TECHNOLOGICAL INNOVATION AND THE CO-PRODUCTION OF ACCOUNTING SERVICES IN SMALL ACCOUNTING FIRMS[1]

Grégory JEMINE

HEC - Management School – Université de Liège

François-Régis PUYOU

Emlyon Business School

Florence BOUVET

HEC - Management School – Université de Liège

Please use the following reference for citing: Jemine, G., Puyou, F., & Bouvet, F. (in press). Technological innovation and the co-production of accounting services in small accounting firms. *Accounting, Auditing & Accountability Journal*. DOI: 10.1108/AAAJ-08-2022-5981

Abstract: Increasingly, emerging information technologies such as shared software and continuous accounting are offering alternative ways to perform accounting tasks in a supposedly more efficient fashion. Yet, few studies have investigated how they affect the provision of accounting services, especially in the context of small accounting firms, which provide legal and tax services to entrepreneurs and businesses. Drawing on the service perspective, the paper critically examines how technological innovation challenges and reconfigures the co-production of accounting services in these firms. The paper answers calls issued in prior studies to conduct empirical research on emerging information technologies for accountants. It focuses on the specific context of small accounting firms and draws on interviews with small accounting firms' managers (n=20). The study emphasizes five significant challenges that accounting firm managers face when using information technologies to support the provision of their services (ensuring reliability, factoring in their heterogeneous client base, repricing, training clients to use new technologies and promoting advisory services). Information technologies are shown to have a structuring role in the co-production of accounting services, as they lead to reconfigurations of the relationships between accountants and their clients. A range of four configurations is developed to highlight accountants' strategies to maintain collaborative relationships with their clients while integrating new technologies into their work practices. By conceptualizing accounting services as a co-production process, the paper offers new insights into the implications of emerging information technologies for small accounting firms.

Keywords: technological innovation, service perspective, co-production, small accounting firms, emerging technologies, continuous accounting

1. INTRODUCTION

Increasingly, accounting work is being performed through and delegated to emerging technologies that would supposedly enable faster and more efficient ways of processing financial information, leading to all sorts of improvements for accounting firms (Cong *et al.*, 2018; Gulin *et al.*, 2019; Kruskopf *et al.*, 2020). While several studies have reported or foreseen significant changes in accounting practices due to the rise of information technologies such as artificial intelligence (Kokina and Davenport, 2017) and continuous accounting (Izzo *et al.*, 2021), the actual effects of contemporary information technologies on the provision of accounting firms' services have remained largely underexplored. Despite calls for more empirical research (e.g. Moll and Yigitbasioglu, 2019; Richins *et al.*, 2016; Yigitbasioglu *et al.*, 2022), extant studies on information technologies have so far mostly remained designed around literature reviews aimed at suggesting research directions (e.g. Arnold, 2018, Jedrzejka, 2019), developing conceptual frameworks (e.g. McKinney *et al.*, 2017), and '*providing guidance for the future*' (Sutton *et al.*, 2016, p. 68). As a result, little is known about how the implementation of emerging information technologies within accounting firms changes the nature of the services that they provide. Therefore, the aim of this paper is to explore how contemporary information technologies affect the relationship between accountants and their clients and the co-production of accounting services.

Drawing on the service perspective (e.g. Diaz-Mendez and Saren, 2019), we conceptualize accounting as a professional service that is co-constructed through regular interactions between accountants and their clients (Knechel *et al.*, 2020). Leaving aside the context of the Big Four, which have been subject to several studies on the implementation of new information technologies (e.g. Dowling and Leech, 2014; Kokina and Davenport, 2017; Kruskopf *et al.*, 2020), the paper focuses on the numerous but much smaller accounting firms that provide legal and financial services to other small businesses and entrepreneurs who are required to comply with national accounting obligations. These small accounting firms can be seen as professional service firms (Von Nodernflycht, 2010) in which qualified professionals provide value-added services and where client participation is essential (Díaz-Méndez and Saren, 2019). These services notably include financial reporting and bookkeeping (i.e. compliance work) as well as financial and strategic analyses or forecasting (i.e. advising work). While small accounting firms are essential economic actors in managing and monitoring the financial activities of many businesses, they have received scant attention from accounting scholars, especially when it comes to studying the effects of information technologies on the services that they provide.

Relying on semi-structured interviews conducted with small accounting firm managers in Belgium, this study emphasizes how emerging information technologies are reconfiguring the relationships between accountants and their clients. By "information technologies", we specifically target the advent of new accounting solutions embedding optical character recognition (OCR), shared interfaces with clients, and continuous accounting, which are made available to small accounting firms by software publishers. These solutions embody a move towards automated accounting processes (Drum and Pulvermacher, 2016; Kokina and Davenport, 2017) and open up new ways of performing accounting tasks that imply a redistribution of the accounting tasks between accountants and clients themselves, which both parties are not always willing to accept. In this context, the present study contributes to the literature on information technologies in accounting

by drawing on the service perspective to shed light on the effects of these technologies on the co-production of accounting services. While scholars have voiced concerns that accountants would be particularly slow to adapt to technological changes (e.g. Cong *et al.*, 2018; Griffin and Wright, 2015), little insight has been provided on how accounting firms were effectively integrating information technologies into their work practices, and on the implications of such technologies on the accountant-client relationship. We address this gap by showing how the new solutions available to accountants lead to complex reconfigurations of the delivery of services between accountants and their heterogeneous client base. This study shows that the managers of small accounting firms, due to the heterogeneity of their client base, are not able to enforce new technological systems unilaterally, and need to run several socio-technical configurations in parallel to accommodate their heterogeneous client base. It contributes to the literature on technological innovation in accounting by emphasizing how small accounting firms face specific challenges in using new technologies due to the nature of their activities (mostly centered around compliance work), of their resources (that are limited and hardly allow them to make economies of scale on technologies), and of their client base (made of entrepreneurs and very small firms that participate in the co-production of their accounting services). More globally, the study offers new avenues for theorizing the role of technological innovation in the co-production of services in professional service firms.

2. LITERATURE REVIEW

2.1 Accounting as a professional service

In the literature, professional service firms (PSFs) are presumed to be distinct from other types of firms due to the specific characteristics of the services that they provide, which would call for specific theories of management (Spence *et al.*, 2017; Von Nordenflycht, 2010). Professional services consist of predominantly intellectual tasks (e.g. analysis, advice, opinion and action) performed by a professional or team holding appropriate qualifications, and are characterized by a high degree of active client participation (Diaz-Mendez and Saren, 2019). Professional service firms would thus be characterized by the provision of intangible experiential services that would limit standardization and commoditization possibilities (Empson *et al.*, 2015). In that view, clients are not passively waiting for the service to be produced, but are active contributors to the production process (Sampson and Money, 2015). Yet, scholars have also drawn attention to the strong heterogeneity across different professional sectors (e.g. accounting, legal, engineering consulting), as they rely on different types of knowledge and maintain different sorts of relationships with their clients (Malhotra and Morris, 2009). For the purposes of this paper, it is therefore necessary to better understand the specificities of small accounting firms as distinctive professional service firms.

Interestingly, the accounting industry appears to be one of the most prevalent exemplifications of professional service firms (Von Nordenflycht, 2010). It is often described as a well-established profession in which knowledge is highly codified (Empson, 2001). Large accounting firms have been extensively studied as they appear to be spearheading wide-scale challenges such as knowledge transfer in merger processes (Empson, 2001), the commercialization and professionalization of services (Spence *et al.*, 2017) and transnational regulation of professional

services (Suddaby *et al.*, 2007). Hence, scholarly attention has mostly been drawn to 'conglomerate' PSFs such as large accounting firms or the Big Four, which appear to be emblematic research fields in the PSF literature (e.g. Suddaby and Greenwood, 2001; Suddaby *et al.*, 2007). By contrast, small and very small accounting firms have received much less interest. It has been emphasized that small accounting firms do not possess the same human and financial resources or strategic capabilities, do not have the same scope for action, and do not sustain the same type of relationships with their clients than their much larger counterparts (Feldman *et al.*, 2003). Consequently, additional developments are required to better grasp the specificity of the professional services that small accounting firms provide.

