



Construction companies' awareness and perceptions of eFPS: A correlational study

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ABSTRACT

This study assessed the effectiveness of the Electronic Filing and Payment System (eFPS) among construction companies in Ilocos Norte, Philippines. Specifically, it explored the level of awareness, challenges, and effectiveness of the Electronic Filing and Payment System (eFPS) among construction companies in Ilocos Norte, Philippines, and examined the relationships between business profile, awareness, challenges, and system effectiveness. Using a descriptive-correlational research design, data were collected from 33 construction companies via a structured survey and analyzed using statistical tools, including frequency and percentage, weighted mean, Spearman's rho, the Mann-Whitney U test, and Pearson's r correlation.

Findings revealed that regardless of ownership structure, construction companies collectively serve as indispensable agents of progress. Construction companies exhibited a very high level of awareness of eFPS, particularly regarding technical competence and knowledge, whereas awareness of costs and benefits was slightly lower. The severity of the challenges encountered was rated as high, with system errors and incorrect data entries identified as the most pressing issues. The overall effectiveness of eFPS was perceived, with perceived usefulness rated higher than convenience. Statistical analysis showed that certain business profile variables, specifically capitalization and number of employees, were significantly related to awareness of eFPS, while form of ownership, revenue, and years in operation had no significant influence. Moreover, higher technical competence and knowledge were significantly associated with fewer challenges, whereas greater awareness was positively correlated with greater perceived effectiveness of eFPS. Conversely, the severity of challenges reduced the convenience of system use.

The study concluded that technical knowledge and awareness are key drivers in maximizing the benefits and minimizing the difficulties of eFPS use among construction companies. It is recommended that companies enhance staff training and internal processes, the Bureau of Internal Revenue (BIR) strengthen system reliability and user support, and other taxpayers adopt best practices in digital compliance. Future research may expand the study to other industries, use larger samples, and incorporate factors such as digital literacy and organizational culture to further explore the long-term impact of electronic filing systems on business efficiency and compliance.

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Introduction

Taxation is the lifeblood of a nation. It sustains governance, funds infrastructure, and supports public welfare through the steady flow of revenue. In the Philippines, taxes finance essential services, drive development programs, and help maintain economic stability. As Villanueva (2019) explains, effective tax collection and utilization are fundamental to national progress, allowing both public and private sectors to operate within a stable fiscal system.

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However, the country's tax system has long struggled with administrative inefficiencies, excessive paperwork, and human error, which weaken compliance and transparency. In response, the government pursued reforms to modernize tax administration. This effort led to legislative initiatives such as the Ease of Paying Taxes (EOPT) Act, designed to simplify procedures and promote digitalization.

The passage of Republic Act (R.A.) No. 11976, or the Ease of Paying Taxes (EOPT) Act, represents a major step toward streamlined and digital tax compliance. The law restructures taxpayer classifications, simplifies reporting requirements, and institutionalizes online tax filing and payment systems (Congress of the Philippines, 2024). The Bureau of Internal Revenue (2024) notes that the Act improves accessibility, particularly for small and medium enterprises, by aligning tax procedures with modern technology. It also strengthens the government's broader digitalization agenda by promoting transparency and efficiency. Importantly, the EOPT Act reinforces digital platforms such as the Electronic Filing and Payment System (eFPS), which plays a central role in modern tax administration.

The Electronic Filing and Payment System (eFPS) was introduced by the Bureau of Internal Revenue (BIR) in 2001 through Revenue regulation No. 9-2001 to support electronic transactions. Initially implemented for large taxpayers and later expanded, eFPS evolved into a centralized online platform that automates tax filing and payment. Its goal was to simplify procedures, reduce manual errors, and enhance efficiency. Villanueva (2019) observes that the system minimizes human error and shortens processing time, while Lopez (2021) highlights its secure online filing, payment verification, and real-time monitoring features. Aquino and Garcia (2022) further emphasize that eFPS reduces miscalculations and non-compliance, fostering transparency and accountability. These advantages are especially valuable in industries with complex financial structures, such as construction, where timely and accurate compliance is critical.

The construction industry is a key driver of economic growth, transforming plans into infrastructure that supports modernization. Construction firms handle projects such as flood control systems, farm-to-market roads, access roads, multipurpose buildings, and commercial establishments—developments vital to both public welfare and private enterprise. Yet their financial operations are complex. Progressive billing, retention payments, subcontractor transactions, and long-term contracts make tax compliance demanding.

Revenue in construction is contract-based and typically recognized over time rather than through immediate sales. Firms operate under various contract types—fixed-price, cost-plus, unit-price, and time-and-materials agreements—each of which defines risk allocation and revenue timing. Under IFRS 15: Revenue from Contracts with Customers, revenue is recognized as performance obligations are satisfied, often using the percentage-of-completion approach and cost-to-cost method to match revenue with project progress (IFRS Foundation, 2014; AICPA, 2017). Revenue systems also consider variation orders, contract modifications, incentives, and claims, recognized only when collectability is highly probable. Given uncertainties such as fluctuating material costs, project delays, retention policies, and documentation requirements, firms must maintain precise cost monitoring and strict compliance with accounting standards to ensure transparency and sustainability (Schaufelberger & Holm, 2017; Trevino, 2018).

In this environment, digital systems like eFPS offer practical benefits. Martinez (2020) notes that eFPS simplifies filing, reduces administrative workload, and ensures timely tax submissions. For construction firms, maintaining compliance with the BIR is essential, especially when participating in government-funded projects. These reforms are particularly relevant in regions like Ilocos Norte, where infrastructure development continues to expand.

In Ilocos Norte, construction companies significantly contribute to regional growth. The Department of Agrarian Reform (DAR, 2025) reports that farm-to-market roads enhance agricultural productivity and market access. Infrastructure such as flood control systems and road networks improves transportation efficiency, strengthens commercial activity, and supports tourism (DPWH, 2025; DPWH, 2022). Flood walls and river management projects also increase community resilience against natural hazards (DPWH, 2022).

Given the scale of development, effective financial management and tax compliance are essential. The adoption of eFPS, reinforced by the EOPT Act, provides construction firms in Ilocos Norte with a centralized platform to manage obligations, including VAT, expanded withholding tax (EWT), and income tax (Lopez, 2021). The integration of digital platforms and

legislative reforms promotes transparency, accountability, and alignment with national digital governance goals. Assessing eFPS effectiveness in this regional context, therefore, offers meaningful insights into how technology and policy can enhance fiscal efficiency and support sustainable infrastructure growth.

This study is grounded in a commitment to national development and professional integrity. The rapid expansion of infrastructure under the “Build, Build, Build” program highlights the increasing complexity of construction operations and the need for transparent tax administration (PNA, 2019). In this context, eFPS is more than a digital tool—it is central to fiscal integrity. National progress depends not only on infrastructure but also on accountability in financial reporting. By examining eFPS effectiveness among construction firms in Ilocos Norte, this study seeks to demonstrate how ethical tax compliance strengthens fiscal systems and reinforces public trust, particularly amid concerns about ghost projects and substandard infrastructure. It reflects the accountant’s broader responsibility: not merely to compute figures, but to safeguard integrity as the foundation of development.

Despite the nationwide implementation of eFPS, limited research has examined its effectiveness in specific industries and provincial contexts, especially among construction firms in areas such as Ilocos Norte. Most studies focus on general adoption trends, overlooking industry-specific challenges, including digital literacy gaps, infrastructure limitations, and operational complexity. Moreover, the impact of the EOPT Act on eFPS usage remains underexplored. This study addresses these gaps by evaluating the experiences, challenges, and perceived effectiveness of eFPS among construction firms in Ilocos Norte, contributing insights to strengthen tax administration and compliance.

Literature review

This part includes concepts drawn from various literatures on eFPS awareness, effectiveness, perceived usefulness, convenience, and the challenges faced by eFPS users.

Electronic Filing and Payment Systems (eFPS)

The Bureau of Internal Revenue (BIR) Electronic Filing and Payment System (eFPS) is a web-based platform that simplifies tax filing and payment in the Philippines. Developed to improve taxpayer compliance, eFPS provides a secure, efficient, and convenient alternative to manual filing, reducing paperwork and administrative burden. It primarily serves large and medium taxpayers, allowing them to file returns and pay taxes electronically through accredited banks and financial institutions. By integrating filing and payment into a single accessible online system, eFPS supports major tax types, including income tax, value-added tax (VAT), and withholding tax.

