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Quality of E-Tax System and Tax Compliance Intention: The Mediating Role of User Satisfaction

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Abstract: The effectiveness of the e-tax system in encouraging tax compliance has been largely unexplored. Thus, the current study aims to examine the interrelationship between technological predictors in explaining tax compliance intention among certified tax professionals. Based on the literature on information system success and tax compliance intention, this paper proposed an expanded conceptual framework that incorporates convenience and perception of reduced compliance costs as predictors and satisfaction as a mediator. The data were collected from 650 tax professionals who used e-Filing and 492 who used e-Form through an online survey and analyzed using hierarchical multiple regression. The empirical results suggest that participants' perceived service quality of e-Filing services and perceptions of reduced compliance costs positively influence users' willingness to comply with tax regulations. The latter predictor is also, and only, significant among e-Form users. The empirical results also provide statistical evidence for the mediating role of satisfaction in the relationship between all predictors and tax compliance intention. This study encourages tax policymakers and e-tax filing providers to improve their services to increase user satisfaction and tax compliance.

Keywords: electronic tax filing; e-Form; tax compliance intention; tax professional; Indonesia

1. Introduction

Governments worldwide are investing heavily in information technology to provide online public services to citizens [1]. E-Filing and e-Form are examples of online public tax filing services that were first introduced in Indonesia in 2007 and 2017, respectively. Investing in the e-tax system may reduce tax evasion in developing nations, as shown by the increased tax ratio following the e-tax filing adoption [2]. In addition to providing customers with fast access and individualized services, the public service transformation through electronic technologies decreases government spending and promotes public trust [3,4]. The introduction of the e-tax system was found to have a considerable impact on tax compliance [5,6].

Since the introduction of the e-Form service, the level of tax compliance in Indonesia—which, in the context of key performance indicators of tax administration, is related to the amount of compliance with filing annual tax returns—has steadily risen to roughly 70%. In 2021, the compliance ratio even reached 84.07% (out of 19 million individual and corporate taxpayers who are obliged to file tax returns). Before 2017, compliance to file was significantly lower, at approximately 60% [7]. The rise may be attributable to the actual effect of introducing an e-tax system to boost public engagement in the tax system. However, it is unclear whether the progress is due to increased tax literacy and satisfaction

with the system or other factors like increased demand for data requests and audits by tax authorities. Data matching and requests for taxpayer data and information have become increasingly popular in Indonesia today in achieving tax revenue realization [8]. The frequency of tax non-compliance, including non-tax filing, is still challenging amidst the growth of information technology. This implies that the e-tax system is still ineffective [9].

Despite the significance of evaluating the efficacy of the e-tax system, comparative studies of e-Filing and e-Form services are largely ignored. Most studies on public finance focus on e-Filing user experience assessment [7,10–13]. Other studies consider the e-Filing service as an antecedent of tax compliance intention/behavior [14–16]. Evaluations of the e-Form system in Indonesia are also few, with Annisa et al. 2019 [17] and Suwardi 2020 [6] being the pioneers. Nurhayati and Hidayat 2019 [18] may have also attempted a qualitative comparison of e-Filing and e-Form services. However, additional contributions to the literature are still required because the characteristics of the e-Form service that offer offline flexibility are crucial within an unstable internet access setting. Empirical research involving e-Form users is rather challenging, as the system initially required users to install the IBM viewer software on their devices before using it [19], causing many tax filers to avoid it.

Therefore, this study aims to fill the gaps mentioned above by quantitatively assessing the quality and satisfaction of e-Filing and e-Form services from the perspective of tax professionals in Indonesia. It also extends the analysis of tax compliance intention based on their experiences with both services. The perspective of certified tax professionals is brought forward because they may be more involved in using tax services than ordinary taxpayers. Due to the lack of evidence, it can only be implied that tax professionals' qualifications are associated with more experience in using digital tax administration services, which is relevant to tax compliance intention.

Our study adds to the existing literature on the IS success model of e-Filing service [12,15,19,20] by extending it through convenience assessments and perceptions of reduced compliance costs. Because the adoption of the e-tax system was also found to encourage tax compliance, as was the case in Vietnam [21], Ethiopia [22], and Uganda [5], our study would like to present further empirical evidence from Indonesia. Government initiatives by establishing e-tax services to address the country's internet connection issue are becoming an interest for recent investigation since ICT infrastructure and reliable internet access is crucial for decreasing tax evasion [23]. As Goldsmith et al. 2022 [24] note, more people may choose to file tax returns if they trust the e-tax system. We solicit the response from tax professionals with experience utilizing e-Filing and e-Form to determine whether they are meaningful for tax compliance.

In addition to the above introduction (Section 1), this paper includes six sections. Section 2 is the literature review. The hypothesis development is explained in Section 3. The fourth section describes the study methodology, sample selection, instrument development and validation, and model estimation. The empirical results are presented in Section 5, while the discussion and conclusion, as well as implications for theory and practice, limitations, and future studies, are presented in Section 6.

2. Literature Review

2.1. E-Tax Filing System in Indonesia

Along with technological developments, the Directorate General of Taxes (DGT) in Indonesia has adopted technological innovation as a form of service to make it easier for taxpayers to fulfill their tax obligations [14]. The Directorate General of Taxes website (http://www.djponline.pajak.go.id (accessed on 5 July 2022) provides e-Filling and e-Form as the channels for filing tax returns. The e-Filing service can be accessed online and in real-time, as the devices used must always be connected to the Internet. The e-Form service, on the other hand, compensates for the limitations of internet access in Indonesia by combining online and offline functions.

The distinction between the e-Form and e-Filing services is that taxpayers must complete the e-Form offline before uploading it to a viewable online page, much like e-Filing [25]. The e-Form service is introduced to alleviate the load on the online DGT server at the deadline for reporting tax returns [26]. The risk of a server outage should be anticipated, given that, for instance, the annual tax returns for individual taxpayers in March 2022 (reporting for the 2021 fiscal year) reached 5,920,237. Those who reported tax returns through e-Filing and e-Form numbered 5,321,538 and 294,892 filers, respectively, while the rest still reported tax returns manually [27]. In March 2021, the Indonesian tax administration innovated by establishing the e-Form service that can be accessed using the Adobe PDF Reader program. Previously, it was limited to access using IBM viewer software.

Tax return reporting has become simpler, faster, and safer with the advent of e-Filing and e-Form services. As this technology advances, tax authorities harbor the hope that taxpayers will eventually migrate from paper to digital filing of tax returns. In addition, with various conveniences, it is expected that tax compliance will increase from year to year [26].

2.2. Tax Compliance Amidst the E-Tax System Adoption

Tax compliance is generally associated with people's readiness to behave according to the "spirit" and "letter" of tax regulations and administration without having to wait for law enforcement activities [28]. Tax compliance has previously been defined by Roth et al. 1989 [29] as an accurate and timely reporting of tax obligations in line with the tax laws in effect when tax returns are filed. The definition suggests that a person must disclose the correct amount of income, deduct the correct amount from the allowable expenses, and then pay the correct amount of tax by the deadline to comply with the law [30]. Although there is no universally used definition of compliance in all tax compliance studies [30], the dimensions of tax compliance can be characterized by regulatory compliance and payment compliance [5]. Payment compliance, as defined by Night and Bananuka 2020 [5], refers to the timeliness of tax payments, the accuracy of the amount of tax paid, and the priority for fulfilling tax payments. Meanwhile, regulatory compliance is conformity in declaring all income, deductible expenses and taxes payable, and reporting tax returns on time [5,21].

