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Unlocking technological capabilities to boost the performance of accounting firms

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Abstract

***Research Question*:** What is the impact of the use of Internet technology on the financial and non-financial performance of accounting firms?
***Motivation*:** The evaluation of the performance of an accounting firm is based on the technological factor. This study is based on a multi-activity study of accounting firms which includes mainly reporting, auditing, and tax activities to create a realistic approach to appropriately measure the performance of accounting firms. Especially with the scarcity of studies have been conducted regarding the organizational impact of technologies on accounting firms.
***Idea*:** the purpose of the study was to determine the effect of technology on the performance of accounting firms, based on empirical data.
***Data*:** 104 observations were received via a questionnaire sent to the heads of the accounting firms.
***Tools*:** we used linear regression to measure the impact of technology use on performance and validated our results graphically.
***Findings*:** the results demonstrate that accounting firms equipped with technological capabilities benefit from superior performance.
Contribution: these results have practical implications, suggesting that there is value in fostering a mutually beneficial relationship between academic research and the professional practice of accounting firms. Accounting professionals can utilize research insights to enhance their working methods, policies, and decision-making processes pertaining to technology. This collaboration can lead to tangible improvements within the accounting field and contribute to its ongoing development.

Keywords: Technology Use, Accounting Firms, Organizational performance, Organizational innovation

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1. Introduction

Digitization has emerged as a key driver of competitiveness and growth for organizations. As a result, digitization has become a strategic priority for a growing number of organizations (Chan et *al.*, 2019), providing them with new opportunities and tools to enhance their performance. Technology has become particularly ubiquitous in many professional activities, profoundly transforming processes and operations at the organizational level. However, its impact on organizational performance is still being investigated (Chaumon et *al.*, 2018). The accounting profession has been identified as an area where digitization is likely to accelerate, requiring a better understanding of these technological impacts (Mohammed & Ebo, 2019; Hentati et *al.*, 2021).

However, performance is a key concern for many organizations (Tseng & Lee, 2014), especially in the age of digitalization, which is leading to organizational transformations and implications that affect business processes, task, strategy, and performance (Lingmont & Alexiou, 2020). On the other hand, the accountancy profession is one of the business sectors that is influenced by technological developments (Frey & Osborne, 2017). This technological revolution is driven by the need for accounting firms to adapt to the new demands of digitalization while improving their organizational performance (Taouab & Issor, 2019).

The choice of accounting firms as our study population is justified. Firstly, by the fact that researchers have limited access to a population of specialized experts who can contribute to the quality and validity of financial information. Secondly, accounting firms have relationships with different organizations and industries, which allows for the indirect exploration of a variety of contexts that can help develop new insights and use them to improve existing practices. Finally, because they are key players in the economy, interactions with these organizations can provide valuable insights.

This need motivates the present document. It seeks to better understand the context surrounding the emerging implementation of Internet-related technologies and their organizational implications. According to Tomo et *al.* (2021) tliteraturehas lacked attention to the implementation of technologies and their impact on performance particularly in the field of accountancy. The analysis presented in this study aims to identify the relationship between Internet-related technology and organizational performance in public accounting firms. Our research question is therefore as follows: What is the impact of the use of Internet technology on the financial and non-financial performance of accounting firms?

The approach of this research focused on a multi-activity analysis, including reporting, audit and tax. Through a linear regression applied to 104 observations, the results show that firms with technology capabilities perform better overall. These findings underline the crucial importance of integrating technology to improve the performance of accounting firms and highlight the paucity of research devoted to the organizational impact of technology in this area. As well as the significant implications, highlighting the need for close collaboration between academic research and professional practice, to enable optimal integration of technological advances and thus contribute to the ongoing development of the accounting sector.

The rest of the paper has the following structure. In the next section, we provide a literature review that summarizes relevant research on the topic. This is followed by a description of the methodology used in this study, including the operationalization process, details of the study population, variable selection, and data collection methods. The fourth section presents the results of the data analysis, followed by a discussion and interpretation of the findings. The fifth section presents the validation of our analysis through graphical representations. Finally, we conclude the paper by summarizing the contributions made, acknowledging the limitations encountered, and suggesting potential avenues for future research.

2. Review of the literature

2.1 Resource-based view theory

This theory explains how an organization can gain a competitive advantage by transforming its unique resources into capabilities through the systematic integration and reconfiguration of these resources into the organization's business processes. Early theorists in this field argued that resources enable organizations to design and implement value-creating strategies (Peteraf, 1993; Barney, 1991). The theory of resource-based vision assumes that the skills, capabilities, and other resources that organizations possess are the most important determinants of firm performance (Bharadwaj, 2000). Indeed, studies have shown the importance of technological capability as a key organizational capability that can lead to superior organizational performance (Nwankpa & Roumani, 2016).