The introduction of eFPS marked an important step in modernizing Philippine tax administration and aligning it with global digital governance practices. Before its implementation, taxpayers often encountered long queues, delayed processing, and frequent filing errors, which discouraged timely compliance. eFPS addressed these inefficiencies by enabling faster and more accurate submissions, thereby improving revenue collection and reducing the risks of tax evasion and errors (Manalo, 2021; Santos & Del Rosario, 2019). Studies also show that the system enhances taxpayer satisfaction by offering 24/7 access, minimizing in-person visits, and promoting greater transparency in tax transactions. Its digital framework proved especially valuable during the COVID-19 pandemic, as it supported social distancing while ensuring continuity of tax compliance (Ramos et al., 2022).

A key strength of eFPS is its fully online functionality. Taxpayers can file returns and remit payments electronically, receiving real-time confirmation and official receipts as proof of compliance (Delgado & Cruz, 2020). The system integrates with multiple accredited banks, allowing users to choose convenient payment channels (Manalo, 2021). Security remains a core feature, with encryption and secure communication protocols safeguarding sensitive information (Santos & Del Rosario, 2019). Its user-friendly interface includes pre-filled templates and step-by-step guidance, reducing confusion and minimizing errors (Ramos et al., 2022). From the government’s standpoint, eFPS enables real-time monitoring and reporting, allowing the BIR to efficiently detect discrepancies and compliance gaps (Bureau of Internal Revenue, 2020).

Overall, the BIR eFPS represents a significant milestone in the Philippines’ digital transformation of tax administration. Integrating filing and payment processes into a single online platform enhances taxpayer compliance, strengthens revenue

collection, and improves operational efficiency. Through features such as real-time processing, bank integration, robust security, and accessible design, eFPS reinforces fiscal management and supports the government's broader commitment to digital governance and public service modernization (Bureau of Internal Revenue, 2020; Manalo, 2021).

Awareness of eFPS

The Electronic Filing and Payment System (eFPS) is the Bureau of Internal Revenue's (BIR) digital platform for electronically filing tax returns—including required attachments—and paying taxes online. Through eFPS, taxpayers enjoy a paperless process and can settle their tax liabilities via internet banking by debiting their enrolled bank accounts. Because the system is web-based, taxpayers may file and pay anytime and anywhere, provided they have internet access (BIR, 2001).

Beyond the system itself, awareness plays a crucial role in its effectiveness. Consciousness shapes how individuals perceive their responsibilities and act upon them. In taxation, taxpayer knowledge refers to the level of understanding that enables individuals to exercise their rights and fulfill their legal obligations properly (Chandra et al., 2021). When taxpayers are informed, they are better equipped to comply accurately and confidently.

Research underscores the importance of awareness in the adoption of digital tax systems. Ayesha and Mynavathi (2018) found that tax professionals are central to the effective implementation of income tax frameworks. They guide taxpayers in meeting obligations efficiently while offering insight into the structural and administrative challenges of tax systems. Their expertise helps bridge gaps between law, policy, and practice. The same study explains that electronic filing offers a streamlined alternative to paper-based submissions, eliminating the need for physical documentation. Many tax software platforms now incorporate built-in e-filing features for individuals and businesses. To further ease compliance, the Income Tax Authority also provides simplified return forms on its official website, allowing taxpayers to file without attaching additional documents (Ayesha & Mynavathi, 2018).

Tax awareness can be understood through three key dimensions (Chandra et al., 2021). First, individuals are more likely to comply when they recognize that paying taxes contributes to national development and public welfare. Trust in the system's fairness strengthens this motivation. Second, awareness that delayed payments and tax avoidance strain government resources—and potentially hinder economic growth—encourages timely compliance. Third, understanding that taxation is grounded in law reinforces the view that compliance is not only a legal duty but also a civic responsibility. When taxpayers see compliance as both an obligation and a privilege, they are more inclined to fulfill it with respect for the rule of law.

Supporting this perspective, Estrellana (2023) found that increased taxpayer awareness—through government campaigns and training initiatives—significantly improves compliance and encourages the adoption of digital filing systems. Together, these findings highlight that while systems like eFPS provide the technological infrastructure, informed and aware taxpayers ultimately determine their success.

Effectiveness of eFPS

Recent studies highlight the growing importance of electronic filing (e-filing) and computerized payment systems in improving tax collection. The shift from manual to digital processes is designed to enhance convenience and perceived usefulness. Estrellana (2023) found that taxpayers enrolled in the Taxpayers Account Management Program (TAMP) generally agree that eFPS is effective and beneficial. However, concerns about filing challenges still influence taxpayers' willingness to use the system. The study recommends continuous taxpayer education, improved information dissemination, a more user-friendly payment-tracking feature, and faster issuance of confirmation receipts. It also emphasizes the need to strengthen the reliability and accessibility of e-services to ensure efficient taxpayer access and ultimately improve revenue collection by the BIR.

Respondents widely regard electronic filing and online payment systems as more efficient and preferable than traditional methods. These systems reduce time, cost, and effort while eliminating the frustrations associated with manual filing. The core objective of e-filing implementation, as respondents emphasized, is to replace bureaucratic, paper-based procedures with streamlined, secure, and dependable digital processes that better serve taxpayers.

Globally, tax authorities recognize the critical role of information technology and modern communication platforms in strengthening tax administration (Patnaik et al., 2019). Technological innovations such as e-invoicing and pre-filled tax returns have proven effective in reducing compliance costs, minimizing penalties, and lowering risks associated with strict audits, fraud, and tax evasion. Hesami et al. (2024) underscore the transformative impact of these tools, noting that they reduce both compliance and administrative costs, streamline procedures, enhance operational efficiency, and lessen the financial burden on businesses.

Perceived usefulness

Sungkono (2020) explains that the Technology Acceptance Model (TAM) is one of the most widely used frameworks for understanding why individuals adopt new technologies. TAM identifies two core determinants: **perceived usefulness** and **perceived ease of use**. These variables help predict whether a person will accept and use a technological system. Because it explains both external influences and internal perceptions that shape user behavior, TAM remains one of the most effective models for studying information technology adoption.

Perceived usefulness refers to the belief that a technology improves performance or productivity, while perceived ease of use reflects confidence that the system is simple to understand and operate. Gangwar et al. (2015) affirm that these two factors are dominant drivers of technology implementation.

In the context of tax systems, Estrellana (2023) found that perceived usefulness directly influences system effectiveness. This suggests that electronic filing and computerized payment methods are more likely to succeed when taxpayers see them as efficient and beneficial. People are generally motivated to adopt technologies that help them achieve tasks more effectively. Similarly, Ayesha (2018) notes that citizens are more inclined to use government e-service platforms when they offer clear time and effort savings compared to traditional manual processes.

In the context of e-filing, TAM provides a practical framework for evaluating e-government initiatives. Santhanamery and Ramayah (2015) emphasize that TAM is particularly useful in assessing the adoption of electronic tax filing systems. Ultimately, e-filing enables taxpayers to meet reporting obligations online and in real time, making compliance more efficient and accessible.

The Electronic Filing and Payment System (eFPS) enhances tax compliance by offering greater accessibility, automation, and efficiency. Taxpayers can file and pay anytime and anywhere, eliminating in-person visits and reducing delays (Estrellana, 2023). Automated tax calculations help minimize errors, which is especially beneficial for individuals and businesses unfamiliar with complex tax regulations (Organization for Economic Co-operation and Development, 2021).

By digitizing records and reducing paperwork, eFPS also streamlines the filing process and supports environmentally sustainable practices (Bird & Zolt, 2018). Although tax compliance in the construction sector can be complex due to multiple project sites, workforce structures, and material sourcing, modern accounting technologies and professional expertise make compliance more manageable. Leveraging these digital conveniences allows construction firms to streamline tax payments, reduce liabilities, and improve financial planning (Dobbs, 2024).

However, convenience depends heavily on system reliability. Technical issues such as downtime, slow processing, and glitches can discourage users and limit adoption (Alm & McClellan, 2018). Continuous system improvements, user-friendly design, and reliable support services are essential to sustaining effectiveness. As noted by Caasi et al. (2015), eFPS was established to deliver faster processing and instant confirmation of tax submissions, replacing manual filing at revenue district offices. Through the BIR website, taxpayers can directly encode and submit returns online, making the process more efficient and accessible.