Small accounting firms are important suppliers of financial and legal services to small and medium enterprises (SMEs) and entrepreneurs. They provide and sell two main types of services to accounting firms' clients: mandatory compliance services, and advisory services (Doving and Gooderham, 2008). The most common service sold by small accounting firms to their clients is the preparation of accounts and tax-return completion (Marriott and Marriott, 2000). Indeed, most SME owner-managers want to get rid of the '*accounting burden*' (Keasey and Short, 1990). As a result, the relationship between entrepreneurs or small businesses and their accountants is '*primarily an economic one*' that is '*driven by regulatory requirements'* (Marriott and Marriott, 2000, p. 476). Because most small business owner-managers have limited financial skills, they often consider that there is not much added value to the statutory accounts they receive from their accountants (Marriott and Marriott, 2000). However, the literature has generally acknowledged that higher value would result from the professional advisory services provided by small accounting firms to their clients (Doving and Gooderham, 2008; Stone, 2011). These advisory services are inherently dependent upon the development of trust relationships over time between accountants and their clients (i.e. entrepreneurs or the managers of small firms) (Blackburn *et al.*, 2018). Interactivity is particularly relevant when contacts between providers and customers are lengthy, iterative, and require reciprocal contributions from all parties (Jaakkola *et al.*, 2015).

In this context, the accounting services provided by small accounting firms can be seen as a professional service that results from a co-production process taking place between accountants and their clients. On the one hand, compliance services require clients to share the necessary documents that will allow accountants to keep their accounts up to date (Marriott and Marriott, 2000). Clients' discipline, rigor, and responsiveness in doing so are essential as it directly influences the outputs of the service provided by the accountant, which means that sustained interactions between both sides are indispensable (Grönroos and Ojasalo, 2004). On the other hand, advisory services can only be enabled by the trust, empathy and integrity that accountants will be able to nurture in their relationship with their clients (Blackburn *et al.*, 2018). As these advisory services have been shown to be more remunerative than compliance services (Doving and Gooderham, 2008), it is in the interest of accountants to preserve long-lasting relationship with their client base. In sum, sustained interactions with clients appear to be essential to the provision of accounting services by small accounting firms.

With this in mind, the present paper questions how information technologies alter the relationships between accountants and their clients and affect the co-production of accounting services in small accounting firms. Technology is known to be both a force behind many service innovations and

an opportunity for delivering existing services in more accessible, convenient and productive ways (Bitner *et al.*, 2010). At the same time, technology may also result in overly standardized professional services that can end up poorly aligned with clients' contextual specificities and hinder adjustment to political and business contexts (Humphrey *et al.*, 2021). As of today, small accounting firms are confronted with a large range of innovative technologies such as optical character recognition (OCR) software (Shaffer *et al.*, 2020) and continuous accounting (Izzo *et al.*, 2021) of which the effects on the co-production of accounting services remain largely unknown. Indeed, there has been limited reporting of the effects of innovative technologies on the professional services provided by small accounting firms in extant research. In the following section, we provide a critical review of the literature that has investigated contemporary technological innovations for accountants, underlying its shortcomings and the relevance of conducting research that builds on the service perspective, is empirically-grounded, and focuses on small accounting firms.

2.2 Information technologies for small accounting firms

Increasingly, new accounting software and solutions are developed with the aim of redefining how accounting work is performed in an ever-evolving environment (Borthick and Pennington, 2015). Such accounting solutions, often marketed as encompassing 'artificial intelligence', rely on more or less sophisticated algorithms that have many ends, such as measuring new performance indicators (McKinney *et al.*, 2017), processing invoices automatically (Jedrzejka, 2019), generating accounting reports in real-time (Cong *et al.*, 2018), storing data more efficiently (Arnold, 2018) and enhancing decision-making (Moll and Yigitbasioglu, 2019). While new information technologies in accounting have a broad range of potential applications and can be labeled in a multitude of ways, the most relevant innovations for small accounting firms today are presumably OCR software (Shaffer *et al.*, 2020), cloud computing (Dimitriu and Matei, 2014), and continuous accounting (Izzo *et al.*, 2021). These innovations have all been described as having the potential to induce major changes in the way accountants perform their tasks (Guthrie and Parker, 2016; Yigitbasioglu *et al.*, 2022) and are now being marketed by software developers who are actively promoting their products toward accountants.

The bottom line of this emerging research trend in accounting is to argue that new accounting software would inevitably transform the work that accountants do (Gulin *et al.*, 2019). This is notably because several accounting processes would be directly impacted by technologies enabling instant information sharing as well as real-time detection and automatic correction of errors (Cong *et al.*, 2018; Schmitz and Leoni, 2019). As a result, technical operations (i.e. recording, classifying, and transcribing data), decision-making, and social interactions (i.e. interactions with clients) would be affected to some extent by contemporary information technologies (Gulin *et al.*, 2019). According to scholars, accountants would, therefore, face an imminent 'disruption' (Cong *et al.*, 2018) or a 'paradigm shift' (e.g. Dimitriu and Matei, 2014) consisting in the automation of many traditional accounting tasks characteristic of compliance services and a transition toward new strategic roles (Moll and Yigitbasioglu, 2019). Consequently, accountants have been repeatedly encouraged by consultants, professionals and scholars alike to actively engage with emerging technologies (Marrone and Hazelton, 2019; Richins *et al.*, 2016).

Several studies have argued that these technologies would come with a number of significant benefits for accounting firms and, by extension, their clients. First, the automation of tasks once performed manually would result in lower costs for the adopter (Jylhä and Syynimaa, 2019; Richins *et al.*, 2016). That is because, on the one hand, information technologies would cause time-consuming tasks to be performed faster (Kruskopf *et al.*, 2020) and, on the other hand, such technologies are also expected to replace human roles and tasks to some extent, hence leading to a reduction in labor intensiveness for the adopting organization (Jedrzejka, 2019; Schmitz and Leoni, 2019) as well as in lower fares for their clients (Jylhä and Syynimaa, 2019). Second, new accounting software would significantly reduce manual data entries that accountants have to perform in order to process accounting data (e.g. Gulin *et al.,* 2019). Information technologies are built on algorithms able to automatically handle accounting data processing (e.g. categorizing expenses, refreshing financial data, reconciling transactions, etc.) They also possess features such as real-time detection of errors and intelligent exception analysis that could warn accountants of potential errors in their databases (Cong *et al.*, 2018). As a result, transitioning to digital platforms would lower mistakes made by accountants who handle data manually (Jedrzejka, 2019). In turn, the accuracy and quality of data are expected to improve significantly, as information technologies should ultimately lead to fewer errors and less outdated data in accounting (Drum and Pulvermacher, 2016; Gulin *et al.*, 2019). Besides, task automation would allow accounting firms to work faster, improving their productivity gains (Jedrzejka, 2019) and resulting in a competitive advantage over their competitors (Griffin and Wright, 2015; Gulin *et al.,* 2019; Kruskopf *et al.*, 2020). Accountants would be in a better position to provide in-depth information to their clients through more diverse types of reports (Trigo *et al.*, 2014), and even to become strategic advisors able to provide essential business insights and real-time information to their customers (Cong *et al.*, 2018; Gulin *et al.*, 2019; Richins *et al.*, 2016). Finally, whereas accounting professionals have usually worked around definite periods of compiling, analyzing, and reporting data, information technologies would make it technically possible for data and information to flow continuously (Smith, 2018). Indeed, AI-supported systems could operate in the background and process data without interruption (Kruskopf *et al.*, 2020). Financial information would then be more immediately available to clients (Arnold, 2018). As a result, the conventional definite times and busy periods characteristic of accounting work (such as closing the book and tax filing) would become increasingly diffuse (Izzo *et al.*, 2021). Accounting work would then cease to be defined by busy seasons and workload fluctuations, and would result in a more even distribution of work over the year.

Although these observations may suggest a quite enticing view of information technologies, they come with a number of significant risks and limitations. First, many of the expected benefits underlined above have remained predicted by scholars rather than thoroughly backed up by empirical studies (Yigitbasioglu *et al.*, 2022). Hence, while it is often assumed that these benefits would, somewhat mechanically, materialize in accounting firms, the actual empirical evidence to demonstrate the effective uses of new technologies by accountants has remained scarce (Griffin and Wright, 2015). This is partly due to the fact that existing contributions on information technologies in accounting have often set out as their main objective to suggest research directions (e.g. Arnaboldi *et al.*, 2017; Arnold, 2018; Jedrzejka, 2019; Moll and Yigitbasioglu, 2018), to examine particular issues in light of the existing literature (Cong *et al.*, 2018; Marrone and

Hazelton, 2019; Smith, 2018; Sutton *et al.*, 2016), or to develop conceptual frameworks (e.g. McKinney *et al.*, 2017). Second, many studies have seemingly overlooked the deep intertwining of humans and technologies and their enactment in practice (Orlikowski and Scott, 2008). Indeed, the growing entanglement of users and technology calls for considering service providers and service customers together with the technology that they use, instead of considering specific features (or "expected benefits") of technology in isolation (Wagner *et al.*, 2011). Hence, we know relatively little about how technologies such as OCR software, cloud computing or continuous accounting actually alter the work that accountants do. In sum, there is, at the present time, a tendency to describe innovative technologies as unavoidable and disruptive, causing a profound transformation of the accounting profession, while little attention has been paid to the way these technologies affect the coproduction of accounting services. It follows that the extent to which these technologies effectively result in concrete advancements for accountants and their clients remains largely unknown (Coyne and McMickle, 2017).