In fact, an organization can achieve sustainable competitive advantage through the acquisition and control of its resource and capability sets. Which are uniquely valuable, rare, difficult to imitate (Bharadwaj, 2000; Barney, 1991). A company's resources refer to the assets, both tangible and intangible (e.g. information technology infrastructure, information or process knowledge), that enable the production of goods and services.

However, a few studies have also explored the resource-based perspective that is likely to drive superior performance. For example, Nandi et *al.* (2020) examined the relationship between the integration of blockchain technology on supply chains and performance. Mwaurah's (2021) study measured the impact of cloud on performance. Dubey et *al.* (2019) conducted a study on big data and predictive analytics and their impact on industrial performance. Wen et *al.* (2020) conducted a study on the impact of artificial intelligence on performance, etc.

In this study, we use the domain of technology to identify a particular capability related to each accounting firm that is consistent with the logic of resource-based theory, and then examine the value created by the firm's IT capability.

2.2 Accounting Internet-Related Technologies

We have studied the technological trends for the three areas of accounting: reporting and related activities, auditing, and taxation.

2.2.1 Reporting Internet-Related Technologies

The evolution of technology in reporting activities can be seen in the use of the cloud (Smith, 2017). Cloud-based accounting provides real-time data updates and redundancy through automatic backups (Sutthikun et *al.*, 2018; Pisching et *al.*, 2015). This technology has no hardware or infrastructure dependencies. The cloud provides access to the cloud provider's facilities, such as servers, software, and storage functionality (Dimitriu & Matei, 2015; Törnqvist & Forss, 2018; Ghorbani, 2019).

The study by Shaffer et *al.* (2020) shows that bookkeeping as a task is likely to disappear thanks to the technology of Optical Character Recognition (OCR). This technology captures digital data from purchase and sales invoices, receipts, and bank statements, and then enables data capture and recording, automating the entire process. However, big data analytics technology is essential for valuing assets, which will improve the determination of their value. For example, they use sensory data and visuals to measure the condition of an asset, which is used to select a more appropriate depreciation method (Moll & Yigitbasioglu, 2019).

With the increasing penetration of the internet, which provides accountants with unlimited access to external information, accounting firms will be able to improve their networks through fiber optics or the use of 5G and 4G technology. Accounting firms can improve their networks through fiber optics or the use of 5G and 4G technology, which is becoming increasingly mature and has recently been introduced into accounting (Marr, 2020). The Internet of Things (IoT) technology is another new trend that enables the collection, processing, and communication of

data. According to Dai (2017), these systems can be an effective way to collect data from accountants. Industry 4.0 has already used the Internet of Things in production lines and logistics systems, allowing data to be collected, processed, and communicated (Vasarhelyi, 2015).

About accounting information systems, studies have shown that blockchain as a technology allows for the approval of sending invoices between parties and payments (Rechtman, 2017). It approves the transactions made and declares them valid, as well as systems based on XBRL. This is a new format for the digitalization of financial reports, based on the XML language and specifically designed for financial reports (Hentati et *al.*, 2021). Furthermore, accountants and accounting firms will invest in cybersecurity to protect their interests and those of their clients (Imène & Imhanzenobe, 2020). Indeed, the problems faced by accountants in the computer age and the increased use of technology by accountants will make investment in cybersecurity inevitable (Haapamäki & Sihvonen, 2019).

2.2.2 Auditing Internet-Related Technologies

Researchers focused on the development of auditing to incorporate different technologies, such as the use of blockchain as a foundation to enable automated assurance and bring more agility and accuracy to the current auditing paradigm, studied technological trends. They proposed a blockchain-based transaction processing system (Wang & Kogan, 2018; Rozairo &Vasarhely, 2018). The use of analytics through mega data in auditing is increasing (Keskinen & Tarwireyi, 2019). In fact, auditors can use big data analytics to ensure that anomalies or misstatements are detected immediately after they occur (Gepp et *al.*, 2018). Liu et *al.* (2019) added that auditors can benefit from the interactive visualization produced by ERP systems, making the results of the audited data easier to understand and analyze (Dilla & Raschke, 2015).

The process of integrating artificial intelligence systems into audits began with PwC. Their technology called 'Halo' involves analyzing massive amounts of data. It can examine and test journal entries to detect any high-risk or suspicious transactions recorded (PwC, 2016; Keskinen & Tarwireyi, 2019). In addition to other artificial intelligence technologies, robotic process automation technology is used for manual and repetitive tasks, such as bank reconciliations and internal control testing (Moffitt et *al.*, 2018). Furthermore, machine learning is also being incorporated by auditors in the form of an audit support system (Sutton et *al.*, 2016).

Various other technologies have been proposed in the studies for the automation of some auditing functions through the use of drones and sensor physics for evidence collection during physical inspection and inventory (Appelbaum & Nehmer, 2017).

Also, electronic systems and management software for audit work (Yan, 2019). In addition, auditors can use the Internet of Things to provide full assurance in real time (Alarcon & Staut, 2017; Dai, 2017). Finally, the audit profession is gradually moving towards online services, with audit firms deploying audit work on cloud infrastructure and accounting information systems (Gepp et *al.*, 2018; Dai, 2017).