Globally, tax administrations frequently adopt electronic tax systems to facilitate the fulfillment of taxpayers' tax responsibilities. The economically and socially damaging problem of tax evasion in the tax administration system can be mitigated by the successful implementation of the e-tax system. Prior research has shown that an effective e-tax system significantly reduces tax evasion [9]. In other words, the effectiveness of the e-tax system's adoption is crucial for promoting tax compliance. In turn, the rise in tax compliance that follows the e-tax system increases tax collections [16]. However, inadequate utilization of the e-tax system contributes significantly to low tax revenue [31]. Therefore, taxpayers need to be encouraged to use e-tax services provided by the government to facilitate tax compliance.

Identifying the factors affecting taxpayers' willingness to use the e-tax system is crucial for increasing its adoption [32]. Several prior studies [33–35] have demonstrated that users' satisfaction with the e-tax system is the primary driving force for continuing use intention. The conceptual model of our study, which integrates numerous variables, is theoretically based on the IS success model with several extensions, resulting in eleven hypotheses that are explained in detail in Section 3.

3. Conceptualization and Hypotheses Development

3.1. Perceived Quality of E-Tax System and Tax Compliance Intention

The perspective of users on the quality of information systems (ISs) is a crucial aspect of an IS's success. This perspective will determine whether the system is usable. Consequently, we cannot evaluate the quality of an IS separately from the system's users [36]. A conceptual framework underlying the quality of an IS that is important to users has

been developed from the user's perspective. End-user computing satisfaction [37], user information satisfaction [38], technological acceptance model [39], and information system (IS) success model [40] are some examples.

DeLone and McLean's (D&M) IS success model is the most sophisticated and widely cited of the existing concepts ten years after its introduction [41,42]. Since this first model was published in 1992 until a ten-year update was released by DeLone and McLean 2003 [43], nearly 300 articles have cited the D&M IS success model. Today, approximately 4505 studies have cited the updated model, as indicated by the social citation index data. On the other hand, Davis's TAM model, more widely accepted by IS researchers than the D&M IS success model, measures only a subset of IS success and does not consider the nature of use, service quality, or organizational impact. Thus, although the TAM model is very informative for comprehending user behavior, it is less comprehensive than the D&M model for measuring IS success [44].

The initial D&M model introduced two dimensions for measuring the quality of an IS: information quality and system quality. Nonetheless, numerous researchers criticized the first D&M model during the first decade and suggested its modification or expansion. For instance, Pit et al. 1995 [45] revealed that commonly used IS quality measurements tend to ignore the IS function's services and concentrate solely on products. Therefore, if researchers do not incorporate measures of IS service quality in their evaluation packages, there is a risk that they will mismeasure IS quality. Other researchers [46,47] have concurred, citing the importance of service quality measurements to the success of an IS. In response to this criticism, DeLone and McLean [43] published a revised IS success model that included a service quality component. Thus, three dimensions for measuring IS quality have been established to date: information quality, system quality, and service quality. Since e-Filing and e-Form are specialized types of IS, we measure the quality of these two Indonesian e-tax services using these three main criteria.

Multiple empirical investigations on the success of ISs have operationalized the quality of ISs following the parameters provided. The information quality of an IS includes accurate information, current information, adequate information, trustworthy information, and useful information [48–50]. In the meantime, the tool created by Wang and Liao 2008 [48] and Chiu et al. 2007 [51] to evaluate the service quality of IS consists of four dimensions: service readiness, availability, individual attention, and users' particular needs. Lastly, the system quality of an IS can be assessed using three dimensions: user friendliness, usability, and ease of use [48,49]. Hence, we hypothesize that:

H1. *Information quality of e-tax system positively affects tax compliance intention.*

H2. *System quality of e-tax system positively affects tax compliance intention.*

H3. *Service quality of e-tax system positively affects tax compliance intention.*

According to DeLone and McLean 2003 [43], the three primary elements of IS quality are independent variables that affect user satisfaction individually or collectively. Consequently, most empirical studies on IS success included user satisfaction as an outcome variable for measuring three dimensions of IS quality [52]. For instance, McKinney et al. 2002 [53] identified website information quality as a critical web consumer satisfaction element. In the context of augmented reality (AR) technology, Yoo 2020 [54] also discovered that user perceptions of information quality had a favorable effect on satisfaction. Seddon and Kiew 1996 [55], Chiu et al. 2007 [51], and Halawi et al. 2007 [56] found a positive association between system quality and user satisfaction, and numerous empirical studies have evaluated this relationship [52]. Several empirical studies have demonstrated that improved service quality can raise user perceptions of satisfaction [57]. In particular, Gorla et al. 2010 [58] hypothesized that pleasant encounters with IS personnel could also lead to a more satisfying experience using mandatory systems. Satisfaction with the services the government offers is an important predictor of tax compliance [59]. However, studies conducted to assess the relationships between user satisfaction with e-tax adoption and

tax compliance remain scarce. Fjeldstad et al. 2020 [60], who found a relationship between satisfaction with tax and administration and tax compliance among Tanzanian businesses, appears to be one of them. The following hypothesis is then reasonable:

H4. *User satisfaction towards e-tax system positively affects tax compliance.*

In addition, most prior research exploring the relationship between IS services and taxation also included user satisfaction as an outcome variable (see, for example: [61–65]). Their investigation, therefore, focuses on the extent to which taxpayers are satisfied with e-tax services. These studies may bring insight that can serve tax authorities in assessing the implementation of e-tax services in the respective jurisdiction. However, those studies did not assess the effect of adopting electronic tax filing systems on tax compliance. The primary goal of establishing an e-tax system is to make it easier for taxpayers to complete their obligations, as outlined simply in Section 2.2 of this study. Therefore, performing such an analysis makes a great deal of sense.

Some empirical evidence suggests that user satisfaction mediates the relationship between e-tax systems and tax complaints. For instance, Nkundabanyanga et al. 2017 [66] believe that taxpayers will only pay taxes if they are satisfied with the services the government provides, which seems to be approximately equivalent to the taxes they pay. The level of user satisfaction significantly affects their behavioral intentions [67]. When taxpayers believe they are being "paid" equally, they are more likely to comply with tax regulations [68]. Khaddafi et al. 2018 [69] underlined that the deployment of the electronic tax system is a sort of government-provided service that can enhance taxpayers' impressions of the simplicity of tax payment. For this reason, taxpayers must be pleased to use the electronic tax system, which encourages them to pay their taxes electronically. If taxpayers are pleased with the services offered by the system, their tax compliance behavior will improve [70,71]. Accordingly,

H5. *Satisfaction mediates association between information quality of e-tax system and tax compliance.*

H6. *Satisfaction mediates association between system quality of e-tax system and tax compliance.*

H7. *Satisfaction mediates association between service quality of e-tax system and tax compliance.*

3.2. Convenience and Tax Compliance Intention

Adopting the e-tax system could benefit taxpayers in terms of convenience (Lee, 2016). In the online tax services context, the word convenience means everything that improves comfort while requiring less time and effort from the taxpayer [72]. It was found that the user interface of the e-tax system service, which is designed to be simple and easy to use for users' convenience, was favorably correlated with the satisfaction of Certified Accountants in Portugal [33]. Studies of taxpayers in Indonesia who feel comfortable, as represented by easy access anywhere and anytime, show a tendency of higher satisfaction with the e-tax system as a whole [73]. Since the e-tax system can be used in real-time from anywhere worldwide, convenience is a crucial aspect of e-tax system design [72].

It is expected that people will tend to comply with the tax law due to the perceived convenience of the e-tax system. Implementing an e-tax system aims to provide users with a sense of convenience, making them more likely to demonstrate tax compliance [5]. The public can benefit from an e-tax system by being more comfortable carrying out various tasks than paper-based tax filing [20]. Although the literature on the influence of convenience in using an e-tax system on tax compliance intentions is still limited, this direction is possible since operational problems will hinder the compliance process [74]. A study showed that the negative link between e-government services and tax evasion was lessened by having a stable internet connection [23]. We argue that high convenience can increase satisfaction among tax professionals and their tax compliance intentions.

