

# **The Role of E-Invoicing in Enhancing Business Efficiency and Promoting Sustainability in Finland**

**Exploring Benefits, Efficiency, and Environmental Impact**

## Abstract

Author(s) Ruslan Asender, Gyan Sapkota	Publication type Thesis, UAS Number of pages 54	Completion year 2024
Title of the thesis <b>The Role of E-Invoicing in Enhancing Business Efficiency and Promoting Sustainability in Finland</b> Exploring Benefits, Efficiency, and Environmental Impact		
Degree Bachelor of Business Administration, Business Information Technology		
Name, title and organisation of the client		
Abstract <p>This thesis explores how e-invoicing makes businesses more efficient, improves financial performance, and boosts sustainability in Finland. It looks at what consumers think and how businesses are using e-invoicing. The study combines surveys and an in-depth interview with a Finnish business owner to dig into the benefits, challenges, and adoption patterns of e-invoicing.</p> <p>The findings indicate that e-invoicing reduces costs, improves efficiency, and supports sustainability by cutting down on paper use and emissions. Despite some hurdles, like incomplete adoption, the benefits of streamlining operations and aligning with sustainability goals are significant. This research provides practical insights for businesses and stakeholders, highlighting both the challenges and strategies for enhancing adoption and implementation.</p>		
Keywords E-invoicing, Business efficiency, Sustainability, Financial performance, Digital transformation		

# Contents

1	Introduction.....	1
1.1	Background and Purpose of the study.....	2
1.2	Research Objectives .....	2
1.3	Research Questions .....	3
2	Literature Review.....	4
2.1	Rise and Development of E-invoicing in Finland.....	4
2.2	E-Invoicing Preferences Across Sectors.....	6
2.2.1	Overview of E-Invoicing Preferences Across Sectors .....	6
2.2.2	B2B Preferences: Efficiency, Automation, and Compliance .....	8
2.2.3	B2C Preferences: Convenience and Environmental Concerns .....	9
2.2.4	G2B and B2G: Regulations and Interactions .....	9
2.3	Sustainability in E-Invoice Practice .....	10
2.3.1	Definition and Importance of Sustainability in Business Operations .....	10
2.3.2	How Automated Invoicing Contributes to Environmental Sustainability .....	11
2.3.3	Examples of Sustainable Practices in E-Invoicing.....	12
3	Methodology and Implementation .....	14
3.1	Research Design.....	14
3.2	Research Method .....	14
3.3	Data Collection and Data Analysis.....	15
3.3.1	Survey .....	16
3.3.2	Interview.....	17
3.4	Reliability and Validity.....	19
4	Results and Discussion.....	20
4.1	Survey .....	20
4.1.1	Age and Familiarity with E-Invoicing .....	20
4.1.2	Frequency of Receiving E-Invoices.....	23
4.1.3	Channels for Receiving E-Invoices .....	25
4.1.4	Satisfaction with E-Invoice Format.....	26
4.1.5	Managing e-invoices easier to compared to paper invoices .....	27
4.1.6	Perceived Benefits of E-Invoicing .....	27
4.1.7	Issues Encountered with E-Invoices .....	28
4.1.8	E-Invoicing and Sustainability Perception .....	29
4.1.9	Ease of Payment with E-Invoices .....	30
4.1.10	E-Invoice Continuation Preferences .....	31

4.1.11	Support for Wider Adoption of E-Invoicing .....	32
4.2	Interview .....	32
5	Findings and Conclusions .....	35
6	Ethical considerations .....	37
7	Limitation and Further Research .....	38
7.1	Limitations .....	38
7.2	Further Research .....	39
	List of references .....	40

## Appendices

Appendix 1. Survey

Appendix 2. Interview Questions

## 1 Introduction

The financial management system is one of the important factors for businesses to run successfully. The invoicing system is considered as a core feature of financial management including entire procurement process. (Koch 2017.) A financial records management system can help small businesses enhance their performance in the short or long term by stream-lining invoice records and expenses tracking, reducing errors in accounting data entry, and minimizing duplication in record keeping. (Yin et al. 2017, 154.) Historically, most companies used to rely on paper-based invoicing systems, which take longer to process, cost more, and are more likely to have errors. However, technology is already driving a substantial shift in the invoicing process that will result in a total digital makeover. (Bani 2024, 22.)

E-invoicing is becoming more popular because of rising environmental concerns and the need for businesses to cut operational risks. This trend is especially noticeable in Nordic countries, where sustainability and digital transformation are highly valued (Koch 2019, 5-6, 33-34). As a result, electronic invoicing has become a key tool for companies wanting to reduce the negative environmental effects of traditional paper invoicing (Aivela 2024). In 2020, the number of e-invoices sent worldwide surpassed 110 billion, and it keeps growing, showing a lot of potential (Billentis 2024). The Climate Group's Smart 2020 study suggests that e-invoicing is not only a technological achievement but also helps cut carbon emissions across various industries by promoting digital transformation. As more companies learn about the financial and environmental benefits of e-invoicing, its use is expected to rise. This will lead to less paper use and encourage greener business practices (Tenhunen & Penttinen 2010, 5).

E-invoicing has lots of advantages, but not all businesses have fully adopted it yet. While it's more common in Finland now, there's still a long way to go until it reaches 100% usage. For businesses to remain competitive and simplify their financial management processes, they need to fully switch to e-invoicing (Aivela 2024). Companies can use e-invoicing data to analyze and reduce their carbon footprint. For example, companies can use this data to tweak their transport networks, which can help cut logistical costs and reduce environmental impacts. E-invoicing data lets businesses track their use of raw materials, energy efficiency, pollution, and other metrics more accurately and share the data with stakeholders to help them make decisions on sustainability. (Aivela 2024).

This thesis explores into how e-invoicing affects business efficiency and sustainability, focusing on benefits, operational efficiency, and environmental impact. By interviewing companies that have adopted e-invoicing, this research checks out changes in operational

costs, processing times, error rates, and resource usage, showing how it contributes to environmental goals. It also explores users' experiences, preferences, and satisfaction with e-invoicing, especially in terms of convenience and sustainability. Additionally, the thesis aims to give recommendations for businesses looking to adopt e-invoicing systems, taking practical operations and regulations into account while emphasizing its role in promoting sustainable practices.

## 1.1 Background and Purpose of the study

More businesses today are moving away from paper invoices in favour of digital solutions. Reducing or eliminating paper use not only streamlines processes but also supports environmental sustainability. In Finland, the majority of businesses focus on digitalization and adopting sustainable practices. These two elements are key foundations for this research and reflect the priorities of businesses in Finland. The European Commission has accepted that digitization has several advantages, particularly when it comes to e-invoicing. (Bojanc et al 2024, 5-6.) E-invoicing can support economic expansion and be incorporated into corporate and governmental goals such as sustainable development. The European Commission claims that invoices' capacity to automatically fill in data fields makes filing VAT returns and compliance reporting simpler. As a result, automation reduces administrative costs and increases governance efficiency. SMEs will be more competitive in the single market and able to differentiate themselves from the competition with lower administrative costs. E-invoicing is not prevalent in business-to-business (B2B) or business-to-customer (B2C) transactions, but it has been effectively implemented in the public sector in Finland. (Lautala 2024.)

## 1.2 Research Objectives

The primary goal of the thesis research is to investigate how E-invoice contributes to businesses to promote sustainability in Finland. In order to accomplish this goal, the followings objectives are outlined:

- To analyse the adoption of E-invoicing in Finland.
- To assess the effectiveness of electronic invoicing in relation to conventional invoicing methods.
- To evaluate the obstacles that organizations have while integrating e-invoicing solutions.

- To investigate how switching to electronic invoicing supports environmentally friendly corporate practices.

### 1.3 Research Questions

- RQ1. What cost reductions and increased operational efficiency have companies in Finland experienced since implementing e-invoicing?
- RQ2. What obstacles must companies overcome in order to make the switch from paper to digital invoicing systems?
- RQ3. What role does electronic invoicing play in digital transformation and environmental sustainability?

## 2 Literature Review

### 2.1 Rise and Development of E-invoicing in Finland

According to the 2022 edition of the Digital Economy and Society Index (DESI) released from the European Union, Finland is ranked first out of 27 EU member states. Finland is a pioneer in the adoption and application of digital technologies, particularly with regard to e-invoicing. (European Commission 2022.) For a number of years, it has continuously ranked among the best performers in the DESI index. A summary of key metrics for the digitalization and competitiveness of EU member states is provided by the DESI index. Additionally, Finnish businesses use social media extensively (51% compared to the EU average of 29%) and e-invoices (83% compared to the EU average of 32%). (European Commission 2022.)

	Finland		EU
	rank	score	score
<b>DESI 2022</b>	<b>1</b>	<b>69.6</b>	<b>52.3</b>

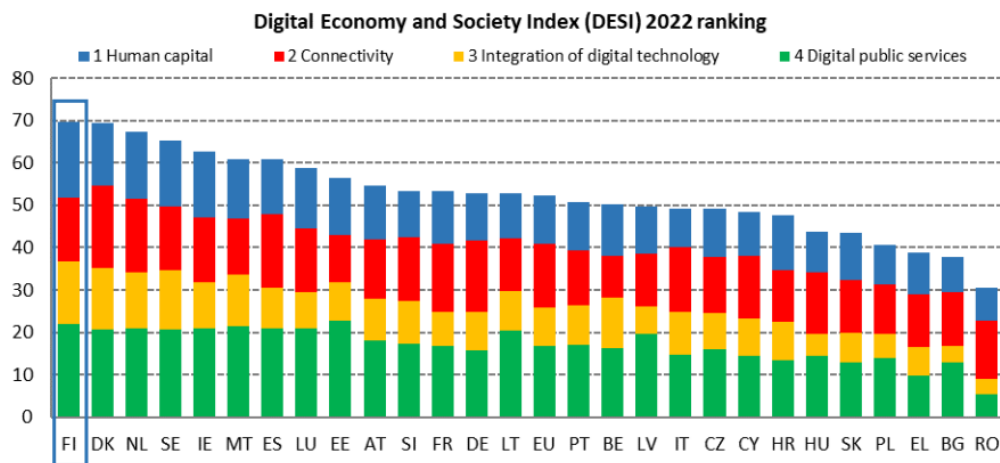


Figure 1. Finland in the Digital Economy and Society Index (European Commission 2022)

A law requiring public entities to only accept electronic invoices (e-invoices) that comply with the European standard on e-invoicing was passed by the Finnish parliament in February 2019. (European Commission 2022.) According to Finnish national law, all private businesses and public organizations have the right to ask their suppliers for an electronic invoice as of April 1, 2020. Businesses who solely make business-to-consumer transactions or have a turnover of less than 10,000 euros are exempt from the regulation (Lautala 2024.) As a Result, Finland's e-invoicing indicator index was only 79% in 2018; by 2022, it had increased to 83%. (European Commission 2022.) As part of the "Real-Time Economy

Project," the Finnish Tax Administration is involved. The Real-Time Economy Project aims to create a nationwide digital environment for businesses that can work with comparable systems in other Nordic nations. Between businesses of all sizes, the ecosystem would enable the smooth, safe, and real-time transfer of orders, digital sales receipts, e-invoices, and company data. (Lautala 2024.) Finland has led the way in e-invoicing in Europe and even the world, as have all of the Nordic nations. In Finland, businesses began using the Peppol network in 2008, and in 2019 and 2020, the government made it mandatory for public authorities to adopt electronic invoicing. (The Invoicing Hub 2024.)