2.2.3 Taxation Internet-Related Technologies

Today, we see that digital technologies are actively implemented in the field of taxation. Among the technological practices in taxation, accountants can perform their tasks more easily and quickly using software to prepare tax returns (Imene & Imhanzenobe, 2020). In addition, intelligent solutions allow tax professionals to free themselves from tedious, boring, and unrewarding tasks and focus on analyzing and optimizing the tax process through big data analytics (Huang, 2021). Furthermore, optical character recognition and artificial intelligence have emerged as solutions for tax processing and other tax-related aspects (Cooper et *al.*, 2019). However, there has been a transition in the interaction between taxation and technological tools, with the abandonment of the printed form of the document (Mikhaleva et *al.*, 2020) in favour of digital filing of tax returns (Okunogbe & Pouliquen, 2018; Olaoye & Kehinde, 2017). This format has the advantage in terms of archiving, as returns can be scanned and stored in a database.

The current tax system urgently needs to address the integration of blockchain technology. According to the literature, tax collection, withholding, and crediting can be achieved through the application of blockchain technology (Ricci, 2020; Fatz et *al.*, 2019; Wijaya et *al.*, 2017). Also, with the application of robotics and artificial intelligence, the time-consuming tasks of a tax professional, such as document processing and reporting, which are repetitive, are eliminated due to self-matching. Hence, there is a need to integrate these technological solutions that would help tax professionals carry out repetitive procedures and allow them to focus on more intellectually demanding tasks (Joshi, 2020; Cooper et *al.*, 2019).

2.3 Organizational performance

Organizational performance refers to how well an organization achieves its financial and non-financial objectives (Richard et *al.*, 2009). Fadhilah & Subriadi (2019) pointed out that the overall concept of performance can be measured not only by tangible indices of a financial nature but also by any other intangible measure. Rajapathirana & Hui (2018) added that performance measurement is a technique that helps organizations to monitor performance, identify areas for improvement, and grow the organization. In fact, financial performance was felt to be a direct indicator of the financial status of an organization in various aspects, including sales, revenue growth, costs, market share, cash flows, profitability,

return on assets, cash flows, and other measurements (Tang et *al.*, 2018; Wroblewski, 2018; Hutagalung & Siagian, 2022). These measures are considered more objective than non-financial measures, which are otherwise more subjective (Khin & Ho, 2018). In addition, non-financial performance is measured using various indices, such as service quality (Apornak, 2017), organizational effectiveness and efficiency (Rajapathirana & Hui, 2018), employee turnover (Nouri & Parker, 2020), interpersonal relations and cooperation among employees (Jarah et *al.*,2023), market share (Mintz, 2023), and productivity (Gardi, 2021).

2.3.1 Relationship between performance and technology

Current research in the literature argues that internet-related technology enables the reinvention of business processes. The implication is that improving processes through technology leads to increased productivity and reduced costs, resulting in an improvement that enables value creation to achieve organizational goals more effectively (Bakotic & Krnic, 2017). Martinez's (2019) research shows that the most successful organizations are those that use technology in their products and services. These organizations have the technological resources and capabilities to achieve a strong competitive position (Anwar, 2018), which improves the customer base of the organization (Li et *al.*, 2018). However, another stream of research suggests that technology can have a negative impact on performance (Wroblewski, 2018). In addition, Gupta et *al.* (2018) have shown that there is a paradox between organizational performance and technology investments. Technology spending can limit organizational performance (Chae et *al.*, 2018). In this sense, Yu et *al.* (2023) affirmed that there is a paradox between the phenomenon of digitization and organizational performance. However, some studies have found no significant relationship between technological capability and organizational performance (Chae et *al.*, 2014; Koski,1999). Aral & Weill (2007) found no correlation between technological investment and firm performance. Furthermore, Siha & Saad (2008) argue that technology has no significant relationship with value creation.

In the context of accounting firms, Reichert & Zawislak (2014) argued that technological capabilities promote innovation and competitiveness and have a positive impact on the delivery of their services to improve their performance in a cost-effective manner. In Malaysia, Amirul et *al.* (2017) noted that the rapid development of technological innovation in the accounting profession enables them to improve their services in terms of quality and speed by performing value-added tasks. Furthermore, Mohammed & Ebo (2019) stated that accounting firms with technological capabilities are able to compete more effectively in the industry due to technological advancements. This has a positive impact on performance. Oyanda (2016) pointed out that technological innovations have led to significant advances in accounting, especially in the efficiency of services related to auditing. Muiruri (2021) found a positive correlation between technology and the performance of the big four. Acevedo (2012) concludes that accounting firms can use information

technology to create new services or improve the services they provide to their clients to maintain a competitive advantage over their rivals. In contrast, a study by Kolvereid & Åmo (2021) found a negative relationship between organizational performance and information technology in a sample of Norwegian accounting firms.