H8. *Convenience positively affects tax compliance.*

Convenience is one factor that can influence satisfaction [33,75] and potentially tax compliance. However, the relationship between convenience, satisfaction, and tax compliance has not been adequately examined. Javanmard et al. 2010 [76] attempted to correlate these pathways, although their results did not establish a significant correlation. In another way, previous studies found that taxpayers with high privacy concerns about their personal data being misused (inconvenient) will be less satisfied and less likely to utilize online tax filing [77,78]. Therefore, it can be implicitly posited that the more convenience users feel in the experience of using e-tax services, the more satisfied they are, which, in turn, encourages them to comply with taxes. As convenience increases, satisfaction increases, and as satisfaction increases, tax compliance also increases. This suggests that user satisfaction should be considered as part of any effort to promote tax compliance. Thus, we hypothesize that:

H9. *Satisfaction mediates association between convenience and tax compliance.*

3.3. Perception of Reduced Compliance Cost and Tax Compliance

The financial situation of users may benefit from efforts to lower compliance expenses. Companies can devote more resources to profitable endeavors by reducing the cost of compliance [79]. According to Blaufus et al. 2019 [80], compliance costs are the total of monetized financial expenses and labor hours required to comply with tax law. Similarly, Loh et al. 1997 [81] define it as "the costs of conforming with the mandatory requirements of a tax regime, involving the preparation and submission of timely tax returns following the relevant tax laws of a country at a given time." Compliance costs may rise if e-Filing policy implementation is inappropriate. For example, it requires taxpayers to disclose electronic and paper filings.

The most significant aspect of tax compliance costs that can be influenced by e-Filing usage is tax accounting, which includes filling out and reporting forms [74]. E-Filing is a likely contender to help taxpayers save compliance costs by streamlining and improving the reporting process, decreasing human error, and cutting down on in-person visits to the tax office [74]. Empirical data suggest compliance costs may affect total tax system compliance [82]. Costs associated with compliance might thus be seen as an economic issue for society. According to Akamavi 2005 [83], adoption of the electronic system provides more convenience to the expanding population of internet users and offers significant cost savings. By eliminating the need to visit the tax department and wait in line, the switch from a manual to an online procedure saves time [84]. Based on a recent case study conducted in Tajikistan, taxpayers' time spent on taxes reduced by 40% by adopting the e-tax system [85]. Therefore, we posit that:

H10. *Perception of reduced compliance cost positively affects tax compliance.*

Compliance cost is empirically also found to affect filing compliance [86]. Those who perceive high compliance costs are more likely to decide not to file. Kochanova et al. 2020 [2] found that the e-tax system reduces tax compliance costs. In measuring compliance costs, they were considering the time to prepare tax returns and pay taxes. In the context of e-tax system adoption, compliance costs that may be reduced include monetary expenses, time efforts [2,80], storage to keep the physical documents, and proneness to error [74]. We posit that those who perceive that the e-tax system reduces compliance costs are more likely to be satisfied with the e-tax system and more likely to have intentional tax compliance.

H11. *Satisfaction mediates association between perception of reduced compliance cost and tax compliance.*

4. Materials and Methods

4.1. Sample Size and Sampling Criteria

Our study design was cross-sectional, i.e., data were collected from a population at a specific time point [87]. A cross-sectional survey approach was used because we wanted

to examine taxpayers' intention to comply with their taxes based on the quality of e-tax services and their satisfaction with the services.

The population under study is not ordinary taxpayers; instead, they are active tax professionals registered with the Ministry of Finance's Tax Consultant Information System (SIKOP). It indicates they hold a tax consultant certificate, either A, B, or C (C represents the highest qualification of a tax consultant in Indonesia). Minister of Finance Regulation 111/PMK.03/2014 defines a tax consultant as someone who provides tax consulting services to other taxpayers to exercise their rights and fulfill their tax obligations per tax laws and regulations. They are undoubtedly the main users of e-Filing and e-Form services and have a better understanding of these two electronic tax services. Most likely, they can deliver valid assessments of the issues being investigated. According to this population criteria, we dealt with 6307 Indonesian tax consultants active in the current year. The target sample size to represent the population is 361, as Krejcie and Morgan 1970 [88] recommended in their table of sample selection approaches.

Random sampling was used to collect data from respondents. This method was chosen because it is quick, convenient, and less costly, but not generalizable [87]. We could not physically distribute the questionnaires due to social restrictions imposed by the government due to the pandemic. Instead, the questionnaire was created using a Google form and distributed online through various social media, including the WhatsApp group of the Indonesian Association of Tax Consultants, Twitter, and LinkedIn. In total, this process took about one month (23 September 2022–26 October 2022). At the end of the period in which the questionnaires were distributed, we received 676 responses. However, some of them were invalid and should be removed from the analysis. These questionnaires were submitted by respondents who did not have a tax advisor certificate and had never used e-Filing or e-Form services. This gave us 650 usable responses for e-Filing users and 492 for e-Form users. This size exceeds the specified minimum target (361). Table 1 contains the characteristics of the sample used in the study.

Table 1. Characteristics of the sample.

	Category	e-Filing		e-Form	
		Frequency	Percentage (%)	Frequency	Percentage (%)
Gender	Female	249	38.31	177	35.98
	Male	401	61.69	315	64.02
Age	18–24 years	31	4.77	23	4.67
	25–35 years	227	34.92	177	35.98
	36–45 years	218	33.54	164	33.33
	46–55 years	128	19.69	97	19.72
	>55 years	46	7.08	31	6.30
Education	Secondary	9	1.38	8	1.63
	3-year Diploma	47	7.23	39	7.93
	Bachelor	448	68.92	344	69.92
	Master	140	21.54	97	19.72
	PhD	6	0.92	4	0.81
Certificate Level	A	351	54.00	304	61.79
	B	255	39.23	152	30.89
	C	44	6.77	36	7.32
Working Experience	<1 years	49	7.54	41	8.33
	1–4 years	200	30.77	158	32.11
	5–9 years	138	21.23	102	20.73
	10–15 years	143	22.00	110	22.36
	>15 years	120	18.46	81	16.46

4.2. Questionnaire and Measurement

A closed-response questionnaire was used to measure the variables under study. This questionnaire format seems to be more appropriate than the open-response format,

since we want to capture the average score of each questionnaire item [84]. Therefore, we used a Likert scale from 1 to 6 (1 for strongly disagree and 6 for strongly agree) for this questionnaire. This survey is divided into two sections. The first section was used to collect information about respondents' demographic and social characteristics, such as gender, age, education, residence, tax advisor certification level, and work experience (see Table 1). The last section was used to measure the research variables. These variables were measured and operationalized using several items based on previous empirical literature. Table 2 provides an overview of the 27 measured items that were used to operationalize all variables studied. With the exception of tax compliance, the other items assessing e-Filing or e-Form services are duplicated. Thus, respondents who have already used e-Form services would rate a total of 47 items.

Table 2. Measurement of the variables.