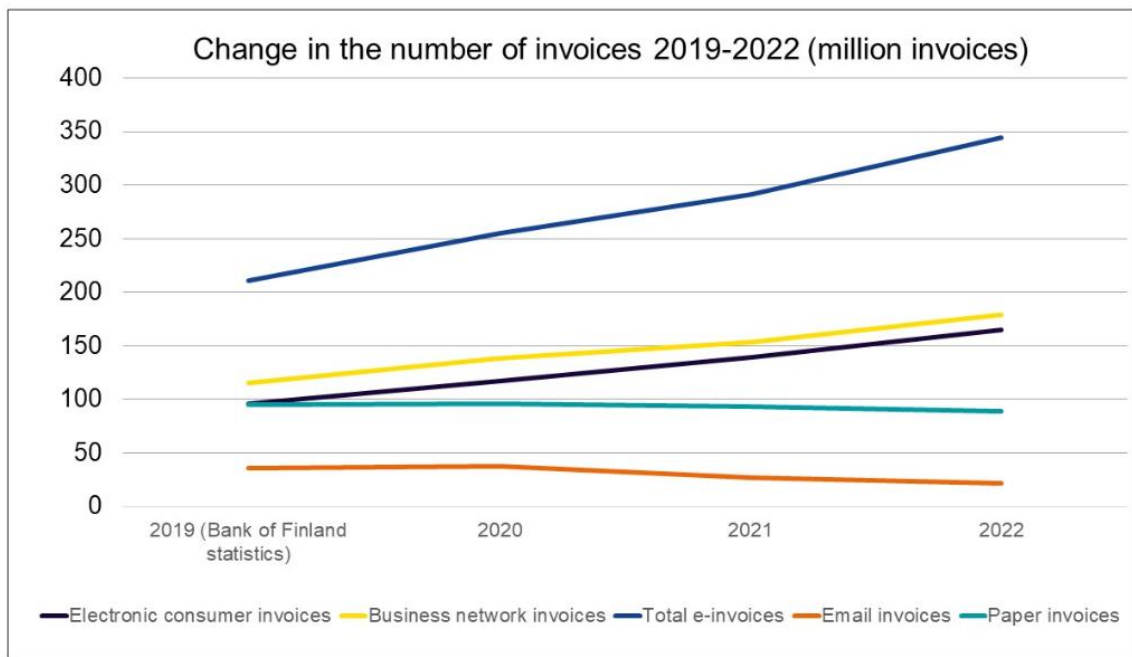


Figure 2. Change in number of invoices 2019-2022 (Real time economy 2023)

According to Real Time Economy (2023) as shown in figure 2, as the Business Digitalization effort continues, the overall volume of invoices sent via e-invoice intermediaries has grown by 17%. Roughly 390 million electronic invoices were sent, by 2022, that figure had risen to 455 million. Compared to the prior year, there has been a about 10% growth. This enhancement demonstrates the effectiveness of regulatory measures in accelerating the transition to digital invoicing. The greater adoption rate is consistent with Finland's broader goals of enhancing digital public services and boosting the efficiency of administrative processes through digital solutions.

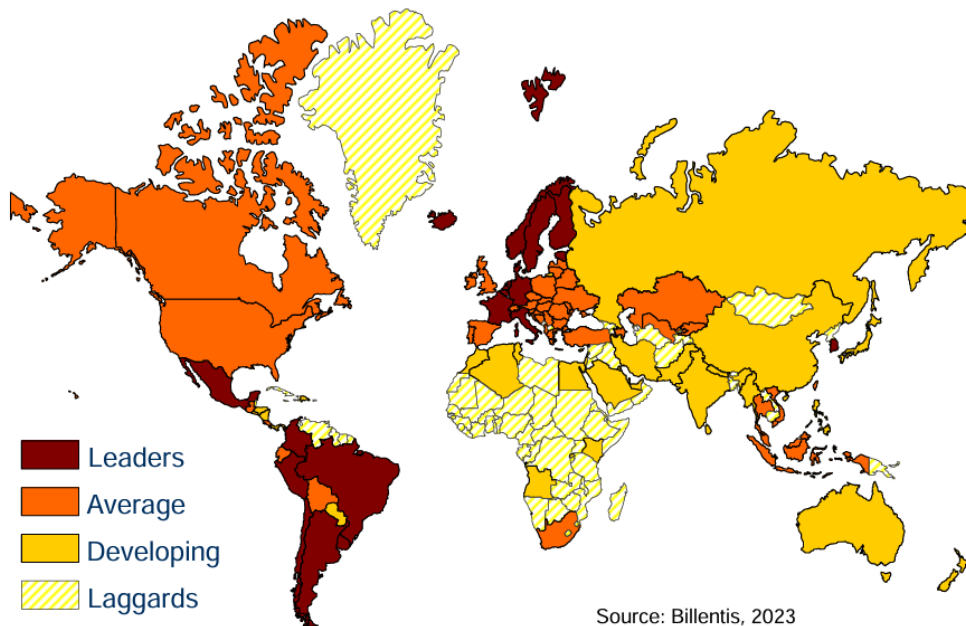


Figure 3. E-invoicing global market (Billentis 2023)

European countries are also steadily advancing their use of electronic invoices to automate their payments to various businesses. When it comes to introducing electronic invoices into their businesses, According to Joung et al. (2014) Nordic countries Finland, Sweden, Denmark, and Norway are leading the European Union. As shown in Figure 3, Finland is among the countries leading in the e-invoicing market. Many Finnish companies have also embraced e-invoicing (Koch 2012, 23).

## 2.2 E-Invoicing Preferences Across Sectors

### 2.2.1 Overview of E-Invoicing Preferences Across Sectors

The use of e-invoicing has grown a lot worldwide, thanks to its efficiency, cost savings, and sustainability benefits across various sectors. A report by Zion Market Research projects that the e-invoicing market will hit about USD 20,529 million by 2026, growing at an annual rate of around 20.4% (Zion Market Research, 2024). This growth shows e-invoicing's potential to outperform traditional invoicing methods in many countries. It's becoming more common in different business fields due to advantages like speed, automation, and compliance benefits, as shown in Figure 4.



Figure 4. E-invoicing eliminating many invoice handling steps (Cloudtrade)

In Europe, e-invoicing has rapidly grown because of specific regulations that encourage its use, especially in public procurement. The European Union mandates electronic invoicing for all transactions with suppliers and public administrations, creating a framework that has led the private sector to adopt it too (Šoltéssová 2022, 4-6). For instance, Finland began using e-invoicing for public procurement in 2010. This move helped establish an advanced system in both public and private sectors. Currently, most of Finnish businesses use e-invoicing, not just for government-related tasks but in many different industries too. This has created a kind of "snowball effect," showing how it could be widely adopted after public sector standardization (SERES Global 2024).

In addition, compliance-driven factors play a huge role in the adoption and growth of e-invoicing among different sectors, as both government and private sectors are recognizing the advantages of automated compliance. The Euro Retail Payments Board (ERPB) Secretariat (2015) noted, "The general focus in Europe with the call for a European standard for e-invoicing is more specifically on the business-to-government space," which illustrates how regulations contribute to simplifying processes while maintaining interoperability. The European Commission (2015) also supports this, as it estimates that standardization may save €2.3 billion across the EU by reducing invoice prices from as much as €50 to as little as €1. The importance of regulatory frameworks in promoting adoption rates and compliance benefits is further supported by this economic impact.

E-invoicing's potential for economic and environmental efficiency appeals to a range of industries, including B2B, B2C, and B2G. When combined with an integrated strategy, e-invoicing enables efficient, paperless transactions, supporting a more environmentally sustainable model for business operations globally. (SERES Global 2024.) Due to both regulatory requirements and a growing focus on sustainability, e-invoicing is becoming an

essential tool for both government and private sector operations, leading to its increased adoption.

### 2.2.2 B2B Preferences: Efficiency, Automation, and Compliance

Particularly in the business-to-business (B2B) domain, electronic invoicing has been very transformative due to its ability to improve efficiency and simplify automation while strengthening compliance. Electronic invoicing is also known for its role in reducing operational costs through automating processes, which cuts down expenses. (Ivwithren 2024.) E-invoicing can save up to 60-80% on invoice processing costs compared to traditional paper invoices, showing the benefits of e-invoicing in both efficiency and cost savings (TJC Group, 2023).

By reducing mistakes and getting rid of manual data entry, businesses can boost productivity and scalability, using resources more strategically (Ivwithren 2024, 170). The efficiency of e-invoicing gets a further boost from governments using continuous transaction controls (CTCs), which ensure tax compliance and lower costs for businesses. A recent study found that using e-invoicing in CTC models can cut tax compliance costs for businesses by 37-39% (Billentis 2024). Automating invoice processing is especially handy in sectors with a lot of transactions because it cuts down non-compliance fines and boosts transparency, making the savings even more worthwhile (Awan 2023, 7).

E-invoicing also improves how systems work together in the B2B world. In Europe, formats like the ISO 20022 Financial Invoice standard have become popular, helping businesses smoothly integrate invoicing across borders and different systems (Imobisoft 2015). Standardization like this makes it easier for B2B transactions to happen in real-time in a unified digital setup, which boosts efficiency and helps meet compliance across regions (Zhao & Xia 2014, 269–298).

Automation is a key part of B2B invoicing now. Businesses are shifting to Electronic Data Interchange (EDI) formats and using supplier portals to smooth out invoice processing. About two-thirds of companies still use emailed PDF invoices, but fewer than 20% have switched to structured electronic invoices via EDI (Billentis 2024). The trend towards structured electronic invoices shows a move towards more automation and standardized processes. Major suppliers are adapting to the formats their customers prefer, which shows that automation helps improve internal processes and meets the needs of different business partners (Awan 2023, 14-16).

### 2.2.3 B2C Preferences: Convenience and Environmental Concerns

In the business-to-consumer (B2C) sector, convenience, and environmental sustainability are two factors that are influencing the adoption of electronic invoicing, or e-invoicing. E-invoicing offers customers a flexible and effortless way to handle payments as digital transactions grow increasingly and become part of daily life, making it a convenient substitute for traditional paper invoicing. For example, research shows that most customers prefer to receive e-invoices over email, and many European nations anticipate that this method of delivery will become the standard. (Billentis 2014.) This determination for digital invoicing is compatible with the consumer demand for simply navigable and straightforward invoicing systems that offer automatic payment options and integrate easily with daily life.

Furthermore, by reducing paper usage and carbon emission that are related to it, e-invoicing helps address consumer's raising concerns about the environmental sustainability. As the businesses are aiming to meet with corporate social responsibility (CSR) goals, and global efforts to reduce environmental impacts in business transaction, e-invoicing plays a major role in contributing to these goals. According to TJC Group (2023), "e-invoicing also contributes to environmental sustainability by reducing paper consumption and carbon emissions," this makes it a desirable option for customers and businesses that value the environment. As consumers increasingly prefer companies that show environmental responsibility, this sustainability benefit also supports brand loyalty. (Moisescu & Gică 2020, 1-3.)

Another key factor that is affecting the adoption of electronic invoicing in the B2C sector is the wide range of options that it offers in payments. Aside from that, consumers can easily handle both one-time and recurring payments using Electronic Bill Presentment and Payment (EBPP) solutions and have more control over their payment schedules. These kinds of solutions have been common, especially in Europe, where service providers link their EBPP with their online banking portals, which allows the clients to view, and pay their invoices online securely and efficiently. (ERP Secretariat 2015.) Beyond payment flexibility, consumers also benefit from easy access to archived bills, providing a well-organized overview of their financial transactions. This accessibility simplifies budget tracking and helps manage warranty claims efficiently (Yuan 2013, 3).

### 2.2.4 G2B and B2G: Regulations and Interactions

The implementation of e-invoicing in the government-to-business (G2B) and business-to-government (B2G) sectors is mainly driven by the regulations intended to improve financial compliance and streamline processes. Governments across Europe and beyond are

increasingly requiring public procurement to adopt e-invoicing. As a larger strategy to improve efficiency and transparency in financial dealings with companies. The growing governmental regulations in this area are reflected in the European Union's directive on e-invoicing in public procurement (Directive 2014/55/EU), which mandates standardized e-invoicing for transactions between public administrations and suppliers. In addition to improving government operations' efficiency, this directive offers a framework for compliance that promotes broader use by private-sector businesses. (ERP Secretariat 2015, 4-5).

