmacy services.

If respondents answered "No", they were redirected to a different set of questions focusing on barriers to adoption, reasons for preferring traditional pharmacies, concerns about online medicine purchases, and factors that might encourage them to try an online pharmacy in the future. This section was designed to identify potential obstacles preventing wider adoption of e-pharmacies and to understand how these concerns might be addressed to convert non-users into future customers.

Regardless of their prior e-pharmacy usage, all respondents answered a final section titled "General Attitudes Toward E-Pharmacies." This section captured broader perceptions of online pharmacies, including trust, safety concerns, interest in additional services (e.g., telemedicine, subscription-based deliveries), and overall openness to digital healthcare solutions. This gave a complete view of consumer opinions on e-pharmacies, offering insights beyond just user behavior.

4.1.1 “User” Section Key Findings

This section presents key findings from the survey responses of e-pharmacy users (53 respondents) in Finland, focusing on usage frequency, satisfaction, trust, situational use, and consumer behavior patterns. The results show that most of the respondents

purchase pharmacy products (in-store or online) on a regular basis, with 45.3% buying medications monthly and 43.4% a few times a year. However, when looking specifically at online pharmacy usage, purchasing frequency drops significantly: 64.2% of respondents buy from an e-pharmacy only a few times a year and 30.2% use an online pharmacy once a year or less. This disparity suggests that while consumers rely on pharmacies regularly, they still prefer in-store purchases for the majority of their needs. This suggests that e-pharmacies serve as a complementary rather than primary purchasing channel.

Among users who shop online for pharmacy products, the most cited reasons include: Home delivery (71.7%), Convenience (67.9%), Being sick and unable to visit a pharmacy (67.9%), and Avoiding queues at physical stores (17%). These results are displayed in Figure 4.

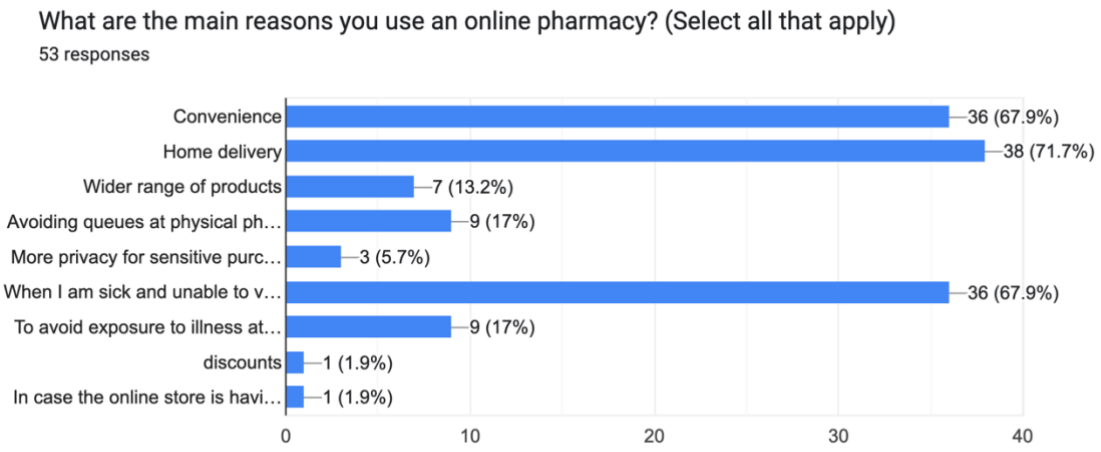

Figure 4. Main reasons for online pharmacy use among users

The TCV suggests that consumer decision-making is influenced by multiple value dimensions, including functional value (practical benefits) and conditional value (situation-driven use) (Sheth, Newman, & Gross, 1991). In the context of e-pharmacies, these two values are closely interlinked. The survey results in Figure 4 show that the most significant functional drivers are home delivery, convenience, and access to a

pharmacy while being ill. These findings align with prior research indicating that consumers prioritize services that enhance efficiency, reduce effort, and offer flexibility.

Additionally, 17% of respondents cited avoiding queues at physical pharmacies as a reason for using online pharmacies. This reinforces the idea that functional value is strongly tied to time-saving and reduced effort. Although fewer people chose e-pharmacies for a wider product selection or privacy for sensitive purchases, these still highlight unique benefits over physical pharmacies. The survey also explored the importance of fast delivery when choosing an e-pharmacy, with 88.7% of respondents rating it as important (4 or 5 on a 5-point scale). This highlights that logistics and rapid fulfillment are key considerations for users, supporting the idea that timely access to medications is a fundamental expectation.

Beyond motivation, users also expressed high satisfaction levels with e-pharmacy services, as seen in their ratings (Likert scale 1-5). Figure 5 displays the average ratings of each category.

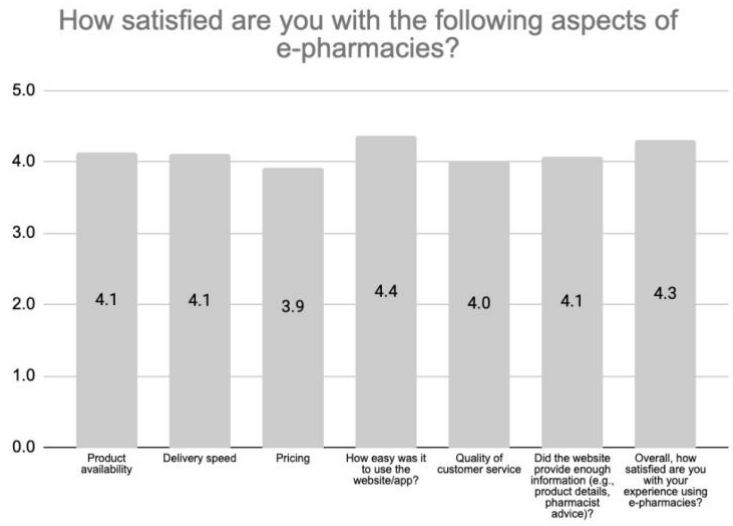

Figure 5. E-pharmacy satisfaction averages

These results in Figure 5 suggest that users find e-pharmacies reliable, efficient, and easy to navigate. Overall satisfaction is very high. However, pricing received the lowest satisfaction rating (3.9/5), indicating that affordability remains an area for improvement.

The conditional value refers to situational factors that influence consumer decision-making (Sheth, Newman, & Gross, 1991). The survey findings show that 67.9% of respondents use e-pharmacies when they are sick and unable to visit a physical pharmacy as one of the main reasons for using an e-pharmacy. This shows that health conditions act as a primary situational driver for adoption. Additionally, 17% of respondents cited concerns about exposure to illness at physical pharmacies (e.g., flu season, crowded spaces) as a reason for choosing online pharmacies. This suggests that external conditions, such as pandemics or seasonal illnesses, could further accelerate e-pharmacy adoption. However, despite access to a pharmacy while ill being a top motivator, actual adoption of e-pharmacies in emergencies remains limited. The survey found that 58.5% of respondents have used an e-pharmacy for urgent health needs *occasionally,* and 41.5% have *never* relied on an e-pharmacy in emergencies. 0% reported using e-pharmacies *frequently* in urgent situations. This discrepancy suggests that while consumers recognize the potential of e-pharmacies in urgent situations, some barriers still prevent wider adoption.

The strong emphasis on home delivery and convenience (functional value), combined with the situational necessity of accessing medications while sick (conditional value), demonstrates that e-pharmacies are primarily used for non-emergency, convenience-driven purchases rather than urgent medical needs. Consumers view e-pharmacies as an alternative rather than a replacement for traditional pharmacies, with their value increasing in specific conditions, such as illness, lack of mobility, or concerns about in-store exposure. However, satisfaction levels indicate that while e-pharmacies meet functional needs, there are areas where improvements could enhance their conditional value. Delivery speed was rated positively (4.1/5), but consumers still hesitate to rely on e-pharmacies for urgent needs. Pricing was rated the lowest (3.9/5), suggesting that cost

remains a barrier to wider adoption. Customer service (4/5) and website information clarity (4.1/5) indicate that while most consumers find e-pharmacies user-friendly, improvements in digital pharmacist interactions and clearer product details could strengthen trust.

Beyond functional and conditional value, TCV also highlights the role of social, emotional, and epistemic value in consumer decision-making (Sheth, Newman, & Gross, 1991). Social value refers to the extent to which a product or service is influenced by social approval, recommendations, or norms (Sheth, Newman, & Gross, 1991). In e-pharmacies, trust plays a significant role in shaping consumer adoption, and external influences, such as recommendations from family, friends, and healthcare professionals, impact perceptions. To assess how consumers perceive trust in e-pharmacies compared to traditional pharmacies, respondents were asked to rate their level of trust in e-pharmacies, whether they feel safe purchasing medicine online, and what factors influence trust in e-pharmacies. Figure 6 displays the results of respondent's trust in online pharmacy versus traditional pharmacy and Figure 7 displays the different factors influencing trust in online pharmacies.