This observation is particularly true for small accounting firms. While some studies have been conducted on the implementation and uses of information technologies within the particular context of the Big Four (e.g. Dowling and Leech, 2014; Kokina and Davenport, 2017; Kruskopf *et al.*, 2020) or "medium-to-large" accounting firms (Yigitbasigolu *et al.*, 2022), scant attention has been paid to the galaxy of smaller accounting firms that provide similar accounting services on a more limited scale. Yet, since small accounting firms have limited resources (e.g. finances, time, expertise), it might be safely assumed that the adoption of new technologies is all the more challenging in such firms. Paying increased attention to the accountant-client relationship is significant since research has well established that accountants working in small accounting firms were usually strongly committed to their client base (Kolvereid and Åmo, 2021). The quality of the services provided by accountants has been shown to be critical to retaining clients and building a lasting client base (Gooderham *et al.*, 2004). Hence, while new information technologies may have deep implications for the way accountants interact with their clients, we know very little about how small accounting firms manage the evolving relationship with their client base as they implement new technologies.

Contrasting with existing studies that have often focused on the absolute benefits of given information technologies, this paper assumes that new technological solutions are necessarily introduced within existing systems of relationships between accountants and their clients that cannot be abstracted nor disregarded. From the service perspective, accounting can be defined as a co-production process between accountants and clients in which the relationship between these two parties is of vital importance (Knechel *et al.*, 2020; Sampson, 2010). Indeed, the quality of the services provided will depend on the quality of the relationship between both parties (Grönroos and Ojasalo, 2004). These services, in the context of small accounting firms, imply that clients will share their financial documents (such as bills and invoices) so that accountants can encode and process their data to produce compliance documents and advisory services that will, in turn, support clients' decision-making. Yet, while accounting work has often been prophesized to be "disrupted" by new technologies (e.g. Cong *et al.*, 2018), it is currently unclear how these technologies affect the compliance and advisory services that accountants provide to their clients. Therefore, the paper focuses on how emerging information technologies such as OCR platforms,

cloud computing, and continuous accounting influence the co-production of accounting services in small accounting firms once they are implemented (see Figure 1).

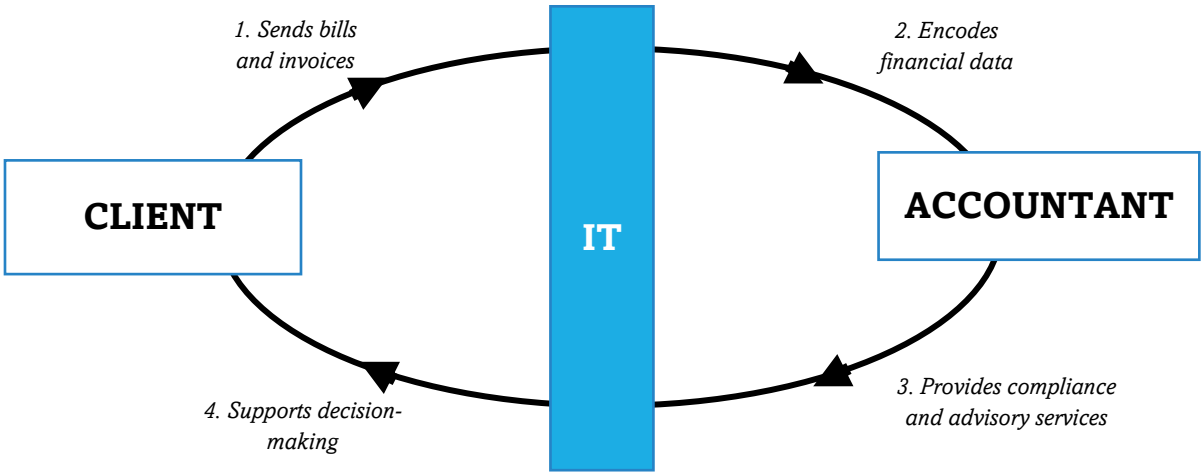

Figure 1: Accounting services as a technologically-supported process of co-production (authors' own)

Answering prior calls for subjecting emerging technologies in accounting to increased empirical scrutiny (e.g. Moll and Yigitbasioglu, 2019; Richins *et al.*, 2016), the paper ultimately aims to study how information technologies affect the co-production of accounting services in small accounting firms. Based on the theoretical assumptions of the service perspective (e.g. Sampson, 2010), we assume accountants in small accounting firms to be engaged in permanent co-production processes with their clients, to strive for maintaining sustained and collaborative relationships, and to be wary of excessive standardization induced by technological innovation that could negatively affect their work practices (Knechel *et al.*, 2020). Using empirical material collected among small accounting firms' managers themselves, we illustrate how emerging technologies in accounting are challenging and reconfiguring the relationships that they sustain with their clients. By doing so, we contribute to the literature by providing a more comprehensive overview of how technological innovation affects the service processes of a significant yet neglected majority of accounting companies – small professional accounting firms.

3. METHODS

The present study focuses on Belgian small accounting firms and, more specifically, on the managers of such firms. The Belgian labor market is organized around a very high proportion of independent workers and small and medium firms (SMEs). In that regard, accounting is no exception, and most of the firms that we designate in the paper as 'accounting firms' are, therefore, small firms that provide accounting services to other firms (which are mostly SMEs themselves). The term "small firm" usually designates enterprises with less than fifty employees, although, by that definition, many small accounting firms in Belgium should rather be seen as very small (as all but one firm investigated in this study had less than fifteen employees). While there is no official count of these accounting firms, estimates indicate that there should be between six and seven thousand of them operating in Belgium. For reasons previously mentioned, the paper is centered around these firms specialized in accounting that provide bookkeeping and other legal, tax, and

advisory services to companies and business owners, and should not be seen as representative of the particular context of large international accounting and auditing firms such as the Big Four.

The study is informed by semi-structured interviews conducted with twenty managers, i.e. company heads who systematically own or co-own a small accounting firm (n=20; see Appendix 1 for a summary table) with the aim of grasping their current experiences and concerns related to information technologies. A qualitative research design was privileged for three main reasons. First, as accountants working in small firms have seemingly not yet been questioned by researchers regarding the actual effects of innovative technologies on their work practices, the study is largely exploratory in nature. Semi-structured interviews thus allowed us to obtain rich and reflexive accounts of interviewees' views of emerging technologies (Alvesson, 2003). Second, while extant literature has often built on case studies conducted among the Big Four (e.g. Arnold, 2018; Dowling and Leech, 2014), the market of small accounting firms is much wider than four firms; as a consequence, interviews with a variety of accounting firm managers were seen as an appropriate design to grasp the heterogeneity of the situations these firms found themselves in. Finally, while the case study has been a popular research design to account for the adoption of a specific technological innovation in a specific case, the present research rather looks into how information technologies as a whole transform the co-production of accounting processes. Hence, resorting to semi-structured interviews made it possible to get a broader understanding of how technologies were currently affecting the provision of accounting services in small accounting firms.

The focus was set on small accounting firm managers since they can be assumed to be the ones in charge of the decision-making related to information technology adoption and, more broadly, to the strategy of the firm that they are in charge of and that they own. The selection process was especially challenging due to the difficulty in identifying and obtaining contact details for small accounting firm managers. We first established a list of potential interviewees and met with the ones open for an interview (n=12). We then shared an open call on three professional groups of accountants on social media, which resulted in a few accounting firm managers expressing their interest in taking part in the study (n=4). Finally, we also resorted to chain referral or "snowball" sampling to identify interesting managers to meet with, who could hardly be reached through the use of the methods described above (n=4). Indeed, since Belgian accounting firms are not formally authorized to advertise their services to the general public, there is limited marketization of accountancy at the level of these firms (Picard, 2016). Consequently, many of them do not have a company website nor an interest in sustaining a professional online activity. Snowball sampling allowed us to make sure that we conducted interviews with these managers as well.

The aim of these interviews was to explore accounting firm managers' perspectives on information technologies and their effects on the provision of accounting services. Relying on a loosely structured list of questions and themes at first, we gradually built an interview guide structured around three main themes that were 1) the information technologies in use within the accounting firms, 2) the effects of these technologies on accounting processes and tasks, and 3) the changing relationship between accountants and their client base (see Appendix 2 for the interview guide). It should be noted that the emphasis on accountant-client interactions emerged quite inductively in the course of the research process, as it gradually appeared that respondents were granting great significance to the way technologies affected their relationship with their client base. Indeed,

the interviews made it clear that the disruptive potential of information technologies was first and foremost related to the way they transformed the interactions between accountants and their clients and the production of accounting services. Due to the lack of literature on technology use in small accounting firms, these interviews also made it possible to identify contemporary topics related to information technologies and sparking the interest of accountants. Interviews were conducted in French or English, and were recorded and transcribed to facilitate the process of data analysis.