Various technologies such as blockchain, cloud services, data analytics, and artificial intelligence can positively impact the accounting profession in terms of added value (Moll & Yigitbasioglu, 2019). Blockchain has improved the accuracy of the accounting work performed due to better quality of service, thus allowing accounting firms to reduce the cost of services (Muiruri, 2021). However, artificial intelligence is essential to process and collect data on everything for routine and time-consuming tasks (Moll & Yigitbasioglu, 2019). Due to their speed and optimization for complete tasks (Kelly et *al.*, 2019; Rachinger et *al.*, 2019). Similarly, this technology improves the performance of accounting functions and eliminates certain accounting costs (Odoh et *al.*, 2018). These findings are also in line with Taiwo (2016), who believes that automated accounting can meet these needs. It is common for accounting firms to charge clients by the hour, and reducing the number of hours spent on the accounting process could make the service more attractive to clients. In conclusion, the effect of technology on performance has produced mixed results in previous studies. Therefore, we have the following hypotheses:
H 1: the use of technology in accounting firms has a positive impact on Organizational performance
H 2: the use of technology in accounting firms has a positive impact on financial performance.
H 3: the use of technology in accounting firms has a positive impact on non-financial performance.

3. Methodology

3.1. Study population

The sampling frame included managers of accounting firms registered with the Ordre des experts-comptables de Tunisie. The questionnaire was tested before distribution to ensure that the questions were well-formulated, understandable, and operational. We used Google Forms to send out 1,100 questionnaires to firm managers in order to collect 106 responses. Two responses were excluded due to missing data, giving 104 usable responses. This gives us a response rate of 9.45% over a six-month period, from January 16 to June 17, 2023. Finally, the data will be transmitted and analyzed using SPSS software.

Table 1. Demographic Information of the Survey Respondents

Gender	Frequency	%	Experience	Frequency	%
Male	77	74.04 %	Under 10	18	17.30%
Female	27	25.96%	[10 -15]	44	42.30 %
			Over 15	42	40.40 %
Total	104	100 %	Total	104	100 %

As shown in Table 1, our sample exhibits a predominantly male representation in terms of gender. Furthermore, regarding experience in the accounting field, most of the participants in our sample possess over 10 years of experience as chief accounting firms.

3.2 Variable Setting

The variables required from the items and their relationships are shown in Figure 1. However, all measurement items have been reused or adapted from existing scales in the literature. This ensures reliability and validity. In this study, the non-financial performance variable was conceptualized using four items formulated by Aydiner et *al.* (2019) and Djellal & Gallouj (2013), and the financial performance variable was measured using three items developed by Khin & Ho (2018). However, the dependent variable 'technology use' in section 2.2 was measured using three items developed by Khin & Ho (2018). Finally, all constructs were measured using multiple items on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Table 1 provides an overview of the measurement items.

Table 2. The variables and items of variables

Variable: Technology Use (TU)	
IT capability in reporting	• Using cloud-based accounting software • Access to real-time information using applications on mobile devices. • Automatic data updates • Generation of financial statements in real time • Archiving and storage functionalities for digital information • Use of optical character recognition technology in bookkeeping • Use of sensory and visual data to establish an accounting practice (depreciation method, inventory valuation, etc.) • Use high capacity in internet and intranet networks such as fiber optics, 4G and 5G • Use of the internet of things to collect information. • Implementation of an information system based on blockchain technology. • Use of XBRL[2] or XML for reporting purposes • Investment in cybersecurity and customer data security
IT capability in audit	• Audit of blockchain-based transaction processing systems • Predicting audit risks and anomalies through big data analysis • Interactive data visualization through the ERP[3] system during an audit mission • Use of audit support systems based on artificial intelligence. • Use of audit support systems based on robotic process automation and machine learning. • Use of technology during the physical inventory (drones, sensors and etc.) • Adoption of audit work management systems • Using the Internet of Things (IoT) in audit processes as a means of substantiation • Providing online auditing services
IT capability in taxation	• Processing of tax returns via software • Communication of tax information in real time • Automation of the tax process by using technologies (optical character recognition, artificial intelligence, big data analysis) • Easy access to historical tax information on database • Piloting the use of blockchain in the tax field • Execution of time-consuming tax tasks with the help of robots and artificial intelligence
Organizational performance (OP)	
Non-financial performance	• Better internal coordination between the members of the firm • Quality of customer service • Productivity within the firm

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Variable: Technology Use (TU)	
(PNF)	• Efficiency of the operational process
Financial performance (PF)	• Level of satisfaction with sales • Level of satisfaction with profits • Level of satisfaction with cash flow