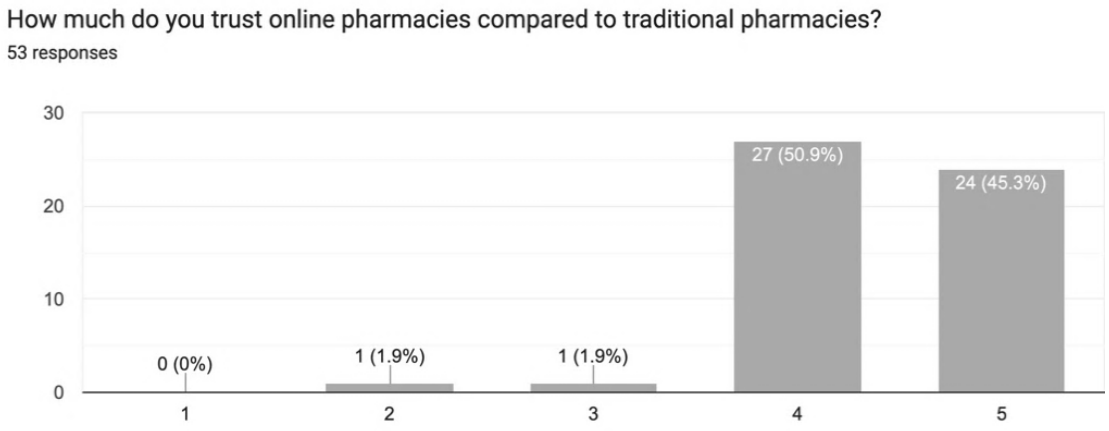

Figure 6. Trust in online pharmacy vs. traditional pharmacy

Figure 7. Factors influencing trust in online pharmacies

The results seen in Figure 6 show that trust in e-pharmacies is high, with 96.2% of respondents rating their trust level as 4 or 5 out of 5. The results in Figure 7 also show that trust in e-pharmacies is shaped by various social factors, with personal experience as the strongest factor. This means that repeat users who have had positive interactions with e-pharmacies are more likely to trust them. This suggests that once consumers overcome initial skepticism and have successful experiences, they are more inclined to continue using online pharmacies. Also, government or official certifications and brand reputation are significant contributors to trust, which highlights the idea that regulatory oversight and well-established pharmacy brands improve consumer confidence. Furthermore, the recommendations from friends and family and recommendations from healthcare professionals results suggest that word-of-mouth referrals and professional endorsements are also important in e-pharmacy adoption. The online reviews and ratings result show that digital feedback also contributes to consumer trust but is slightly less influential than personal referrals.

These insights align with the social value dimension of TCV, where consumers rely on validation from trusted sources before engaging in new behaviors (Sheth, Newman, & Gross, 1991). To increase social trust, e-pharmacies should emphasize regulatory

transparency, collaborate with healthcare professionals for endorsements, and encourage positive customer reviews.

The emotional value of TCV can also be assessed. Emotional value relates to the feelings and psychological benefits associated with a purchase decision (Sheth, Newman, & Gross, 1991). In the context of e-pharmacies, safety perceptions and confidence in digital healthcare interactions influence consumer adoption. Contrary to the assumption that in-person pharmacies are preferred for safety, the survey results in Figure 8 show that most respondents (81.8%) feel equally safe purchasing medicine online compared to traditional pharmacies. This data indicates that many consumers do not perceive e-pharmacies as inherently riskier than traditional pharmacies. This shows that emotional hesitation around e-pharmacy safety is lower than expected, and most consumers view online pharmacies as a secure alternative. However, a small group (9.1%) of respondents still expressed a preference for in-person purchases due to safety concerns.

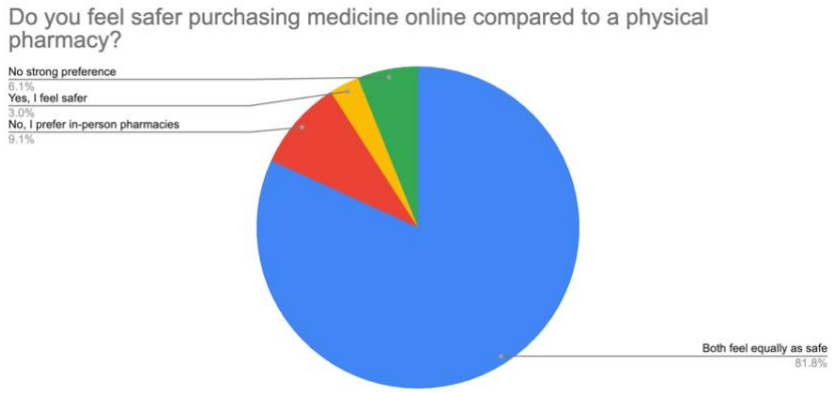

Figure 8. Safety perceptions of e-pharmacies

To further enhance emotional confidence in e-pharmacies, strategies for pharmacies could include strengthening pharmacist accessibility through chat, video or phone call consultations, providing more transparency about medication information, and emphasizing security features such as encrypted transactions. However, since most consumers already feel e-pharmacies are just as safe as traditional pharmacies, online

providers should shift their focus from reassuring safety to enhancing convenience, trust in prescription handling, and expanding digital pharmacist interactions.

In the TCV, epistemic value refers to consumer curiosity and interest in exploring new experiences (Sheth, Newman, & Gross, 1991). In the context of e-pharmacies, this is reflected in the openness to digital healthcare solutions and additional services. The survey results displayed in Figure 9 show a strong willingness to explore additional e-pharmacy services.

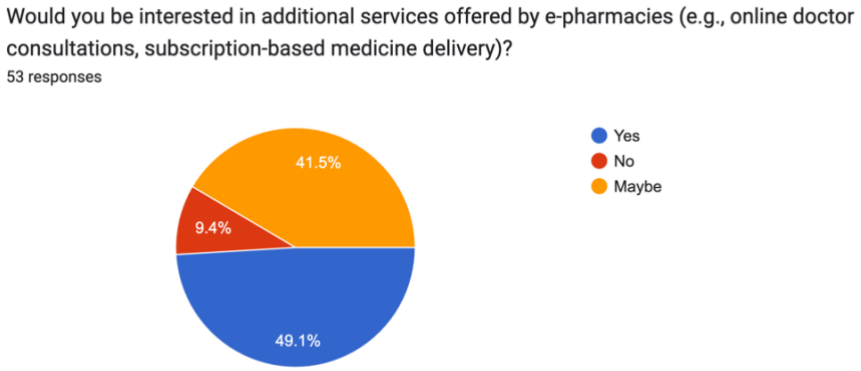

Figure 9. Interest in additional services offered by e-pharmacies

Additionally, when asked about discussing sensitive health information with an online pharmacist, 43.4% were highly comfortable and 31.1% rated their comfort level 4 out of 5. These findings suggest that consumers are open to using and exploring new digital health services and this demonstrates a growth opportunity for e-pharmacies. For example, by offering telemedicine, medication subscription plans, online doctor consultations, and enhanced digital pharmacist interactions, pharmacies could gain additional loyal customers and expand their revenue streams. Leveraging consumer interest in digital health services can drive long-term adoption and engagement with e-pharmacies.

4.1.2 “Non-User” Section Key Findings

This section presents key findings from the “Non-Users” section of the survey (62 respondents). It focuses on barriers to adoption, factors that could increase usage, perceptions of e-pharmacies, and trust levels compared to traditional pharmacies. Although e-pharmacy usage was relatively high among respondents, over half of the respondents had not purchased from e-pharmacies before. This shows that many consumers remain hesitant to transition to digital pharmacy services due to various reasons.

The survey explored why “non-user” respondents have not used e-pharmacies, what would make them more likely to try one, in what situations they see e-pharmacies as useful, and their trust levels compared to traditional pharmacies. These insights provide a good understanding of the obstacles preventing non-users from engaging with online pharmacy services and what pharmacy businesses can do to bridge the gap between perception and adoption.

Respondents were asked to select the main reasons why they have not used e-pharmacies before. The results from this question are displayed in Figure 10.

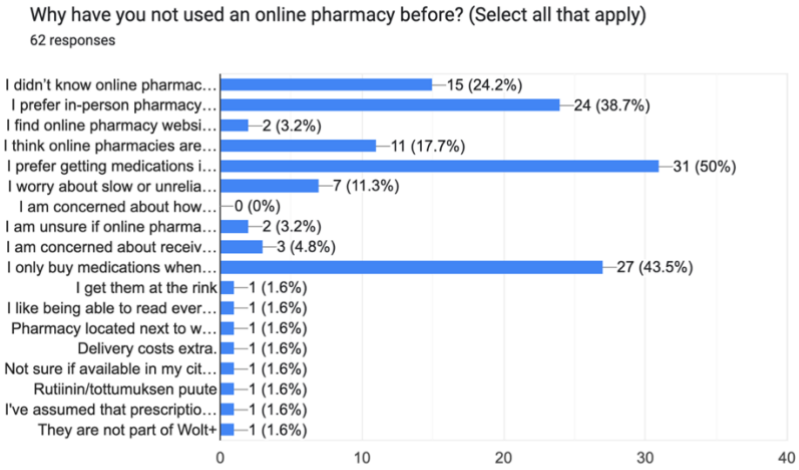

Figure 10. Reasons why respondents have not used e-pharmacies

The results displayed in Figure 10 show that “I prefer getting medications immediately from a physical pharmacy” was the most cited reason (50%). Additionally, “I only buy medications when I am sick and prefer in-person consultation” (43.5%) and “I prefer in-person pharmacy visits” (38.7%) also had high response rates. Beyond preference for in-person pharmacy interactions, other barriers include lack of awareness about online pharmacies, concerns about higher price in e-pharmacies, and concerns about slow or unreliable delivery. These findings suggest that many non-users do not yet see e-pharmacies as an equally functional or efficient alternative to traditional pharmacies. Similarly to the user section findings, the importance of functional value is highlighted here. To convert non-users, e-pharmacies should focus on emphasizing service efficiency and reliability, as well as raising awareness with marketing efforts. Also reinforcing the importance of logistics and fast delivery options is needed to build adoption. If non-users do not perceive functional benefits, they are unlikely to explore e-pharmacy services as an option.