Finland was among the leading European countries to mandate e-invoicing for public procurement. As a result, the invoicing framework is now mature and well-established, which led most private Finnish companies to adopt it, along with the public sectors. This adoption, which is driven by regulations, played a key role in normalizing the invoicing practices across sectors, by establishing a standard for compliance and operational efficiency. (Penttinen et al. 2008, 27). These programs contribute to uniform standards that promote compatibility and cross-border transactions in addition to creating smoother interactions between governments and businesses. (SERES Global 2024.)

Furthermore, the mandatory adoption of electronic invoicing has significant economic implications. When standardized e-invoicing is implemented in Germany, for instance, it is expected that the price of an invoice would drop from €50 to just €1, resulting in substantial savings that can be redirected to other government initiatives. (SERES Global 2024.) These economic benefits highlight the value of e-invoice mandates in supporting government operations to run more efficiently while improving tax compliance and reducing the chances of fraud.

## 2.3 Sustainability in E-Invoice Practice

### 2.3.1 Definition and Importance of Sustainability in Business Operations

Sustainability has become a crucial factor in shaping corporate strategy and operations. It is defined as the ability to meet the needs of the present without compromising the future generations' ability to meet their own needs. Nowadays, sustainability influences every facet of business, from supply chain management to financial practices (Ashrafi et al. 2020, 1-3.)

While concerns about climate change are increasing, businesses are more compelled than ever to adopt sustainable practices in their operations to reduce their environmental footprint. Integrating sustainability into business is not only about meeting compliance requirements; it has become a strategic imperative. By doing so, companies can enhance

their efficiency, competitiveness and strengthen their relationships with the stakeholders. (Ioannou and Serafeim 2019, 5-8.) Research by Feroz, Zo, & Chiravuri (2021, 2) highlight how digital transformation drives sustainability, by helping companies use resources more efficiently and reduce their environmental impact. Which is crucial for today's fast changing business landscape.

E-invoicing is a clear example of how sustainability might be implemented in the financial sector. Businesses may significantly reduce their usage of physical resources and carbon emissions by shifting from traditional paper invoices to electronic ones. This transformation not only supports environmental protection but also helps reduce costs and enhances efficiency in businesses. (Medius, 2023.) Reducing the paper along with transportation costs, emissions, and eliminating manual tasks show the importance of sustainability for the digital transformation of financial operations.

Sustainable practices like e-invoicing does not just lower environmental impact, it also fits with wider corporate social responsibility goals. Companies understand that sustainability is essential for long-term success and resilience in a competitive world with limited resources. (Tenhunen & Penttinen 2010, 2-3.) As a result, sustainability in business, especially in financial operations, is not only an ethical duty but also a smart opportunity for growth and innovation. The following picture illustrates the process of sending invoice and its respective savings in time and cost.

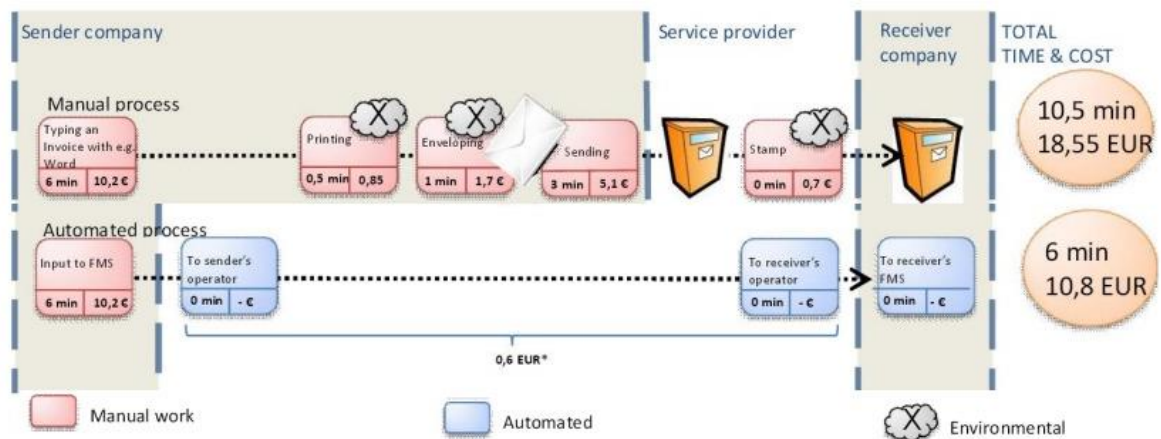


Figure 5. Sending invoice and its respective savings in time and cost. (Penttinen 2008.)

### 2.3.2 How Automated Invoicing Contributes to Environmental Sustainability

E-invoicing has become a key tool for lowering environmental footprint, especially in sectors where paper-based procedures have long been the norm. The significant decrease in paper usage, which immediately translates into less deforestation, water use, and energy expenses that are related to producing and distributing paper invoices, is one of the most

important environmental advantages of e-invoicing, Figure 5 above illustrates how e-invoicing streamlines processes, leading to time and cost savings.

Switching to electronic invoicing can significantly reduce the carbon footprint of invoicing processes. Tenhunen and Penttinen (2010, 2) showed that moving from paper to electronic invoicing reduced the carbon footprint of each invoice by 63% over its lifecycle. Eliminating unnecessary manual work, significant reductions in material use and transportation emissions. (Tenhunen and Penttinen 2010, 2.)

The automation that electronic invoicing provides, lowers the need for the physical delivery of invoices as the paper documents transportation is one of the main processes in traditional invoicing which contributes to emissions from postal and courier services. E-invoicing reduces these logistical needs, which leads to more sustainable business operations. (Lăzăroiu et al. 2020, 3-5) "Digitizing invoices reduces transportation needs and lowers transportation-related emissions" states Medius (2023). This not only supports the broader objective of environmental sustainability but also enhances operational efficiency.

In addition to cutting emissions, e-invoicing increases energy efficiency within companies. By automating the invoicing process rather than using manual data entry, organizations can reduce the energy required for physical handling and storage, as well as minimize human errors. It enables better tracking and storage, decreasing the demand for physical space and energy-intensive document storage systems. According to Ahmad (2024, 14), e-invoicing "significantly streamlines invoicing by automating data entry, validation, and approval workflows, reducing errors and accelerating the payment cycle".

Automated invoicing significantly contributes to a company's sustainability initiatives and lowers its environmental impact; by minimizing paper waste and cutting transportation emissions, the adoption of electronic invoicing contributes to a greener and more efficient work environment.

### 2.3.3 Examples of Sustainable Practices in E-Invoicing

The implementation of e-invoicing across different industries shows many examples of how companies can bring in sustainable practices to their financial operations. These examples show the significant impact that digital invoicing can have on environmental sustainability, operational efficiency, and overall corporate responsibility. Different sectors use e-invoicing, providing many ways for companies to adopt sustainable practices in their financial processes (Taticchi & Demartini 2021, 120-123).

One key example is the difference in the carbon footprint between traditional paper invoicing and electronic invoicing. Research by Tenhunen and Penttinen (2010) shows that the carbon footprint of electronic invoicing can be up to 75% smaller than that of paper invoicing. E-invoicing cuts down resource use by eliminating the need for paper and saving raw materials like trees and water. It also lowers energy consumption since it needs less energy than paper production. Moreover, data centers where e-invoices are stored and processed are now running with renewable energy sources and becoming more energy-efficient to reduce environmental impact (Tenhunen & Penttinen 2010, 18-20). The study points out that transportation and manual handling are two key areas where resource consumption is greatly reduced, making a big difference between paper-based and electronic invoicing. Besides the environmental benefits, e-invoicing also boosts operational sustainability by optimizing and automating the invoicing process. This improvement reduces human errors through integration with business software, which leads to better data accuracy and compliance. Ahmad (2024) mentioned that e-invoicing makes operational efficiency better by cutting down on manual tasks and shortening transaction times.

Scandinavian countries such as Finland, Sweden, and Norway, are examples of sustainable practices in e-invoicing. They've adopted e-invoicing in both public and private sectors, using systems like PEPPOL and Finvoice. These systems help promote sustainability in financial transactions and ensure compliance with environmental standards. In Finland, companies have to follow e-invoicing regulations and adopt the European Union standard EN 16931, making sure invoices are fully digital, machine-readable, and environmentally friendly (Rödl & Partner 2024).

Companies that switch to e-invoicing don't just reduce their environmental footprint, they also strengthen their relationships with stakeholders like partners and customers who care about sustainability. A lot of businesses and consumers have embraced sustainable practices by using e-invoicing in their daily operations. This clearly shows their commitment to improving transparency, enhancing efficiency, and cutting down their carbon footprint (Medius 2023). By doing this, companies achieve both business value and environmental benefits, paving the way for a future-ready approach that supports sustainable growth.

### **3 Methodology and Implementation**

The research methodology is essential because it gives a clear plan for answering the research questions. It focuses on the tools and processes for collecting, analyzing, and interpreting data reliably. A good methodology makes sure the chosen methods match the research goals, making the results trustworthy and useful (Saunders et al. 2007, 130).

#### **3.1 Research Design**

A research design is a detailed plan that specifies the steps to take for collecting and analysing the necessary data to address research questions and achieve the objectives of the study. This study combines qualitative and quantitative approaches to offer a comprehensive understanding of e-invoicing deployment. (Burns et al. 2016.) Combining qualitative interviews and quantitative surveys gives researchers a better grasp of people's experiences with e-invoicing and helps analyze trends (Harwell 2011, 149-150).

Mixed-methods research allows for triangulation, which means checking findings from both qualitative and quantitative sources to make them more reliable and accurate. In this study, qualitative insights from interviews are compared with quantitative data from surveys to validate the findings from different angles. This method follows Creswell's guidelines on triangulation, using both types of data to make sure the insights are confirmed, boosting the study's credibility (Creswell 2003, 4-6).

Following Creswell's suggestions for mixed-methods research, concurrent methods are used which means collecting qualitative and quantitative data simultaneously. Interviews and surveys will be conducted concurrently to gain a comprehensive real-time understanding of the study subject, ensuring that insights from each method support and confirm each other (Östlund et al. 2011, 372-373).

#### **3.2 Research Method**

In this study, Semi-structured interviews and structured surveys published via SurveyHero have been used. The structured surveys provide statistical data on general patterns in the use and opinions towards e-invoicing, which allowed to analyse trends through broad base of respondents. while semi-structured interviews enable individuals to share personal perspectives.

The structured survey uses close-ended questions cross responses, which makes the data more reliable (Harwell 2011, 155-156). The semi-structured interviews use open-ended questions that allow for flexibility by allowing the participants share their perspectives more

freely. This approach enriches the qualitative data by uncovering individual differences and exploring themes more deeply (Lakshman et al. 2000, 373).

Combining structured surveys with open-ended interviews keeps the study accurate and reliable. This mix captures general trends and personal insights, making the findings more valid. Table 1 shows the methods used, including the question types, their purposes, and how they fit with the study’s goals. It helps to understand how different methods contribute to the overall research design.

<b>Research Method</b>	<b>Question Type</b>	<b>Purpose</b>	<b>Supporting Scholar</b>
<b>Interview</b>	Structured yet open-ended questions	Capturing individual preferences, challenges, and perceptions related to e-invoicing benefits and sustainability	Lakshman et al. (2000 373.)
<b>Survey</b>	Close-ended questions with options or Likert scales	Identifying general usage patterns, satisfaction levels, and perceived benefits or challenges associated with e-invoicing	Lakshman et al. (2000 373.)

Table 1. Data Collection Method

### 3.3 Data Collection and Data Analysis

Collecting data is a key part of research because it helps answer the questions and gives useful insights. This means getting primary data through surveys and interviews (Malhotra, Birks & Wills 2013, 61). It also includes secondary data from existing studies, books, or online sources. While secondary data is usually easier and cheaper to access, it might not be as tailored to the specific research goals (Malhotra, Birks & Wills 2013, 61).