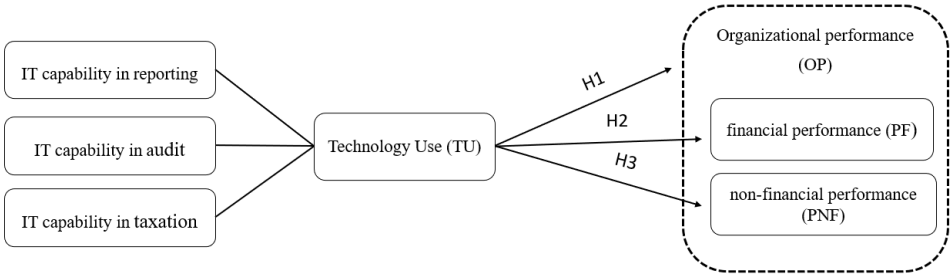

Figure 1. conceptual framework of the research

Table 3. Testing the reliability of the scale

Variables	Cronbach's Alpha
Technology Use (TU)	0.809
Organizational performance (OP)	0.824
Non-financial performance (PNF)	0 .701
Financial performance (PF)	0.804

As shown in Table 3, the reliability of the internal consistency of the items has been verified. The literature stipulates that a coefficient value greater than 0.5 is considered acceptable (Cronbach, 1951). The lowest Cronbach's alpha coefficient (α) value observed was 0.701 for all items, indicating that the responses generated for all the items used in this study are reliable. This suggests that the responses generated for all the items used in this study are adequate.

4. Discussion of results

Table 4. Descriptive result

	N	Min	Max	Mean	Std. Deviation
OP	104	1.43	5	3.2363	0.7834
PF	104	1	5	3.3630	0.7935
PNF	104	1.75	5	3.0673	1.0127
TU	104	0.89	2.78	1.8262	0.4268

Table 5. Correlation matrix

	OP	PF	PNF	TU
OP	1	0.877**	0.888**	0.389**
PF	0.877**	1	0.558**	0.244*
PNF	0.888**	0.558**	1	0.438**
TU	0.389**	0.244*	0.438**	1

The descriptive analysis between the variables 'TU' and 'OP' reveals significant differences in their central measures and dispersion within the sample of 104 observations. The average of the variable 'TU' is 1.8262 with a standard deviation of 0.78341. However, the mean of 'OP' is 3.2363 with a standard deviation of 0.42681. These data suggest that, on average, the level of organizational performance is higher than the technology used in the given sample, except PF, which shows a mean of 3.07 and a high standard deviation of 1.01, highlighting greater variability in technology use. The coefficients of the correlation matrix are practically moderate between TU and the other variables, while the most remarkable correlations are observed between OP and PNF, as well as between OP and PF, since the variable OP is already calculated by PF and PNF.

Table 5. Estimation Result

Model		Coeff. (β)	P value
OPi= = β0i+ β1 TUi+ + εi VIF = 1,00 R2= 0,153 p-value>0.001 ANOVA {test F 18,153 p>0,000}.	**Constant** **TU**	**1.933** **0.713**	**-** **0.389*** **
*, ** and *** indicate that the coefficient is significant, respectively, at the thresholds of 10%, 5% and 1%. β = constant; i: respondent; ε: error, Dependent variable: OP: Organizational performance, Independent variable TU: Technology Use.			
PNFi= = β0i+ β1 TUi+ + εi VIF = 1,00 R2= 0,191 p-value>0.001 ANOVA {test F 24,153 p>0,000}.	**Constant** **TU**	**1.877** **0.814**	**-** **0.438*** **
*, ** and *** indicate that the coefficient is significant, respectively, at the thresholds of 10%, 5% and 1%. β = constant; i: respondent; ε: error, Dependent variable: PNF: non-financial performance, Independent variable TU: Technology Use.			
PFi= = β0i+ β1 TUi+ + εi VIF = 1,00 R2= 0,060 p-value>0.001 ANOVA {test F 6,483p>0,012}.	**Constant** **TU**	**2.008** **0.580**	**-** **0.244****
*, ** and *** indicate that the coefficient is significant, respectively, at the thresholds of 10%, 5% and 1%. β = constant; i: respondent; ε: error, Dependent variable: PF: financial performance, Independent variable TU: Technology Use.			

According to Table 4, the results of our first model demonstrated statistical significance (R2=0.153, p-value<0.001), indicating a strong explanatory relationship for the first model. The results also reveal a positive and highly significant association between the use of technology and overall accounting firm performance (β= 0.713, Sig=0.000<0.001). This finding aligns with the existing literature, which suggests that continuous technology adoption empowers organizations to enhance automated and intelligent internal operations, achieve significant cost reductions, improve operational efficiency and service quality, leading to business process transformation and ultimately optimizing organizational performance of accounting firms (Wang et *al.*, 2020; Mohammed & Ebo, 2019; Amirul et *al.*, 2017).