While many non-users hesitate to use e-pharmacies regularly, they recognize the value of them in specific situations. To explore what values affect consumers decision making, respondents were asked what would make them more likely to try an online pharmacy

and in which scenarios they would find e-pharmacies beneficial. The results are displayed in Figure 11 and 12.

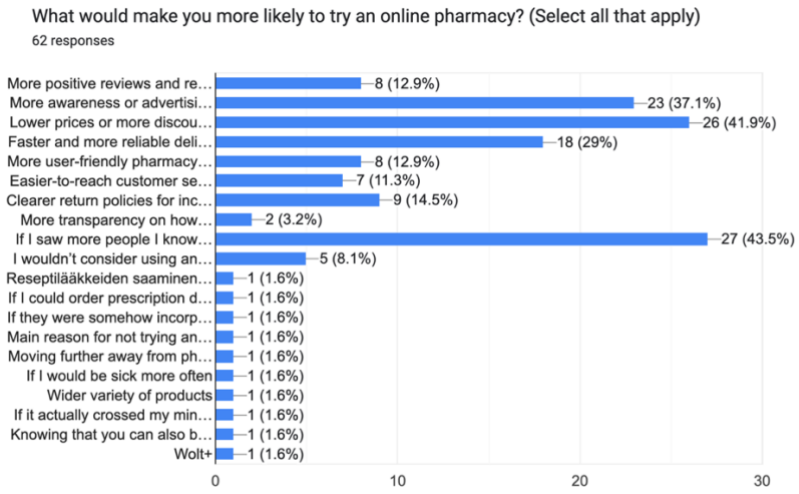

Figure 11. Factors contributing to non-users trying an online pharmacy

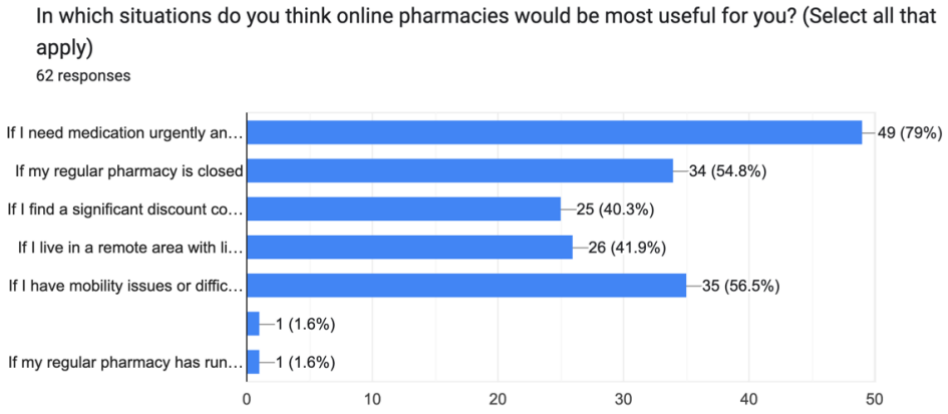

Figure 12. Scenarios where e-pharmacies could be found useful

The results displayed in Figure 11 show that “If I saw more people I know using them” was the most cited reason (43.5%). This suggests that social validation is a key motivator for non-users considering e-pharmacies. Social influence plays a significant role in shaping consumer behavior, as seeing friends, family, or colleagues using an online pharmacy can reduce skepticism and encourage first-time purchases. This aligns with the

social value dimension of the TCV (Sheth, Newman, & Gross, 1991), where consumers tend to adopt behaviors that are socially reinforced. E-pharmacies should strengthen their social value by leveraging word-of-mouth marketing, referral programs, and influencer partnerships to encourage adoption.

Additionally, 41.9% of respondents cited lower prices or more discounts as a motivator, showing that cost considerations play a major role in adoption. This suggests that e-pharmacies should highlight affordability, offer first-time user discounts, and develop loyalty programs to attract hesitant consumers. Also, the “More awareness or advertising about trusted online pharmacies” responses (37.1%) highlight that non-users lack sufficient knowledge about e-pharmacies or do not actively consider them as a viable option. Furthermore, consumers may not be aware of government regulations, safety measures, or convenience offered by e-pharmacies. This highlights the importance of educational marketing campaigns to raise awareness. For example, pharmacies could leverage social proof through customer testimonials, influencer partnerships, and advertising about legitimacy and convenience.

Figure 12 displays the results for the question “In which situations do you think online pharmacies would be most useful for you?”. This question reflects the conditional value in TCV, which is how external factors influence consumer decisions, such as urgency, location or access to alternatives (Sheth, Newman, & Gross, 1991). The results show that many non-users recognize that e-pharmacies could be most useful in emergency medical needs, during pharmacy closures, or when mobility is limited. The fact that many respondents prioritize price and delivery speed suggests that they would be more likely to try an online pharmacy under the right conditions, such as a time-sensitive situation where discounts or convenience outweigh other concerns.

Non-users were also asked two questions about trust and comfort levels regarding e-pharmacies and medical prescription purchases. The results are displayed in Figures 13 and 14.

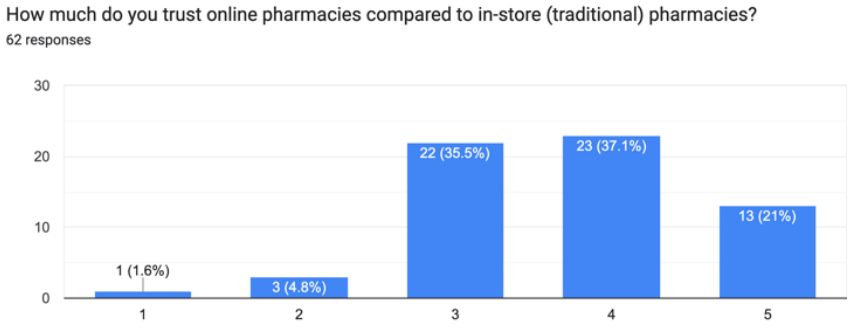

Figure 13. Trust in online pharmacies compared to in-store (traditional)

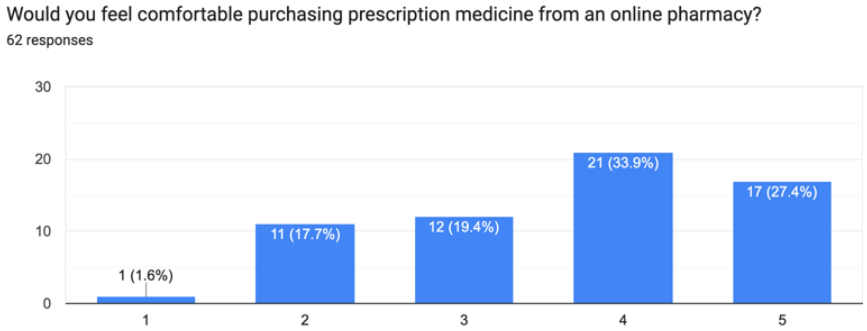

Figure 14. Comfort levels of purchasing prescription medicine from an online pharmacy

Figure 13 shows that non-users demonstrated moderately high trust levels, with 37.1% rating their trust as 4 out of 5 and 35.5% 3 out of 5. These results show that e-pharmacies are not distrusted, and most non-users feel neutral about trustworthiness, but at the same time e-pharmacies have yet to reach the same level of confidence as traditional pharmacies among non-users. Trust levels in e-pharmacies directly correlate with comfort in purchasing prescription medications online, displayed in Figure 14. 33.9% rated their comfort at 4 out of 5, indicating moderate openness to online prescription purchases. However, 37.1% of respondents rated their comfort level as 3 or lower, which shows that there is also hesitation.

Respondents who answered 3 or lower were asked a follow-up question to specify their concerns. The most cited concerns included preference for speaking to a pharmacist in person, being unsure of how online prescriptions work, concerns about counterfeit or unsafe medications, and not trusting how personal and medical data is stored. These results are related to different values of TCV, including the emotional value, which is the psychological comfort and security that consumers feel when making purchasing decisions (Sheth, Newman, & Gross, 1991). Preferring to speak with a pharmacist in person indicates that emotional reassurance from human interaction is important and could be a key reason consumers hesitate to switch to e-pharmacies.

The final section of the survey was answered by both e-pharmacy users and non-users, providing a broader perspective on consumer trust, perceived convenience, and likelihood of future adoption. Respondents were asked how much they trust that online pharmacies in Finland provide safe and authentic medications. The results indicate a strong level of trust, with 51.3% rating their trust 5 out of 5 and 34.8% 4 out of 5. This shows high confidence in Finnish e-pharmacy safety standards. Additionally, respondents were asked how likely they are to purchase medications from an online pharmacy in the next six months. The results are displayed in Figure 15.