The coding process took place in three rounds. In the first round, based on our interview guide, transcriptions were coded using three codes: information technology use, information technology effects, and the accountant-client relationship. The third category of information was identified as the most significant to answer our research question (i.e. how do information technologies affect the co-production of accounting services in small accounting firms?), the other two providing important contextual information to support our findings. In a second round of coding, interviews were recoded and transcripts were analyzed again to distinguish between (1) the *challenges* of information technologies for accounting work and the accountant-client relationship on the one hand, and, on the other, (2) the *configurations* supporting the provision of accounting services and the role of technology within them, hence accounting for the structuring role of technology in producing accounting services.

Once that distinction was established, we performed a third round of coding for each of these two dimensions. Looking at *challenges*, we highlighted five key issues and problems pertaining to the co-production of accounting services that information technologies raised when implemented in small accounting firms. Particular attention was thus paid to accountants' discourses on the effects of these technologies on their relationship with their clients. The interviews notably revealed that clients' appetence towards such technologies, their capacity to use them effectively, as well as the work required from an accountant to assist them in using these technologies, were significant concerns for the interviewees. In total, five significant challenges were identified, each of them emphasizing the centrality of the relationship between accountants and their clients and drawing attention to neglected implications of new technologies for these firms. Then, paying attention to *configurations*, we looked into how technology, once in use, was effectively changing the production of accounting services and redistributing the work between accountants, clients, and technological systems. The analysis revealed four configurations relying on distinct technologies and implying four different ways of producing accounting services. The presentation of the findings is structured accordingly.

4. FINDINGS

Nowadays, small accounting firms in Belgium are increasingly exposed to new technological systems that are either generic accounting software sold by large software companies or more specific IT solutions designed by startups that are tailored to the specific tasks that accounting firms do. In both cases, these solutions are continuously enriched with new functionalities that have gradually been expanding the realm of possibilities in terms of how accounting work can be performed. Accounting software are far from new, insofar as many accounting firms have been using one for decades. However, these software have historically remained internal to accounting

firms and limited to the recording of financial transactions. Over the years, software developers added support for on-web accounting and cloud storage, OCR recognition (i.e. conversion of financial documents into text information), structured electronic invoicing, collaborative platforms (i.e. software that encompass a client interface, on which they can upload documents, communicate with their accountant, and follow the evolution of the financial situation of their firm), and, more recently, continuous or "real-time" accounting (i.e. the automated processing of financial data) as well as mobile accounting (i.e. mobile applications for clients connected to the accounting software). While all these innovations have been introduced on the market at an alarming pace, they have also been welcomed with varied levels of enthusiasm by small accounting firm managers. The latter often perceive these changes as a "*necessary evolution*", sometimes even as "*the only way to keep up with the increasing pressure, responsibility, and tasks that fall on accountants' shoulders*" (Accounting firm manager). However, they have also remained wary of the changes that they induce to the accounting services that they provide. In this section, we cover five key challenges of technological innovations for the co-production of accounting services.

4.1 – The challenges of technological innovation for the co-production of accounting services

4.1.1 - The challenge of reliability: preserving the quality of the co-constructed services

The move towards more automated systems should theoretically enable accounting data to be processed by an algorithm that would gradually 'learn' how to proceed to correct accounting coding operations, hence unburdening accountants from encoding tasks. In that view, accountants' job would shift from performing coding operations themselves to verifying the outputs of the algorithm and participating in its calibration. In addition, automation would also enable accounting data to be processed in real-time. Accounting documents uploaded by the client would become immediately computed by the algorithm and the result directly visible in the client's interface, which would in turn make the traditional time standards of accounting work obsolete. However, several interviewees explained that, in practice, continuous accounting solutions were not fully ready yet:

> *The marketing around accounting software able to process invoices automatically is exaggerated and misleading. The automatic encoding of accounting documents… I have yet to see that working as it should. In my experience, software can correctly process, let's say, 50% to 60% of the documents at most.* (Accounting firm manager)

> *From what I have seen, it does not always work as it should. Well, maybe it does work well in a majority of cases… But I can't settle for a "maybe". As sure as you are not 100% certain that the system is fully working, you have to verify what the system did anyway.* (Accounting firm manager)

Interviewees were usually not convinced that AI-supported solutions such as continuous accounting could do a better job than them at processing accounting information correctly. Even if technological solutions managed to be efficient at processing the ordinary, they often fail when it comes to reacting to the extraordinary, which is described as routine work by accountants who deal with entrepreneurs and SMEs. Accountants gave examples of "*unpleasant experiences*" and "*complex situations*" in which the system had failed to recognize specific information, resulting in errors in accounting operations (Accounting firm manager). One interviewee also mentioned the

case of a client who would push all his purchase bills into the system at once. Looking at his accounting data, he would most likely be warned that he is going bankrupt, which would make him call his accountant in a panic. However, that information would be erroneous since his sales invoices have not been uploaded on the platform yet. Such a situation would require accountants to spend time explaining the system to the client and, most importantly, could potentially threaten the relationship between the client and their accountant. Hence, interviewees usually remained cautious about automatizing the existing processes and streamlining accounting practices, arguing that real-time accounting has its own share of risks:

> *I do not caution real-time accounting systems where client information is processed without being verified. I really want to keep a system where I, as an accountant, give a green light that means, the information is reliable and can be shared with the client.* (Accounting firm manager)

Through this excerpt, we can appreciate the reservations that accountants have when it comes to considering automatic encoding solutions. One of their main concerns revolved around the loss of control over accounting processes induced by new technologies and their potentially adverse effects on their relationship with their client base. Indeed, clients expect their accountants to perform the correct accounting operations; and regardless of the technological systems that they use, accountants are the ones who remain fully responsible for the correctness of these operations. To a certain extent, the compliance work performed by accountants is expected to remain error-free. Hence, accountants appeared quite wary of technological innovations that could potentially threaten the quality of the services that they provided.

4.1.2 The challenge of heterogeneity: sharing work with a highly diverse client base

Another critical point of discussion when it comes to adopting innovative technologies relates to their significance and relevance for clients themselves. Are clients open to, asking for, or even pushing their accountant to use information technologies? On this point, accounting firm managers held a broad variety of discourses. Some of them conveyed the traditional argument of software developers that accountants have to lend an attentive ear to their clients' eagerness to benefit from digitized accounting services. In that view, clients would increasingly expect their professional accounting services to be delivered in the same way that their private banking services have evolved over the years, with the ability to access their financial information at any time and from any device. Some respondents concurred that clients were rather enthusiastic about the idea of having their accounting services provided online. A common argument is that clients' expectations regarding how fast their accountant should provide financial information or advice evolved over time. As stated by an interviewee, '*clients now expect their accountant to deliver the information that they need almost immediately'* (Accounting firm manager). However, others hold a more nuanced view, arguing clients' expectations tended to be grossly overstated by software developers:

> *From my experience, clients who want their accountant to be more digital are a minority. My opinion is that our clients are not ready to use these technologies. Many are also tired to hear about that digital stuff every single day.* (Accounting firm manager)

> *Clients, in truth, do not care* (…) *A client saying, 'how cool, you're working paperless, that's all I am asking for?' I never heard that once in ten years. Losing clients because you ask them to scan their bills, however, that happened to me multiple times*. (Accounting firm manager)

In several interviews, clients were depicted as unresponsive at best to the digital innovations implemented by accounting firms. Worse, several accountants encountered unexpected problems when they began working digitally. Most notably, some clients categorically refused to scan their invoices or to comply with the new tools being implemented, to the point that some even decided to change their accountant. On this basis, several accountants criticized the "*marketing discourse of the burning platform"* urging them to implement new technologies as being disconnected from their everyday realities (Accounting firm manager). Rather, they emphasized the wide diversity of their client base, often made of very small firms and entrepreneurs from all kinds of sectors and in charge of very different sorts of businesses. This heterogeneity resulted, in turn, in a range of different responses to technological innovation. Some clients categorically refused to use digital platforms, while others seemingly did not care, and still others showed various levels of enthusiasm:

> *Clients are generally more or less able to scan their documents as they should. I would say that it works well for half of my clients. But some do not want to, do not have the time to do so, or seem to be unable to make it work*. (Accounting firm manager)

When it came to compliance work, it remained necessary for many accountants to juggle between contrasted client types, i.e. the client who is unwilling to scan any document, the client who agrees to send his scans by mail, the client who uses a customer extranet to deposit bills and invoices, and the client who is able to pre-encode his accounting data within a platform. This is why respondents argued that the number of accounting firms in Belgium with a client base fully adhering to digital tools could '*be counted on the fingers of one hand*' (Accounting firm manager). A common argument found in accountants' discourses is that many clients are not familiar with such technologies, or that their entrepreneurial activity leaves them with little time to engage in learning how to use them efficiently. Accountants, therefore, plead for paying serious attention to the wide-ranging diversity of their client base, which they realize are more or less collaborative and more or less knowledgeable (Diaz-Mendez and Saren, 2019). Indeed, electronic invoicing, for example, will not resonate in the same way for a doctor, a construction contractor, an IT professional, a farmer, or a shop owner. At the end of the day, it is accounting firm managers who hold the responsibility of contending these different client types. Their rational response often consisted in developing tiered services and, therefore, resorting to multiple technological solutions, to accommodate the heterogeneity of their client base. As a consequence of the heterogeneity of accountants' client base, technological innovation materialized in a segmentation of the services provided by accounting firms.