In this research, primary data was gathered using a structured questionnaire and semi-structured interviews. Meanwhile, secondary data was sourced from relevant studies and reports to add context. Figure 6 shows how both qualitative and quantitative methods were used in this study. Quantitative data from the questionnaire were analyzed with descriptive statistics, and qualitative data from the interviews were analyzed using thematic coding. This approach gave a well-rounded understanding of e-invoicing adoption and its challenges.

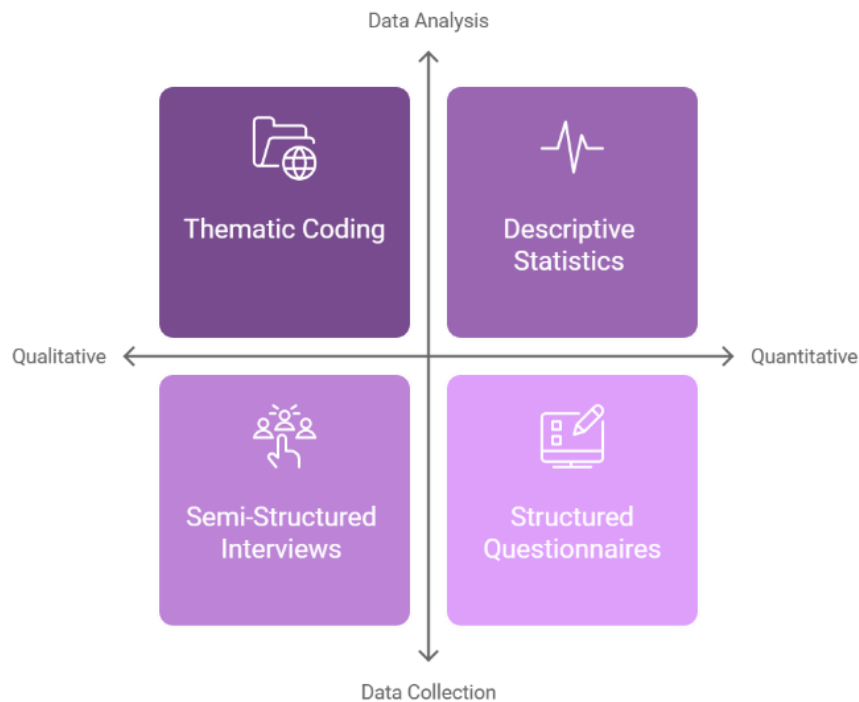


Figure 6. Research Methodology Approaches

### 3.3.1 Survey

A survey is a common method used to gather information from people in a structured way, it allows researchers to gather data patterns and opinions across group. It known to be particularly useful in collecting quantitative data, which can be easily measured and analysed, and then summarize responses and a clear statistical format (Saunders et al. 2016, 385).

As described in the methodology chapter, the survey was published in this research, a structured survey was conducted through SurveyHero platform, to gather quantitative data from consumers perspective on e-invoicing as in its adoption rate, satisfaction level, the benefits, and its impact on the environment. To reach a broad and diverse audience, the survey link was shared amongst student groups and networks. This approach helped get responses from people with different backgrounds. Although everyone was based in Finland, they represented a range of educational, professional, and demographic perspectives.

In addition, the survey was launched on November 2 and closed within a week November 10. It was circulated through different messaging apps and also via email to friends and colleagues, bringing the total number of participants to over 100. As a result, the survey collected 52 valid responses, with 9 of incomplete responses which were excluded out after the survey was closed, as shown in the figure 7. It did not surpass the initial expectations;

it still provided a rich source of data. This response rate enhances the reliability of the findings and ensures a more comprehensive understanding of attitudes toward e-invoicing in Finland.



Figure 7. Survey Results Overview

To analyse the data, the summary report feature of the SurveyHero was utilized, which organizes the responses into common patterns, making it easier for users to quickly identify key findings such as average, and frequencies in certain responses. Additionally, the results were exported to Microsoft excel where described analysis was conducted using pivot tables to cross tabulate the data for better analysis and insights. By using these summaries and analysing them, conclusions will be drawn based on the respondent's views on e-invoicing and the quantitative patterns, to meet with the goals of the research. The discussion and conclusion part of the thesis will be based mainly on this information.

### 3.3.2 Interview

In this study, primary data was gathered through semi-structured interviews, to understand the reasons behind, difficulties with, and advantages of using e-invoicing systems, with an emphasis on sustainability. Semi-structured interviews were selected for interview due to its adaptability, provide flexibility, allowing for a thorough examination of the viewpoints of the participants while upholding a methodical approach to guarantee that important subjects are covered. (Saunders et al. 2009, 320-332.) The goal of the interviews was to understand the contribution of e-invoicing adoption but also on its alignment with sustainability for the interviewed companies. Each interview lasted approximately half-hour to one hour, during which participants were asked open-ended questions, giving them the opportunity to elaborate on their experiences and opinions.

Using thematic analysis, the responses were analyzed to spot patterns related to the practical aspects of e-invoicing and its sustainability benefits. Saunders et al. (2016) describes this method as organizing data through coding and grouping similar ideas into broader themes. By categorizing responses this way, it becomes easier to understand how e-invoicing matches up with sustainability goals and how businesses use technology to hit these targets.

<b>Company</b>	<b>Interview Date</b>	<b>Interviewee Position</b>
<b>Bravi Ragazzi Oy</b>	13th Nov. 2024	Owner and Financial Manager

Table 2. Interviewee Profiles and Timing

Table 3 above outlines the key details of the interviewee, including their roles and the dates of the interviews. The complete list of interview questions is available in Appendix 2. Below, these questions are explained, organized by theme, along with the rationale for their selection.

- Theme 1: Adoption of E-invoicing

This theme was designed to explore the process of the organization in the transition from paper to electric invoicing, including challenges or the success it has brought with it. These questions are related to each other as the motivation for adoption is most likely influences the easiness level of the transition.

- Theme 2: Impact on Financial Management Efficiency

This Theme investigated how the e-invoice affected the organization's financial processes. The first question in this theme was to specify the improvements, such as cost savings and reduced processing times. However, the second question concerned the errors and accuracy of the invoicing process.

- Theme 3: Sustainability Goals and E-invoicing

This theme was designed to explore the environmental benefits of e-invoicing and how it might help accomplish sustainability goals. The first question sought to determine whether e-invoicing helped the organization achieve its sustainability goals, such as decreasing waste and enhancing resource efficiency. The second question delves deeper into effects that are more or less measurable, such as paper reduction and energy consumption. These questions collectively provide a broad picture of the influence of e-invoicing on sustainability.

- Theme 4 Challenges and Limitations:

This theme was to examine the challenges that companies face when using digitalized invoicing solutions. The first question was to identify challenges that might limit the effectiveness or expansion of e-invoicing. The second question looked at what might limit

e-invoicing from helping companies become more sustainable in order to understand perceived shortcomings or areas for improvement within the e-invoicing system. These questions are connected because challenges with how e-invoicing is used often reveal bigger problems that need to be fixed to make it more widely used and better for sustainability.

- Theme 5: Future Perspectives

The theme focused on the future of digital invoicing. The first question asked businesses how they plan to improve their e-invoicing processes and what changes they expected to see. The second question aimed to gather insights and advice to help other businesses in similar industries. These two questions are connected because the lessons and experience businesses learn often shape their future strategies. At the same time, these insights can provide valuable guidance for others looking to adopt or improve their e-invoicing systems.

### 3.4 Reliability and Validity

The survey uses standardized questions with clear answer choices to ensure reliability and encourage consistency in responses. The validity of quantitative data depends on both stability and the reduction of interpretive bias, which are enhanced by a well-structured survey design (Lakshman et al. 2000, 377).

Triangulation, which involves confirming quantitative survey results with qualitative viewpoints from interviews, further strengthens validity. By providing evidence from several perspectives, minimizing bias, and strengthening the research's interpretive validity, triangulation improves the confidence of results (Saunders et al. 2016, 207). Creswell's emphasis on cross-validation in mixed-methods research to produce reliable, accurate results aligns with this approach (Creswell 2003, 22-23).

## 4 Results and Discussion

### 4.1 Survey

#### 4.1.1 Age and Familiarity with E-Invoicing

This demographic question was the first as seen in appendix 1, to capture the age distribution of the respondents, which would provide their attitudes and familiarity towards e-invoicing. As age can be influential factor in adopting digital services, younger people being often more open to technology while older respondents might less open. Therefore, collecting this data allows to understand whether the age play role in the openness for e-invoicing.

The age ranges as shown in the figure 9, are broad to capture generation segments without being too detailed, which allowed to identify general age, without complexing the analysis. the question about familiarity was asked to help understand how much knowledge people already have with e-invoicing. Familiarity can effect on answering upcoming questions about benefits, challenges, satisfaction, and the e-invoices role in sustainability. The options for answering however as shown in figure 10 let respondents express their level of knowledge and experience with e-invoice.

A special logic was added for respondents who are unfamiliar, where it took them to another set of two questions, but first they were provided with brief explanation of the e-invoice as shown in the appendix 1, and then they were asked if they would be open to receiving e-invoices and whether they believed e-invoicing could support environmental sustainability. This logic ensured that unfamiliar respondents would not be asked questions that require prior experience while still capturing their openness on e-invoice and impact on sustainability, by introducing them to e-invoicing.

### What is your age range?

Number of responses: 52

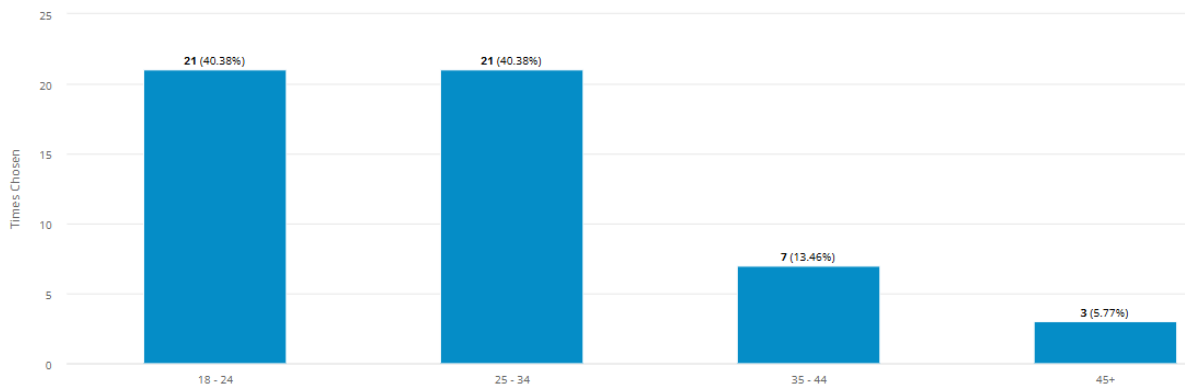


Figure 8. Q1: What is your age range?

### How familiar are you with e-invoicing?

Number of responses: 52

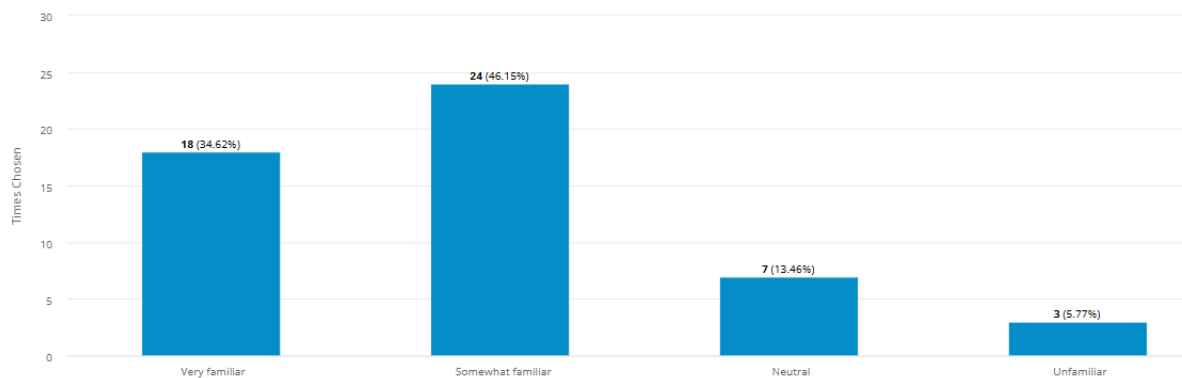


Figure 9. Q1.1: How familiar are you with e-invoicing?