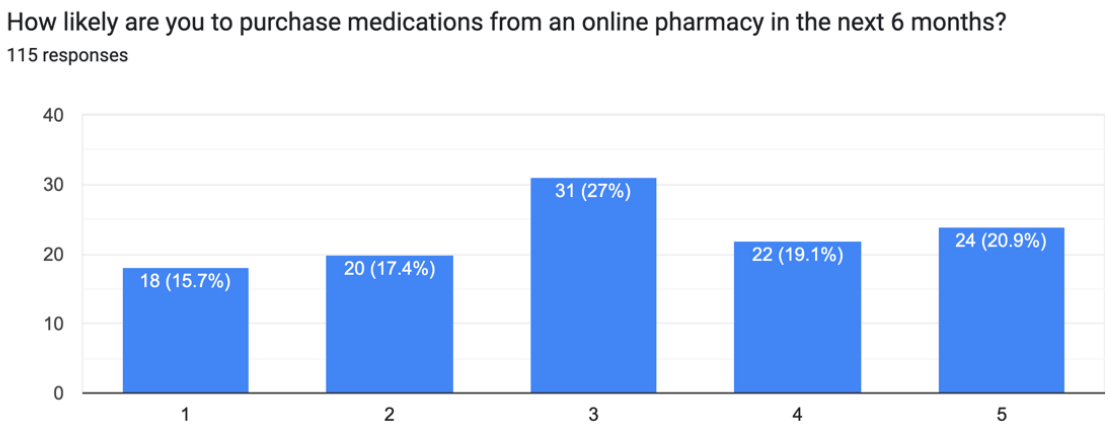

Figure 15. Likelihood of purchasing from an online pharmacy in the next six months

The results in Figure 15 show that a relatively large portion of consumers are open to using e-pharmacies in the future, many remain undecided, and a small portion show no intent to use an e-pharmacy in the next 6 months. The neutral respondents (27%) may be influenced by price, delivery speed, or familiarity with traditional pharmacies. Respondents were also asked whether they are more likely to use online pharmacies when sick. The results indicate a strong correlation between illness and e-pharmacy adoption. 45.2% rated it 5 out of 5, meaning they would strongly consider using an e-pharmacy when sick. 30.4% rated 4 out of 5, reinforcing this trend. Only 4.3% rated 1 out of 5, indicating that very few respondents would reject the idea entirely. This suggests that situational necessity (conditional value) plays a key role in e-pharmacy adoption. Consumers may prefer in-person pharmacies for routine purchases but recognize the value of e-pharmacies when mobility is limited due to illness.

4.2 Finland's Pharmaceutical E-commerce Regulatory Research

This section examines Finland and EU pharmaceutical e-commerce regulatory landscape. Insights are drawn from the secondary sources listed in Table 1 on pages 33-38.

4.2.1 Finland's Healthcare Landscape

Finland's healthcare system is built on the principles of equity, accessibility, and efficiency and it provides a solid foundation for the development of pharmaceutical e-commerce (MarketLine, 2024). Managed through a decentralized structure, over 300 municipalities are responsible for delivering basic healthcare services, funded primarily through taxation (MarketLine, 2024). Despite these strengths, Finland faces challenges such as an aging population, healthcare worker shortages, and increasing public debt (MarketLine, 2024). Recent reforms, including the establishment of 21 well-being services counties (WSCs) to centralize healthcare, aim to address these systemic issues while granting national authorities' greater financial oversight (Karanikolos, Tynkkynen, & Keskimäki, 2024).

The adoption of digital technologies, including Finland's national ePrescription system and MyKanta platform, highlights the country's development in digital healthcare (Lämsä et al., 2017). The ePrescription system allows healthcare professionals to issue prescriptions electronically and it connects seamlessly to pharmacies for dispensing medicines (Peltoniemi et al., 2021). MyKanta platform enhances transparency and access by enabling Finnish citizens to manage personal health data, request prescription renewals, and access vaccination records online (Kanta, 2024). These digital tools form the core of Finland's digital pharmaceutical system (Lämsä et al., 2017).

4.2.2 Finland's Pharmacy Sector

The Finnish pharmacy sector plays a critical role in ensuring access to medications, supported by an extensive network of 827 pharmacies and 188 subsidiary pharmacies (Apteekkariliitto, 2023). Finland has two university-owned pharmacies: the University Pharmacies of Helsinki (Yliopiston Apteekki or YA), operating 17 branches nationwide, and the University Pharmacy of Eastern Finland, located in Kuopio. These university pharmacies function similarly to privately owned community pharmacies (Lämsä et al., 2017). The average annual revenues are €4 million per pharmacy and prescription medicines accounts for over 81% of sales (Apteekkariliitto, 2023).

Regulated by Fimea, the Finnish Medicines Agency, Finland's pharmacy system operates under strict licensing requirements, with all medicines (except nicotine replacement therapies) exclusively sold through pharmacies (Apteekkariliitto, 2023). This centralized model ensures quality and safety but limits competition, particularly in the growing online pharmacy market (Nordic Competition Authorities, 2021). However, recently there have been proposals to allow OTC medicines to be sold outside pharmacies, but these discussions remain controversial, with stakeholders debating the impact on public health and pharmacy networks (Fimea, 2023).

4.2.3 Finland's Pharmaceutical E-commerce Landscape

Finland's pharmaceutical e-commerce market is expected to grow significantly, with a projected market size of €131.2 million by 2028, representing an 8.8% compound annual growth rate (eCommerceDB, 2024). E-prescriptions, mandatory since 2017, have been pivotal in facilitating the growth of online pharmacies (Nordic Competition Authorities, 2021). Despite this progress, the market remains underdeveloped compared to other Nordic countries due to strict regulations requiring online pharmacies to operate as extensions of physical pharmacies, effectively barring online-only pharmacies (Nordic Competition Authorities, 2021).

YA dominate the online pharmacy market, with online sales surging from €9.5 million in 2019 to €23 million in 2020, largely due to the COVID-19 pandemic (Nordic Competition Authorities, 2021). Individual pharmacies have also launched e-pharmacy operations in Finland, with many new e-pharmacies being established in recent years (Fimea, 2025; Nordic Competition Authorities, 2021). According to Fimea (2025), there are 270 legal operating e-pharmacies in Finland. Additionally, multiple mobile platforms, including Treet, Wolt, and Remomedi, support e-pharmacy services, offering features such as remote consultations, express home-delivery, and personalized medication management (Treet, 2025; Wolt, 2025; Remomedi, 2025).

4.2.4 Finland Regulatory Frameworks

Pharmacy operations in Finland are highly regulated under the Medicines Act, with Fimea responsible for granting licenses (Medicines Act (395/1987). Licenses are location-specific, often requested by municipalities, and can be held by licensed pharmacists in Finland (Fimea, 2024). A pharmacist can operate one main pharmacy and up to three subsidiary pharmacies simultaneously and service points can also be established in areas where a full pharmacy is not feasible, provided Fimea approves the request (Apteekkariliitto, 2023).

According to The Finnish Pharmacy Association (Apteekkariliitto) (2023), prescription drug prices in Finland are determined by the Decree on Medicine Tariffs, which bases retail prices on wholesale prices. Pharmacies are not allowed to set prices independently, as these are state-controlled. An amendment to the Medicines Act in April 2022 introduced a maximum retail price for OTC medications. While pharmacies can sell OTC medicines at a lower price, they cannot go below the wholesale price. The pricing model is degressive, meaning that as the wholesale price increases, the pharmacy's relative profit margin decreases.

According to The Finnish Pharmacy Association (Apteekkariliitto) (2023), the pharmacy tax in Finland is progressive, based on revenue from prescription and OTC medicine sales. Smaller pharmacies benefit from lower tax rates or exemptions, while larger pharmacies pay a higher tax rate, sometimes exceeding 10% of their revenue from medicine sales. This system reduces income disparities among pharmacies of varying sizes and generates approximately €207 million annually for the Finnish state. For medicines with a wholesale price exceeding €1,500, only a portion of the revenue (€1,683.92) is taxable under the pharmacy tax.

The Finnish government is exploring reforms to pharmacy regulations, particularly focusing on the sale of OTC medicines outside of traditional pharmacies (Fimea, 2023). This potential expansion would allow commonly used OTC medicines, such as pain killers and allergy medications, which are currently only sold in pharmacies in Finland, to be sold in grocery stores and other non-pharmacy locations (Fimea, 2023). Key considerations for this reform include maintaining high standards of medication safety and ensuring proper counseling for consumers. Currently, Finnish law requires pharmacists to provide counseling on the safe use of medicines, a safeguard that would need to be adapted for non-pharmacy settings. Proposals include remote counseling options, as seen in pharmacy service points, to address this challenge (Fimea, 2023; Yle, 2025). However, critics warn that such changes could negatively impact small pharmacies, particularly in rural areas, potentially reducing access to essential

medicines in underserved regions. There are also concerns about the misuse or overuse of certain OTC medicines without adequate supervision (Fimea, 2023).

The Finnish Pharmacy Association has expressed strong opposition to the proposed changes, citing risks of increased improper use of medicines and higher healthcare costs. They argue that similar reforms in Sweden led to a sharp rise in OTC medication sales and spending, without significant benefits to public health. The association also highlights the potential for the reform to weaken Finland's pharmacy network (Yle, 2025; HS, 2025). Representatives from retail industries argue that the reform could significantly enhance accessibility, particularly for individuals in remote areas. They suggest that the reform could reduce costs for consumers by encouraging competition, as seen in Sweden and Norway, where similar changes led to price reductions (Yle 2025; HS, 2024). However, achieving this balance would require thorough planning, including solid regulations to handle challenges like providing proper counseling and making sure taxes are fair for both pharmacies and new sales options.