4.1.3 The challenge of repricing: co-bearing the costs of new technologies

Unsurprisingly, innovative accounting solutions come at a financial cost for the accounting firm, which is a significant concern for small accounting firms that do not always have a sufficient volume of clients to make economies of scale. As software are flourishing and covering more and more

areas of accounting work (e.g. financial reporting, accounting firm management, accountant-client interfaces, etc.), many accountants now reported using several solutions concomitantly. Yet, a recurring problem that they faced was that their clients were often expecting that innovative technologies would result in a gain for themselves:

> *Automated technologies cause us a real problem. If you tell your clients to directly upload their documents on an online platform, the first reaction of your clients will be, so, will your fees drop now? But they do not realize all the costs that we still have to bear. And there is nothing more frustrating than having to justify your fees in front of a client.* (Accounting Firm Manager)

While clients expect their fees to drop as they are now taking over a series of tasks (e.g. scanning their invoices or encoding their financial data in a platform), accountants are not always able or willing to pair their investment in new technologies with a reduction in fees. It should be noted that there is some diversity in the pricing strategies of accounting firms. In some cases, fees are linked to a package of accounting services, or calculated on the basis of clients' revenues, which means that technology is nont necessarily taken into consideration. In other cases, accountants work with flat hourly rates, which translated into differentiated prices depending on the tasks that clients would do (e.g. scanning, pre-encoding, etc.) Even if, in these cases, new technological systems resulted in differentiated prices, the pricing strategy itself was not fundamentally transformed. Another argument of accountants was that they did not plan to lower their fares because of the high cost of the adoption of new solutions, stating that they '*would rather lose a customer than have to negotiate* [their] *fees*' (Accounting firm manager). Overall, accountants remained fairly skeptical about the idea that the adoption of new technologies would lead to a decrease in the cost of accounting services for their customers:

> *Take two clients with an identical situation and the same number of bills. One of them could very well be charged twice as much. Because nothing is in order, bills are missing, he doesn't answer our requests, he doesn't understand. Digitalization brings nothing when it comes to costs, what we need is to educate our clients about accounting*. (Accounting Firm Manager)

As illustrated above, the price of accounting services relies at least as much on clients' discipline than on technologies enabling new ways of processing financial documents. Hence, the repricing of accounting services induced by new technologies appeared to be a matter of discussion between accountants and their clients, in which the benefits of technologies are emphasized by the client and denied by the accountants. This, in turn, reveals that the work that accounting firms do is strongly anchored in collaborative relationships with their clients, and that technological innovation is a contested terrain in which clients' importance is repeatedly highlighted.

4.1.4 – The challenge of adherence: educating clients to new ways of working

Innovative technologies such as OCR recognition and continuous accounting do not only change the way accountants work: they also affect the way clients share their accounts, interact with their accountant, and access their financial information. In this context, accountants highlighted that technological innovations required them to commit more actively to their clients by informing them about the possibilities offered by technology, training them on how to use new systems, and

proactively sharing relevant tools and resources with them. This, in turn, raises a major question, namely, the role that accountants take on in the digital education of their client base. The word 'education' was commonly used by the interviewees (such as in the previous quote) to designate the work that they had to do to convince their clients to transition towards digital tools and support them in doing so. As stated above, many technological innovations in accounting require clients to change their work habits (e.g. scan their invoices, encode data on a customer portal, transact through a web platform, view their financial data online). Therefore, accounting firm managers have an active role to play in '*converting*' their client base to information technologies (Accounting firm manager). Yet, respondents do not believe that this is easily done in practice:

> *It is very time-consuming for an accounting firm to develop a digital relationship with its clients and to change their work habits. Also, this is not really the kind of work that an accountant is accustomed or trained to do.* (Accounting firm manager)

A crucial point raised by accountants was that the quality of their services had now become increasingly dependent upon the capacity of their clients to use information technologies adequately. Hence, clients misusing the system (e.g. by failing to scan their documents properly, uploading files in the wrong section, mislabeling their files, using it sporadically or even refusing to use it) had direct implications on the work performed by accountants. Many information technologies are now made available as shared platforms that operate on the premise that clients actively participate in the co-production of their accounting services. Promoters of these platforms argued that, by enabling real-time processing of accounting information, they would result in a better spread of the workload over the year for accountants. However, spreading the workload over the year did not appear to be as crucial for accounting firm managers as spreading the work between accountants and their clients. In this context, a significant implication for accountants is that they have to become the ambassadors of the technological systems that they adopt, a role that they are not always willing nor prepared to endorse.

4.1.5 – The challenge of pragmatism: the myth of the business partner

An additional point worthy of attention pertains to the belief, sometimes echoed by the scientific literature (e.g. Jedrzejka, 2019), that technological innovation in the profession would allow accountants to free up time to endorse a more strategic role toward their clients. The general idea behind that belief is that new technologies would supposedly put accountants in a position where they are able to provide deeper, data-led insights advice to their clients, hence allowing them to act as strategic counselors rather than mere data handlers. However, interviewees usually doubted the practical feasibility of evolving toward such a role in the context of their small accounting firms:

> *While a handful of clients are really eager for strategic advice and are ready to pay for it, many can't afford it or don't really see the point. A lot of clients just want to fulfill their tax obligations, and that's it. (Accounting firm manager)*

> *When I tried to hold this discourse of, 'accounting is not just a tool for tax authorities, it is also a management tool that can support you…' It didn't raise the slightest interest from my clients, all they asked was, so, are you going to raise your fees? (Accounting firm manager)*

Interviewees generally noted that their clients were mainly expecting them to perform compliance work, and paid limited attention at best to advising services that accountants can offer. Several accountants experienced a strong disillusion when they attempted to foster the development of their counseling practices:

> *As an accountant, I gradually became aware of the significance of internal control and processes for firms. I thought, I could use that to enhance SMEs and entrepreneurs, develop a counseling activity… But when I tried, I was dumbfounded. It was like talking to a wall. I would say that 80%, maybe even 90% of my customers do not want to know anything besides being reassured that their tax situation complies with the rules. (Accounting firm manager)*

The excerpts above underline the gap between marketing discourses emphasizing information technologies as some sort of remedy that would make it possible for accountants to endorse more strategic roles and the actual experiences of small accounting firm managers who attempted to do so. As it stands, clients of small accounting firms mostly expect them to provide compliance services, which makes the development of advising services more tenuous. Indeed, the added value of such services is not self-evident for entrepreneurs and small firms. Therefore, in many instances, attempts to capitalize on faster information technologies to free up time and invest in counselling did not live up to the expectations of small accounting firm managers. As a consequence, many accountants expressed very pragmatic views when it came to their strategic intentions for their firm, in which they recognized the limited importance of advising activities for their business as compared to compliance services.

4.2 The structuring role of IT in the co-production of accounting services

Interviews revealed five challenges (data reliability, client heterogeneity, repricing, client adherence, and the development of advising services) that contemporary information technologies spark in small accounting firms. All of them are based on the central idea that the client-accountant relationship is essential to the provision of accounting services. These services, as evidenced below and in the context of small accounting firms, appear to remain mostly centered around compliance work. To better understand how and why accounting services result from a co-production process, as well as the role of information technology in this process, this section further elaborates on the dynamics of the provision of accounting services. These services imply a set of tasks that make it possible for accountants to keep track of their clients' financial situation so that their business comply with the applicable regulations.

More specifically, the main purpose of accountants' work is to establish for their clients three compulsory financial documents that are the profit-and-loss statement, the cash flow statement, and the balance sheet. In turn, these documents will be used for tax reporting purposes. To establish these documents, it is essential that clients periodically keep their accountant informed of the financial flows of their business by sharing the receipts supporting their purchases and expenses (i.e. invoices and bills). The correctness of accounting services is inherently dependent upon clients' ability to pass on the correct information to their accountant. Then, these documents have to be processed, i.e. booked into the right accounting category. Accountants store the results of these operations so that they can aggregate the data and issue the aforementioned financial

statements. Ultimately, they are in a position to provide their clients with these documents and up-to-date information on the financial situation of their business.