The bar chart illustrates familiarity with e-invoicing across different age groups. As shown in Figure 10, the age groups 18-24 and 25-34 both had the highest number of respondents, each comprising 40.38% of the total participants. Notably, within the 18-24 age group, three respondents reported being unfamiliar with e-invoicing, making them the only individuals unfamiliar with the concept among all 52 survey participants.

The results indicate that the 18-24 age group has the least familiarity with e-invoicing overall as shown in Figure 11. Despite this, only 5.17% of the total respondents were entirely unfamiliar with e-invoicing, suggesting a moderate level of exposure among younger users. In contrast, all respondents in the older age groups (25-34, 35-44, and 45+) reported at least some familiarity with e-invoicing. This trend suggests that familiarity

with e-invoicing may increase with age, potentially due to longer exposure to digital technologies or experience with business processes that utilize such systems.

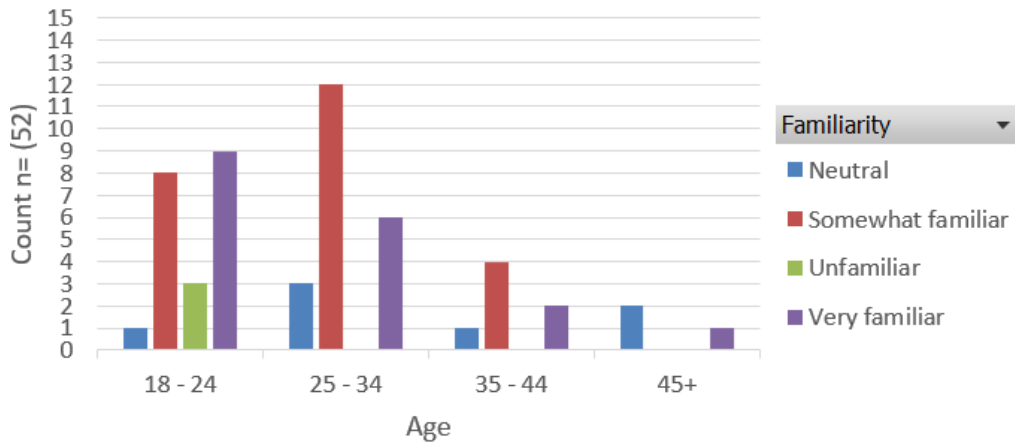


Figure 10. Familiarity with E-Invoicing Across Age Groups

### UNFAMILIAR RESPONDANTS QUESTIONS

For the 3 respondents who were not familiar with the e-invoice, two additional questions were asked:

#### Q1:

This question intended to determine if unfamiliar people would still be open to use e-invoicing. Understanding this helps know if people might be willing to switch to a digital invoice even if they haven't used them before, the answers for the question were straightforward making it easy for them to answer without complex since they lack experience with e-invoicing.

**Would you be open to receiving invoices electronically (instead of in paper form) if companies offered this option?**

Number of responses: 3

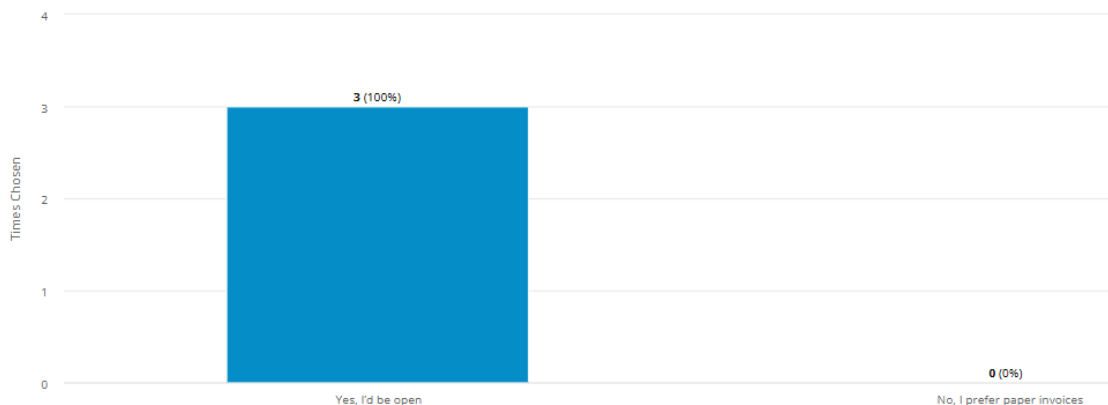


Figure 11. Q1.2: Would you be open to receiving invoices electronically (instead of in paper form) if companies offered this option?

All 100% of the respondents answered they would be open to receive e-invoices if companies offered them as seen in the graph above in figure 12.

**Q2:**

This was the second and last question for the unfamiliar respondents, it was asked to find out if they believe it is good for the environment, if they might be more willing to try e-invoicing if they find it as environmentally friendly. The answer range allowed respondents show their level of belief in e-invoices environmental impact clearly, which also captures opinions even for those without experience. This question connects with previous ones to suggest a need for awareness in case unfamiliar respondents don't believe its environmental value, it also adds context for next questions when user with more experience might express their views on sustainability differently. At this point the survey ends for the unfamiliar respondents

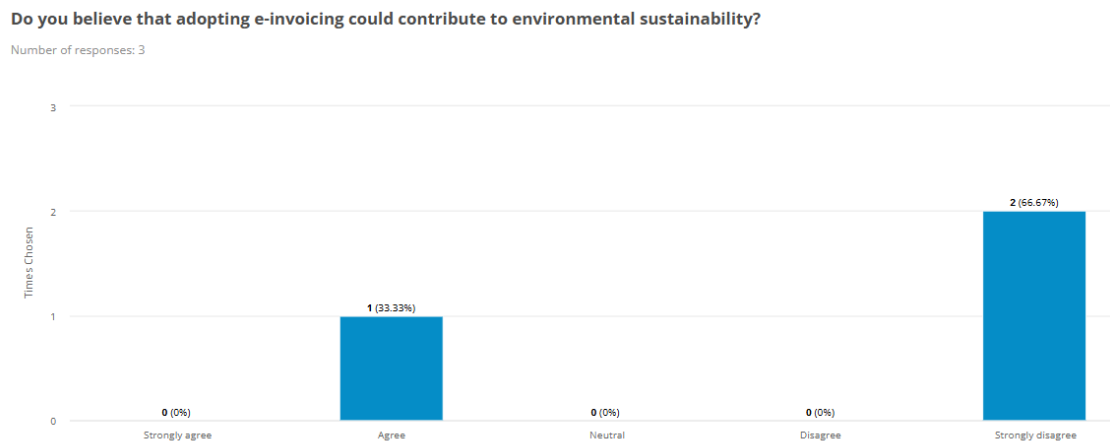


Figure 12. Q1.3: Do you believe that adopting e-invoicing could contribute to sustainability?

In this second question responses were mixed on whether e-invoice could contribute to sustainability. One person agreed as shown in Figure 13, while two others strongly disagreed. This shows that some unfamiliar users might need more information on the environmental benefits of e-invoicing to understand its value from that perspective.

#### 4.1.2 Frequency of Receiving E-Invoices

For users who are familiar with e-invoicing, the survey continues with this question, which aims to understand how often respondents interact with e-invoice, reflecting their level of experience and reliance on it, which might relate to their comfort level and familiarity.

### How frequently do you receive e-invoices for your purchases or subscriptions?

Number of responses: 49

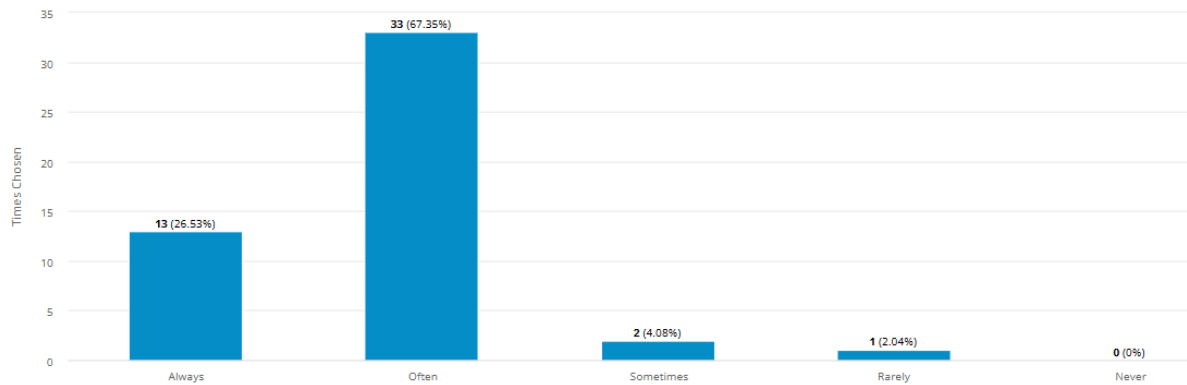


Figure 13. Q2: How frequently do you receive e-invoices for your purchases or subscriptions?

As shown in figure 14, the majority of respondents (67.35%) noted that they “Often” receive e-invoicing, which makes it the most common response, while 13 (26.53%) respondents stated that they “Always” receive e-invoice, showing that it is a consistent practice for them. Only 4.08% respondents said they “Sometimes” receive e-invoices, and 2.04% said they “Rarely” do, no one noted “Never” receiving an invoice. This indicates that most people receive e-invoices regularly, highlighting their widespread use.

Further insights were taken through the cross-table on Familiarity with E-Invoicing vs Frequency of Use as seen in figure 15 below, to provide additional insights into how familiarity affects usage. Respondents who are “Very familiar” with e-invoicing use it most often, with many saying they “Always” or “Often” receive e-invoices. Those who are “Somewhat familiar” also use it frequently, mainly selecting “Often” on other hand, respondents with “Neutral” familiarity showed more varied use, with some using it regularly and others less frequently.

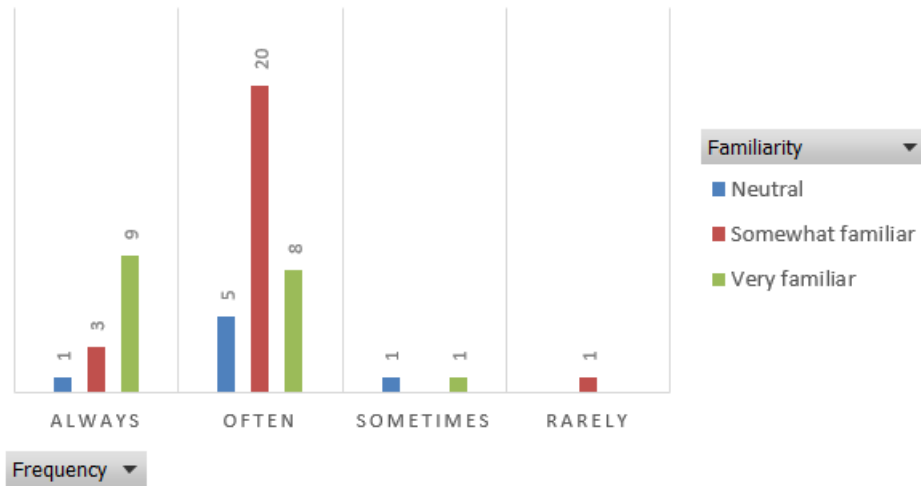


Figure 15. Familiarity vs. Frequency of Use

These combined findings showed a positive correlation between familiarity and frequency of use, as the people who are more familiar with e-invoicing tend to rely on this system more often. This highlights that awareness is needed to enhance familiarity in order to encourage more the adoption of e-invoice.