International comparisons provide valuable insights, as neighboring countries like Norway and Sweden allow limited OTC sales outside pharmacies but lack the counseling requirements mandated in Finland. Surveys indicate that nearly half of Finnish consumers would prefer to purchase OTC medicines from grocery stores for convenience (Yle, 2025). However, pharmacy representatives caution that this could weaken Finland's well-established pharmacy network, which plays a crucial role in maintaining equitable access to medicines nationwide (Yle, 2025). Any regulatory changes would require updates to the Medicines Act and significant investment in monitoring and enforcement mechanisms to maintain the high safety standards Finland is known for (Fimea, 2023).

4.2.5 E-pharmacy Regulation Finland

Online pharmacies or e-pharmacies in Finland also operate under a strict regulatory framework. They are governed by the Finnish Medicines Act (395/1987), the Medicines

Decree (693/1987), and Fimea's specific regulations on online pharmacy services (2/2011). Online pharmacies must operate as an extension of a physical pharmacy, and there are no online-only pharmacies allowed (Nordic Competition Authorities, 2021). Pharmacists can establish online pharmacies by notifying Fimea, which oversees and supervises these operations to ensure compliance with safety, quality, and privacy standards (Apteekkariliitto, 2023; Fimea, 2024). According to Section 38 of the Medicines Act (395/1987), an online pharmacy service refers to the sale of medicines based on an order placed by a customer via the internet. Section 52b of the Medicines Act states that the regulations governing online pharmacy services also apply to the sale of medicines through other remote communication methods. Examples of remote communication methods mentioned in the legislative materials include the internet, telephone, mail, television, or any other medium that allows agreements to be made without the parties being physically present at the same time. Section 52b also specifies that pharmacy services via online platforms may be provided by individual pharmacies, the University Pharmacy of Helsinki, and the University Pharmacy of Eastern Finland.

Establishing an e-pharmacy in Finland is a complex process. To initiate an e-pharmacy, pharmacists must submit an advance notification to Fimea using a designated form available on its website (Fimea, 2024). Fimea charges the pharmacy handling fees for the advance notifications and certain change notifications (Fimea, 2024). Once the notification is submitted, operations can begin unless Fimea requests additional information or objects within 60 days (Fimea, 2024). Pharmacists are also required to notify Fimea when the service officially starts or ends, as well as report any significant changes to operations (Fimea, 2024). Notifications can be sent electronically without a signature if submitted from a recognizable email address belonging to the pharmacist or pharmacy (Fimea, 2024).

All legitimate e-pharmacies are listed on Fimea's website. These pharmacies must include a link to this list on their own websites, allowing customers to verify their legitimacy (Fimea, 2024). Consumers can recognize a legal online pharmacy from the

official logo on the website (displayed in Figure 11). Clicking on the logo takes the customer to Fimea's website with a list of all legal online pharmacies in Finland (Fimea, 2024).

Figure 16. Legal online pharmacy logo (Fimea, 2024).

According to Fimea (2024), e-pharmacies in Finland are legally required to offer customers the opportunity to consult a pharmacist for guidance on the correct and safe use of medications. This applies to both prescription and OTC drugs. To purchase prescription medications online, an electronic prescription is mandatory, and legitimate e-pharmacies must contact customers to provide additional usage guidance. Furthermore, medicines purchased online cannot be returned.

When ordering prescription, for example from the biggest pharmacy chain in Finland, YA, customers must undergo strong authentication and possess an electronic prescription (Yliopiston Apteekki, 2025). Additionally, the pharmacy provides guidance through a secure chat service with pharmacists, who assist with purchasing both prescription and OTC products. Some products, like emergency contraception and orlistat prescriptions, require extra pharmacist consultation before purchase. These can only be purchased after registering as a user and completing counseling via chat or phone (Yliopiston Apteekki, 2024).

Remote sales of medicines must comply with additional retail regulations to ensure the quality, safety, and efficacy of medicines and the protection of customer privacy and these regulations also extend to the sale of veterinary medicines (Fimea, 2024) Fimea

supervises all e-pharmacy operations as part of its broader oversight responsibilities. Pharmacists must ensure compliance with these regulations and use appropriate equipment and systems (Fimea, 2024).

Finland enforces the EU's General Data Protection Regulation (GDPR) regulations to protect sensitive personal and health data in e-pharmacy operations. This includes strict rules on obtaining explicit consent, implementing secure data handling practices, and ensuring customer privacy at every stage of online transactions (Apteekkariliitto, 2023; Fimea, 2025). Concerns about data leaks have led to heightened awareness on GDPR in e-pharmacies. In response to risks highlighted in other EU countries, Finnish pharmacies are investing in data protection training and internal protocols. The Finnish Pharmacy Association has developed comprehensive GDPR training programs for pharmacy staff in collaboration with the Pharmaceutical Learning Center in Finland (Apteekkariliitto, 2023) .

Pharmaceutical logistics in Finland is also regulated by Fimea under the Medicines Act (395/1987) and EU's Good Distribution Practice (GDP) guidelines (Fimea, 2019; EU GDP, 2013). Distribution ensures the safe and efficient delivery of medicines from manufacturers to wholesalers, pharmacies, and healthcare facilities. It includes strict controls to prevent counterfeit medicines from entering the supply chain (Fimea, 2019; EU GDP, 2013).

According to the Medicines Act, only licensed wholesalers are permitted to handle medicinal products, and they must have appropriate facilities and equipment to store and transport medicines under specified conditions (Medicines Act, Section 32). According to Pharma Industry Finland's (2024) overview, all medicines pass through pharmaceutical wholesalers, with Oriola and Tamro being the largest players in the market (Pharma Industry Finland, 2024). The system operates on a one-channel principle, meaning pharmacies and hospitals can obtain a pharmaceutical company's products from only one designated wholesaler. This approach simplifies logistics and enhances

control. Additionally, The Finnish distribution chain is professionally managed and closely monitored to prevent counterfeit medicines from entering the system. Since 2019, the European Medicines Verification System has been in place to further ensure the authenticity of medicines. Pharmacies handle the retail distribution for prescription and OTC medicines (Pharma Industry Finland, 2024).

The distribution chain in Finland adheres to GDP guidelines to prevent counterfeit medicines from entering the supply chain and to maintain high safety standards (Fimea, 2019). Wholesalers must maintain detailed records of procurement, storage, and distribution, which are subject to regular audits. Additionally, Fimea enforces quality systems that include proper storage, temperature control, and immediate reporting of any product irregularities or falsifications (European Commission 2013; Fimea, 2019).

4.2.6 EU Regulations on Pharmaceutical E-commerce

Pharmaceutical e-commerce in the EU is governed by a combination of national and EU-level regulations aimed at ensuring the safety, quality, and accessibility of medicines. Key EU measures include:

1. **EU Common Logo for Online Pharmacies**

Since July 1, 2015, EU member states have been required to comply with regulations mandating a common logo for authorized online pharmacies, which must be registered with national regulatory authorities (NRAs) (European Medicines Agency, 2024). NRAs ensure the quality, safety, and effectiveness of medical products, including those distributed through e-commerce platforms. NRAs regulate medical products throughout their entire life cycle, from market entry to ongoing quality assurance, and eventual market exit. This includes evaluating and monitoring products to ensure they meet safety and quality standards while implementing core regulatory functions at every stage (World Health Organization, 2023).

The common logo, recognizable across the EU, allows consumers to identify legitimate online pharmacies and links to the website of the competent authority in the relevant

member state (EU Directive 2001/83/EC). Clicking on the logo redirects users to the register of online retailers for the specific country where the retailer is established and registered, matching the flag displayed on the logo. The logo includes both the national flag and accompanying text as essential components. Only national flags of EU Member States, along with those of Norway, Iceland, and Liechtenstein, are permitted. A logo displaying the EU flag, for instance, is not genuine (European Medicines Agency, 2024). This initiative, supported by the creation of a national registry for authorized online medicine retailers, aims to mitigate risks associated with counterfeit or substandard medications (European Medicines Agency 2024).

2. **GDPR Compliance**

According to the European Union (2024), GDPR is a legal framework designed to safeguard the personal data and privacy of individuals within the EU. Implemented in May 2018, GDPR applies to all businesses and organizations that process personal data, regardless of whether they are based in the EU or operate outside its borders while dealing with EU citizens. Its primary objective is to ensure that personal data is collected, processed, stored, and shared in a secure, lawful, and transparent manner.

Furthermore, the EU states that under GDPR, businesses are required to obtain explicit consent from individuals before processing their data and must clearly explain how this data will be used. Consumers have the right to access their personal data, request corrections or deletions, and even object to specific types of data processing. For organizations, non-compliance can result in severe penalties, including fines of up to €20 million or 4% of their global annual turnover, whichever is higher. GDPR is central to safeguarding the privacy of consumers engaging with online pharmacies across the EU (European Medicines Agency, 2024). GDPR requires that personal data, including sensitive health information, is collected, processed, and stored securely. Consumers have the right to access, correct, or delete their data, and companies must notify authorities promptly in the event of data breaches (European Medicines Agency, 2024).

3. **Good Distribution Practices (GDP)**

The EU's Guidelines on Good Distribution Practice (GDP) for medicinal products, revised in 2013, establishes the framework for ensuring the quality and integrity of medicines throughout the supply chain. Based on Directive 2001/83/EC and further reinforced by Directive 2011/62/EU, these guidelines are designed to protect patients by preventing falsified medicines from entering the legal distribution network and ensuring that all medicinal products maintain their safety and efficacy during storage and transport (European Commission, 2013).