Notwithstanding the intricacies of some of the bookkeeping operations to be performed – such as handling '*particular cases*' and '*exceptions*' (Accounting firm manager), this process does not appear to be overly complex on the technical level. It can be summarized in a few steps – sharing invoices, interpreting data, storing it, producing the final outputs (i.e. financial documents), and communicating them to the client. This explains why software developers have gradually attempted to offer solutions aiming to delegate some of these steps to information systems, up to the point of automating the whole process in the case of continuous accounting solutions. However, doing so also disrupts the established relations between accountants, clients and IT, as well as the work that each of them does in the process, causing social transformations that might have deeper implications than the mere technical changes induced by new technologies. To gain a clearer idea of these transformations, the paper develops four configurations of accounting services provision that imply distinctive technologies and result in distinctive interplays between accountants and their clients (see Figure 2).

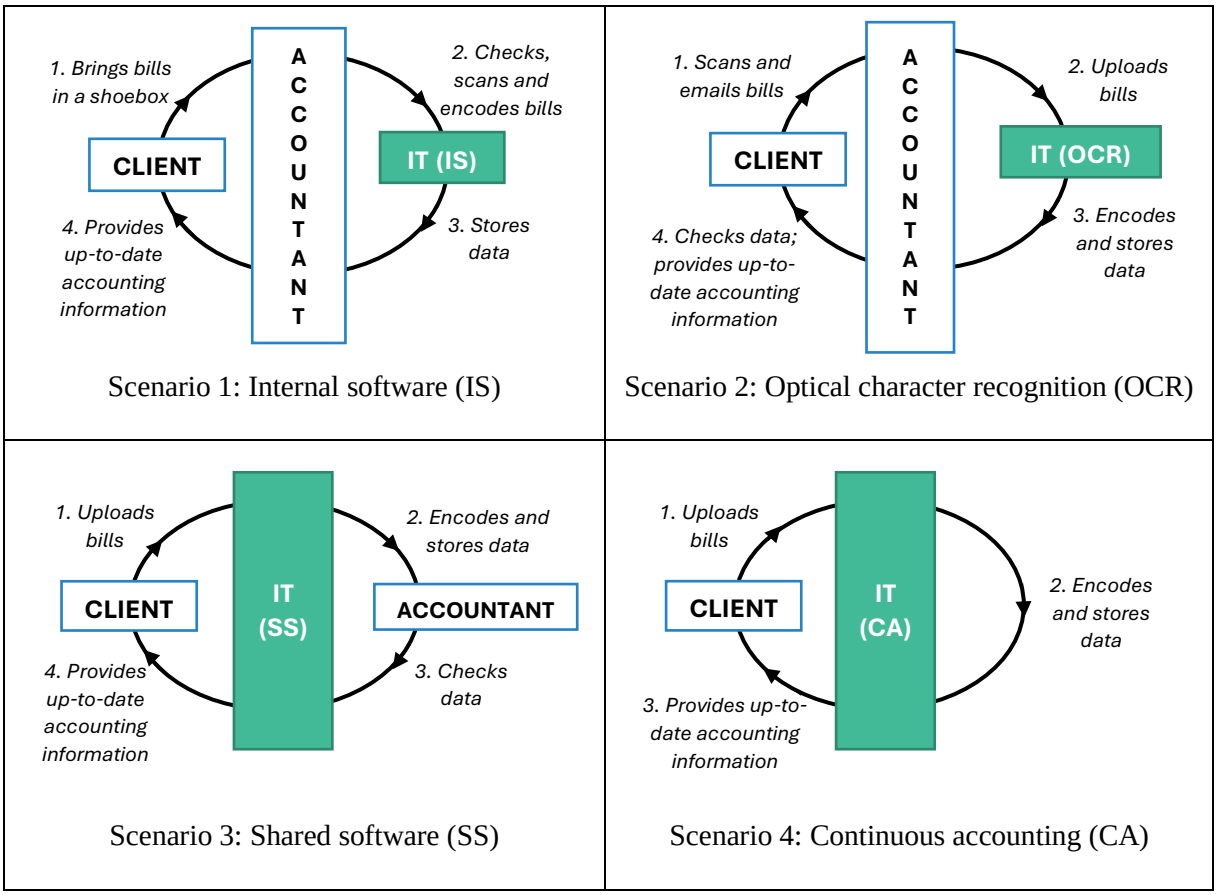

Figure 2 – Co-production configurations between accountants, clients, and IT

In each of these configurations, accountants, clients and information systems perform different sets of tasks depending on the technological system that they use. In the first scenario, information technology is solely used for encoding and storage purposes (Scenario 1). It should perhaps be recalled that, historically, clients would bring their financial documents to their accountants periodically, typically once every three months, in a '*shoebox*' (Accounting firm manager).

Accountants would then process these documents and encode the outputs of their accounting operations into their internal software. The shoebox still appears to be a shared symbol among accountants which alludes to an old, although not extinct, way of working. In this first configuration, accountants are largely in control of the provision of accounting services, and technology is merely used as a support to encode and store data.

The rise of scanners and, later, optical character recognition (OCR), resulted in the emergence of a second configuration in which accounting documents were emailed by clients, pushed by accountants into their software, and pre-interpreted by OCR technologies. In this second configuration (Scenario 2), the scanning task became the responsibility of clients, increasingly invited or required to scan their documents on their own. Part of the work that accountants did was delegated to clients, strengthening the role of clients in the co-production of their accounting documents. Additionally, OCR also enabled information systems to pre-allocate recorded transactions into assets, expenses, revenues and other accounting categories, supposedly alleviating accountants' processing work "*in cases it worked as it should*" (Accounting firm manager). As a result, accountants' work shifted from encoding accounting information to checking the accuracy of the software outputs, a new task that was absent from the previous scenario. Despite these changes, accountants remained in control of the overall provision of services by exerting upstream checks of the documents sent by the clients, and downstream checks of the operations performed by the software.

Gradually, software developers began to market shared accounting platforms integrating client interfaces, with the aim of facilitating the transmission of information between clients and accountants (Scenario 3). A direct implication of these platforms is that they completely removed the need for encoding clients' invoices and bills, a task perceived as one of the most cumbersome in the process. Indeed, clients' documents became automatically processed by the software, which removed a layer of control that was traditionally exercised by accountants. This, in turn, strengthened the importance for accountants to check software outputs that became increasingly black-boxed (as they embedded scanning and allocation operations altogether). By performing these checks, accountants remained in control of the final accounting assignments. Incidentally, shared accounting platforms also increasingly featured advanced client interfaces expanding the realm of possibilities in the communication between accountants and their clients, offering notably more intuitive data visualization options enabling clients to keep track of their financial situations.

Most recently, technologies such as continuous accounting (Scenario 4) made it possible to go one step further by removing the need for accountants to check the data produced by the software. Indeed, systems based on artificial intelligence would supposedly be able to use the available information to process bills and invoices on their own and immediately reflect the result in clients' interfaces. In that configuration, the work traditionally performed by accountants would be entirely delegated to the software. As a result, accountants' role in the process would become considerably reduced and even optional, in theory at least. This configuration rests on the assumption that the tasks that accountants do as part of the compliance services that they provide can be entirely automated.

Faced with this observation, mainstream views on technological innovation would argue that accountants should seek to move from the first to the fourth scenario to break free from

cumbersome and low value-added tasks such as encoding, and focus on the development of more value-added activities such as counselling. However, due to the challenges that have been previously highlighted, this is not what appears to happen in practice. Rather, the dominant strategy of accounting firms consists in running several configurations in parallel to accommodate their client base, hence juggling between different socio-technical arrangements. Indeed, these scenarios do not appear to be mutually exclusive, which allows accountants to tailor their practices to match the needs, skills, and demands of their client base:

> *I say to my clients, I work with flat hourly fees. If you wish to pay me for scanning your bills when watching my TV, this is your choice. You can also scan it yourself and that would cost you less, but once again, this is up to you.* (Accounting firm manager)

> *We are using* [a continuous accounting software] *for, I would say, 30% of our clients. That would not work for anyone. In fact, we had to remove the app for a few clients, they got distressed with it, so we went back to a more traditional system where we handle the encoding*. (Accounting firm manager)

These examples show that combining the different configurations might be more manageable and rational for small accounting firms than attempting to switch from one to another. Indeed, combining arrangements allows sustaining a greater degree of flexibility in the structuration of the relations between clients, accountants, and technology. This is notably because some of the systems described above, such as OCR-based technologies and continuous accounting software, result in a highly standardized way of processing accounting data that does not always fit all contexts and situations. On that point, it should be noted that the increasingly popular subscription-as-a-service model (SaaS) allows accountants to make a partial adoption of a given technology and to '*try out new systems*' on a small portion of their client base (Accounting firm manager). These strategies reveal the importance for accountants to offer different technological configurations at once, which in turn allow them to sustain different ways of co-producing accounting services.