#### 4.1.3 Channels for Receiving E-Invoices

This multiple-choice question identifies the most common channels for e-invoices, it is important to understand user preference and any convenience factor. It also gives an insight on which channels are most widely used and preferred. This question links to satisfaction with the e-invoice format, since it may influence the use of invoices and how is the feel about the format of the e-invoice the receive.

##### How do you typically receive e-invoices?

Number of responses: 49

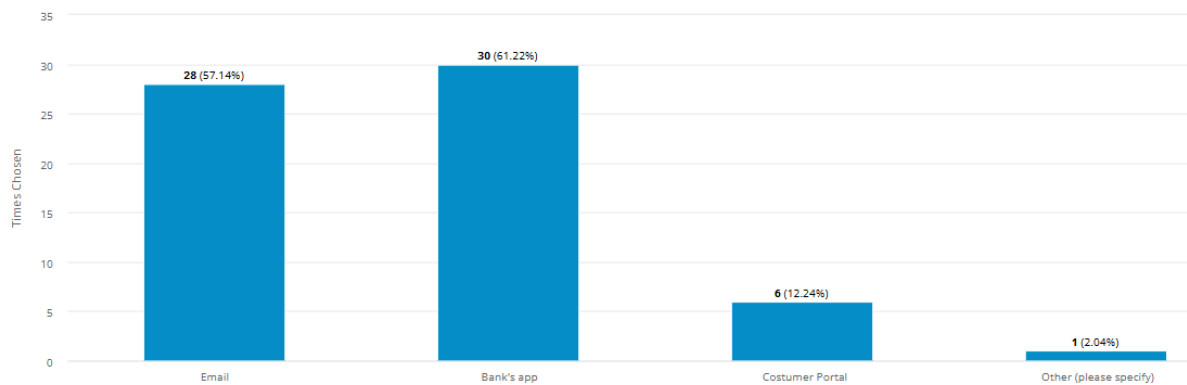


Figure 14. Q3: How do you typically receive e-invoices?

Bank's app (61.22%) and email (57.14%) were reported to be the main channels used by the respondents for receiving and paying invoices, A smaller group recorded to be accessing e-invoices through costumer portal (12.24%) with only one respondent (2.04%) noting using other methods like "Posti app". This suggests that banks app and emails are the preferred and most common channels for e-invoicing among respondents, Illustrated in figure 16 above.

#### 4.1.4 Satisfaction with E-Invoice Format

This question was to measure the satisfaction of the users with the presentation and usability of e-invoice, as shown in the figure 17, the meaning of the format was explained in the question, as shown in appendix 1, to not to mislead the respondents, Satisfaction scale allowed them express range of opinions from highly satisfied to highly dissatisfied, capturing detailed feedback on the format.

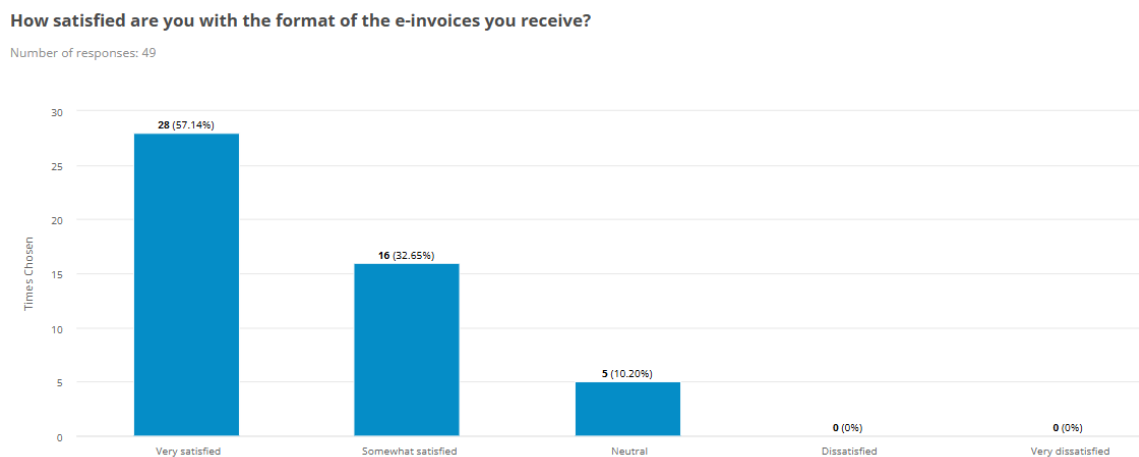


Figure 15. Q4: How satisfied are you with the format of the e-invoices you receive?

The vast majority of respondents (89.79%) noted that they were happy with the format of the e-invoice. Of those surveyed, 57.14% said they were "very satisfied," while 32.65% said they were "somewhat satisfied." This indicates that the e-invoice format largely meets users' needs and expectations. No participants expressed dissatisfaction and just 10.20% expressed neutrality regarding their level of happiness. These findings suggest efficient and user-friendly, meeting the needs and expectations of most users. The positive feedback about the e-invoice format shows that it meets users' needs for usefulness and convenience, resulting in high satisfaction levels.

#### 4.1.5 Managing e-invoices easier to compared to paper invoices

After the satisfaction question with the e-invoice format by taking into account elements like layout, clarity, and usability. This manageability question aims to explore how easy respondents think it is to manage e-invoices compared to regular paper invoices. The answers will give provide useful insights about how efficient digital invoicing systems are seen to be.

**Do you find e-invoices easier to manage compared to paper invoices?**

Number of responses: 49

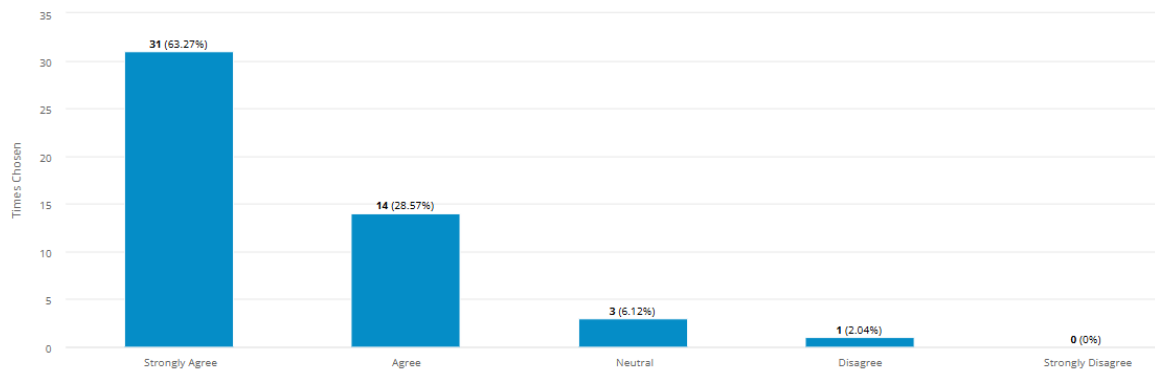


Figure 16. Q5: Do you find e-invoices easier to manage compared to paper invoices?

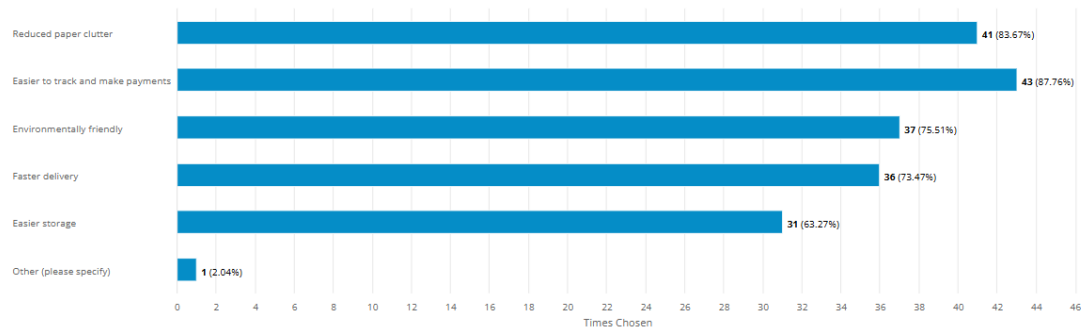
According to the figure 18, a majority of respondents believe that electronic invoices are easier to manage than paper invoices. Specifically, 28.52% agree with the statement and 63.27% fully agree, indicating a strong preference for the ease of managing electronic invoices. A very low percentage of 6.12% responded "neutral", meaning they don't agree or disagree with the comparison. Only one (2.04%) of participants disagree and none strongly disagree. This indicates that e-invoicing is generally thought to be a simpler and more effective option than traditional paper invoices.

#### 4.1.6 Perceived Benefits of E-Invoicing

This question was to identify main advantages users see in e-invoicing, which helps understand what features are most valued, like convenience and environmental impact or ease of organizing. The options covered some of common benefits related to e-invoicing, allowing respondents to select multiple options as well as adding their own choice in the "other" if they want express, to provide full view of their priorities and experiences. Hence, it relates to previous questions on satisfaction and format preference as the recognized benefits might influence the overall satisfaction of respondents with e-invoice.

**What do you consider the main benefits of receiving e-invoices? (Select all that apply)**

Number of responses: 49



"Other (please specify)" text answers:

transparency

Figure 17. Q6: What do you consider the main benefits of receiving e-invoices?

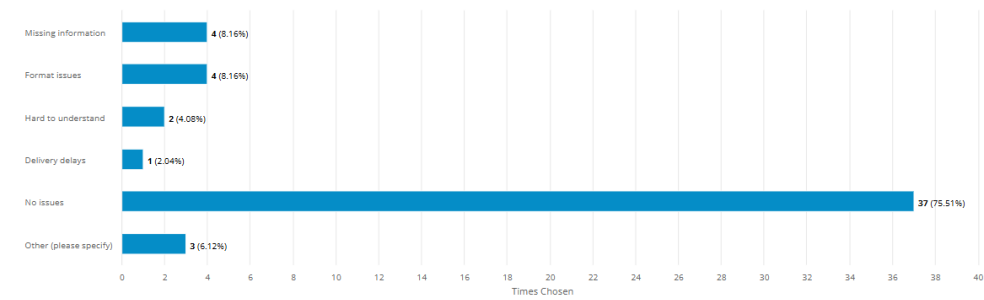
The most selected benefits among respondents were “Easier to track and make payments” (87.76%), “Reduced paper clutter” (83.67%), and “Environmentally friendly” (75.51%) (Figure 19). Additionally, “Faster delivery” (73.47%) and “Easier storage” (63.27%) were also popular choices. One respondent mentioned “Transparency” under “Other,” further indicating that users appreciate the efficiency and organization that e-invoicing offers, along with its positive environmental impact.

#### 4.1.7 Issues Encountered with E-Invoices

This question was designed to identify any problems respondents may have experienced when using e-invoices. Understanding the challenges or barriers faced by users is crucial to identify areas for improvement in the e-invoicing process. Issues could range from technical problems (e.g., problems with software or platforms) to misunderstandings about invoice content or delivery.

### Have you encountered any issues with the e-invoices you receive?

Number of responses: 49



"Other (please specify)" text answers:

In (rare) occasion if not paying the invoice immediately or automatically, forgot to pay e-invoice in time due to not having the physical paper as a reminder.
usually no issues
barcode

Figure 18. Q7: Have you encountered any issues with the e-invoices you receive?