GDP is defined as "that part of quality assurance which ensures that the quality of medicinal products is maintained throughout all stages of the supply chain from the site of manufacturer to the pharmacy or person authorized or entitled to supply medicinal products to the public" (page 13, EU Directive 2013/C 68/01). Key features of the GDP regulation include quality management systems, personnel requirements, premises and equipment requirements, documentation and record-keeping, transport and handling, and prevention of falsified medicines (European Commission, 2013).

4. **Medicines Directive 2001/83/EC**

This directive establishes safety and quality standards for medicinal products across the EU, ensuring consistent oversight and monitoring (European Medicines Agency, 2024).

4.2.7 Finland & EU: Regulatory Comparison

The following Table 2 compares Finland's pharmaceutical e-commerce regulations with broader EU standards and practices.

Table 2. Finland & EU: Pharmaceutical Regulatory Comparison

Aspect	**Finland**	**EU**
Online Pharmacy Models	Only extensions of physical pharmacies are allowed; online-only	Online-only pharmacies are permitted in several EU countries, including Sweden

	pharmacies are prohibited (Fimea, 2024).	and Denmark (Nordic Competition Authorities, 2021).
Consumer Safety	Customers must be provided the option for guidance from a pharmacist for all OTC products, and mandatory guidance for prescription products (Fimea, 2024). When ordering prescriptions, customers must undergo strong authentication and possess an electronic prescription. The pharmacy provides guidance through a secure chat service with pharmacists, who assist with purchasing both prescription and OTC products. Some products, like emergency contraception and orlistat prescriptions, require extra pharmacist consultation before purchase (Yliopiston Apteekki, 2024).	Similar safety standards apply across the EU, but mandatory guidance for OTC medicines is not universally required (European Medicines Agency, 2024).
Market Competition	No price competition for prescription medicines; OTC and prescription medicine pricing is state regulated (Apteekkariliitto, 2023).	Price competition is allowed in countries like Sweden for example (Nordic Competition Authorities, 2021).
Data Protection	Finland enforces the EU's GDPR regulations to protect sensitive	GDPR applies across the EU, with varying levels of enforcement and adaptation

	personal and health data in e-pharmacy operations.	to local contexts (European Union, 2024).

5 Discussion

The survey findings provide valuable insights into how consumer behavior trends shape pharmaceutical e-commerce in Finland. The results reveal a growing acceptance and trust in e-pharmacies, particularly among digitally literate and health-conscious consumers. However, they also reveal several barriers that continue to affect broader adoption of e-pharmacies. Additionally, the regulatory analysis highlights how strict legal framework, such as price controls, limitations on marketing, mandatory pharmacist consultations, and licensing requirements, further shape the development of the sector. This section discusses how behavioral and regulatory factors interact and influence the opportunities and challenges for e-pharmacy development in Finland, aligning with the research question and objective of the thesis.

The survey sample was predominantly composed of young, highly educated, and health-conscious individuals. This group reflects a key demographic typically more ready for digital health adoption and being comfortable with using online platforms and services. Their responses reflect a generally optimistic outlook on the convenience and safety of purchasing medicines online through e-pharmacies. However, although this segment represents an important target segment for e-pharmacy businesses, it is important to recognize that this demographic has potential biases that can limit the generalizability of the findings to the broader Finnish population. While the findings reveal significant potential for growth among digitally adept users, they may overlook the perspectives and challenges faced by older adults, individuals with lower digital literacy, or those living in rural areas, all of whom are critical to understanding the full landscape of pharmaceutical e-commerce adoption in Finland.

One of the most promising insights from the survey is the high degree of trust in the Finnish pharmaceutical system. Consumers expressed confidence in the safety and authenticity of medications purchased online in Finland. This consumer trust is supported by Finland's digital healthcare infrastructure, including the national e-prescription system and MyKanta platform, which simplify the access to prescriptions

and medical records. According to Fimea, the regulation of medicine authenticity and traceability is strictly enforced, further enhancing consumer trust. This level of safety perception directly aligns with the functional value in the TCV, which states that consumers evaluate products based on their capacity to fulfill practical, utilitarian needs.

While most respondents trust e-pharmacies for general OTC medication purchases, a significant portion remains hesitant to purchase prescription medicine online. However, reasons for this did not include concerns with medicine safety and authenticity, indicating strong confidence in Finland's pharmaceutical quality control systems. Instead, the results show that the hesitation is mostly due to uncertainty with medication delivery, unfamiliarity with online prescription processes, and concerns over data security. These concerns highlight the importance of emotional values, particularly feelings of safety, security, and reassurance, in shaping consumer decision-making, as emphasized in the TCV. Consumers are less likely to adopt services that feel risky or unfamiliar, even if they are convenient or efficient. This suggests that building trust is not solely about the quality of the medicine, but also about how the overall experience is perceived in terms of security and transparency. To address this, e-pharmacy platforms must invest in clear and transparent communication regarding data handling, delivery timelines, and prescription verification procedures.

E-pharmacy businesses should invest in strong digital tools and easy-to-use websites that make ordering prescription medications online effortless and stress-free for consumers. Educational efforts, such as step-by-step guides, customer testimonials, and pharmacist-led digital consultation, can reduce uncertainty and improve confidence. Businesses should also highlight trust and safety credentials throughout the ordering process, especially regarding consumer data safety and GDPR compliance. There should be more transparency regarding data security, and detailed descriptions of how and when the medications will be delivered to the end-user. For example, the Wolt app offers real-time tracking and updates on a map when ordering from a pharmacy, which

creates a safe user experience. Additionally, users are required to verify their order upon receiving it through a digital handshake feature (a unique four-digit code that is checked from the end customer before the order can be received), which creates an extra level of safety, which is essential when delivering sensitive medical products (Wolt, 2025). Wolt's use of real-time delivery tracking and digital verification codes offers a secure and seamless customer experience, addressing both emotional reassurance and functional efficiency.

Situational convenience emerged as another strong motivator amongst consumers. Survey respondents indicated a clear interest in using online pharmacies in certain situations, such as when sick, when physical pharmacies are closed, or when facing mobility challenges. These findings highlight the conditional value consumers place on services that are responsive to their immediate needs. The findings point to a demand for flexible, context-sensitive services that cater to temporary or urgent needs. Many respondents recognize e-pharmacies as an efficient alternative for routine medication purchases, especially for avoiding unnecessary pharmacy visits when sick. One of the strongest advantages of e-pharmacies is clearly the convenience and home delivery. Post COVID-19 pandemic behavior has led to consumers being increasingly reliant on receiving purchases directly to their doorstop with quick delivery options, and this trend is present in the survey findings too. E-pharmacies can capitalize on this trend by ensuring fast delivery options, partnering with reliable logistics providers, and communicating their availability for urgent needs in marketing efforts, and this way position their businesses as a reliable solution for urgent medication needs.

The survey sample was predominantly composed of young, highly educated, and health-conscious individuals, which reflects a key demographic ready for digital health adoption. Additionally, the findings demonstrate that many consumers would be interested in trying new e-pharmacy services, highlighting the epistemic value of curiosity in TCV. This demographic of consumers is generally more open to new technologies and willing to try online services. This presents an opportunity for early

growth and brand loyalty. E-pharmacy businesses can benefit by targeting Millennial and Gen Z consumers with engaging and innovative digital experiences. Businesses can also benefit by using personalization and health tracking integrations to enhance customer experience and engagement. Additionally, prioritizing ease of navigation and excellent customer service to meet the expectations of digital natives is very important.

Despite these opportunities, significant challenges also exist. One of the clearest obstacles identified in the survey was the awareness gap. Many respondents had never used an e-pharmacy simply because they were unfamiliar with the concept or its benefits. This suggests a need for more marketing and educational efforts to bridge the knowledge gap. The findings also indicate the importance of social value in consumer decision-making, as many respondents expressed that they would be more willing to try e-pharmacy services if friends or family members had recommended them. This reflects the role of social influence and word-of-mouth in building credibility and reducing perceived risk. This aligns with TCV, which states that social value, gained from approval or shared use within one's social circle, can significantly impact adoption behavior, especially for newer or less familiar services. Therefore, leveraging influencer partnerships, social proof, or healthcare professional endorsements could help normalize the use of e-pharmacies and increase consumer confidence and adoption. Encouraging satisfied users to share their experiences through testimonials, reviews, and referrals may further enhance trust and encourage hesitant consumers to try the service.

Additionally, it is clear in the research findings that a significant portion of consumers still prefer purchasing medications from traditional pharmacies. Many still want face-to-face pharmacist consultations and the immediate availability of medicines. This behavioral pattern can be explained through the emotional and conditional components of the TCV—trust in interpersonal interaction and the value placed on immediate fulfillment. E-pharmacies are not expected to fully replace physical pharmacies, but they

can offer a good alternative to in-store purchasing. However, the value of this is clearly not recognized by some consumers.

To address this challenge, e-pharmacies can position themselves as a complementary service, highlighting the benefits for repeat and routine purchases, such as chronic medication management and long-term treatment plans. Providing subscription-based programs and refill reminders for customers could also enhance the customer experience and boost loyalty in customers. Additionally, ensuring that the digital shopping experience is seamless and easy is also important, for this ensures that e-pharmacy platforms are convenient and user-friendly, which should in turn encourage long-term engagement of consumers. For elderly consumers who may struggle with digital navigation, simplified interfaces, assisted ordering options, and clear tutorials can improve accessibility and inclusion.