Moreover, taxpayer awareness and digital literacy influence perceived convenience. While digitally skilled users may adapt easily, individuals with limited technological familiarity—particularly older taxpayers or those in less technologically developed areas—may prefer traditional methods (Alm & McClellan, 2018). Expanding educational initiatives and providing accessible guidance can bridge this gap, ensuring that eFPS remains convenient and inclusive for a broader range of users.

Challenges in using eFPS

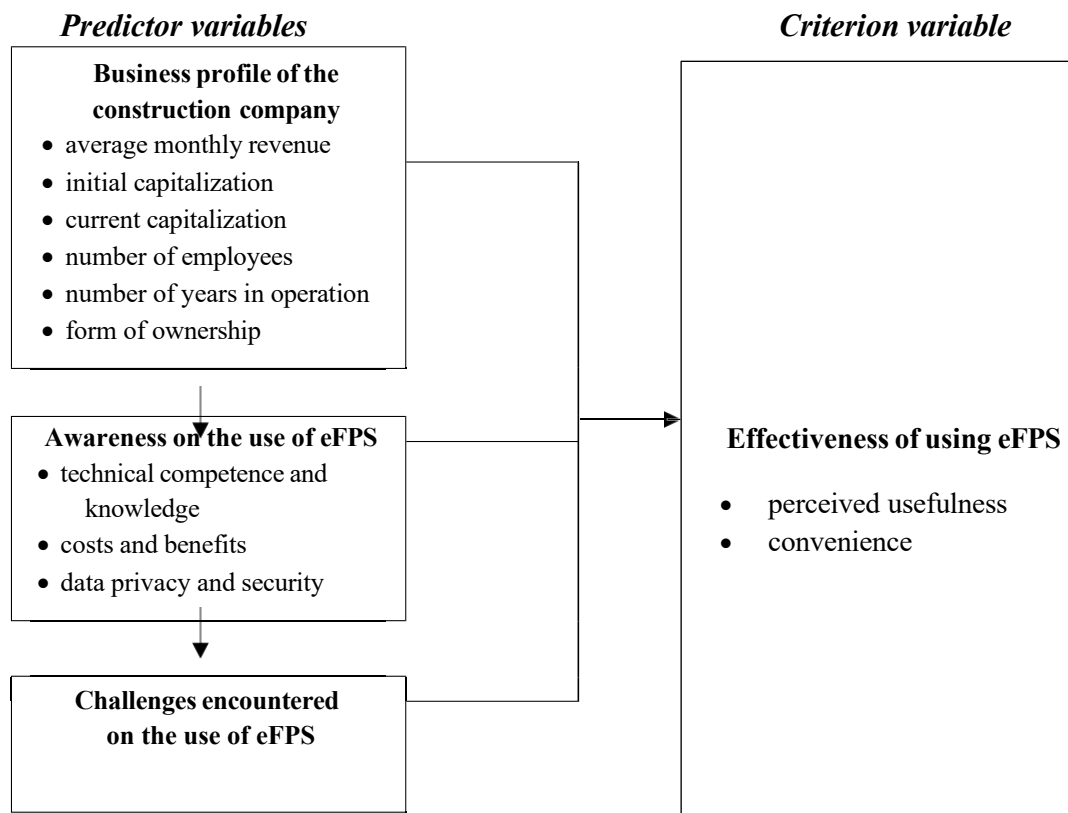
Linking taxpayer awareness, perceived usefulness, and technical barriers to eFPS effectiveness.

The Bureau of Internal Revenue's (BIR) Electronic Filing and Payment System (eFPS) was introduced to streamline tax compliance processes and improve revenue collection efficiency in the Philippines (BIR, 2019). This digital system allows taxpayers to file tax returns and remit payments online, thereby reducing reliance on manual processes, minimizing human errors, and fostering transparency. Despite its potential, the effectiveness of eFPS in achieving widespread adoption and compliance depends on several interrelated factors, including taxpayer awareness, perceived usefulness and convenience, and technical challenges (Venkatesh et al., 2003).

Taxpayer awareness is a foundational determinant of system adoption, as individuals and businesses cannot utilize services that they are unaware of (BIR, 2019). This highlights the necessity for effective outreach and information campaigns to increase awareness and understanding of eFPS. Once awareness is established, perceived usefulness becomes pivotal; it reflects the extent to which users believe that using eFPS will enhance their tax-filing efficiency, reduce errors, and provide benefits over traditional methods (Davis, 1989; Venkatesh et al., 2003). Moreover, convenience factors—such as ease of access, user-friendly interfaces, flexible filing options, and time savings—further amplify users' perceptions of eFPS as a valuable tool (Zhao et al., 2012).

However, the system's effectiveness is not solely determined by awareness and perceived usefulness. Technical challenges, including system downtime, slow response times, and a lack of support infrastructure, can undermine convenience and erode taxpayer trust (Al-Gahtani, 2016). Reddick (2005) emphasizes that the stability and reliability of e-government systems are crucial for fostering sustained usage, especially when users encounter technical issues that impede their workflow. Thus, while awareness and perceived usefulness encourage adoption, persistent technical difficulties can negate these positive influences and hinder the system's overall effectiveness (BIR, 2021).

Conceptual framework



Source: Estrellana (2023)

Figure 1 illustrates the research paradigm showing the relationship between the predictor and criterion variables of the study. The framework posits that the construction company's business profile, including average monthly revenue, initial capitalization, current capitalization, number of employees, years in operation, and form of ownership, influences both eFPS awareness and the challenges encountered in its use. Awareness is determined by factors such as technical competence, knowledge, understanding of costs and benefits, and concerns about data privacy and security. It seems to collectively contribute to eFPS's effectiveness, as measured by perceived usefulness and convenience.

Statement of the problem

This study determined the effectiveness of eFPS among construction companies in Ilocos Norte. Specifically, it sought to address the following questions:

1. What is the business profile of the construction companies in terms of:
 - 1.1 average monthly revenue;
 - 1.2 initial capitalization;
 - 1.3 current capitalization;
 - 1.4 number of employees;
 - 1.5 years in operation; and
 - 1.6 form of ownership?
2. What is the level of awareness on the use of eFPS among construction companies in terms of:
 - 2.1 technical competence and knowledge;
 - 2.2 costs and benefits; and
 - 2.3 data privacy and security
3. What is the degree of seriousness of the challenges encountered in the use of eFPS by construction companies?
4. How effective is the use of eFPS as perceived by construction companies in terms of:
 - 4.1 perceived usefulness; and
 - 4.2 Convenience?
5. Is there a significant relationship between the business profile and the level of awareness of the use of eFPS of the construction companies?
6. Is there a significant relationship between the level of awareness in terms of technical competence and knowledge, costs and benefits, and data privacy and security on the use of eFPS and the degree of seriousness of the challenges encountered on the use of eFPS?
7. Is there a significant relationship between the business profile and the effectiveness of the use of eFPS by construction companies?
8. Is there a significant relationship between the level of awareness and the effectiveness of the use of eFPS by construction companies?
9. Is there a significant relationship between the degree of seriousness of the challenges encountered and the effectiveness of the use of eFPS by construction companies?

Hypothesis

Ha1. There is a significant relationship between the business profile and the construction company's level of awareness of eFPS use.

Ha2. There is a significant relationship between the level of awareness of technical competence and knowledge, costs and

Ha3. There is a significant relationship between the business profile and the effectiveness of eFPS use by construction companies.

Ha4. There is a significant relationship between the level of awareness and the effectiveness of eFPS use by construction companies.

Ha5. There is a significant relationship between the severity of the challenges encountered and the effectiveness of eFPS use in construction.

Scope and delimitation of the study

This study determined the effectiveness of the Electronic Filing and Payment System (eFPS) among construction companies in Ilocos Norte. The research focused on assessing the business profile of construction companies in terms of: average monthly revenue; initial capitalization; current capitalization; number of employees; number of years in operation; and form of ownership. It further examined the level of awareness on the use of eFPS among construction companies in terms of: technical competence and knowledge; costs and benefits; and data privacy and security. Moreover, the study assessed the severity of challenges encountered when using eFPS by construction companies. Furthermore, it assessed the perceived effectiveness of eFPS among construction companies in terms of usefulness and convenience. The study also explored the relationships among the business profile, level of awareness of eFPS use, degree of seriousness of the challenges encountered in eFPS use, and the effectiveness of eFPS use. The study was delimited to construction companies operating within the jurisdiction of Ilocos Norte and registered with eFPS. The study was conducted from July to November 2025.