As illustrated by Figure 20, most users with total of 75.51% noted they have not faced any issues. While those who faced issues reported the most common ones were "missing information" and "format issues" each reported 8.16% of respondents. Smaller percentage reported "Hard to understand" (4.08%) and "Delivery delays" (2.04%). A small group (6.12%) mentioned other concerns, including forgetting to pay without a physical reminder and minor issues like barcode problems. Overall, the results suggest that most users find e-invoicing reliable, with only a few reporting specific challenges.

#### 4.1.8 E-Invoicing and Sustainability Perception

This question aimed to assess whether respondents associate e-invoicing with environmental sustainability. Understanding how e-invoicing is viewed in terms of sustainability can help businesses better convey the environmental benefits of digital invoicing.

### Does receiving e-invoices make you view companies as more committed to sustainability?

Number of responses: 49

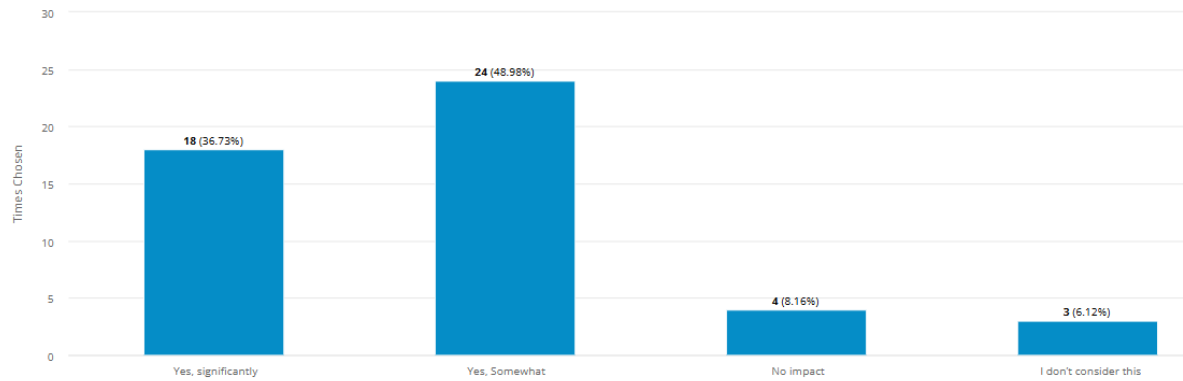


Figure 19. Q8: Does receiving e-invoices make you view companies as more committed to sustainability?

Figure 21 demonstrates that the majority of respondents (85.71%) believed that e-invoicing makes companies appear more committed to sustainability. Of these, 36.73% felt that it made companies appear "significantly" more sustainable, while 48.98% felt it had a "somewhat" significant impact. However, 8.16% of respondents did not perceive any impact on a company's sustainability by adopting e-invoicing. This indicates that e-invoicing is generally seen as a sustainable choice, although some respondents might need more information or awareness about its environmental benefits to fully recognize its impact.

#### 4.1.9 Ease of Payment with E-Invoices

This question aimed to understand how easy respondents find it to make payments using e-invoices. Knowing their experiences helps show how user-friendly and efficient e-invoicing systems are, which are key factors in its adoption and acceptance. The options allowed respondents express the level of easiness of the process, which captures their overall satisfaction with the payment function.

### How easy is it for you to make payments directly through e-invoice?

Number of responses: 49

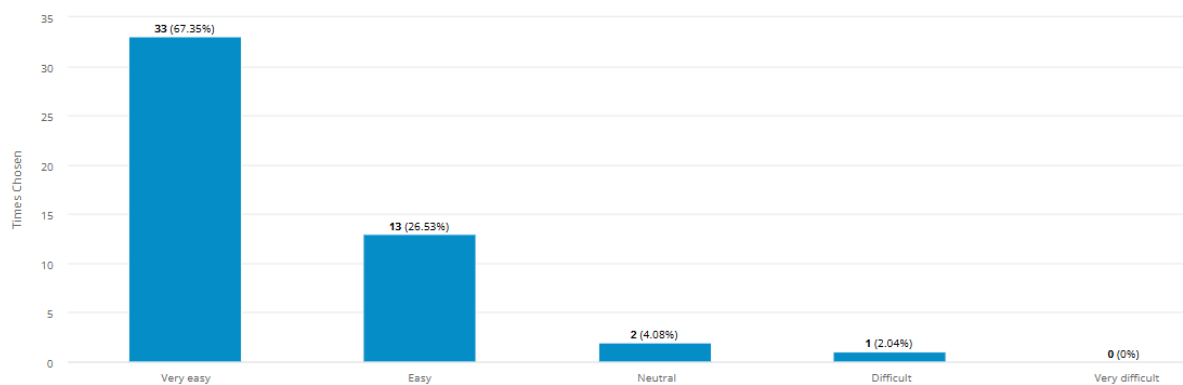


Figure 20. Q9: How easy is it for you to make payments directly through e-invoice?

As illustrated in figure 22, significant majority 93.88% of respondents indicated that using e-invoices was easy for payment, reflecting a their preference for the convenience of the process. Specifically, 67.35% of respondents reacted the payment process was "very easy," while just over quarter portion of the respondents noted it was "easy." Just two respondents were neutral, while only one said the procedure was "challenging." It is noteworthy that none of the participants said the payment procedure was "very difficult." These results support the generally positive perception of e-invoicing by showing that the payment method for e-invoicing is user-friendly and efficient.

#### 4.1.10 E-Invoice Continuation Preferences

The aim of this question is to understand whether users are satisfied with e-invoicing or would prefer a return to paper invoices. it helps to measure the overall acceptance of e-invoicing, The options "Continue with e-invoices," "Prefer paper invoices," and "No preference" allow respondents to express a clear preference, capturing a range of attitudes towards e-invoicing.

Would you prefer to continue receiving e-invoices, or would you rather receive paper invoices?

Number of responses: 49

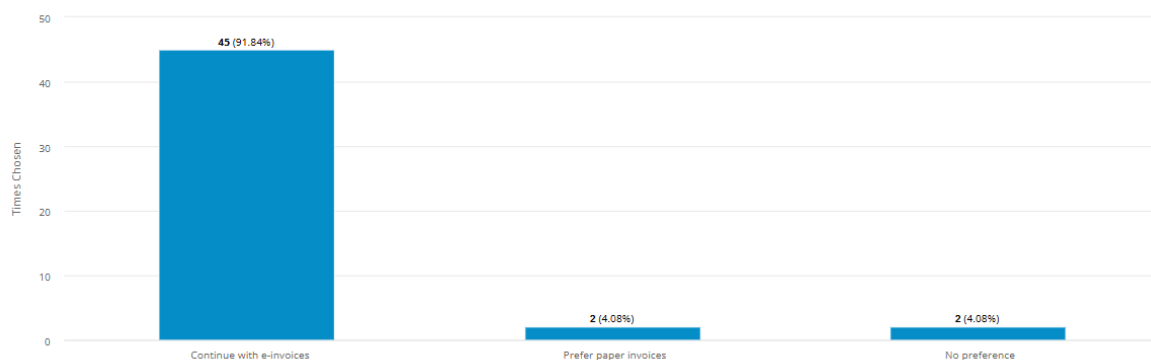


Figure 21. Q10: Would you prefer to continue receiving e-invoices, or would you rather receive paper invoices?

Most respondents (91.84%) said they prefer to continue receiving e-invoices, as shown in Figure 23. A small number (4.08%) preferred paper invoices, while another 4.08% had no strong preference. This shows that most people are happy with e-invoicing and find it convenient and reliable. The low interest in paper invoices suggests that digital invoicing has become the preferred choice for many, highlighting the shift away from traditional methods.

#### 4.1.11 Support for Wider Adoption of E-Invoicing

This question aimed to understand respondents' support and attitude toward the broader adoption of e-invoicing. It also highlights the demand for this technology across more companies. The straightforward options allowing for support, neutrality, or opposition helped capture general opinions on the idea of more companies adopting e-invoicing. This question relates to previous questions about benefits and issues of e-invoicing, as the users that see positive benefits and minimal issue rate, are more likely to support this adoption, while others who favour e-invoicing for its environmental impact might incline more to encourage more companies to adopt it.

##### Do you think more companies should adopt e-invoicing for consumers?

Number of responses: 49

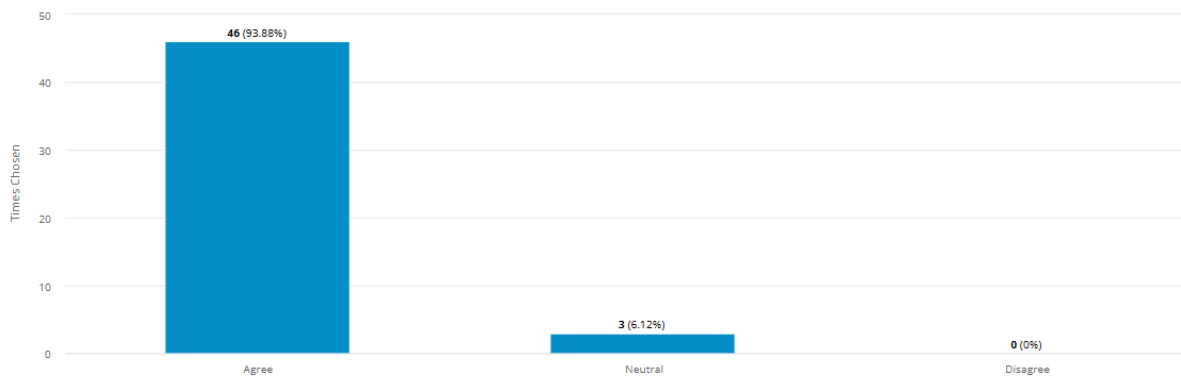


Figure 22. Q11: Do you think more companies should adopt e-invoicing for consumers?

Figure 24 indicates that 93.88% of respondents think that more companies should adopt e-invoice showing the strong overall support for e-invoice, only 6.1% were neutral and no one disagreed. Reflecting positive attitude and wide acceptance towards e-invoicing.

#### 4.2 Interview

As laid out in the research plan and methodology sections, the interview was carried out using a thematic approach. This method fit well with the research questions and helped ensure a structured analysis of the responses. Themes were developed to explore key aspects of e-invoicing adoption, like motivations, transition experiences, financial management efficiency, sustainability contributions, challenges, and future perspectives.

The interview, shown in Table 3, was with Virpi Kämppe, who is one of the owners and the financial manager at Bravi Ragazzi Oy. This company runs the Mamma Maria restaurant in Lahti, Finland. Face-to-face interview was conducted with her on November 13, 2024, to

get some insights into how they're using e-invoicing and its role in promoting sustainability. Even though it wasn't a focused case study, the interview gave us valuable perspectives from the food service sector on digital invoicing practices and their impact. All the interview questions can be found in Appendix 2.

<b>Theme</b>	<b>Key Insights from Interview</b>	<b>Overall Analysis</b>
<b>1. Motivation for Adopting E-Invoicing</b>	<ul style="list-style-type: none"> <li>- E-invoicing adopted mainly to save time and reduce costs.</li> <li>- Transition was gradual; some paper invoices are still processed manually.</li> </ul>	E-invoicing was motivated by cost-effectiveness and operational efficiency, though full transition has not been achieved for all invoices.
<b>2. Transition from Paper to E-Invoicing</b>	<ul style="list-style-type: none"> <li>- The transition was smooth as many suppliers already used e-invoicing.</li> <li>- Some address errors caused issues with receiving invoices.</li> </ul>	The transition to e-invoicing was largely positive, with occasional errors due to data entry issues. The shift was facilitated by suppliers' early adoption.
<b>3. Impact on Financial Management Efficiency</b>	<ul style="list-style-type: none"> <li>- Easier tracking of financial records.</li> <li>- Faster access to invoices and quicker responses to supplier inquiries.</li> </ul>	E-invoicing has significantly improved financial management, particularly in terms of speed, accuracy, and ease of access to records.
<b>4. Sustainability Goals and E-Invoicing</b>	<ul style="list-style-type: none"> <li>- E-invoicing reduced paper usage, physical storage, and human effort involved in managing paper invoices.</li> <li>- Measurable reductions in paper consumption and resource usage.</li> </ul>	E-invoicing supports the company's sustainability goals by reducing paper and storage, contributing positively to environmental goals.