The research findings show that the cost of e-pharmacies remains a key concern influencing consumer purchase decisions and adoption. Affordability is a common concern among non-user respondents, and both user and non-user respondents expressed a desire for more competitive pricing and discounts. However, the regulatory analysis reveals that Finnish pharmacies are constrained by strict price controls and regulations. Prescription medicine prices in Finland are regulated by the government, and pharmacies cannot independently set prices. OTC products are also similarly restricted, and marketing regulations prevent price-based promotions for medicines. This creates challenges for pharmacy businesses in pricing flexibility and limits competitive differentiation. Additionally, pharmacies are not able to offer discounts or loyalty rewards on OTC or prescription medications, which limits marketing capabilities significantly. The Medicines Act regulation on the marketing and advertising of medicines also limits this. For example, when creating free-delivery campaigns, OTC and prescription medicine must be excluded from these campaigns. Furthermore, fixed pricing creates challenges in competing with other e-commerce platforms. Although these controls aim to promote equity and affordability, they also inhibit the ability of e-pharmacies to create dynamic pricing or personalized promotions.

The pharmaceutical regulatory landscape in Finland creates further challenges for profitability of pharmacies. The progressive pharmacy tax system imposes higher rates on larger pharmacy chains and larger individual pharmacies. These taxes reduce margins on high-volume sales and disproportionately impact online focused or expanding pharmacies. Furthermore, Fimea imposes various administrative fees related to starting or changing e-pharmacy operations. Pharmacies must also notify Fimea of any major operational changes. Therefore, establishing an e-pharmacy requires significant financial and administrative investment. In addition to being costly, these regulatory processes can be very time-consuming, as pharmacies must wait for approval or risk delays if additional information is requested by Fimea. This slows down the pace of innovation and makes it more difficult for new entrants or smaller players to enter the market efficiently.

While digital infrastructure in Finland supports pharmaceutical e-commerce, regulatory requirements significantly limit the operational flexibility of e-pharmacies. Only pharmacies with a physical location may operate online services, and online-only pharmacies are not permitted. This requirement for a physical base limits market entry and scalability, as new players must invest in brick-and-mortar premises even if their primary business model is digital. This contrasts with neighboring markets such as Sweden, where online-only pharmacies are allowed to operate without a physical storefront, enabling faster growth and reduced overhead (Joint report, 2021). The Finnish regulation creates a higher threshold for entry, particularly for digital-first or startup companies that may not have the resources to invest in physical infrastructure. As a result, innovation in the sector may be stifled, and competition may remain limited to well-established pharmacy chains that already possess the necessary resources and infrastructure to meet these requirements.

Every e-pharmacy in Finland must also meet Fimea’s and oversight standards and provide mandatory pharmacist consultation for prescription purchases. While Fimea’s

regulation ensures a safe and reliable system for handling medicine orders, these requirements require staffing, which in turn increases costs for pharmacies. Furthermore, the mandatory consultation feature must be integrated into the digital shopping experience to ensure compliance and meet regulatory standards. E-pharmacies must ensure compliance while offering fast, convenient, user-friendly services. The emphasis on a need for fast delivery to doorstep requires partnerships with logistics and platform companies, which also requires investments. All this increases the operational costs for e-pharmacies. While these policies ensure safety and maintain pharmacy quality, they also restrict innovation and delay market competitiveness.

The regulatory analysis reveals that regulatory compliance also extends to logistics. The GDP regulation mandates specific conditions for handling and transporting pharmaceuticals, especially in last-mile delivery. These include requirements for temperature control, secure packaging, and traceability throughout the delivery chain. E-pharmacies using third-party delivery services must monitor logistics carefully to ensure compliance, which adds another layer of operational expense and responsibility. This often necessitates partnerships with specialized logistics providers, additional staff training, and investment in tracking technologies to ensure full visibility over the supply chain. Non-compliance can lead to penalties and reputational damage, which further raises the stakes for pharmacy businesses operating online.

Consumer data privacy is another pressing concern. GDPR regulations require businesses to handle personal data with transparency and care, particularly when processing sensitive health-related information. Survey responses showed that many consumers are unclear about how their personal data is stored or used by e-pharmacies, and some even reported avoiding using online purchases due to these uncertainties. This highlights a trust gap that must be addressed. Transparent data policies, easy-to-understand consent forms, and clear communication about GDPR compliance are essential for e-pharmacies to build consumer trust in this critical area. Furthermore, data privacy concerns influence emotional value perceptions, feelings of security, control,

and peace of mind, which significantly shape online behavior. For consumers to feel safe engaging with e-pharmacy services, businesses must prioritize visibility and clarity around data handling practices and invest in secure digital infrastructures that visibly demonstrate compliance.

Lastly, regulatory uncertainty surrounding the potential OTC reform adds an additional layer of complexity. The ongoing discussions about allowing OTC medications to be sold outside pharmacies could radically transform the e-pharmacy competitive landscape. While such reform may improve accessibility for consumers, it raises concerns about public health, misuse, and the weakening of traditional pharmacy networks. For e-pharmacy businesses, this uncertainty complicates strategic planning. However, it may also open doors for new partnerships with grocery retailers or digital health platforms. In such a scenario, e-pharmacies would need to compete on service quality, customer experience, and convenience rather than exclusive access to medicines.

In summary, the development of pharmaceutical e-commerce in Finland is shaped by a combination of consumer behavior trends, particularly among young, digitally literate populations, and a tightly regulated operating environment. Trust in the system, situational convenience, and digital infrastructure offer clear opportunities for growth. However, challenges related to pricing, regulation, and inclusion must be addressed for the sector to fully evolve. As this discussion has shown, consumer values—functional, emotional, social, epistemic, and conditional—all play a key role in shaping adoption and engagement with e-pharmacy services. Addressing these values through user-centered design, regulatory compliance, and inclusive strategies will be essential for the successful development of this industry in Finland.

6 Conclusions

6.1 Strategic Implications for E-pharmacy Businesses

The findings of this study offer insights that e-pharmacy businesses in Finland, and potentially across similar regulatory environments, can use to identify growth opportunities and address key challenges. Businesses should look to expand market presence and build customer engagement by focusing on enhancing customer experience, marketing and awareness efforts, good logistics and compliance measures, regulatory readiness, and policy engagement.

The consumer behavior insights highlight that e-pharmacies should focus on delivering user-friendly, efficient, and seamless digital experiences for customers. This could include simplified website navigation and checkout processes, integrating secure and efficient chat-based pharmacist consultations, offering educational content that builds consumer confidence in purchasing prescription medicines online, personalized services such as subscription plans, first-time-user discounts, refill reminders, and tailored wellness recommendations. Additionally, raising awareness is very important. Targeted marketing campaigns, such as flu season, or allergy season, and promotions and campaigns that resonate with specific use cases can help position e-pharmacy businesses as a reliable and convenient solution for consumers.

Clear communication of safety credentials, data privacy policies, and regulatory compliance will be critical to strengthening consumer trust. Additionally, fast, transparent, and secure delivery options are essential to meet consumer expectations and ensure GDPR and GDP regulatory compliance. Furthermore, expanding delivery reach to underserved or rural areas could unlock new customer segments. Clear communication around delivery timelines, tracking, and product handling is also essential to be a successful e-pharmacy business.

E-pharmacies must also be prepared for the possibility of regulations evolving. This includes preparing for the potential OTC reform by exploring strategic partnerships options with non-pharmacy retailers. Lastly, businesses should actively engage in policy discussions around digital health services to enable long-term growth and build innovation in the sector. By participating in regulatory development, businesses can help shape a better environment for e-pharmacy operations. Ultimately, aligning services with both consumer expectations and regulatory realities will be essential for e-pharmacy businesses aiming to scale sustainably and competitively in Finland and beyond.

6.2 Strategic International Perspectives on E-Pharmacy Development

This study contributes to the international business field by demonstrating how national regulatory environments and consumer behavior directly influence the scalability and competitiveness of pharmaceutical e-commerce. It highlights the need for strategic localization in highly regulated industries like healthcare. When comparing the Finnish pharmaceutical e-commerce to other EU countries, the sector remains small. This is largely due to the strict regulation which ties online operations to physical pharmacy licenses, restricts price competition, and limits marketing capabilities.

By contrast, Sweden represents a more liberalized online pharmacy market in the Nordics. The Swedish e-pharmacy market has grown rapidly since the deregulation of the market in 2009, which allowed online-only pharmacies to emerge and increased competition (Kivilahti, 2024). As of 2023, e-commerce accounted for approximately 21% of the community pharmacy market, generating sales of about SEK 1 billion per month (Kivilahti, 2024). Similarly, Germany's online pharmacy market has grown rapidly and is much larger than Finland's. It is forecasted to reach €23 billion by 2030, driven by players like Shop Apotheke, which holds a 46% share in the non-prescription e-pharmacy segment in Germany (Smile AI, 2024).

These examples highlight a critical insight for international business: regulatory diversity within the EU significantly shapes e-pharmacy market entry and expansion strategies. Even with overarching EU regulations, such as GDPR or the Medicines Directive, national-level implementation varies. For example, while GDPR is enforced across the EU, Finland's regulation enforces additional layers of privacy protection, such as secure pharmacist chat services (Apteekkariliitto, 2023). In contrast, other countries may allow more flexible interpretations of compliance.