The second model reveals a positive and highly significant relationship at the 1% level between technology use and the non-financial performance of the accounting firm (β= 0.814, Sig=0.000<0.01). As a result, our second hypothesis is supported. This finding is consistent with the existing literature, which suggests that the integration of Internet-related technologies enhances productivity, service quality, internal collaboration processes, and the efficiency and effectiveness of accounting firms (Liao et *al.*, 2015; Bakotic & Krnic, 2017; Li et *al.*, 2018). Moreover, our third model reveals a positive and significant relationship at the 5% significance level (β= 0.580, Sig=0.012<0.05). This finding confirms the existing literature, which suggests a strong connection between the role of technology in enhancing the profitability of accounting firms. It further emphasizes the importance of technology in improving the profitability of accounting firms (Mohammed & Ebo, 2019; Odoh et *al.*, 2018).

5. Graphic validation of results

5.1 Hypothesis validation

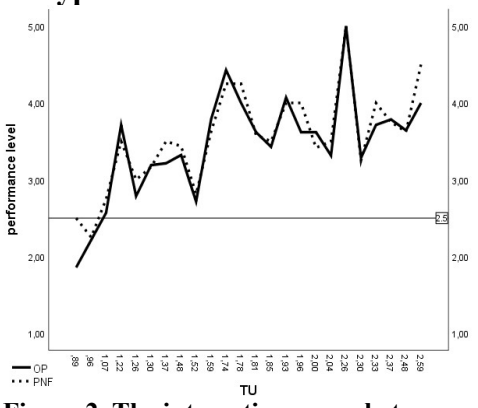

Figure 2. The interaction curve between the dependent variables (OP, PNF) and the independent variable (TU)

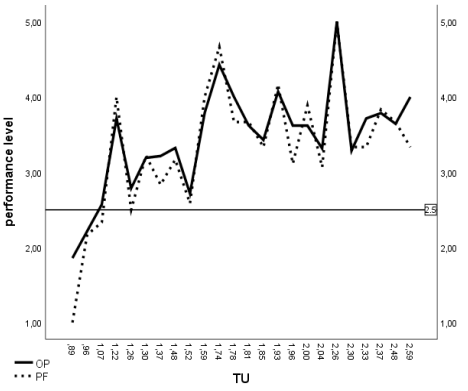

Figure 3. The interaction curve between the dependent variables (OP, PF) and the independent variable (TU)

To validate our results, we conducted a study using a recoverable corube graph consisting of 104 observations, as shown in Figure 2 and 3. The graph indicates that lower levels of technology use (minimum TU = 0.896) are associated with below-average organizational performance. However, as the level of technology use increases, the company's expectations of organizational performance also increase, surpassing the average level. This trend continues until it reaches a critical point (TU = 2.33), where performance remains above average but starts to decline. This decline, observed after reaching a certain high level of technology use, can be attributed to Technical Complexity (Jilke, 2021; Pan et *al.*, 2022). Some advanced technologies introduce additional complexity, and if the accounting firm fails to manage this complexity, it can lead to issues such as decreased efficiency, coordination problems, and reduced profitability, all of which impact performance. Additionally, the progressive integration of technologies into existing systems can present challenges, including operational difficulties that affect performance (Dubey et *al.*, 2019). However, these findings can be generalized to both financial and non-financial performance measures. As accounting firms invest more effort in the use of Internet-related technologies, their performance levels increase, thus validating our hypotheses (Figure 2 and 3).

5.2 Validation of the contribution of the Resource-Based View theory

Based on resource-based view theory asserts that the firm's internal resources are essential for developing and leveraging these resources and capabilities in a manner is crucial for the successful performance of accounting firms for this we believe we present the following graphs:

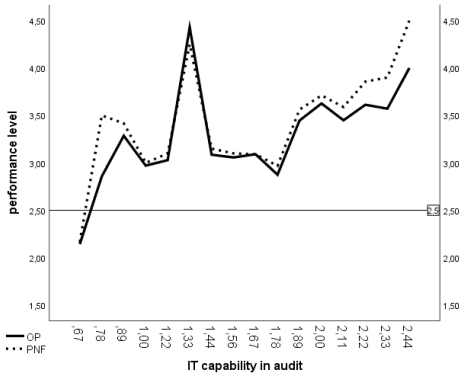

Figure 4. The interaction curve between the dependent variables (OP, PNF) and IT capability in audit

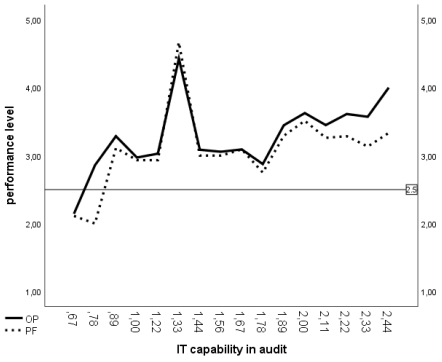

Figure 5. The interaction curve between the dependent variables (OP, PF) and IT capability in audit

