





Artificial Intelligence in Professional Services: A Systematic Review and Foundational Baseline for Future Research

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Abstract. *Purpose:* The growing body of literature on Professional Services Firms (PSFs) using Artificial Intelligence (AI) offers valuable insights, yet a synthesised, systematic examination of this literature is lacking. This paper addresses this research gap by synthesising the literature at the intersection of AI and regulated PSFs, unveiling key issues, and proposing a research agenda for future studies. *Design/Methodology/Approach:* Through a systematic literature review conducted in January 2023, we evaluated 612 articles and analysed 75 academic papers in detail, originally published over 34 years between 1988 and 2022. This temporal boundary offers a stable benchmark for future comparative studies, providing context for understanding the impact of even newer and emerging technologies. *Findings:* Our findings reveal that the use of AI within PSFs has a profound impact, far beyond the initial economic or efficiency gains expected. We uncover five dominant themes within the literature, which include the motivations for using AI, challenges and limitations of AI, human–AI interaction, increasing ethical considerations, and the strategic implications for PSFs. *Originality/Value:* This paper offers a synthesised, systematic examination of AI in regulated PSFs, which is notably absent in the literature. We present a visual summary of the themes and overall findings, illustrating the complex interplay of AI within PSFs. We propose a research agenda of future research opportunities emerging from the research.

Keywords: Professional Services Firms (PSFs); Artificial Intelligence (AI); Systematic Literature Review (SLR).

1. Introduction

Artificial intelligence (AI) is profoundly transforming the skills required in the workforce (Calvino and Fontanelli, 2023), particularly disrupting the knowledge-based

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work (Makani and Marche, 2012) of Professional Services Firms (PSFs) because it forces firms to adapt to new ways of working through automating tasks, altering skill requirements, intensifying competition and changing client expectations (Billings and Campbell, 2020; Brooks *et al.*, 2020; Gravett, 2020; Bezuidenhout *et al.*, 2022). Today, AI is materially more viable and appealing for business (Collins *et al.*, 2021), due to reduced computation costs (Lee and Al-Hawamdeh, 2002), the surge in daily data created, widespread cloud adoption, advanced algorithms (Legg and Bell, 2019; Gravett, 2020), and increased computational power (Mariani *et al.*, 2023). Global AI investment reflects this, estimated at US\$207 billion in 2023, yet expected to increase nine-fold to US\$1.85 trillion by 2030 (NMSC, 2023). Recent advancements in Generative AI (GenAI), such as ChatGPT in late 2022 (OpenAI, 2023), Microsoft's Bing and Copilot (Mehdi, 2023a, 2023b), Google's Bard (Hsiao, 2023), and China's Baidu (Soo, 2023), have raised expectations of AI's global impact across several sectors.

PSFs are organisations that provide highly specialised knowledge-based services to clients in fields requiring advanced expertise, and unlike firms in manufacturing or retail, PSFs typically sell intellectual capital through professional advisory activities. The value offered by PSFs stems from their deep knowledge, problem-solving abilities, client-centric relationship orientation, and professional expertise in a specific domain (Von Nordenflycht *et al.*, 2015). Broadly, these firms operate in, but are not limited to, medical and health, tertiary education, law, accounting, management consulting, engineering, architecture, and IT consulting industries. Two prominent examples used as demonstrative examples of PSFs in this research are legal and accounting firms, also known as regulated or classical PSFs (Von Nordenflycht, 2010), with a global market valued at US\$1.62 trillion in 2024, comprising \$992 billion for legal services (Precedence Research, 2024), and \$627 billion for accounting services (IBISWorld, 2024). Through increased investment in AI (Bezuidenhout *et al.*, 2022) to increase margins, innovate services and improve efficiency (Pemer, 2021), PSFs are complicit in accelerating change. The significance of PSFs is understood through their influence on corporate decision-making, as these firms are vital economic participants (Suddaby *et al.*, 2008) and play critical roles in shaping business exchanges through setting regulatory standards, advising on financial and legal risks and opportunities, arbitrating disputes and framing business activity (Brock *et al.*, 2014). However, there is growing recognition that AI is transforming knowledge-based work (Makani and Marche, 2012), yet the consequences of these changes are not synthesised to present a holistic perspective. Existing studies often address specific aspects in isolation, failing to provide a comprehensive view of how AI affects these firms as a whole, and therefore, there is a lack of comprehensive synthesis that integrates these findings into a coherent narrative.