Research methodology

Research design

This study utilized a descriptive–correlational research design to describe the business profile, awareness, challenges, and perceived effectiveness of eFPS among construction companies in Ilocos Norte and to examine how these variables relate to one another. The descriptive component outlined the firms' characteristics and experiences with eFPS, while the correlational component assessed the natural associations among awareness, challenges, and system effectiveness. This design was appropriate since the study aimed to analyze existing conditions without manipulating variables. Similar studies, such as those by Estrellana (2023) and Santos and Del Rosario (2019), support the use of this design to evaluate user awareness, system issues, and the effectiveness of digital tax platforms.

Locale of the study

This study was conducted in Ilocos Norte, a province located in the northwestern part of Luzon, Philippines. It specifically covered construction companies operating within the province. Ilocos Norte was chosen as the study's locale because of its booming economy.

infrastructure development, which highlighted the active participation of construction firms in various public and private projects across the province.

Population

The study population consisted of construction firms in Ilocos Norte that use the Electronic Filing and Payment System (eFPS). A total of 38 construction companies were initially identified as potential respondents obtained from the official list provided by the Department of Public Works and Highways (DPWH). Out of these, only thirty-three (33) construction firms completed and returned the survey questionnaires. The respondents were individuals directly responsible for tax-related functions within their respective companies, such as accountants, finance officers, or administrative personnel who used eFPS. This selection ensured that the data gathered accurately represented firsthand experiences and assessments of the

Data gathering instruments

The questionnaire used in this study was adapted from Estrellana (2023).

The questionnaire was composed of four major sections:

Part I determined the respondents' profiles, including average monthly revenue, initial capitalization, current capitalization, number of employees, years in operation, and form of ownership. This section enabled the researchers to categorize respondent companies and identify patterns in organizational characteristics.

Part II assessed the level of awareness among construction companies regarding the use of electronic filing and payment systems. It was subdivided into three components: (1) Technical Competence and Knowledge, (2) Costs and Benefits, and (3) Data Privacy and Security. Each item in this section was rated using a five-point Likert scale, ranging from "Fully Not Aware."

(1) to "Fully Aware" (5). This scale was used to measure respondents' understanding of key technical and functional aspects of the systems.

Part III determined the effectiveness of eFPS in terms of (1) Perceived Usefulness and Convenience. A separate five-point Likert scale, ranging from "Strongly Disagree" (1) to "Strongly Agree" (5), was used to assess agreement with statements about the system's effectiveness in improving tax compliance and operational efficiency.

Part IV identified the challenges construction companies encountered in adopting and effectively using the eFPS.

Data gathering procedure

Data collection was conducted only after approval was secured from the relevant authorities. Formal letters requesting lists of construction firms in Ilocos Norte were sent to the Business Permits and Licensing Office (BPLO), the Bureau of Internal Revenue (BIR), and the Department of Public Works and Highways (DPWH). Among these agencies, only the DPWH provided an official list.

After identifying the target firms, formal permission was obtained from company management, and informed consent was sought from qualified respondents. Survey questionnaires were then distributed to company representatives responsible for tax-related functions. The completed questionnaires were collected, reviewed for completeness, and encoded for statistical analysis.

Ethical considerations

The conduct of this study strictly adhered to established ethical research standards to safeguard the rights and welfare of all participants. Before data collection, the researchers obtained permission from relevant authorities and company management. Participation was entirely voluntary, and informed consent was obtained after respondents were provided with a clear explanation of the study's objectives, scope, and confidentiality measures. The study involved no physical, psychological, or social harm to participants. All information gathered was treated with utmost confidentiality and utilized solely for academic and research purposes.

Tools for data analysis

The collected data underwent rigorous statistical analysis to ensure accurate interpretation. Quantitative responses were analyzed using both descriptive and inferential statistical methods. Descriptive statistics, such as frequencies and percentages, were used to characterize the business profiles of construction companies. The weighted mean was used to determine the level of awareness, perceived usefulness, challenges encountered, and effectiveness in the use of eFPS by the construction companies in Ilocos Norte.

The following were used to analyze the mean ratings.

Level of awareness with eFPS:

<i>Scale</i>	<i>Range of Mean Values</i>	<i>Descriptor</i>	<i>Descriptive Interpretation</i>
5	4.51 - 5.00	Strongly Agree	Very much aware (VMA)
4	3.51 - 4.50	Agree	Highly aware (HA)
3	2.51 - 3.50	Somewhat Agree	Aware (A)
2	1.51 - 2.50	Disagree	Slightly Aware (SA)
1	1.00 - 1.50	Strongly Disagree	Very slightly aware (VSA)

Degree of seriousness of the challenges encountered in the use of eFPS:

<i>Scale</i>	<i>Range of Mean Values</i>	<i>Descriptor</i>	<i>Descriptive Interpretation</i>
5	4.51 - 5.00	Strongly Agree	Very serious (VS)
4	3.51 - 4.50	Agree	Serious (S)
3	2.51 - 3.50	Somewhat Agree	Moderately Serious (MS)
2	1.51 - 2.50	Disagree	Slightly serious (SS)
1	1.00 - 1.50	Strongly Disagree	Not a problem (NAP)

Effectiveness of the use of eFPS:

<i>Scale</i>	<i>Range of Mean Values</i>	<i>Descriptor</i>	<i>Descriptive Interpretation</i>
5	4.51 - 5.00	Strongly Agree	Very Effective (VE)
4	3.51 - 4.50	Agree	Effective (E)
3	2.51 - 3.50	Somewhat Agree	Moderately Effective (ME)
2	1.51 - 2.50	Disagree	Ineffective (I)
1	1.00 - 1.50	Disagree	Very Ineffective (VI)

Furthermore, One-way ANOVA, Spearman's rho, Mann-Whitney U, and Pearson's r were used to assess relationships among the study variables. The Statistical Package for the Social Sciences (SPSS) version 20 was used to analyze and interpret the data. Interpretation level will be set to level 0.05

Data presentation and analysis

The data are presented in accordance with the statement of the problem. The study answered the following questions:

1. What is the business profile of the construction companies in terms of:

- 1.1 average monthly revenue;**
- 1.2 initial capitalization;**
- 1.3 current capitalization;**
- 1.4 number of employees;**
- 1.5 years in operation; and**
- 1.6 form of ownership?**

Table 1. Business profile of construction companies in Ilocos Norte (n=33)

	Frequency (f)	Percentage (%)
Average monthly revenue		
Below ₱5,000,000	10	30.30
₱5,000,001 – ₱10,000,000	6	18.18
₱10,000,001 – ₱15,000,000	5	15.15

₱15,000,001 – ₱20,000,000	7	21.21
Above ₱20,000,000	5	15.15
Total	33	100.00
Initial capitalization		
Below ₱10,000,000	13	39.39
₱10,000,000 – ₱15,000,000	9	27.27
₱15,000,001 – ₱20,000,000	3	9.09
₱20,000,001 – ₱25,000,000	3	9.09
Above ₱25,000,000	5	15.15
Total	33	100.00
Current capitalization		
Below ₱10,000,000	6	18.18
₱10,000,000 – ₱15,000,000	6	18.18
₱15,000,001 – ₱20,000,000	9	27.27
₱20,000,001 – ₱25,000,000	1	3.03
Above ₱25,000,000	11	33.33
Total	33	100.00
	Frequency (f)	Percentage (%)
Number of employees		
Below 50	18	54.55
51 – 100	7	21.21
101 – 150	4	12.12
151 – 201	1	3.03
Above 200	3	9.09
Total	33	100.00
Number of years in operation		
1 – 5 years	5	15.15
6 – 10 years	14	42.42
11 – 20 years	7	21.21
More than 20 years	7	21.21
1 – 5 years	5	15.15
Total	33	100.00
Form of Ownership		
Sole Proprietorship	24	72.73
Corporation	9	27.27
Total	33	100.00

Source: Authors' own table (2025)

Table 1 presents the business profile of construction companies operating in Ilocos Norte. It includes information on their average monthly revenue, initial and current capitalization, number of employees, years in operation, and form of business organization.

As shown in the table, a considerable proportion of the construction companies (30.30%) reported an average monthly revenue below ₱5,000,000, followed by 21.21% earning between ₱15,000,001 and ₱20,000,000. Only 15.15% of firms generated more than ₱20,000,000 monthly, indicating that while a few firms operate at a large scale, most are small- to medium-sized enterprises.