5. Discussion

This study investigated how emerging technologies in accounting are challenging and reconfiguring the relationships that small accounting firms' managers sustain with their clients. As a reminder, we conceptualized accounting in these firms as a professional service embedding compliance and advising tasks that are continuously co-produced by accountants and their clients (Knechel *et al.*, 2020). We suggested that technological innovation had the potential to disrupt the co-production of accounting services, and that extant research had so far paid scant attention to these issues and to the context of small accounting firms altogether. More globally, we underlined an overall dearth of contemporary empirical studies on technological innovations in accounting provided for and by small firms (Yigitbasioglu *et al.*, 2022) and a need to study accountants, users and technologies altogether rather than in isolation (Wagner *et al.,* 2011). On this basis, the paper pursued two complementary aims. First, it sought to better grasp the challenges of contemporary information technologies for the co-production of accounting services. To this end, we identified five challenges that illustrate how technological innovation, once implemented and beyond technical considerations, transforms the relationship between accountants and their clients.

Second, by exploring the several configurations through which accounting services are provisioned in small accounting firms, we highlighted the structuring role of IT in the co-production of these services. We discuss these findings and their implications below.

5.1 – Information technology and their challenges for the co-production of accounting services

In existing studies, while contemporary technological innovation in accounting is often seen as desirable or unavoidable (e.g. Gulin *et al.*, 2019; Sutton *et al.*, 2016), accountants are depicted as slow to adjust to innovative technologies (Griffin and Wright, 2015). Prior research has mostly explained accountants' reluctance to adhere to new technologies as being the expression of a lack of technology-related skills on their part (e.g. Kokina and Davenport, 2017; Jackson *et al.*, 2022; McKinney *et al.*, 2017). In that view, encouraging the adoption and use of new technologies would require accountants to develop skills pertaining to data analytics and critical thinking (Richins *et al.*, 2016). However, the original argument developed in this paper is that emerging technologies transform the relationship between accountants and their clients, hence changing how the co-production of accounting services takes place. Operations that may appear fairly simple and unproblematic on a technical level (e.g. the automated processing of invoices) can prove to have deep social implications insofar as part of the work that was performed by the accountant (i.e. encoding invoices) should now be made by the client. It appears that scholars have so far been seemingly more interested in understanding how technologies could make accountants 'wiser' (Quattrone, 2016) and help them make better decisions in complex situations (Knudsen, 2020) than in reflecting on the social implications of information technologies on the accountant-client relationship. A key argument of the present paper, then, is that the literature on information technologies in accounting might have overlooked their potential for disrupting service production, especially in the context of small accounting firms (Marrone and Hazelton, 2019). That is notably because many studies on new technologies in accounting have so far focused on suggesting directions for research (e.g. Arnold, 2018; Jedrezjka, 2019; Moll and Yigitbasioglu, 2018) or even on '*promoting the use*' of new technologies among accountants (Sutton *et al.*, 2016, p. 69), underestimating the complexity of the entanglement between users and technology in practice (Wagner *et al.*, 2011).

In this paper, we identified five challenges for accountants willing to develop technology-supported ways of providing accounting services. These challenges allow us to better understand why accountants might be reluctant to disrupt well-established routines with their client base by adopting new technologies. A first challenge pertains to the risk that technologies produce errors that will negatively affect the trust relationship that accountants have built with their clients over time, as well as their credibility. Even if some studies have warned that investments in information technologies would not mechanically result in improvements in performance, accuracy, or quality (e.g. Kolvereid and Åmo, 2021; Locke *et al.*, 2018), the implications of imperfect technologies for the client-accountant relationship has been rather understated so far. Yet, it is absolutely essential for accountants that the services that they provide remain error-free, which makes them reluctant toward systems that are imperfect or based upon gradual learning, such as the ones based on AI technologies.

Second, respecting the heterogeneity of their client base in terms of needs and skills appears to be another key priority for small accounting firms' managers that call for differentiated ways of using new technologies. However, many of these technologies are prescribing highly standardized ways to exchange information with their clients, whether upstream (e.g. automated invoices processing) or downstream (e.g. data visualization through an extranet portal). A core argument of accounting firms' managers is that these systems are not perceived similarly across their heterogeneous client base. Accountants are, therefore, well aware that standardizing their relationships with their clients through automated processes and tools presents the risk of degrading the quality of the accounting services that they provide (see Knechel *et al.*, 2020, for a similar argument in the context of big audit firms).

The difficulty of offering adequate repricing strategies appears to be a third challenge of information technologies. Studies have usually assumed that adopting new technologies would result in lower costs for the adopter (e.g. Jylhä and Syynimaa, 2019; Kruskopf *et al.*, 2020; Richins *et al.*, 2016). However, pricing systems are subject to ongoing negotiations between accountants and their clients. At the same time, small accounting firms do not possess a large enough client base that would allow them to perform economies of scale as larger firms do. Therefore, the financial implications of these technologies are more uncertain and open-ended than what extant literature has suggested so far.

Fourth, it appears that clients might be unresponsive or reluctant to changes in the provision of their accounting services induced by new technologies. Accountants are thus prompted to act as change facilitators with their clients, which is a new role that they are not especially familiar nor comfortable with. While research on accounting education has identified critical technical and analytical skills for accountants to develop in a more digitized world (e.g. McKinney et al., 2017), less emphasis has been set on more social skills such as promoting and accompanying change or training clients. Yet, it appears to be an important issue, as clients' interest in new technologies is more significant for the small accounting firm managers interviewed in this study than other priorities underlined in prior research, such as remaining competitive (Griffin and Wright, 2015) or increasing their productivity (Kruskopf *et al.*, 2020).

Finally, whereas studies have suggested that technologies would make it possible for accountants to increasingly endorse advising roles (e.g. Yigitbasioglu *et al.*, 2022), this paper emphasizes how difficult that might be in small accounting firms. It appears that such a transition is not merely a strategic decision that accountants can take on their own; rather, it is deeply rooted in the relationships that accountants sustain with their client base. This point might seem surprising since the literature generally acknowledges that the added value of accounting services essentially comes from these advisory services (e.g. Blackburn *et al.*, 2018; Stone, 2011; Yigitbasioglu *et al.,* 2022). However, while research has usually assumed that compliance services would become increasingly common and lose significance in professional service firms (e.g. Moll and Yigitbasioglu, 2019), this is not what was observed in the present study. Compliance work remained viewed as the core activity of small accounting firms, and while many accountants shared the hope that information technology would help them to develop advisory services, that hope did not appear to be shared by their clients, many of whom reacted with disinterest. This observation allows for a finer-grained understanding of the accounting profession by suggesting a crucial distinction

between several types of accounting firms. Medium or large accounting firms are likely to work with medium or large enterprises that have a high degree of interest in financial advice and more complex types of accounting services (Suddaby et al., 2007; Yigitbasioglu *et al., 2022*). In contrast, the small accounting firms studied here are usually working very small clients themselves, who are solely focused on their internal processes and do not always have basic accounting skills nor master their own billing. Therefore, clients' expectations, accountants' strategic priorities, and uses of technology appear to be radically different depending on the type of accounting firm under study.

Ultimately, by conceptualizing accounting as a professional service, this study sheds light on challenges that are significant to better understanding the actual effects of new technologies on the provision of accounting services in small accounting firms. Rather than witnessing a "disruption" of accounting work (Cong *et al.,* 2018; Marrone and Hazelton, 2019), accounting firms appear to carefully integrate new technologies to support the range of services that they provide. What ultimately matters is the adoption by their clients of the alternative working methods induced by new software, which is done progressively. In addition, it appears that several arguments to be found in the scientific literature for legitimating innovative technologies, such as reducing costs, increasing productivity, or remaining competitive (e.g. Jylhä and Syynimaa, 2019; Schmitz and Leoni, 2019), do not appear to be the most salient concerns of accounting firm managers. Rather, they emphasize the threats that new technologies induce in their relationship with their clients. The shifting responsibility for scanning invoices, the renegotiation of fees, the varying degrees of clients' proficiency with information technologies, the lack of client enthusiasm towards new systems, the loyalty of the client base, the absence of visible impact of new technologies on client satisfaction, are all illustrations of arguments in which accountants place the client at the center of their strategies. This is a significant point, as it better contributes to the understanding of accounting work in small accounting firms as a professional service in which the interactions between accountants and their clients take a central place. Hence, whether technologies allow accountants to work more efficiently or faster does not seem to matter as much as the respect of the idiosyncratic nature of their relationship with their clients.