Variable	Code	Items	Source
Tax Compliance	TC1	Disclose all tax liabilities in the tax return	[5,21,59,89]
	TC2	Disclose all income in the tax return	
	TC3	File tax returns on time	
	TC4	File tax return before the due date	
	TC5	Pay taxes before the tax return due date	
	TC6	Prioritize paying taxes over other bills	
	TC7	Paying taxes correctly will prevent future tax penalties/fines.	
User Satisfaction	SF1	Never experiencing any problems in filing the tax return	[48,72,90]
	SF2	Feeling satisfied in filing tax returns through the e-tax system	
	SF3	The performance of the e-tax system is as expected	
Information Quality	InfQ 1	The e-tax system's information is tailored to the users' demands	[43,48,72]
	InfQ 2	The e-tax system provides precise information	
	InfQ 3	The e-tax system provides reliable information	
	InfQ 4	The e-tax system provides sufficient information	
Service Quality	ServQ1	The e-tax system is easy to use	[43,48,72]
	ServQ2	The e-tax system is user friendly	
	ServQ3	The e-tax system contains the complete feature to file tax returns	
System Quality	SysQ1	The e-tax system has readiness in filing tax return services	[43,48,72]
	SysQ2	The e-tax system is secure and safe to use	
	SysQ3	The e-tax system is accessible anytime	
Convenience	Con1	The user interface of the e-tax system is comfortable	[20,33,72]
	Con2	The e-tax system provides simplicity in filing tax returns	
	Con3	The e-tax system offers convenience in filing tax returns	
Perception of Reduced Compliance Cost	RCC1	Filing tax returns through the e-tax system takes less time than does it in person at the Tax Office	[74,80]
	RCC2	Filing tax returns through the e-tax system is less expensive than does it in person at the Tax Office	
	RCC3	The e-tax system allows for saving more room for physical tax return storage	

4.3. Validity and Reliability of the Research Instrument

In this study, the convergent and discriminant validity of the items was examined using explanatory factor analysis (EFA). Principal component analysis (PCA) and common factor analysis are the two approaches offered by the EFA. We opted for PCA because

it is a typical standard method widely used when performing factor analysis [91]. The widespread use of PCA is mainly attributed to the complications and fundamental problems inherent in common factor analysis. As Mulaik and McDonald 1978 [92] noted, common factor analysis suffers from factor uncertainty, which means that a single-factor model can produce several different factor scores. In addition, common factor analysis involves calculating communality estimates that are sometimes invalid (for example, greater than 1 or less than 0), thus requiring the removal of the variable from the analysis.

A rotational method was required to facilitate the interpretation of factors resulting from PCA in a less complex manner. Varimax, the most common orthogonal type, is recommended as a rotation method [93]. This method is frequently used because it has the potential to avoid the multicollinearity problem [89]. However, in the social sciences, especially behavioral studies, independent variables are often correlated to each other [94]. In this sense, using varimax could hide the true effect of independent variables when they are strongly correlated [95]. Consequently, using the promax (oblique) method as a rotation method, which allows the factors to be correlated [96], appears to be more appropriate for the characteristics of our study.

The promax-rotated PCA method defines convergent validity as the proportion of a construct's components that load onto the same factor (Streineret et al. 2015 [97]). In the absence of cross-loading scenarios in which a single item contains two or more components, discriminant validity can be determined [98]. As recommended by Hair et al. 2019 [91], the limit point for the factor loading coefficient considered significant is 0.5 or more.

Before running the above tests, we need to assess the feasibility of exploratory factor analysis by examining the results of the Kaiser–Meyer–Olkin (KMO) sampling adequacy measure and Bartlett's test of sphericity [99]. KMO is a statistic that indicates the proportion of the variable's variance that may be attributable to underlying factors. If the KMO coefficient is above 0.5, the results of factor analysis are likely to be useful with our data, and vice versa [100]. The existence of a correlation between two variables can be statistically tested using Bartlett's test. If the significance level is below 5%, it shows that the correlations in the correlation matrix are statistically significant.

To measure the reliability of an instrument, we employed Cronbach's alpha (α). Cronbach's alpha is the most used method [91]. It measures the degree to which items within the same construct are related to one another, namely internal consistency. However, DeVellis 1991 [101] notes that Cronbach's alpha is not strong enough to capture measurement scales and does not ensure unidimensionality. This measurement is also based on a strict one-factor model that suggests all factor loadings and error variances must be equal [102]. As a result, we also calculated composite reliability (CR, ρ_c) for the reliability test. When assessing reliability, CR takes item factor loading into account and treats all items equally, in contrast to Cronbach's alpha [91]. Using these two tests, we can say that our questionnaire is reliable if both Cronbach's alpha coefficient and the CR value exceed the threshold of 0.7 [98].

Tables 3 and 4 summarize all the test results mentioned above. According to Table 3, the KMO coefficient is 0.937 for e-Filing and 0.957 for e-Form. Both are above the threshold of 0.5, which should be satisfactory. The Bartlett's test for both issues of electronic tax services has a significance value of less than 5% (*p*-value < 0.05). This means that the observed variables share a high degree of correlation, making them an excellent prospect for EFA analysis. The results of the validity test are shown in Table 2, where all items load considerably (>0.5) into a similar factor, implying these items have established convergent validity. In addition, it was found that discriminant validity was met, which was determined by the absence of cases of cross-loading (when one item loads into more than one factor). From the reliability standpoint, Table 4 shows that Cronbach's alpha ranges from 0.838 to 0.949 for e-Filing and from 0.839 to 0.967 for e-Form, suggesting great reliability, since coefficients are well above the critical value of 0.7. The constructs' composite reliability values range from 0.715 to 0.969 for e-Filing and 0.754 to 0.911 for e-Form, which also exceeds the threshold value of 0.7.

Table 3. Factor loading.

	e-Filing							e-Form						
	1	**2**	**3**	**4**	**5**	**6**	**7**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
TC1	0.839							0.819						
TC2	0.808							0.763						
TC3	0.659							0.736						
TC4	0.946							0.868						
TC5	0.650							0.700						
TC6	0.564							0.877						
TC7	0.621							0.611						
SF1		0.794							0.770					
SF2		0.632							0.707					
SF3		0.591							0.735					
InfQ1			0.753							0.615				
InfQ2			0.835							0.666				
InfQ3			0.799							0.672				
InfQ4			0.798							0.682				
ServQ1				0.946							0.896			
ServQ2				0.931							0.872			
ServQ3				0.989							0.836			
SysQ1					0.904							0.830		
SysQ2					0.881							0.766		
SysQ3					0.876							0.733		
Con1						0.796							0.848	
Con2						0.709							0.832	
Con3						0.609							0.858	
RCC1							0.834							0.823
RCC2							0.817							0.822
RCC3							0.800							0.800
Kaiser–Meyer–Olkin measure of sampling adequacy						0.937							0.957	
Bartlett's Test of Sphericity (Sig)					0.000							0.000		

Table 4. Reliability test.

	e-Filing		e-Form	
	Cronbach's Alpha	**Composite Reliability**	**Cronbach's Alpha**	**Composite Reliability**
TC	0.838	0.890	0.839	0.911
SF	0.880	0.715	0.896	0.782
InfQ	0.949	0.874	0.967	0.754
ServQ	0.933	0.969	0.948	0.902
SysQ	0.865	0.917	0.885	0.820
Con	0.910	0.750	0.948	0.883
RCC	0.886	0.858	0.941	0.856

4.4. Estimation Model

Since the validity of all items was tested, it is reasonable to present them with the corresponding variables in the regression analysis. To develop a new set of orthogonal variables, called principal components, we extract the factor scores of all items generated by PCA in the previous subsection.

To estimate the impact of the perceived quality of the e-tax system, convenience, perception of reduced compliance costs, and users' satisfaction towards the e-tax system on tax compliance intention, we use a simple ordinary least square (OLS). To alleviate omitted variable bias, we include a battery of control variables (e.g., [103]). These variables, consisting of age, gender, and education level, were used in the questionnaire to capture the respondents' demographic profile. In Section 3, the role of these variables in explaining

the variances in the dependent variable is explained in detail. Hence, the first set of models in this study is stated as follows:

$$TC_i = \gamma_0 + \gamma_1 X_i + \gamma_2 Inf Q_i + \gamma_3 Sys Q_i + \gamma_4 Serv Q_i + \gamma_5 Con_i + \gamma_6 RCC_i + \gamma_7 SF_i + \epsilon_i \quad (1)$$

where i is the indexes for the ith respondent. X_i is a vector of the control variables, which consist of age, gender, education, certificate level, and working experience. γ_0 is the intercept, which represents the dependent variable values when all explanatories are equal to zero. γ_1 to γ_1 are the expected parameters of all independent variables. The rest of the independent variable notations are as indicated in Table 1. Lastly, ϵ_i is the typical error term, assumed to have a non-independent and identical distribution. Hence, we will use the robust standard errors to allow ϵ_i to be heteroscedastic, which is a common case in cross-sectional data [104].