In terms of initial capitalization, 39.39% of the companies started with below ₱10,000,000, whereas only 15.15% began with capital exceeding ₱25,000,000. However, their current capitalization shows improvement — 33.33% now have capital above ₱25,000,000 — suggesting business growth and reinvestment over time.

Regarding employment size, the majority (54.55%) have fewer than 50 employees, which further supports the dominance of small-scale operations within the province. Meanwhile, 21.21% employ between 51 and 100 workers, and only 9.09% have more than 200 employees.

In terms of longevity, 42.42% of firms have operated for 6 to 10 years, while 21.21% have operated for more than 20 years, reflecting a balance between emerging and established firms.

Lastly, the majority (72.73%) operate as sole proprietorships, while only 27.27% are registered as corporations, suggesting a preference for simpler ownership structures among local contractors.

The data indicate that the construction industry in Ilocos Norte is primarily composed of small- to medium-sized enterprises with modest financial bases and limited manpower. The gradual increase in current capitalization compared to initial investment indicates steady growth and expanding financial capacity among firms. However, the predominance of sole proprietorships also implies potential limitations in accessing large-scale projects or external financing due to ownership and resource constraints.

In alignment with these findings, Lopez (2021) underscored the vital role of construction companies as catalysts of national development, translating the blueprints of progress into enduring infrastructures. Their operations encompass both public and private undertakings—ranging from government-funded projects such as flood control systems, farm-to-market roads, multi-purpose buildings, and solar lighting installations, to privately financed projects that spur business expansion and economic vitality. This related study complements the present research by affirming that, regardless of ownership structure or scale, construction enterprises collectively serve as indispensable agents of progress. Thus, while firms in Ilocos Norte may vary in capital strength and organizational form, their consistent financial growth and active participation in infrastructure development underscore their enduring contribution to the province's economic advancement and national development agenda

2. What is the level of awareness on the use of eFPS among construction companies in terms of:
 - 2.1 technical competence and knowledge;
 - 2.2 cost and benefit; and
 - 2.3 data privacy and security

Table 2. Level of awareness on the use of eFPS among construction companies (n=33)

Indicators	Mean	Interpretation
Technical competence and knowledge		
1. E-filing and online payment require basic computer skills and usage.	4.76	VMA
2. E-filing and online payment require internet surfing skills.	4.64	VMA
3. To be able to file electronically, you must know how to accomplish tax returns.	4.79	VMA
4. To be able to file electronically, you must have knowledge of the necessary tax returns and forms (VAT, percentage, income tax, etc).	4.79	VMA
Composite mean	4.74	VMA
Cost and benefit		
1. Online filing of tax and payment is free of charge.	4.30	HA
2. Tax payments can be made at any time and from any location by using a computer with an internet connection.	4.64	VMA
3. When filing or making online payments, users receive a rapid response from the system.	4.18	HA
4. The taxpayer's information is validated before Final submission to avoid errors.	4.61	VMA
Composite mean	4.43	HA

Data privacy and security

1. BIR's e-filing and payment systems are covered by the Data Privacy Act of 2012. 4.21 HA
2. Electronic Filing and Payment System requires two level of password to gain access your account 4.70 VMA
3. Multiple erroneous/malicious attempts to access your account will result in the account being locked. 4.70 VMA

Composite mean	4.54	VMA
Overall mean	4.57	VMA

Source: Estrellana (2023)

<i>Scale</i>	<i>Range of Values</i>	<i>Descriptor</i>	<i>Descriptive Interpretation</i>
5	4.51 - 5.00	Strongly Agree	Very much aware (VMA)
4	3.51 - 4.50	Agree	Highly aware (HA)
3	2.51 - 3.50	Somewhat Agree	Aware (A)
2	1.51 - 2.50	Disagree	Slightly Aware (SA)
1	1.00 - 1.50	Strongly Disagree	Very slightly aware (VSA)

Table 2 presents the level of awareness of the Electronic Filing and Payment System (eFPS) among construction companies regarding technical competence and knowledge, cost and benefits, and data privacy and security.

The overall mean of 4.57, interpreted as *Very Much Aware (VMA)*, indicates that construction companies exhibit a very high level of awareness regarding the use of eFPS. This finding implies that most construction firms are well-informed about how the system works and can use it effectively to file and pay taxes electronically. Such awareness may stem from their regular engagement with large-scale transactions that require compliance with BIR e-services and digital reporting mechanisms.

Among the three components, the highest composite mean of 4.74 (interpreted as Very Much Aware [VMA]) was obtained for technical competence and knowledge. This suggests that construction companies are highly knowledgeable and technically capable of using the eFPS. They possess the necessary computer and internet skills and understand the various tax forms and e-filing requirements. The implication is that these firms are well-prepared for the transition to full digital tax compliance and can efficiently manage their electronic filing responsibilities without extensive external support.

Conversely, the lowest composite mean of 4.43, interpreted as Highly Aware (HA), was recorded for cost and benefit. Although still interpreted as Highly Aware, this relatively lower score suggests that some construction companies may not be fully convinced of the cost efficiency and benefits of using eFPS. Although they recognize the convenience of online filing and payment, there may still be concerns about internet accessibility, system responsiveness, or perceived hidden costs (e.g., time investment, training, or technical support). This indicates the need for further information dissemination and orientation by the Bureau of Internal Revenue (BIR) to emphasize the long-term benefits and efficiency gains of eFPS adoption.

The findings of the present study are complemented by those of Chandra et al. (2021) and Ayesha and Mynavathi (2018), both of which emphasize the importance of awareness and technical competence in achieving effective tax compliance. Chandra et al. (2021) highlighted that awareness shapes taxpayers' behavior toward compliance, aligning with the present study's results, which indicate that construction firms in Ilocos Norte demonstrate a very high level of awareness of the eFPS. Meanwhile, Ayesha and Mynavathi (2018) underscored the value of knowledge and expertise in tax implementation, supporting the finding that these firms possess strong technical competence in managing electronic filing and payment processes. Collectively, these studies affirm that awareness and technical capability are key factors enabling construction firms to efficiently adopt and use digital tax systems such as the eFPS.

3. What is the degree of seriousness of the challenges encountered in the use of eFPS by construction companies?

Table 3. Degree of seriousness on the challenges encountered on the use of eFPS by construction companies (n=33)

Indicators	Mean	Interpretation
1. Government information on tax updates and new rulings did not reach me.	3.36	MS
2. It is difficult to access and process data due to a lack of training.	3.39	MS

3. During processing, there was data loss due to software, electrical, and human error.	3.64	S
4. The BIR website is frequently down/unavailable.	3.82	S
5. Incorrect inputs resulted in incorrect outputs.	4.00	S
6. Computer setups and software/ computer rental used are expensive.	3.30	MS
7. Taxation terminologies are difficult to grasp.	3.24	MS
Overall mean	3.54	S

Source: Estrellana (2023)

<i>Scale</i>	<i>Range of Values</i>	<i>Descriptor</i>	<i>Descriptive Interpretation</i>
5	4.51 - 5.00	Strongly Agree	Very serious (VS)
4	3.51 - 4.50	Agree	Serious (S)
3	2.51 - 3.50	Somewhat Agree	Moderately Serious (MS)
2	1.51 - 2.50	Disagree	Slightly serious (SS)
1	1.00 - 1.50	Strongly Disagree	Not a problem (NAP)

Table 3 presents the severity of the challenges construction companies encounter when using the Electronic Filing and Payment System (eFPS). The overall mean of 3.54, interpreted as *Serious (S)*, indicates that the challenges construction companies face in using eFPS are generally considerable and impactful. This indicates that, while these companies are largely aware of and capable of using the system, they continue to face significant operational and technical difficulties that hinder smooth, efficient online tax filing.

The highest mean of 4.00 (*Serious*) corresponds to the statement “*Incorrect inputs resulted in incorrect outputs.*” This finding suggests that human errors and data-entry mistakes remain a major concern in the utilization of eFPS. Incorrectly encoded information can lead to inaccurate filing or payment discrepancies, or even penalties imposed by the Bureau of Internal Revenue (BIR). This implies the necessity for improved user training and system validation features to minimize input errors and enhance filing accuracy.