Market dynamics also differ. In Finland, the pricing of prescription and OTC products is tightly regulated, eliminating price-based competition. Meanwhile, countries like Sweden allow pharmacies to compete on OTC pricing, which increases consumer choice and market innovation (Nordic Competition Authorities, 2021). Reforming Finland's e-pharmacy and physical pharmacy law and easing operational restrictions could boost growth and competitiveness in the e-pharmacy sector.

Despite EU-level harmonization efforts, country-specific regulatory and structural differences create challenges for e-pharmacy business for cross-border scaling. For Finnish businesses considering international expansion, success requires extensive pre-entry analysis of the target market. This includes detailed regulatory assessments (e.g. licensing, pricing controls, advertising laws), technical integrations with national prescription and pharmacy systems, logistics strategies tailored to local infrastructure and GDP requirements, and localized consumer behavior research. This thesis also emphasizes that understanding local consumer behavior is essential, even within a supposedly unified single market like the EU. Trust, expectations, and digital readiness can vary significantly between countries. For example, partnering with established platform companies such as Wolt, which already operates pharmacy delivery services across multiple markets, could offer a strategic advantage for Finnish e-pharmacies aiming to expand internationally. Looking ahead, continued progress in EU-wide initiatives such as the European Health Data Space (EHDS), an EU initiative that aims to enable secure sharing and access to health data across member states (European

Commission, 2024), can help reduce fragmentation and enable more streamlined cross-border e-pharmacy operations.

6.3 Limitations and Suggestions for Future Research

This thesis is subject to certain limitations. The survey sample was distributed primarily online through professional and academic networks, including social media and student channels. As a result, the sample skews toward younger, digitally literate individuals. Most respondents were between ages 25-34, and nearly 90% rated themselves as very health conscious. It is important to note that this narrow sample profile may lead to overestimating positive attitudes toward e-pharmacies and therefore the findings may reflect a more optimistic view of e-pharmacy services than exists in the general Finnish population. Older adults, individuals with lower digital literacy, people living in rural regions, or those with chronic health conditions were likely underrepresented. This limits the generalizability of the results and highlights the need for more inclusive and representative research in the future.

This thesis does not fully capture the perspectives of the broader Finnish population. Further research should aim to include a more diverse and representative sample of the Finnish population. This would ensure that insights reflect broader consumer attitudes and provide valuable insights and a bigger picture for businesses to learn from. For example, exploring how elderly consumers perceive and navigate e-pharmacy platforms would provide valuable insights into digital inclusion challenges. Similarly, studies focusing on rural populations, where physical access to pharmacies may be limited, could reveal important opportunities for e-pharmacy expansion. Future studies could also incorporate qualitative research, such as interviews with industry stakeholders or case studies of successful e-pharmacy models, to complement the consumer-focused findings of this thesis.

In addition, cross-country comparative studies would help contextualize Finland's regulatory environment and consumer behavior within a broader European or global

framework. For instance, comparing Finland's system with countries like Sweden or Germany, where pharmaceutical e-commerce markets are larger, more developed, and regulatory conditions differ, could offer deeper insights into how market size and policy influences adoption and innovation in pharmaceutical e-commerce. Further research is also needed to examine the potential impact of OTC deregulation in Finland. If non-prescription medications become available outside traditional pharmacies, this could fundamentally shift the competitive landscape and create new partnerships or threats for e-pharmacy providers. Understanding consumer and stakeholder reactions to such a reform would be valuable for both policymakers and businesses.

This thesis offers a starting point for understanding how consumer behavior and regulatory factors shape the development of e-pharmacy services in Finland. As digital health continues to grow and evolve, further research is needed to support informed decision-making and encourage innovation in this regulated but fast-developing industry. By aligning consumer needs with smart regulatory navigation, Finnish e-pharmacies are well-positioned to play a larger role in the future of digital healthcare, both nationally and across borders.

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Appendices

E-Pharmacy Consumer Insights from Finland

Hi!

I am conducting this survey as part of the research for my master's thesis in International Business at the University of Vaasa. This study examines consumer behavior in pharmaceutical e-commerce in Finland.

The survey is 100% anonymous, and your responses will be used only for academic research. It will take no more than 5-10 minutes to complete. Your participation is greatly appreciated.

Thank you for your time!

Respondent Information: To maintain confidentiality, I will only ask your age, gender and education level which will help to better understand the different perspectives contributing to my research.

* Indicates required question

1. Have you ever purchased medicine or health products from an online pharmacy or mobile-app (eg. Wolt, Treet) in Finland? *

   Mark only one oval.

   - ◯ Yes *Skip to question 7*
   - ◯ No *Skip to question 26*

2. Age *

   Mark only one oval.

   - ◯ 18-24
   - ◯ 25-34
   - ◯ 35-44
   - ◯ 45-54
   - ◯ 55+

3. Gender *

Mark only one oval.

- Male
- Female
- Non-binary/ Prefer not to say

4. What is the highest level of education you have completed? *

Mark only one oval.

- High school
- Bachelor's degree
- Master's degree or higher
- Other

5. Do you currently reside in Finland? *

Mark only one oval.

- Yes
- No, but I have lived in Finland before
- No

6. How would you rate your level of health consciousness (how much do you actively care about your health and wellness)? *

Mark only one oval.

	1	2	3	4	5	
Not	◯	◯	◯	◯	◯	Very health-conscious

E-Pharmacy Users

7. How often do you purchase medications/products from a pharmacy (in-store or online)? *

Mark only one oval.

- Once a year or less
- A few times a year
- Monthly
- Weekly
- More than once a week

8. How often do you purchase from an online pharmacy? *

Mark only one oval.

- Once a year or less
- A few times a year
- Monthly
- Weekly
- More than once a week

9. What are the main reasons you use an online pharmacy? *(Select all that apply)* *

Tick all that apply.

- [ ] Convenience
- [ ] Home delivery
- [ ] Wider range of products
- [ ] Avoiding queues at physical pharmacies
- [ ] More privacy for sensitive purchases
- [ ] When I am sick and unable to visit a pharmacy
- [ ] To avoid exposure to illness at physical pharmacies (e.g., crowded spaces, flu season)
- [ ] Other: _____

10. What types of products have you purchased from online pharmacies? (Select all that apply) *

Tick all that apply.

- [ ] Prescription medications (e.g., antibiotics, chronic condition medications)
- [ ] Over-the-counter (OTC) medicines (e.g., pain relievers, allergy meds)
- [ ] Vitamins & Supplements (e.g., multivitamins, herbal supplements)
- [ ] Skincare & Beauty products (e.g., dermatological treatments, cosmetics)
- [ ] Sexual health & contraceptives (e.g., condoms, birth control pills, STI treatments)
- [ ] First aid & medical supplies (e.g., bandages, thermometers, glucose monitors)
- [ ] Other: _____

How satisfied are you with the following aspects of e-pharmacies?
1 = Very dissatisfied, 5 = Very satisfied

11. Product availability *

Mark only one oval.

	1	2	3	4	5	
Very	◯	◯	◯	◯	◯	Very satisfied

12. Delivery speed *

Mark only one oval.

	1	2	3	4	5	
Very	◯	◯	◯	◯	◯	Very satisfied

13. Pricing *

Mark only one oval.

	1	2	3	4	5	
Very	◯	◯	◯	◯	◯	Very satisfied

14. How easy was it to use the website/app? *

Mark only one oval.

	1	2	3	4	5	
Very	◯	◯	◯	◯	◯	Very satisfied

15. Quality of customer service *

Mark only one oval.

	1	2	3	4	5	
Very	◯	◯	◯	◯	◯	Very satisfied

16. Did the website provide enough information (e.g., product details, pharmacist advice)? *

Mark only one oval.

	1	2	3	4	5	
Very	◯	◯	◯	◯	◯	Very satisfied

17. Overall, how satisfied are you with your experience using e-pharmacies? *

Mark only one oval.

	1	2	3	4	5	
Very	◯	◯	◯	◯	◯	Very satisfied

18. Have you used an e-pharmacy in urgent health needs? *

Mark only one oval.

- ◯ Yes, frequently
- ◯ Yes, occasionally
- ◯ No, never

19. How important is fast delivery when choosing an online pharmacy? *

Mark only one oval.

	1	2	3	4	5	
Not	◯	◯	◯	◯	◯	Very important

20. How much do you trust online pharmacies compared to traditional pharmacies? *

Mark only one oval.

	1	2	3	4	5	
No t	◯	◯	◯	◯	◯	Full trust

21. What factors influence your trust in an online pharmacy? (Select all that apply) *

Tick all that apply.

- ☐ Recommendations from healthcare professionals
- ☐ Online reviews and ratings
- ☐ Government or official certifications
- ☐ Brand reputation
- ☐ Personal experience
- ☐ Recommendations from friends and family

22. Do you feel safer purchasing medicine online compared to a physical pharmacy? *

Mark only one oval.

- ◯ Yes, I feel safer
- ◯ No, I prefer in-person pharmacies
- ◯ Both feel equally as safe
- ◯ No strong preference

23. Do you trust purchasing prescription medications online? *

Mark only one oval.

	1	2	3	4	5	
No t	◯	◯	◯	◯	◯	Full trust

24. Do you feel comfortable discussing sensitive health issues with a pharmacist through an online pharmacy consultation? *

Mark only one oval.

	1	2	3	4	5	
Not	◯	◯	◯	◯	◯	Very much