The use of OLS as a linear modeling technique to model a single response variable recorded at least on an interval scale, as in Equation (1), is very prevalent. However, it should be noted that assigning the independent variables' relative contributions to the dependent variable's variance may be beyond the scope of this regression model. Since we are interested in investigating such causal mechanisms, hierarchical regression analysis seems suitable for our study. According to Field 2009 [105], with a hierarchical regression model, researchers can choose which variables to use as predictors depending on the results of prior studies. Researchers can also set the order in which the variables are introduced to the model. Some prior studies in the taxation literature have used this model to determine how much the independent variables affect tax compliance (see, e.g., [5,106–109]). Specifically, the hierarchical regression model we will test is as follows:

Model 1

$$TC_i = \beta_0 + \beta_1 X_i + \epsilon_i \quad (2)$$

Model 2

$$TC_i = \beta_0 + \beta_1 X_i + \beta_2 Inf Q_i + \beta_3 Sys Q_i + \beta_4 Serv Q_i + \epsilon_i \quad (3)$$

Model 3

$$TC_i = \beta_0 + \beta_1 X_i + \beta_2 Inf Q_i + \beta_3 Sys Q_i + \beta_4 Serv Q_i + \beta_5 Con_i + \epsilon_i \quad (4)$$

Model 4

$$TC_i = \beta_0 + \beta_1 X_i + \beta_2 Inf Q_i + \beta_3 Sys Q_i + \beta_4 Serv Q_i + \beta_5 Con_i + \beta_6 RCC_i + \epsilon_i \quad (5)$$

Model 5

$$TC_i = \beta_0 + \beta_1 X_i + \beta_2 Inf Q_i + \beta_3 Sys Q_i + \beta_4 Serv Q_i + \beta_5 Con_i + \beta_6 RCC_i + \beta_7 SF_i + \epsilon_i \quad (6)$$

In addition to the above analysis, we try to extend this study by examining the role of user satisfaction as a mediator of the relationship between e-tax system quality, convenience, perception of reduced compliance cost, and tax compliance intention. Although there are many ways to perform mediation tests (see, e.g., [110]), the hierarchical regression procedure described by Baron and Kenny 1986 [111] is the most used. For a variable to be designated as a mediator, it must satisfy the following criteria [111]: (1) the independent variable must affect the proposed mediator, (2) a significant association must exist between the independent variable and the dependent variable, (3) the expected mediator must affect the dependent variable, and (4) when the expected mediator is controlled, the influence of the independent variable on the dependent variable decreases. Complete mediation holds in the last step if the influence of the IV on the DV is not statistically significant. However, partial mediation is confirmed if the effect is still significant and drastically decreases the coefficient. We will check those conditions without controlling for age,

gender, education, certificate level, and working experience in all regressions. Specifically, we state the following equations:

Step 1

$$SF_i = \phi_{10} + \phi_{11} InfQ_i + \epsilon_i \tag{7}$$

$$SF_i = \phi_{20} + \phi_{21} SysQ_i + \epsilon_i \tag{8}$$

$$SF_i = \phi_{30} + \phi_{31} ServQ_i + \epsilon_i \tag{9}$$

$$SF_i = \phi_{40} + \phi_{41} Con_i + \epsilon_i \tag{10}$$

$$SF_i = \phi_{50} + \phi_{51} RCC_i + \epsilon_i \tag{11}$$

Step 2

$$TC_i = \alpha_{10} + a_{11} InfQ_i + \epsilon_i \tag{12}$$

$$TC_i = \alpha_{20} + a_{21} SysQ_i + \epsilon_i \tag{13}$$

$$TC_i = \alpha_{30} + a_{31} ServQ_i + \epsilon_i \tag{14}$$

$$TC_i = \alpha_{40} + a_{41} Con_i + \epsilon_i \tag{15}$$

$$TC_i = \alpha_{50} + a_{51} RCC_i + \epsilon_i \tag{16}$$

Step 3

$$TC_i = \delta_1 + \delta_2 SF_i + \epsilon_i \tag{17}$$

Step 4

$$TC_i = \alpha_{10} + a_{11} InfQ_i + a_{12} SF_i + \epsilon_i \tag{18}$$

$$TC_i = \alpha_{20} + a_{21} SysQ_i + a_{22} SF_i + \epsilon_i \tag{19}$$

$$TC_i = \alpha_{30} + a_{31} ServQ_i + a_{32} SF_i + \epsilon_i \tag{20}$$

$$TC_i = \alpha_{40} + a_{41} Con_i + a_{42} SF_i + \epsilon_i \tag{21}$$

$$TC_i = \alpha_{50} + a_{51} RCC_i + a_{52} SF_i + \epsilon_i \tag{22}$$

Since we assume that the independent variable is the determinant of the mediator, then these two variables must be correlated. Thus, multicollinearity is predicted to exist at Step 4, resulting in skewed parameters for both variables [111]. These parameters cannot be uniquely identified when multicollinearity occurs [112]. Moreover, the above procedure is an informal way to assess whether mediation took place or not. Thus, MacKinnon et al. 1995 [113] emphasized that a statistics-based method by which mediation may be formally assessed needs to be applied to avoid misleading conclusions.

This study, therefore, will assess further mediation using the steps suggested by Sobel 1982 [114], otherwise known as the Sobel test. The Sobel test is a special *t*-test used to determine whether the independent variable's effect reduction after controlling the mediator in the model is significant and whether the mediation effect is statistically significant. Before carrying out these tests, Steps 1 and 4 of Baron and Kenny's 1986 [111] procedure must be carried out first. The coefficient values of the independent variables from Step 1 and the mediator from Step 4, along with the corresponding standard errors from these two steps, are then used to obtain Sobel statistics using an interactive calculation tool provided by Preacher and Leonardelli 2022 [115] on the following website: https://quantpsy.org/sobel/sobel.htm (accessed on 28 October 2022).

The popularity of the Sobel test in approximating the significance of the indirect effect is undebatable [116]. However, recently, several different research teams (e.g., [117–120]) have turned against the Sobel test because assuming normality for the indirect impact sampling distribution is necessary for this test's standard error. This assumption is only possible when our sample size is very large. In a small sample, the sampling distribution for indirect effects tends to be skewed to the right (i.e., not normal), and thus this assumption may reduce the statistical power of the Sobel test [118,121]. Considering this concern, we

also use bootstrapping estimates, suggested as an alternative for mediation testing [117]. This procedure does not require a priori assumptions on the form of the sampling distribution, so violations of normality can be tolerated when creating a confidence interval for inferring significance [122]. Specifically, bootstrapping analysis in this study was done through Hayes' 2018 PROCESS macro. The indirect effect is considered insignificant if the zero coefficient lies between the lower and upper limits of the confidence interval (LLCI and ULCI).

5. Results

5.1. Descriptive Statistics

Table 5 provides means and standard deviations for descriptive statistics of Likert scale responses for all questionnaire items. Since means summarize the data, and standard deviations demonstrate the extent to which means describe the observed data [105], we report both of them.