On the other hand, the lowest mean of 3.24 (*Moderately Serious*) was noted for the statement “*Taxation terminologies are difficult to grasp.*” This indicates that while some users find tax-related jargon challenging, it is not perceived as a critical barrier. Most construction company staff appear to have a reasonable understanding of basic tax concepts, possibly due to prior exposure and experience with business taxation. Nonetheless, simplifying tax communication and providing clearer instructions or glossaries within the eFPS platform may still improve comprehension and user confidence.

The findings collectively imply that the most pressing issues faced by construction companies are technical and procedural, rather than conceptual. System downtime, data loss, and input-related errors contribute to filing inefficiencies and user frustration. Addressing these through enhanced technical infrastructure, capacity-building initiatives, and stronger IT support could significantly improve the reliability and user experience of the eFPS platform within the construction industry.

This observation is consistent with Estrellana (2023), who highlighted that frequent system downtime, slow processing speeds, and errors in transaction validation have adversely affected the user experience. The alignment between the present findings and Estrellana’s study underscores the persistent nature of technical constraints in digital tax systems. Consequently, addressing these challenges through enhanced IT support, system optimization, and targeted capacity-building initiatives is essential to improve the reliability, efficiency, and overall user satisfaction of the eFPS platform within the construction industry.

4. How effective is the use of eFPS as perceived by construction companies in terms of:

4.1 perceived usefulness; and

4.2 Convenience?

Table 4. Effectiveness of eFPS as perceived by construction companies (n=33)

Indicators	Mean	Interpretation
Perceived usefulness		
1. Avoid actual interaction with officers and bank tellers by filing tax returns or making payments online.	4.45	E
2. Preserve filed file returns in a computer or other storage device to save office space or print immediately after filing.	4.61	VE
3. Submit or pay taxes online from anywhere and at anytime using the internet, to meet the due dates.	4.61	VE
4. Use the electronic filing and payment system to compute penalties automatically.	4.33	E
5. Receive the filing reference as soon as the filing is received as proof of successful tax filing.	4.55	VE
6. Receive payment confirmation as soon as the payment is done as proof of a successful transaction from a registered email.	4.67	VE
Composite mean	4.54	VE
Convenience		
1. Use the online filing and payment system without the assistance of others.	4.15	E
2. Use the procedural manual as a guide in the tax filing.	4.42	E
3. Read and comprehend the information required on electronic tax forms	4.36	E
4. File and pay online to avoid long queues at BIR offices and banks.	4.64	VE
5. Adopt the electronic filing and payment online to avoid time-consuming trips in and out of BIR offices and banks.	4.55	VE
6. Computerized monitors their tax filings and payments.	4.70	VE
7. Access and navigate BIR's website can be done with ease.	4.33	E
8. Accomplish BIR forms with own knowledge in taxation	4.30	E
9. Accomplish all required forms with only one attempt.	4.09	E
10. Use and navigate Online payment systems with ease.	4.06	E
Composite mean	4.36	E
Overall mean	4.45	E

Source: Estrellana (2023)

Scale	Range of Values	Descriptor	Descriptive Interpretation
5	4.51 - 5.00	Strongly Agree	Very Effective (VE)
4	3.51 - 4.50	Agree	Effective (E)
3	2.51 - 3.50	Somewhat Agree	Moderately Effective (ME)
2	1.51 - 2.50	Disagree	Ineffective (I)
1	1.00 - 1.50	Disagree	Very Ineffective (VI)

Table 4 presents the assessment of construction companies of the Electronic Filing and Payment System (eFPS) with respect to perceived usefulness and convenience.

The overall mean of 4.45 (interpreted as Effective [E]) indicates that construction companies perceive the eFPS as an efficient and reliable tool for filing and paying taxes electronically. This suggests that the system fulfills its intended functions—enhancing accessibility, accuracy, and timeliness in tax transactions. The finding implies that the implementation of eFPS has contributed positively to compliance among construction firms by reducing physical interactions, minimizing delays, and ensuring prompt transaction confirmation.

Among the two dimensions, the higher composite mean of 4.54, interpreted as *Very Effective (VE)*, was obtained for *Perceived Usefulness*. This means that construction companies view eFPS as highly beneficial in improving tax-related processes. The system's ability to provide real-time confirmation of filing and payment, automatically compute penalties, and maintain digital records reflects its practical value. This implies that users value the tangible advantages of the system—

such as time savings, reduced paperwork, and secure digital documentation—thereby making eFPS a vital component in enhancing operational efficiency and compliance.

Conversely, the lower composite mean of 4.36, interpreted as *Effective (E)*, pertains to *Convenience*. Although still perceived positively, this slightly lower rating suggests that users encounter minor challenges in system navigation and procedural familiarity. While most can perform online filing independently, some may still rely on guides or repeated attempts when completing electronic forms. This implies that, while eFPS is convenient overall, there remains room for improvement in user interface design, instructional clarity, and technical support to ensure seamless access and use, particularly for less tech-savvy users.

The present study indicates that construction companies perceive the eFPS as effective overall, particularly for streamlining tax processes, though minor challenges remain regarding convenience. These findings transition smoothly into the study of Estrellana (2023), which similarly highlights that users recognize the system's benefits and efficiency but may experience difficulties in filing and system navigation. Estrellana further emphasizes the need for ongoing taxpayer education and more user-friendly applications, reinforcing the present findings and providing additional recommendations to enhance accessibility and usability.

10. Is there a significant relationship between the business profile and the level of awareness of the use of eFPS of the construction companies?

Table 5.1. Spearman rho correlation coefficients obtained on the test of relationships between the business profile and the level of awareness on the use of eFPS of the construction companies (n=33)

Awareness on the use of eFPS

Business profile		Technical competence and knowledge	Cost and benefit	Data privacy and security
Average monthly revenue	ρ	.035	.181	.142
	(Sig. 2-tailed)	.849	.313	.430
Initial capitalization	ρ	.035	.126	.364*
	(Sig. 2-tailed)	.845	.485	.038
Current capitalization	ρ	.027	.374*	.350*
	(Sig. 2-tailed)	.882	.032	.046
Number of employees	ρ	.148	.393*	.356*
	(Sig. 2-tailed)	.412	.024	.042
Number of years in	ρ	.232	.298	.215
	(Sig. 2-tailed)	.195	.092	.230

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 5.1 presents Spearman's rho correlation results for the relationship between the business profiles of construction companies and their level of awareness of the use of the Electronic Filing and Payment System (eFPS).

As shown in the table, the correlation coefficients (ρ) reveal varying degrees of association among the variables tested. Overall, only a few business profile variables were significantly associated with awareness at the 0.05 significance level, indicating that awareness of eFPS is not strongly influenced by most business characteristics.

Specifically, a significant positive correlation was found between initial capitalization and awareness of data privacy and security ($\rho = 0.364$, $p = 0.038$). This suggests that construction companies with larger initial capital investments are more aware of privacy and security measures when using eFPS. Firms with greater capitalization are likely to have more structured financial systems and may prioritize protecting sensitive data given higher transaction volumes and greater compliance exposure.

Likewise, current capitalization showed a significant positive relationship with both cost and benefit ($\rho = 0.374$, $p = 0.032$) and data privacy and security ($\rho = 0.350$, $p = 0.046$). This implies that companies with higher ongoing capitalization tend to be more aware of the operational and financial advantages of eFPS, as well as the importance of safeguarding information in digital tax transactions. These firms likely have greater access to technology and trained personnel, enabling them to optimize the use of eFPS.

Additionally, the number of employees was significantly correlated with cost and benefit ($\rho = 0.393$, $p = 0.024$) and data privacy and security ($\rho = 0.356$, $p = 0.042$). This indicates that larger construction firms—those employing more personnel—are generally more aware of the advantages of eFPS and more conscious of data security requirements. The implication is that a larger workforce may necessitate more organized tax and financial management systems, thereby increasing exposure and awareness of digital filing procedures.

Conversely, average monthly revenue and years in operation were not significantly correlated with awareness across all dimensions ($p > 0.05$). This finding implies that firm size, as measured by revenue and longevity, does not necessarily affect a construction company's awareness of eFPS operations. Even newly established or smaller-revenue firms may demonstrate comparable levels of awareness due to the Bureau of Internal Revenue's (BIR) broad efforts to promote electronic filing systems.