5.2 – The structuring role of information technology in the co-production of accounting services

To provide the legal, financial, and regulatory services that they are expected to deliver, accountants require periodic inputs from their clients, who are asked to share their invoices as well as other supporting documents on a regular basis (Marriott and Marriott, 2000). Without these documents, accountants cannot perform adequate accounting entries and keep track of their clients' operations, which might result in incorrect financial statements. The exactitude and quality of accounting processes are, therefore, inherently dependent upon clients' ability to communicate the correct information in time and reply to their accountant's requests for additional information or further proof. Consequently, it is in the interest of both accountants and their clients to guarantee the flow of financial data over time and to maintain established routines and ongoing relationships between them. Yet, in today's organizations, information systems increasingly equip and structure the collaboration between accountants and their clients, and determine how the co-production of clients' accounts occurs.

This study highlighted four configurations of the provision of accounting services in which the roles and tasks of accountants, clients and technologies vary depending on the technology that is being used. Perhaps more importantly, this study emphasizes that accountants tend to juggle between different configurations at once rather than embrace a unique one. Prior research on information technologies in accounting has usually looked into how a specific technology would be "adopted" and "implemented" (Gulin *et al.*, 2019) while paying less attention to the range and plurality of socio-technical arrangements that accountants could play with in practice. Yet, as this study recalls, small accounting firms have to deal with a large number of small customers with wide-ranging economic activities, experience in bookkeeping, and technological proficiency. Accountants thus need to remain flexible in the ways they interact with a highly heterogeneous client base. Moreover, unlike in large accounting firms (van Brenk *et al.*, 2022) achieving economies of scale through technological innovation does hardly work in small accounting firms, as they face such heterogeneity that they need to operate several systems in parallel. Consequently, they tend to favor versatility by adopting customizable technologies that can serve different clients and uses rather than overly standardized solutions.

As illustrated by this study, information technologies are bound to change the way accountants interact with their clients. At the present time, the role of these technologies in the co-production of accounting services has not been emphasized in extant research (e.g. Sampson, 2010). This might seem surprising given the large body of research on technological innovation in the field. Emerging technologies offer new ways for accountants to collect the information that they need and to communicate with their clients differently (Izzo *et al.*, 2021). They should, therefore, be more closely integrated with studies adopting a service perspective on accounting, insofar as they directly transform accounting processes and structure the '*knowledge spillovers*' between accountants and their clients (Knechel *et al.*, 2020, p. 18). More fine-grained analyses of how contemporary technological innovations (e.g. artificial intelligence, RPA, big data, etc.) cause changes in the accountant-client relationship might be needed to gain insight into accounting firm managers' technologically-related choices and strategies.

5.3 – Study limitations and avenues for further research

This qualitative study was conducted in a given national context and rests on a limited number of interviews conducted with accounting firm managers, which necessarily restricts its scope and the possibility of generalizing its findings (Payne and Williams, 2005). While this study offers valuable insights into how the provision of accounting services is affected by information technology in small accounting firms, we would also encourage readers to reflect on the contingency factors that might induce variations between national contexts. For instance, factors such as the availability or unavailability of innovative accounting solutions adapted to national regulations, or the degree of competitiveness between accounting firms, could alter the strategies of accounting firm managers. However, we argue that the most significant limitation of the study is that, for reasons of practical feasibility and access to the field, the data collection process was limited to accountants and did not include clients themselves. The specifics of clients' businesses as well as their expectations have only been seized through accountants' discourses. Yet, as clients appear to be of central importance for small accounting firm managers, it would be insightful to conduct additional research among clients themselves.

It should also be noted that, adopting a service perspective, the study has focused mostly on the transactions that involve relationships with clients. Less insight was offered into other issues related to technology, such as how these technologies might also transform the organization of work within accounting firms, which does not mean that these issues are not worthy of interest. Likewise, as the findings were driven by the empirical observation that accountant-client relationships are, for the most part, mediated by information technologies, less attention was paid to the dynamics and processes that escape information systems, such as establishing trust relationships (Blackburn *et al.*, 2018) or accounting firms' internal dynamics. Further research would be needed to generate a more comprehensive and global understanding of how technology is embedded and enacted in the everyday life of accountants working in small accounting firms.

Lastly, this study offers a number of practical implications for accountants working in small professional service firms. Most notably, it suggests that transforming the instruments used for delivering compliance services does not increase the potential for developing advisory services. Although accountants may express a desire to position themselves as strategic partners and advisers for their clients, they rather seem to appear, in the eyes of their clients, as mere providers of compliance services and nothing more. More research might be needed to better understand the interactions between compliance and advisory services in small firms, as well as the effects of technological innovation on these interactions. Indeed, it could be the case that technological innovation pulls away accountants from more remunerative activities (i.e. advisory services) by depersonalizing the relationship that they sustain with their clients. Hence, the longer-term effects of information technologies on the co-production of accounting services remain to be explored in further studies.

6. CONCLUSION

Nowadays, the accounting profession has seemingly reached a turning point as it faces unprecedented challenges due to the rise of new technologies, automation, and artificial intelligence (Guthrie and Parker, 2016). This paper has sought to provide more insight into how innovative technological solutions transform the co-production of accounting services in the context of small accounting firms. Despite being essential economic actors who provide tax compliance services to entrepreneurs and businesses, small accounting firms have remained an under-researched area of accounting, as little is known about their uses of marketed technologies such as OCR solutions, shared platforms, and continuous accounting. Relying on semi-structured interviews conducted with accounting firm managers, the paper emphasizes several key challenges of technological innovation for the co-production of accounting services in these firms. The relationship between accountants and their clients appears to be a crucial piece of the equation that drives accounting firm managers' choices in implementing and using new technologies. More precisely, the study illustrates how the latter favor broad and wide-ranging strategies that multiply socio-technical arrangements to accommodate the needs, interests, and skills of a highly varied client base. They manage to do so by developing a range of configurations that involve different patterns of work distribution between accountants, clients, and information technologies. Hence, it is shown that accounting services provided by small accounting firms remain mostly focused on compliance work, which is performed under increasingly varied and complex socio-technical settings in which both clients and IT play an essential role.

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Appendixes

Appendix 1 – Summary table of interviews

ID	Date	Position of the interviewee	Firm size
1.	20.01.20	Manager	6 employees
2.	18.02.20	Founder and manager	3 employees
3.	20.02.20	Founder and manager	6 employees
4.	11.03.20	Manager	8 employees
5.	29.04.20	Co-founder and manager	2 employees
6.	03.02.21	Co-founder and manager	2 employees
7.	11.02.21	Manager	3 employees
8.	17.02.21	Founder and manager	Self-employed
9.	25.02.21	Founder and manager	4 employees
10.	26.02.21	Founder and Manager	11 employees
11.	02.03.21	Founder and manager	Self-employed
12.	04.03.21	Manager	6 employees
13.	04.03.21	Manager	14 employees
14.	26.03.21	Associate and manager	11 employees
15.	02.04.21	Founder and manager	Self-employed
16.	06.04.21	Founder and manager	Self-employed
17.	08.04.21	Founder and manager	Self-employed
18.	13.04.21	Manager	6 employees
19.	15.04.21	Manager	64 employees
20.	20.04.21	Founder and manager	5 employees

Appendix 2 – Interview guide

Main themes	Interview questions
Introduction	• Can you briefly reflect on your professional background and the history of your accounting firm?
General outlook on information technologies	**Main questions** • How do you experience technological innovation in your firm? • What tools do you use in your accounting firm? • Have you recently undertaken a technological change (i.e. acquiring a new software)? • What do you think of technological innovation in accounting at the present time? **Support questions** • Have you stopped using a certain information technology, or considered adopting a given technology and not done so, and why? • To what extent do you discuss the topic of information technologies within professional networks? • How would you describe the current market of accounting software in Belgium?
Benefits and drawbacks	**Main questions** • What are the main implications of information technologies for your firm? • What changes did information technologies cause to your work practices? • To what extent do information technologies work as you would expect them to work? **Support questions** • What do you think of technology X [continuous accounting, artificial intelligence, big data, etc.]? • In the literature, we can read that information technologies are expected to result in X [financial gains, fewer errors, increase in customers, etc.]. What do you think of it?
Relation with clients	**Main questions** • Did the adoption of new information technologies have any impact on your client base? • How receptive would you say your client base has been to new information technologies? **Support questions** • Did you lose clients as the result of the adoption of new information technologies? • Do information technologies have any impact on your pricing strategy?