Table 5. Descriptive statistics.

	e-Filing				e-Form			
	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.
TC1	1	6	5.45	0.817	1	6	4.20	1.326
TC2	2	6	5.50	0.711	2	6	4.69	1.165
TC3	1	6	5.58	0.689	1	6	4.52	1.228
TC4	1	6	5.43	1.072	1	6	4.75	1.063
TC5	1	6	5.48	0.837	1	6	4.75	1.044
TC6	1	6	4.98	1.137	1	6	4.77	1.062
TC7	1	6	5.48	0.724	1	6	4.79	1.046
SF1	1	6	3.98	1.311	1	6	4.74	1.101
SF2	1	6	4.84	1.059	1	6	4.77	1.103
SF3	1	6	4.59	1.109	1	6	4.84	1.044
InfQ1	1	6	4.82	0.976	1	6	4.69	1.179
InfQ2	1	6	4.87	0.983	1	6	4.70	1.140
InfQ3	1	6	4.80	1.019	1	6	4.75	1.203
InfQ4	1	6	4.85	0.968	1	6	4.81	1.043
ServQ1	1	6	4.97	0.936	1	6	4.87	1.033
ServQ2	1	6	4.97	0.892	1	6	4.85	1.045
ServQ3	1	6	5.01	0.903	1	6	5.25	0.954
SysQ1	1	6	4.85	1.050	1	6	5.34	0.875
SysQ2	1	6	4.79	1.076	1	6	5.30	0.889
SysQ3	1	6	4.82	1.125	1	6	5.43	0.831
Con1	1	6	4.94	0.924	1	6	5.50	0.718
Con2	1	6	5.11	0.852	1	6	5.57	0.732
Con3	1	6	5.07	0.883	1	6	5.41	1.121
RCC1	1	6	5.46	0.761	1	6	5.51	0.836
RCC2	1	6	5.51	0.703	1	6	4.98	1.156
RCC3	1	6	5.45	0.768	1	6	5.50	0.729

As previously mentioned, we evaluated the items on the questionnaire using a scale of strongly disagree (1) to strongly agree (6). The even-point scale is preferred to be applied in this study since we expect that respondents can make a definite choice in terms of "agree" or "disagree" concerning the item in question rather than choosing a neutral option. The use of an even-point scale has several advantages, such as eliminating the possibility of misinterpreting the midpoint because some respondents tend to downplay their point of view response by choosing the midpoint, which is skewed towards a negative [123]. To interpret the mean values in Table 5, we took a threshold of 4.5 out of 6 to indicate a high positive response to the investigated questionnaire items. This threshold was set since negative responses tended to increase when an even-point scale was used in the questionnaire [124].

Table 5 shows that tax professionals have a highly positive point of view on information quality (mean values range from 4.80 to 4.87), service quality (mean range was 4.97 to 5.01), and system quality (mean values range from 4.79 to 4.85) of the e-Filing service. The results on intention to comply with tax regulations (mean values range from 4.98 to 5.58) were also similar. The satisfaction of tax professionals in using e-Filing also seems to be quite high, except for the statement "never experiencing problems in filing tax returns" (SF1), which tends to receive negative responses (mean values = 3.98). Tax professionals surveyed also tend to view the e-Form service positively. This is shown by the mean value of all the research variables between 4.20 and 5.57. Nevertheless, the TC1 item with a mean value of 4.20 is below the set threshold and reflects the respondents' low intention to disclose all their tax obligations when using the e-Form. Since the standard deviations for both e-Filing (range from 0.69 to 1.31) and e-Form (range from 0.72 to 1.33) are much lower than the mean value, it is clear that most of our data are clustered around the mean [105]. Thus, the summary of the data described above represents the overall data observed.

5.2. Regression Analysis Results

The OLS regression results of the six independent variables, the control variables (gender, age, education, certificate level, and work experience), and tax compliance intention are presented in Table 6. For the e-Filing case, the results indicate that the service quality and the perception of reduced compliance cost are strong determinants in increasing tax compliance intention among tax professionals. It was evidenced by the *p*-values that were lower than 5% and 0.1%, respectively. Thus, H3 and H11 were supported. However, the rest of the independent variables were statistically insignificant (*p*-value > 0.05), indicating that the other hypothesis of this study was not accepted. Regarding the control variables, only age and tax professionals' experience were shown to be significant contributors to the variation of the dependent variable. In addition, Table 5 reveals that among the key explanatories, only the perception of reduced compliance costs has a positive and significant effect on the tax compliance intention of tax professionals (coefficient value = 0.355, *p*-value < 0.001); thus, H3 was supported. On the other hand, the other hypothesis was not accepted in the e-Form case.

Table 6. Comparative multiple regression analysis between e-Filing and e-Form services.

	e-Filing			e-Form		
	Coefficient	Std. Error	t	Coefficient	Std. Error	t
Constant	−0.175	0.189	−0.923	−0.294	0.220	−1.338
Gender	0.037	0.073	0.506	−0.105	0.089	−1.183
Age	0.088 **	0.044	1.984	0.056	0.044	1.292
Education	−0.005	0.062	−0.086	0.059	0.073	0.799
Certificate Level	0.111 †	0.060	1.851	0.013	0.070	0.193
Work Experience	−0.072 *	0.034	−2.112	−0.001	0.029	−0.018
InfQ	0.112 †	0.061	1.848	0.113	0.090	1.261
ServQ	0.118 *	0.059	1.989	−0.006	0.140	−0.040
SysQ	0.029	0.044	0.665	0.133	0.131	1.014
Con	0.049	0.067	0.731	−0.113	0.118	−0.957
RCC	0.289 ***	0.058	4.967	0.355 ***	0.074	4.814
SF	0.048	0.058	0.824	0.112	0.096	1.170

Note: Std. Error presents robust standard errors. † = significance at 0.1. * = significance at 0.05. ** = significance at 0.01. *** = significance at 0.001.

Table 7 displays the outputs of five hierarchical regression models applied to both e-tax services (e-Filing and e-Form). Gender, age, education, certification, and working experience are the only explanatory factors in Model 1. In Models 2, 3, and 4, each predictor is inserted sequentially to determine how much each variable affects variances in the tax compliance intention as a dependent variable. It starts from the three variables of e-tax system quality and convenience and ends with the perception of reduced compliance cost.

In Model 5, the user satisfaction as an expected mediator is introduced. This latter model is no different from that shown in Table 6.

Table 7. Comparative hierarchical regression results between e-Filing and e-Form services.

	e-Filing					e-Form				
	I	II	III	IV	V	I	II	III	IV	V
Constant	−0.246	−0.221	−0.218	−0.179	−0.175	−0.325	−0.338	−0.310	−0.289	−0.294
Gender	0.070	0.038	0.032	0.037	0.037	−0.193 *	−0.117	−0.118	−0.114	−0.105
Age	0.130 *	0.105 *	0.095 *	0.091 *	0.088 *	0.066	0.059	0.057	0.064	0.056
Education	−0.012	−0.008	−0.008	−0.006	−0.005	0.031	0.064	0.060	0.053	0.059
Certificate Level	0.146 *	0.125 *	0.115 †	0.115 †	0.111 †	0.071	0.024	0.024	0.013	0.013
Work Experience	−0.101 *	−0.076 *	−0.062	−0.074 *	−0.072 *	0.023	0.005	0.001	−0.002	−0.001
InfQ		0.208 ***	0.143 **	0.134 *	0.112 †		0.208 **	0.199 **	0.151 *	0.113
ServQ		0.270 ***	0.188 **	0.121 *	0.118 *		0.071	0.012	0.004	−0.006
SysQ		0.031	0.027	0.029	0.029		0.194 *	0.168 †	0.160 †	0.133
Conv			0.182 **	0.063	0.049			0.101	−0.086	−0.113
RCC				0.287 ***	0.289 ***				0.355 ***	0.355 ***
SF					0.048					0.112
R square	0.022	0.223	0.237	0.287	0.288	0.016	0.212	0.214	0.282	0.269
F statistics	2.830 *	23.040 ***	22.107 **	25.707 ***	23.453	1.551	16.254 ***	14.591 ***	18.830 ***	17.381 ***
Adjusted R square	0.014	0.214	0.226	0.276	0.276	0.006	0.199	0.200	0.267	0.269
F Change	2.830 *	55.526 ***	11.594 **	44.566 ***	0.931	1.551	40.135 ***	1.223	44.972 ***	2.361
R square Change	0.022	0.202	0.014	0.050	0.001	0.016	0.197	0.002	0.067	0.004

Note: † = significance at 0.1. * = significance at 0.05. ** = significance at 0.01. *** = significance at 0.001.