The present study found that certain business profile variables—specifically, initial and current capitalization and the number of employees — have a significant positive relationship with construction companies' awareness of eFPS, particularly regarding cost-benefit considerations and data privacy. These findings complement the studies of Manalo (2021) and Santos and Del Rosario (2019), which indicate that firms with greater financial resources are more likely to adopt modern accounting technologies and digital infrastructures to enhance compliance. The results highlight that while firm size and financial capacity can influence awareness and utilization of eFPS, other factors, such as revenue and years in operation, may not, providing a nuanced understanding of which business characteristics truly impact digital tax adoption. This aligns with the observed positive correlation between capitalization and awareness of the benefits of eFPS and data protection.

Table 5.2. Mann–Whitney U test results on the difference in the level of awareness on the use of eFPS when grouped according to form of ownership (n=33)

Effectiveness of the use of eFPS	Form of ownership with a higher mean rank	Mean Rank (Sole Proprietorship)	Mean Rank (Corporation)	Mann–Whitney U	Z	p-value
Competence and knowledge	Sole proprietorship	17.38	16.00	99.000	-0.424	0.672
Cost and benefit	Corporation	16.13	19.33	87.000	-0.866	0.386
Data privacy	Corporation	16.08	19.44	86.000	-0.931	0.352

The Mann–Whitney U test results in Table 5.2 indicate that there are no statistically significant differences in the level of awareness on the use of eFPS between sole proprietorships and corporations across all three dimensions: technical competence and knowledge, cost and benefit, and data privacy and security ($p > 0.05$).

Although corporations show slightly higher mean ranks for cost and benefit, as well as for data privacy and security, these differences are not statistically significant. This suggests that both forms of ownership are similarly aware and capable of using eFPS. The results imply that government outreach and training initiatives have likely ensured that the system is accessible and understood across different types of business ownership, thereby minimizing awareness gaps.

Ha1 is partially accepted: some business profile variables, specifically capitalization and number of employees, have a significant relationship with awareness in terms of costs and benefits, and data privacy and security, while no significant relationship exists for technical competence and knowledge or form of ownership. Therefore, there is a partially significant

relationship between the business profile and the level of awareness of eFPS use among construction companies.

The Mann–Whitney U test results indicate no significant differences in eFPS awareness between sole proprietorships and corporations, suggesting that both ownership types are similarly capable in using the system. This finding complements the BIR (2020) report, which emphasizes that awareness campaigns and mandatory registration policies have helped standardize the understanding and use of eFPS across different taxpayer groups. The results reinforce the effectiveness of government outreach in minimizing gaps in digital tax knowledge and highlight that organizational structure alone does not determine awareness, providing additional confirmation of the BIR’s role in promoting inclusive access to electronic filing systems.

11. Is there a significant relationship between the level of awareness in terms of technical competence and knowledge, costs and benefits, and data privacy and security on the use of eFPS and the degree of seriousness of the challenges encountered on the use of eFPS?

Table 6. Pearson-r correlation results on the relationship between the level of awareness on the use of eFPS and the degree of seriousness of the challenges encountered on the use of eFPS (n=33)

Awareness on the use of eFPS			Challenges encountered on the use of eFPS
Technical competence and knowledge	r	(Sig. 2-tailed)	
			-.371*
			.033

Cost and benefit	r	-.201
	(Sig. 2-tailed)	.263
Data privacy and security	r	-.062
	(Sig. 2-tailed)	.733

* **Correlation is significant at the 0.05 level (2-tailed).**

Table 6 presents Pearson correlation results examining the relationship between the level of awareness of eFPS use and the degree of seriousness of challenges encountered by construction companies.

The results indicated a significant negative correlation between technical competence and knowledge and challenges encountered ($r = -0.371$, $p = 0.033$). This suggests that construction companies with higher awareness and competence in using eFPS tend to experience fewer or less serious challenges during electronic filing and payment.

In contrast, the correlations between cost and benefit awareness ($r = -0.201$, $p = 0.263$) and data privacy and security awareness ($r = -0.062$, $p = 0.733$) with the degree of challenges were not statistically significant, indicating that awareness in these areas does not strongly influence how serious the challenges are perceived.

Estrellana (2023) found that users who possess higher levels of familiarity and technical understanding of eFPS experience fewer operational difficulties, as knowledge of system navigation and online filing procedures reduces the likelihood of errors and delays. Similarly, Santos and Del Rosario (2019) highlighted that technical competence directly enhances users' efficiency and confidence in using electronic tax platforms, thereby minimizing perceived challenges related to system reliability or usability.

Therefore, Ha2 is partially supported, as a significant negative relationship is observed between technical competence and knowledge, and the seriousness of challenges encountered, whereas no significant relationship is observed for cost and benefit, or for data privacy and security awareness.

12. Is there a significant relationship between the business profile and the effectiveness of the use of eFPS by construction companies?

Table 7.1. Spearman rho correlation coefficients obtained on the test of relationships between the business profile and the effectiveness on the use of eFPS by construction companies ($n=33$)

Effectiveness on the use of eFPS

Business profile		Perceived usefulness	Convenience
Average monthly revenue	ρ	-.052	.144
	(Sig. 2-tailed)	.775	.423
Initial capitalization	ρ	.084	.181
	(Sig. 2-tailed)	.644	.314
Current capitalization	ρ	.152	.185
	(Sig. 2-tailed)	.400	.304
Number of employees	ρ	.157	.202
	(Sig. 2-tailed)	.383	.260
Number of years in operation	ρ	.115	-.092
	(Sig. 2-tailed)	.525	.610

Table 7.1 shows Spearman's rho correlation coefficients examining the relationship between the business profile of construction companies and the effectiveness of eFPS use, measured by perceived usefulness and convenience.

The results indicated that none of the business profile variables—including average monthly revenue, initial capitalization, current capitalization, number of employees, and number of years in operation—have a statistically significant relationship

with either perceived usefulness or convenience (all $p > 0.05$). The correlation coefficients are very weak, ranging from -0.052 to 0.202, suggesting that variations in company size, capital, workforce, or business age do not meaningfully influence companies' perceptions of eFPS effectiveness. As discussed by Manalo (2021) and the Bureau of Internal Revenue (2020), the eFPS platform was specifically designed to provide a standardized digital filing and payment experience that minimizes disparities across business types. Ramos et al. (2022) similarly noted that the system's uniform accessibility and online integration allow both small and large taxpayers to benefit equally from its convenience and efficiency. Moreover, consistent with the Technology Acceptance Model (Davis, 1989; Venkatesh et al., 2003), perceptions of usefulness and convenience are primarily shaped by user experience and system design rather than by firm characteristics. Thus, variations in company size, capital, or age do not substantially affect taxpayers' perceptions of eFPS's effectiveness. These results support the conclusion that the system's streamlined processes and government-driven digital reforms have created a level playing field, enabling construction firms of varying sizes to derive similar benefits from eFPS.

Table 7.2. Mann–Whitney U test results on the difference in the effectiveness on the use of eFPS when grouped according to form of ownership (n=33)

Effectiveness on the use of eFPS	Form of ownership with higher mean rank	Mean Rank (Sole Proprietorship)	Mean Rank (Corporation)	Mann–Whitney U	Z	p-value
Perceived usefulness	Sole proprietorship	16.79	17.56	103.00	-.205	.837
Convenience	Sole proprietorship	17.79	14.89	89.000	-.771	.440

Table 7.2 presents the Mann–Whitney U test results examining whether the effectiveness of eFPS differs by form of ownership among construction companies. For perceived usefulness, corporations had a slightly higher mean rank (17.56) compared to sole proprietorships (16.79), but the difference was not statistically significant ($U = 103.00$, $Z = -0.205$, $p = 0.837$). Similarly, for convenience, sole proprietorships had a higher mean rank (17.79) than corporations (14.89), but this difference was also not significant ($U = 89.00$, $Z = -0.771$, $p = 0.440$).

These results indicate that the effectiveness of eFPS use, as measured by perceived usefulness or convenience, does not differ significantly between sole proprietorships and corporations. This implies that the system provides equal advantages and operational efficiency across different forms of business ownership.

Such results complement the assertions of Villanueva (2019) and Martinez (2020), who emphasized that the adoption of electronic tax systems enhances accuracy, compliance, and overall productivity among firms. The present study reinforces these insights by confirming that the benefits of eFPS are realized uniformly across ownership structures, underscoring the system's inclusivity and the effectiveness of government initiatives in ensuring equitable access and utilization across construction companies.