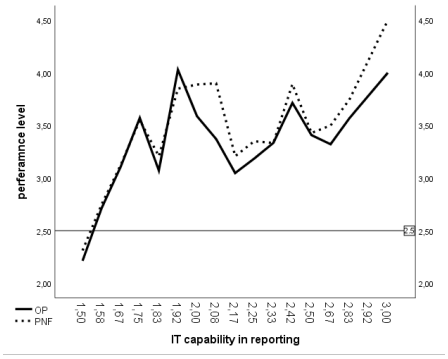

Figure 6. The interaction curve between the dependent variables (OP, PNF) and IT capability in reporting

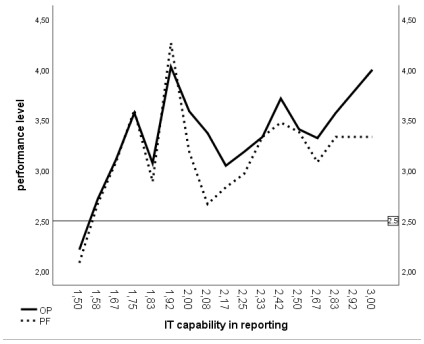

Figure 7. The interaction curve between the dependent variables (OP, PF) and IT capability in reporting

Figure 8. The interaction curve between the dependent variables (OP, PNF) and IT capability in Taxation

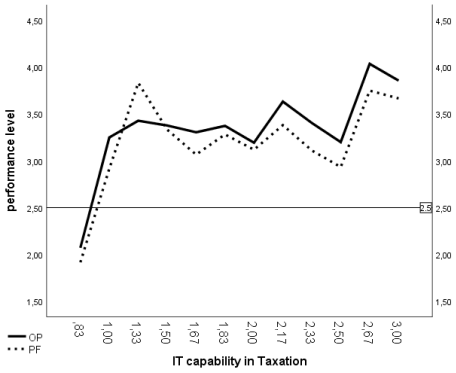

Figure 9. The interaction curve between the dependent variables (OP, PF) and IT capability in Taxation

As shown in Figures 4 and 5, the x-axis represents IT audit capability, while the y-axis presents organizational performance, non-financial performance, and financial performance. The graphic results indicate that when the use of audit technologies exceeds the threshold of 0.83, performance is above average. However, Figure 4 shows that non-financial performance surpasses organizational performance, while Figure 5 indicates that non-financial performance falls below organizational performance, highlighting how the adoption of audit technologies further improves non-financial performance in accounting firms.

Moreover, Figures 6 and 7, analyze the relationship between the use of technology in reporting on the x-axis and organizational performance, financial performance,

and non-financial performance on the y-axis. When the use of technology in reporting exceeds the threshold of 1.50 performance exceeds the average. The non-financial and financial performance curves are both above and below the organizational performance curve, highlighting a dual effect of the use of technology in reporting on organizational performance. Concerning Figures 8 and 9, the X-axis represents technologies in taxation, while the Y-axis shows organizational performance, non-financial performance, and financial performance. When the use of technology in taxation exceeds the threshold of 0.83, performance exceeds the average. In the two graphs, the non-financial and financial performance curves oscillate above and below the organizational performance curve, highlighting that the appropriate use of technology in taxation can significantly influence organizational performance, with varying effects on financial and non-financial performance in accounting firms.

In fact, technologies can be considered scarce resources. For instance, the greater the technological capabilities accounting firms possess in auditing, accounting, or tax processes, the higher the organization's performance (Li et *al.*, 2018). Moreover, integrating appropriate technologies into reporting, auditing, or tax procedures can automate repetitive tasks, resulting in time savings and a reduction in human error (Kokina & Davenport, 2017). Data storage and easy access to information facilitate data retrieval, collaboration with clients, and decision-making based on real-time data. Data analysis techniques can aid in identifying trends, identifying opportunities for tax optimization, and detecting audit risks (Muiruri, 2021). Consequently, the more technological capabilities exist, the more accounting firms can enhance their efficiency, accuracy, productivity, and ability to deliver high-quality services to their clients.

6. Conclusion

This study was motivated by the rapid advancements in technology, especially within accounting firms, and the lack of theoretical research studies investigating the role of technology in the performance of these firms. We have developed a theoretical framework based on the Resource-Based View theory to empirically examine the impact of technological resources utilized in auditing, reporting, and taxation processes, guided by technological capability, on the overall organizational performance.

Consistent with previous research, the results of this study indicate that technology capability in accounting firms has a dual effect. On the one hand, it has a positive effect on financial performance (Mohammed & Ebo, 2019; Muiruri, 2021). On the other hand, it has a positive effect on non-financial performance (Amirul et *al.*, 2017; Rose et *al.*, 2017), leading to improved organizational performance (Moll & Yigitbasioglu, 2019). Therefore, it is crucial that accounting firms have a well-

defined and coherent technology integration strategy. They need to consider technology as an integral part of their organizational and business practices to improve performance.