The results show that in Model 1, the control variable contributes 2.2% (*R* square = 0.022) and 1.6% (*R* square = 0.016) to the variation in the tax compliance intention of tax professionals as users of e-Filing and e-Form, respectively. For the e-Filing case, all control variables can explain any significant difference in tax compliance among tax professionals, except for gender and education. In the case of e-Form, only gender significantly affects tax compliance intention. Overall, Model 1 is significant for the e-Filing case (*p*-value of *F* statistics < 0.05) but not for the e-Form case (*p*-value of *F* statistics > 0.05).

Model 2 shows the incremental contribution of the three quality variables of the e-tax system (information quality, service quality, and system quality), which can be seen from *R* square changes. In the case of e-Filing, these three variables contribute an additional 20.2% to tax compliance intention among tax professionals. This additional contribution is highly significant, as evidenced by the *p*-value of *F* change which is below 0.001. In the case of e-Form, the additional contribution of these three variables to tax compliance is 19.7% and is proven to be statistically significant (*p*-value of *F* change < 0.001).

Moreover, we found that the inclusion of convenience in Model 3 increased the predictive power of the independent variables on tax compliance by 1.4% and 0.2% for the e-Filing and e-Form studies, respectively. These incremental contributions are relatively significant for e-Filing but not for e-Form. Model 4 shows that the perception of reduced compliance cost significantly contributes to the two e-tax systems under study. Lastly, we found that tax professionals' satisfaction does not make a significant incremental contribution to the regression model that predicts the variance in their tax compliance intentions. In the e-Form case, the inclusion of user satisfaction has been recognized as reducing the predictive value of the regression model regarding tax compliance intention. Overall, Model 5, as our complete model, can explain 28.8% and 26.9% of the variance in the tax compliance of tax professionals in the case of e-Filing and e-Form services, respectively.

5.3. Mediation Analysis Results

Table 8 presents the test results of the mediational hypothesis using Baron and Kenny's 1986 [111] procedure. In both the case of e-Filing and e-Form services, the first three steps

of this procedure reveal statistically significant relationships between the five independent variables and the expected mediator, between the predictors and the outcome of interest, and between the expected mediator and the explained variables. These results indicate that the first three conditions of Baron and Kenny [111] are satisfied. Table 8 also confirms the fourth requirement of the procedure, in which the coefficients of the five key explanatory factors decrease when the expected mediator is controlled.

Table 8. Mediation analysis (results of hierarchical regression).

Hypothesized Relationship	Step 1	Step 2	Step 3	Step 4
e-Filing Services				
InfQ –> SF –> TC	0.696 ***	0.415 ***	0.358 ***	0.322 ***
	(0.028)	(0.036)	(0.037)	(0.050)
ServQ –> SF –> TC	0.589 ***	0.432 ***	0.358 ***	0.340 ***
	(0.032)	(0.035)	(0.037)	(0.043)
SysQ –> SF –> TC	0.123 **	0.103 **	0.358 ***	0.060
	(0.039)	(0.039)	(0.037)	(0.037)
Conv –> SF –> TC	0.640 ***	0.431 ***	0.358 ***	0.139 **
	(0.030)	(0.035)	(0.037)	(0.046)
RCC –> SF –> TC	0.394 ***	0.465 ***	0.358 ***	0.383 ***
	(0.036)	(0.035)	(0.037)	(0.037)
e-Form Services				
InfQ –> SF –> TC	0.793 ***	0.429 ***	0.421 ***	0.256 ***
	(0.028)	(0.041)	(0.041)	(0.066)
ServQ –> SF –> TC	0.785 ***	0.415 ***	0.421 ***	0.220 **
	(0.028)	(0.041)	(0.041)	(0.066)
SysQ –> SF –> TC	0.797 ***	0.432 ***	0.421 ***	0.208 **
	(0.027)	(0.041)	(0.041)	(0.067)
Conv –> SF –> TC	0.782 ***	0.415 ***	0.421 ***	0.220 **
	(0.028)	(0.041)	(0.041)	(0.065)
RCC –> SF –> TC	0.562 ***	0.487 ***	0.421 ***	0.366 ***
	(0.037)	(0.039)	(0.041)	(0.047)

Note: Standard errors are in parentheses. ** = significance at 0.01. *** = significance at 0.001.

However, we only have strong evidence to conclude that user satisfaction fully mediates the relationship between e-Filing system quality and tax compliance intentions (Model 3). When user satisfaction is incorporated into the model, the effect of this independent variable on the dependent variable becomes insignificant. Meanwhile, most models (1, 2, 4, and 5), both in the case of e-Filing and e-Form, only show a partial mediating effect of user satisfaction. Rosopa and Stone-Romero 2008 [125] noted that the partial mediating effect is preferable to the complete mediating effect, considering that a social phenomenon has many causes. In addition, expecting the null hypothesis in testing the mediating effect is a logical concern [126], especially for psychological and social fields.

Furthermore, the Sobel test and bootstrapping estimates were used to determine how significant the mediation effect was, and the outcomes are presented in Table 9. The mediation effects of tax professional satisfaction regarding e-Filing and e-Form services were statistically significant across all models. It was evidenced by the *p*-values of Sobel test statistics, which were lower than or equal to 0.008, and no zero value lies between the LLCI and ULCI. It confirmed the crucial role of subject satisfaction in mediating the relationship between the three variables of e-tax system quality, convenience, and perception of reduced compliance cost on tax compliance intention. H5, H6, H7, H9, and H11 are thus undoubtedly supported.

In addition, the bootstrapping estimates in Table 9 offer a more in-depth analysis by explicitly presenting the total effect, direct effect, and indirect effect of the five core determinants of tax compliance intention. In Model 3 for the e-Filing case, the remarkable result is that the direct influence of system quality on tax compliance intention is not significant, whereas the indirect effect is. This result demonstrates that users' satisfaction completely mediates the relationship between system quality and tax compliance. Meanwhile, other

models consistently show a partial mediating effect of satisfaction since the direct and indirect effects are significant. The ratio of the indirect effect to the total effect reveals the mediation's role in establishing the relationship between the IV and the DV. For example, 21.53% (0.093/0.432) of the influence of service quality on tax compliance intention among tax professionals is mediated through their satisfaction with the e-Filing service, while the direct effect is 78.70% (0.340/0.432). It indicates that the direct effect of e-Filing service quality on tax compliance is larger in magnitude than the indirect effect through tax professional satisfaction. The same analysis also applies to all models showing partial mediation of tax professional satisfaction.

Table 9. Mediation analysis (results of Sobel test and bootstrapping).