13. Is there a significant relationship between the level of awareness of the use of eFPS and the effectiveness of the use of eFPS in construction?

Table 8. Pearson-r correlation results on the relationship between the level of awareness of the use of eFPS and the effectiveness on the use of eFPS by construction companies (n=33)

Awareness on the use of eFPS		Effectiveness on the use of eFPS	Perceived Usefulness	Convenience
Technical competence and knowledge	r	(Sig. 2-tailed)	.468**	.365*
Cost and benefit	r	(Sig. 2-tailed)	.006	.037
Data privacy and security	r	(Sig. 2-tailed)	.674**	.630**
			.000	.000

r	.561**	.592**
(Sig. 2-tailed)	.001	.000

* **Correlation is significant at the 0.05 level (2-tailed).**

** **Correlation is significant at the 0.01 level (2-tailed).**

Table 8 presents Pearson correlation results examining the relationship between awareness of eFPS use and its effectiveness among construction companies. The results revealed a significant positive correlation across all dimensions of awareness. Specifically, higher technical competence and knowledge are associated with greater perceived usefulness ($r = 0.468$, $p = 0.006$) and convenience ($r = 0.365$, $p = 0.037$). Awareness of costs and benefits shows a very strong positive correlation with perceived usefulness ($r = 0.674$, $p < 0.01$) and convenience ($r = 0.630$, $p < 0.01$), while awareness of data privacy and security is also positively related to perceived usefulness ($r = 0.561$, $p = 0.001$) and convenience ($r = 0.592$, $p < 0.01$). These findings imply that construction companies that are more aware of the system's technical requirements, benefits, and security measures perceive eFPS as more effective and convenient.

This finding corroborates the study of Estrellana (2023), which emphasized that increased taxpayer awareness through government-led campaigns and training programs enhances the adoption and efficiency of digital tax filing systems. The present study reinforces this assertion by providing empirical evidence that awareness directly influences the perceived effectiveness of eFPS, highlighting the crucial role of continuous education and information dissemination in maximizing user experience and compliance efficiency among construction firms.

Therefore, Ha4 is accepted; there is a significant relationship between the level of awareness of eFPS use and the effectiveness of its use among construction companies.

14. **Is there a significant relationship between the degree of seriousness of the challenges encountered and the effectiveness of the use of eFPS by construction companies?**

Table 9. Pearson-r correlation results on the relationship between the degree of seriousness of the challenges encountered and the effectiveness on the use of eFPS by construction (n=33)

Challenges encountered on the use of eFPS	Perceived Usefulness	Convenience
r	-.224	-.360*
(Sig. 2-tailed)	.210	.040

* **Correlation is significant at the 0.05 level (2-tailed).**

** **Correlation is significant at the 0.01 level (2-tailed).**

Table 9 presents Pearson correlation results examining the relationship between the severity of challenges encountered and the effectiveness of eFPS among construction companies.

The results show a negative relationship, with challenges having a non-significant effect on perceived usefulness ($r = -0.224$, $p = 0.210$) but a significant negative effect on convenience ($r = -0.360$, $p = 0.040$). This indicates that companies experiencing more serious challenges perceive eFPS as less convenient, although they still recognize its usefulness.

Therefore, Ha5 is partially accepted; there is a significant negative relationship between the degree of challenges encountered and the convenience aspect of eFPS effectiveness, highlighting the importance of minimizing operational and technical difficulties to improve user experience.

The findings of the present study both align with and differ from those of Caasi et al. (2015). While both studies affirm the usefulness of eFPS in streamlining tax transactions, the current results indicate that encountered challenges reduce users' perceived convenience. This suggests that although construction companies recognize the benefits of eFPS, technical and operational issues impede a smoother experience. Thus, the study supports Caasi et al. (2015) in emphasizing eFPS' efficiency but extends their work by highlighting the need to address existing system difficulties to improve overall effectiveness.

Results and discussion

The business profile of construction companies in Ilocos Norte shows that the sector is largely composed of small- to medium-sized enterprises with modest financial resources and lean workforces. Most firms generate less than ₱5 million in average monthly revenue and employ fewer than 50 workers. The majority operate as sole proprietorships, reflecting a locally owned and managed industry. Notably, the increase in current capitalization relative to the initial investment indicates steady growth and reinvestment, suggesting financial stability and expansion potential in the province's construction sector.

The findings reveal a very high level of awareness of the Electronic Filing and Payment System (eFPS). Construction firms demonstrate strong technical competence, including familiarity with computer systems, internet use, and tax form preparation. Awareness of data privacy, security, and cost-benefit considerations is also rated highly, aligning with the Organization for Economic Co-operation and Development (2020), which highlights the importance of these factors in digital tax compliance. This suggests that firms recognize both the efficiency and security advantages of online filing. Such preparedness supports the Bureau of Internal Revenue's (BIR, 2023) emphasis on professional awareness as a key element in the effective implementation of tax laws.

Despite this high awareness, companies report notable challenges in using eFPS, particularly incorrect data entry and system unavailability. These issues indicate that while users are knowledgeable, technical and operational limitations still affect efficiency. Filing delays caused by errors and system downtime highlight the need for improved infrastructure and user support. Persistent technical issues remain a barrier to seamless compliance.

Overall, however, eFPS is perceived as effective. Respondents rated the system as very effective in perceived usefulness and in convenience. Construction firms appreciate its ability to automate computations, issue confirmations, and enable remote transactions. While minor usability concerns exist—especially among less tech-oriented users—the system largely fulfills its promise of faster, more accurate, and paperless tax processing.

Correlation analysis shows that capitalization and workforce size are significantly associated with awareness, particularly regarding cost-benefit and data privacy aspects. Larger firms with greater resources tend to be more informed about operational and security features. However, awareness does not significantly relate to firm age or revenue, suggesting that BIR information campaigns have effectively reached both new and established businesses (Gelantaga-an, 2023).

A significant negative correlation exists between technical competence and the severity of challenges. This indicates that greater awareness and skill reduce the difficulties encountered in using eFPS. Strengthening technical knowledge can therefore mitigate operational issues, consistent with Kongsumpao's (2024) findings that competence enhances efficiency in electronic filing systems.

The study found no significant relationship between business profile and overall eFPS effectiveness. This suggests that the system provides consistent utility and convenience across different company sizes and ownership types. Standardized digital platforms appear to minimize disparities among taxpayers.

Supporting this, Lavarez (2022) identified a strong positive relationship between awareness and effectiveness across all dimensions. Firms with greater knowledge of eFPS features perceive the system as more useful and convenient, underscoring the importance of sustained awareness initiatives.

Lastly, the degree of challenges experienced is negatively associated with convenience. Firms encountering frequent technical issues perceive the system as less user-friendly. However, these challenges do not significantly affect perceptions of usefulness, indicating that users still recognize the value of eFPS despite operational constraints.

In summary, the construction sector in Ilocos Norte is steadily advancing toward full digital tax compliance. High awareness, manageable challenges, and generally positive perceptions of effectiveness demonstrate meaningful progress. These findings align with Lavarez (2022), who emphasized that awareness enhances system usefulness and user satisfaction. To sustain and strengthen compliance, continuous system upgrades, targeted taxpayer education, and improved technical support remain

Conclusion

This study examined the effectiveness of the Electronic Filing and Payment System (eFPS) among legally registered construction companies in Ilocos Norte, Philippines, focusing on business profile, awareness, challenges, and perceived effectiveness. Results showed a very high level of awareness of eFPS, particularly regarding technical competence and knowledge, whereas awareness of costs and benefits was slightly lower. Despite this, companies encountered significant challenges, primarily data-entry errors and system downtime.

eFPS was generally perceived as effective, with usefulness rated very effective and convenience rated effective. Capitalization and the number of employees were significantly associated with awareness of cost-benefit considerations and data privacy, whereas other business profile variables were not significantly associated. Higher technical competence was associated with fewer challenges, and awareness across all dimensions had a significant positive relationship with eFPS effectiveness. Challenges were negatively related to convenience, while no significant relationship was found between business profile and effectiveness.

Overall, the findings highlight that awareness and technical competence are key to maximizing the effectiveness of eFPS and minimizing operational issues. While eFPS offers clear benefits for tax compliance, continued technical training, system reliability, and institutional support are essential. The study concludes that eFPS is a strategic necessity for modern, transparent, and efficient tax administration, requiring sustained collaboration between government and the private sector.

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