<b>5. Challenges and Limitations</b>	<ul style="list-style-type: none"> <li>- Some suppliers and private customers still use paper invoices.</li> <li>- Occasionally, invoices are sent by email or post.</li> </ul>	The main challenge is the incomplete adoption of e-invoicing by all stakeholders, although paper invoices have become rare.
<b>6. Future Perspectives</b>	<ul style="list-style-type: none"> <li>- Current e-invoicing system is satisfactory.</li> <li>- Regular updates to improve system security and interface.</li> </ul>	The business plans to continue using e-invoicing, focusing on staying up to date with security and usability improvements.

Table 3. Thematic Analysis of Interview Responses: Key Insights and Overall Analysis

Table 4 offers a concise summary of the key findings derived from the thematic analysis. It is designed to give a quick overview of the most critical results, linking them to the broader objectives of the research.

<b>Key Finding</b>	<b>Description</b>
<b>E-invoicing Adoption Motivations</b>	Cost savings and time efficiency were the main drivers for adopting e-invoicing.
<b>Efficiency Improvements</b>	E-invoicing improved financial management efficiency, reduced errors, and sped up access to invoices.
<b>Sustainability Contributions</b>	E-invoicing reduced paper usage, contributing to sustainability goals by eliminating paper storage and reducing resource consumption.
<b>Challenges</b>	Challenges remain with a few suppliers not fully adopting e-invoicing, leading to occasional manual invoicing.
<b>Future Developments</b>	No major changes are planned, but ongoing updates will enhance security and system usability.

Table 4. Summary of Key Findings from Thematic Analysis

## 5 Findings and Conclusions

The aim of this study was to examine the use and benefits of electronic invoicing in Finland, particularly regarding cost savings, operational efficiency, and sustainability. Data were collected from primary sources, including a survey and an interview with Virpi Kämppe from Bravi Ragazzi Oy. By combining primary and secondary data, the study addressed the initial research questions and provided valuable insights into the real-world impact of e-invoicing on both individuals and businesses.

The main focus was on how e-invoicing affects companies' operational efficiency and financial performance. The survey and interviews showed that e-invoicing really boosts efficiency by cutting down the time and costs tied to traditional paper invoicing. People agreed that e-invoicing speeds up transaction processing, makes documentation better, and helps track payments more easily. Bravi Ragazzi Oy made the switch from paper to electronic invoicing and realized significant time and cost savings. Virpi noted that, although they still receive some paper invoices, e-invoicing has ultimately lowered costs and improved efficiency. These findings align with previous research showing that e-invoicing provides substantial operational benefits, especially in reducing administrative expenses and speeding up payment processing.

The second research question looked at the challenges businesses face when shifting from paper to electronic invoicing. The survey and interviews highlighted issues with suppliers who have not yet adopted e-invoicing systems. Virpi mentioned that while many suppliers now use online invoicing, some still send paper or email invoices, causing occasional problems. A few survey participants brought up issues like missing details or inconsistent layouts in electronic invoices. But Virpi mentioned that these problems were minor and easy to handle. Despite these challenges, most businesses found the switch to e-invoicing to be pretty smooth, according to the interview results.

The objectives of the third research question were to explore how e-invoicing fits into digital transformation and its impact on sustainability. Both the survey and the interview provided strong evidence that e-invoicing has environmental benefits. Virpi confirmed that using e-invoices cuts down the need for physical storage and paper usage. Many survey respondents agreed that e-invoicing cuts down on paper waste. Although some were unsure about the specific environmental impacts, e-invoicing is generally seen as a positive for the environment. This matches with what previous studies have said about e-invoicing being important for sustainability and digital transformation by reducing paper use and simplifying business processes.

In conclusion, this study shows that electronic invoicing has huge benefits for companies, like cutting costs, improving efficiency, and supporting sustainability. The interview with Virpi highlighted the business perks of e-invoicing, while the survey offered a broader perspective from customers, showing its positive impact on business practices despite minor issues with supplier adoption and technical problems for users. Overall, the study emphasizes the potential of e-invoicing as a key tool for modernizing financial processes, reducing costs, and supporting sustainability, marking an important step in the digital transformation of businesses.

## **6 Ethical considerations**

To ensure the ethical integrity and to respect participants rights during this research. Several measurements were taken into consideration.

An overview of the study purpose was provided to the participants, who were informed that their participation was entirely voluntary and that they could withdraw at any time without any consequences. To ensure the information was accurate, participants were given the opportunity to review and approve the interview summaries.

The privacy of the participants was respected as they were allowed to remain anonymous for themselves or their organization, and they were insured that the data collected will be used only academic purposes. Data collected through surveys and interviews were stored securely and only accessed by those who are working on the thesis. Once the project is complete, the data will be deleted. To ensure objective reporting, findings were accurately presented, without misrepresenting anyone's views.

These measures reflect the commitment to conducting the research responsibly, ensuring the reliability of data and respecting participant contributions.

## 7 Limitation and Further Research

### 7.1 Limitations

One of the primary limitations of this study is the limited number of interviews conducted. The research aimed initially to interview several broader in order to gain range of insights of e-invoicing adoption, its environmental impacts and preferences particularly with respect to its environmental impact and alignment with sustainability goals.

However, despite reaching out to several potential participants, only one interview was successfully completed. This limited sample size restricts the ability to draw generalized conclusions from the interview data. With only one company's perspective, the findings from the thematic analysis may not fully capture the diverse experiences and challenges faced by businesses in different industries, especially when it comes to integrating e-invoicing with sustainability objectives. Consequently, the study's exploration of how e-invoicing contributes to sustainability may not be as comprehensive as initially intended, as the insights drawn from just one company may not reflect the broader range of environmental benefits or challenges businesses experience across various sectors.

Another limitation concerns the survey response rate. Although the survey was sent to over 100 individuals, only 52 valid responses were received, which approximately 50% of response rate. While this provided useful data, but low response rate may not fully represent the views of the whole population. A higher response rate would have enhanced the reliability and validity of the survey findings, particularly when examining the impact of e-invoicing on sustainability and business efficiency.

A larger and more varied respondent sample could have offered a more comprehensive understanding of how e-invoicing is perceived and utilized across different sectors and by a broader range of individuals and businesses. One more limitation of this study is that it did not include follow-up questions to delve into why some respondents disagreed with the idea that e-invoicing could aid in sustainability. While the survey did address the role of e-invoicing in sustainability, it fell short by not offering respondents a chance to explain their reasons for disagreement. The study might not have been fully explored in detail because of this gap.

Lastly, the findings may not be fully generalizable to all businesses in Finland. Given the small number of interviews and the relatively narrow survey sample, the insights gathered may reflect only a limited set of perspectives. As such, caution should be taken when applying the results to a broader population of businesses or industries, as the experiences

shared in this study may not represent the full range of challenges and benefits associated with e-invoicing adoption.

## 7.2 Further Research

Further research could focus on collecting data from both companies and their operators in order to get more technical and detailed data regarding the e-invoicing process. Secondly, future research should include vendor and company perspectives to provide a comprehensive knowledge of the benefits and limitations of e-invoicing. Thirdly, future study should look at the current research issue within the framework of Nordic enterprises. Fourthly, future study should collect quantitative data from a large number of organizations to improve the generalizability of the findings.

To expand on this, future studies could include interviews with businesses across various industries to better understand the impact of e-invoicing on sustainability and operational efficiency. Researchers might also design follow-up surveys or in-depth questions to gather more specific insights, particularly regarding e-invoicing's environmental effects. Investigating the long-term impacts of e-invoicing adoption, such as cost savings and sustainability goals over time, would also be valuable. Another avenue for research could focus on identifying regulatory and technological barriers to widespread adoption, especially for smaller businesses or regions with slower digital transformation. Finally, cross-country comparisons could provide a broader perspective on how e-invoicing supports sustainability in different economic and regulatory environments.

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## Appendix 1. Survey

### Q1 & Q1.1

We are final-year students in the Business Information Technology program at Lahti LAB University of Applied Sciences. As part of our thesis project, we are conducting research to better understand consumer experiences, preferences, and perceptions regarding electronic invoicing (e-invoicing). Our aim is to explore how e-invoicing impacts convenience, sustainability, and overall satisfaction for consumers. This survey will take approximately 5 minutes to complete. Your responses are invaluable to our research, and all information will be kept anonymous and used solely for academic purposes. We sincerely appreciate your participation in helping us gather insights that could contribute to improvements in digital invoicing processes. Thank you for your time and support!

**What is your age range? \***

18 - 24

25 - 34

35 - 44

45+

**How familiar are you with e-invoicing? \***

Very familiar

Somewhat familiar

Neutral

Unfamiliar

## Q1.2 & Q1.3

### **What is Electronic Invoice (E-invoice) ?**

E-invoicing refers to receiving invoices in a digital format, usually via email, app, or online portal. These invoices can be accessed electronically rather than in paper form

### **Would you be open to receiving invoices electronically (instead of in paper form) if companies offered this option? \***

Yes, I'd be open

No, I prefer paper invoices

### **Do you believe that adopting e-invoicing could contribute to environmental sustainability? \***

Strongly agree

Agree

Neutral

Disagree

Strongly disagree

## Q2, Q3 & Q4

How frequently do you receive e-invoices for your purchases or subscriptions? \*

Always

Often

Sometimes

Rarely

Never

How do you typically receive e-invoices? \*

Email

Bank's app

Customer Portal

Other (please specify)

How satisfied are you with the format of the e-invoices you receive? \*

By 'format,' we mean the overall design, layout, and organization of information in the e-invoice, including how easy it is to read and understand.

Very satisfied

Somewhat satisfied

Neutral

Dissatisfied

Very dissatisfied

## Q5, Q6 & Q7

Do you find e-invoices easier to manage compared to paper invoices? \*

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

What do you consider the main benefits of receiving e-invoices? (Select all that apply) \*

Reduced paper clutter

Easier to track and make payments

Environmentally friendly

Faster delivery

Easier storage

Other (please specify)

Have you encountered any issues with the e-invoices you receive? \*

You can select multiple options.

Missing information

Format issues

Hard to understand

Delivery delays

No issues

Other (please specify)

Q8, Q9 & Q10

Does receiving e-invoices make you view companies as more committed to sustainability? \*

Yes, significantly

Yes, Somewhat

No impact

I don't consider this

How easy is it for you to make payments directly through e-invoice? \*

Very easy

Easy

Neutral

Difficult

Very difficult

Would you prefer to continue receiving e-invoices, or would you rather receive paper invoices? \*

Continue with e-invoices

Prefer paper invoices

No preference

Do you think more companies should adopt e-invoicing for consumers? \*

Agree

Neutral

Disagree

## Appendix 2. Interview Questions

### Theme 1: Adoption of E-invoicing

- Why did your organization decide to start using e-invoicing?
- How would you describe the process of moving from paper invoices to e-invoicing?

### Theme 2: Impact on Financial Management Efficiency

- How has e-invoicing affected your organization's financial processes?
- Has e-invoicing impacted the accuracy of your invoices or reduced errors?

### Theme 3: Sustainability Goals and E-invoicing

- How does e-invoicing support your organization's sustainability goals?
- Have you seen a reduction in resources like paper or energy since using e-invoicing?

### Theme 4: Challenges and Limitations

- What challenges, if any, have you faced with e-invoicing in your organization?
- Are there any limits to e-invoicing that you think could be improved to make it more sustainable?

### Theme 5: Future Perspectives

- How does your organization plan to improve its e-invoicing in the future?
- What advice would you give to other organizations thinking about switching to e-invoicing?