Although the resource-based view theory has been extensively discussed in the literature, our study contributes as one of the few investigations into the impact of technology on the performance of accountancy firms. This study represents an initial step, shedding light on how technology capabilities in auditing, taxation, and reporting serve as valuable internal resources for enhancing the performance of accounting firms. Furthermore, our study emphasizes the complementary nature of technologies. Rather than focusing on a single technology, we examine the collective impact of various available technologies such as Cloud computing, Big Data analytics, and Blockchain on the three primary activities within the accounting field. This approach allows for novel theoretical insights to be drawn, highlighting the potential synergistic effects of these technologies on performance outcomes. Indeed, the findings of our research can provide valuable advice to management and practitioners in accountancy firms seeking to foster the integration of technologies. By understanding the impact of technology on organizational performance, these firms can develop and implement appropriate technology strategies. These strategies can help shape their technology resources and, in turn, enhance their overall performance. Through effective technology strategies, accountancy firms can optimize their operations, improve efficiency, and provide higher quality services to their clients. This can ultimately contribute to their competitive advantage and long-term success in the dynamic and technology-driven accounting industry.

Our study has several limitations that need to be acknowledged. Firstly, we faced a limitation in the availability of detailed data on the usage of technologies within accounting firms. As a result, we had to rely on proxies to measure both performance and technology usage. However, it is worth noting that using self-assessment scales to evaluate organizational performance has been criticized for its potential lack of validity and reliability. Secondly, our research focused solely on examining the relationship between technologies and performance, neglecting the potential influence of other variables such as organizational culture and the external environment. This narrow focus presents both a limitation of our study and a challenge for future research, as it would be valuable to explore how these factors may interact with technology in shaping performance outcomes. Lastly, our study specifically examined the impact of technologies in the domains of auditing, reporting, and taxation. However, it is important to recognize that accounting firms engage in various other activities. Thus, our findings may not be applicable to other areas within accounting firms, highlighting a potential limitation in the scope of our study. Acknowledging these limitations provides valuable insights for future research to address these gaps and provide a more comprehensive understanding of

the relationship between technology, performance, and other relevant variables within accounting firms.

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Appendix A: Questionnaire survey

Please indicate in each question by the following concepts (**Unknown practice, Aware of the practice, The intent of adopting this practice in the business process, applied in business process, User expert**), how you judge the **reporting** practices in your accounting firm:

1. How would you rate the practice of using cloud-based accounting software in your firm?
2. Do you have access to your information in real time through applications on mobile devices?
3. Do you have the practice of automatically updating data and information?
4. Do you have the practice of generating financial statements in real time?
5. Do you have functionalities for archiving and digital storage of information?
6. Do you use optical character recognition technology in accounting?
7. How would you qualify the use of sensory and visual data to choose an accounting practice (depreciation method, inventory valuation, etc.)?
8. Qualify the position of your firm in relation to the use of high capacity in internet and intranet networks such as fiber optics, 4G and 5G?
9. Do you use the Internet of Things to collect information?
10. Do you have an information system based on blockchain technology?
11. What is your position on the use of XBRL or XML for reporting purposes?
12. Do you invest in cybersecurity and customer data security?

Please indicate in each question by the following concepts (**Unknown practice, Aware of the practice, The intent of adopting this practice in the business process, applied in business process, User expert**), how you judge the **audit** practices in your accounting firm:

1. How would you rate the practice of auditing blockchain-based transaction processing systems in your firm?
2. Do you have a system for predicting audit risks through Big Data analysis?
3. How do you rate the interactive visualization of data through the ERP system for the compression and analysis of results in your practice?
4. Do you use systems based on the application of artificial intelligence for the detection of audit risks?
5. How would you rate the use of audit support systems based on process automation and machine learning in your firm?
6. Do you use technologies during the physical inventory (drones, sensors, etc.)?
7. Do you use audit work management systems?
8. How would you describe the practice of using the Internet of Things “IoT” during the audit process in your firm?
9. Do you have online audit services in your firm?

Please indicate in each question by the following concepts (**Unknown practice, Aware of the practice, The intent of adopting this practice in the business process, applied in business process, User expert**), how you judge the **taxation** practices in your accounting firm:

1. Do you process tax declarations via software?
2. How would you qualify the communication of tax information in real time?
3. Do you use technologies (optical character recognition, artificial intelligence, big data analysis) to automate the tax process?
4. Do you easily access historical tax information through databases?
5. Do you use the blockchain in the tax field?
6. Do you perform tax tasks using robots and artificial intelligence?

Please rate your level of satisfaction with the **performance** of your accounting firm from 1 = not satisfied to 5 = very satisfied.

1. How do you judge the internal coordination between the members of your firm?
2. How do you rate the quality of client service in your practice?
3. How do you qualify the productivity within your office?
4. how do you rate the efficiency of the operational process?
5. Identify the level of satisfaction with the turnover in your firm?
6. Identify the level of satisfaction with benefits in your practice?
7. Do you identify the level of satisfaction with cash flow in your practice?

General information:

Gender: Male ◯ Female ◯

Experience: Under 10 ◯ [10 -15] ◯ Over 15 ◯