Model	Hypothesized Relationship	Sobel Test		Bootstrapping Estimates				
		Test Statistics	*p*-Value	Total	Direct	Indirect	LLCI	ULCI
	e-Filing							
1	InfQ –> SF –> TC	2.645	0.008	0.415 ***	0.322 ***	0.093	0.018	0.165
2	ServQ –> SF –> TC	3.581	0.000	0.432 ***	0.340 ***	0.093	0.042	0.147
3	SysQ –> SF –> TC	2.992	0.003	0.103 **	0.060	0.043	0.013	0.078
4	Conv –> SF –> TC	2.992	0.003	0.431 ***	0.342 ***	0.089	0.027	0.152
5	RCC –> SF –> TC	4.981	0.000	0.465 ***	0.383 ***	0.081	0.048	0.115
	e-Form							
1	InfQ –> SF –> TC	3.296	0.001	0.429 ***	0.256 ***	0.174	0.054	0.285
2	ServQ –> SF –> TC	3.724	0.000	0.416 ***	0.221 ***	0.195	0.084	0.301
3	SysQ –> SF –> TC	3.087	0.002	0.432 ***	0.266 ***	0.166	0.050	0.275
4	Conv –> SF –> TC	3.810	0.000	0.415 ***	0.220 ***	0.195	0.079	0.304
5	RCC –> SF –> TC	4.399	0.000	0.487 ***	0.366 ***	0.121	0.634	0.180

Note: Standard errors are in parentheses. ** = significance at 0.01. *** = significance at 0.001.

6. Discussion

In this study, we examine two unique services, e-Filing and e-Form, based on the literature on the success of ISs [47] and tax compliance intention [6] in an emerging market where both services are in their infancy. In this model, we hypothesized that the e-tax system quality, convenience, and perception of reduced compliance costs influence tax professionals' compliance intention both directly and indirectly through their satisfaction. Using a unique sample of certified tax professionals from Indonesia, we tested our hypotheses.

Specific results suggest that in the case of the e-Filing service, service quality and perception of reduced compliance costs significantly predict tax compliance intentions of e-Filing users amongst tax professionals. The better subjects rated the service quality of the e-Filing service, the more likely they were to be tax-compliant. This is consistent with previous findings [10,23] suggesting that the efficiency of the e-tax system promotes tax compliance. ICT adoption has been shown to increase tax compliance by reducing discrepancies and improving the accuracy of taxpayer records [24]. Furthermore, our results shed additional light on previous studies that were limited to examining the impact of service quality on user satisfaction [13,72]. However, the results show that service quality does not predict tax compliance among tax professionals who use e-Form. This seems to indicate that tax professionals consider the e-Form service to be less easy-to-use and less user-friendly than the e-Filing service. As shown in Table 5, on average, the effect of the positive view of the tax professionals on the two service quality indicators (easy-to-use and user-friendly) is higher in the case of e-Filing than e-Form.

The perception of reduced compliance costs among tax professionals who used e-Filing and e-Form was found to strongly influence the willingness to comply with tax obligations. If they believe that the electronic tax system reduces compliance costs, they are more likely to be willing to pay taxes. This supports previous findings that the electronic tax system reduces compliance costs, including the potential for corruption of conventional services, leading to better tax compliance [24,80]. By streamlining and improving the reporting

process, reducing human error, and reducing in-person visits to the tax office, e-tax is a promising approach to save taxpayers compliance costs [79,84]. The implementation of the e-tax system should be guided by the interests of taxpayers as users, including the reduction in compliance costs [79]. Our results suggest that using e-Filing and e-Form services reduces compliance costs, which confirms previous studies showing that lower compliance costs impact tax compliance as a benefit of the e-tax system [2,81].

In general, the results of the mediation analysis confirm that the relationship between the independent variables and tax compliance intention is partially mediated by satisfaction. Tax professionals with high perceived quality of electronic tax systems who believe that these systems reduce compliance costs and increase convenience will be more satisfied and, accordingly, will be more inclined to be tax compliant. However, this causal mechanism is less favorable than the direct effect of the independent variables on tax compliance. In addition, we found that user satisfaction fully mediates the relationship between the system quality of the e-Filing service and tax compliance willingness. This suggests that the system quality of e-Filing services does not affect tax professionals' compliance unless it increases their satisfaction with using such e-tax services.

The results of this study contribute to some of the literature [1,13,35,36,72] that focuses on users' perceptions of using e-government systems under certain circumstances in tax services. These studies typically focus on one or two outcome variables, such as user satisfaction and/or their intention to continue using such services [56]. While the results of these studies can provide valuable insights, they cannot capture the real objective of adopting electronic tax services, namely their effectiveness in promoting taxpayer compliance [17]. Therefore, this study provides a new analysis by examining the impact of e-tax adoption on tax compliance directly or indirectly through user (tax professionals) satisfaction. Mostly, our results show that the direct impact of the e-tax system quality on tax compliance through satisfaction is greater than the indirect impact.

The empirical analysis in the study was also developed by examining the tax compliance factors of two electronic tax services in Indonesia, namely e-Filing and e-Form. Previous studies with a similar focus [13,17,22,23,65] examined tax compliance based solely on the use of a single e-tax service and thus did not allow for comparative analysis, particularly for the case of Indonesia. The intention of tax professionals who used e-Form to comply with their tax obligations was driven solely by perceptions of lower compliance costs. In contrast, the willingness to be tax compliant among tax professionals who used e-Filing was determined by both the quality of the service and the perception of lower compliance costs. The relationship between these determinants and tax compliance intention in the two e-tax cases is partially mediated by tax professional satisfaction.

7. Conclusions

Our results confirm that the service quality of e-tax systems and the perception of lower compliance costs due to e-tax systems influence tax compliance intention among tax professionals. The results encourage the tax authority to expand and improve e-Filing systems, ultimately leading to better tax compliance. For example, the tax office took immediate action after users, specifically tax professionals, complained about the system's shortcomings. It is essential to establish a complaint-handling unit. Therefore, the tax administration should regularly monitor and evaluate the implementation of the systems. Improvements in electronic filing systems can also be achieved by hiring staff with special skills to maintain and develop such an infrastructure.

In addition, in line with the results of the mediation analysis, tax administration should consider the satisfaction of tax professionals in providing e-tax services to encourage their compliance intentions. This can be achieved by building an e-tax service system that is easily understood by users by providing concise but complete instructions. Furthermore, the tax administration needs to make the system easily accessible. As Akram et al. 2019 [20] noted, some who might use these services often encounter technical problems, which may reduce their satisfaction.

Regarding the limitations, it should be noted that this study used convenience sampling to collect information from respondents. This method was chosen because it is quick, simple, and inexpensive, but it does not allow generalization of the results. Another limitation relates to the fact that the survey is based on a sample of certified tax professionals, which of course does not offer a representative sample of ordinary taxpayers. Consequently, the results should be interpreted with caution, especially regarding generalizations to the taxpayer population. Given these limitations, we encourage future research in this area to draw data from a more representative sample, i.e., the general user, using simple random sampling which allows generalization of the results.

Another limitation of this study relates to our study design using cross-sectional data, that is, data collected from a population at a single point in time. In other words, the design we have chosen is unable to explain the dynamics of changing conditions or relationships in the observed population at different time periods. As a result, the rapid environmental changes related to information technology can affect the evaluation of electronic tax system services that are lagging behind and not comparable. In addition, the preliminary study did not take into account changes in the types of services provided in the e-Form system, so that bias regarding whether participants provided evaluations based on previous experience was not identified. Further research considering the longitudinal design seems necessary to give more meaning to technological developments.

Lastly, the survey uses the Indonesian language because most of the respondents are tax professionals in Indonesia. The questions asked in the questionnaire can be understood by the respondents if they speak Indonesian. However, since the questions were derived and adopted from English, there is a concern that the researcher will not be able to maintain the essence of the previous survey. Applying the methods described in previous studies [3] to the Indonesian context might be worth considering. We also suggest using the research model in different contexts (e.g., other developing and developed countries) and for other e-government services (e.g., e-marketplace, e-payment, e-invoice, and e-withhold).

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