The unique characteristics of PSFs, such as their reliance on human expertise, professional standards, ethical obligations, client relationship centrality and

regulatory requirements (Von Nordenflycht *et al.*, 2015; Smets *et al.*, 2017), present broader challenges and opportunities that require exploration. By its nature, the SLR resolves the issue of fragmented research by consolidating diverse studies into a unified perspective to provide a cohesive, evidence-based understanding of AI's role in regulated PSFs, thus addressing a significant gap in the literature. Such a review will help identify patterns, dominant themes, and unresolved issues in the literature, offering clarity to scholars and practitioners. Specifically, this SLR seeks to answer the following research problem: *How is AI affecting PSFs, and what are the implications for future research?*

By synthesising existing research, this review aims to build a foundational framework for understanding AI's impact on regulated PSFs and guide future studies to address the most pressing and underexplored questions in the field.

Our research will address two key questions:

RQ1: What are the key themes and trends in academic literature at the intersection of AI and regulated PSFs?

RQ2: What are future research opportunities identified from the literature regarding the use of AI within PSFs?

Our contribution lies in the identification and synthesis of five broad themes that persist in the literature, which include context for AI's evolving role within PSFs, the challenges, risks and limitations faced by PSFs using AI, the impact of AI on day-to-day operational and business practices of firms, human–AI interaction and ethical considerations, and the strategic consequences and impact on business models of firms. In addition, the paper proposes a research agenda to explore new research opportunities in this dynamic field.

2. Research Context of Artificial Intelligence for PSFs

AI is maturing rapidly and is, therefore, a challenge to define (Alarie *et al.*, 2018). The issue, in terms of definition, lies with the “Intelligence” part of the concept rather than the “Artificial” component (Wang, 2019). The intelligence aspect of the term relates to “understanding, reasoning, and problem-solving” (Enholm *et al.*, 2022, p. 1712), the very qualities required of human professionals to deliver knowledge-based work in solving their clients' problems. Broadly, AI is “the theory and development of computer systems able to perform tasks normally requiring human intelligence” (Liu and Lin, 2020, p. 414). Yet, there are numerous definitions of AI, and Collins *et al.* (2021) confirm there is no consensus or a clear distinction between AI and other digital technologies. AI is comprised of numerous types of technology, including Machine Learning (ML), Natural Language Processing (NLP), Computer Vision (Image Analytics), Robotic Process Automation (RPA) and GenAI, for example. GenAI is a game-changer for firms, primarily due to its

content creation ability, setting it apart from traditional AI, which focuses on analysis, prediction, and automation (Kanbach *et al.*, 2024). GenAI generates original content like text, images, and videos on demand, offering creative solutions such as drafting articles, legal documents, customised marketing materials, new business proposals, and even composing music (Suh *et al.*, 2021; Murugesan and Cherukuri, 2023). For PSFs, GenAI can increase revenues, improve client communications, automate legal document creation, enhance research, support contract analysis, and personalise reports or marketing engagement with AI-driven chatbots while also reducing costs, driving innovation, and strengthening customer relationships (Deloitte, 2024). Firms encounter challenges in fully integrating AI, particularly related to risk, governance, and scalability, and therefore, tailored AI solutions are being developed, shifting from Large Language Models (LLMs) to Small Language Models (SLMs) designed for specific business needs, to apply AI more effectively and address targeted business challenges (Deloitte, 2024). To improve transparency, interpretability and accountability of AI, there is continuous development, for example, with the emergence of Explainable AI (XAI), which refers to AI systems designed to make their decision-making processes and predictions more transparent and understandable to humans (Ribeiro *et al.*, 2016). The objective of XAI is to create AI systems that perform well yet also allow users to understand, trust, and manage their outputs. This is particularly important in fields like law and accounting, where decisions made by AI can have significant consequences, and stakeholders need to be confident that these decisions are based on sound reasoning (Arrieta *et al.*, 2020). Due to the dynamic nature of these technologies, we view AI broadly as “intelligence exhibited by machines” (Huang and Rust, 2018, p. 155).

Regulated PSFs typically provide services to other businesses (Susskind and Susskind, 2015) and “are defined by their work”, namely “the application of specialist knowledge to creating customised solutions to client’s problems” (Empson *et al.*, 2015a, p. 6). For PSFs, AI is particularly disruptive for several reasons. First, the nature of work changes. There is a growing capacity for AI to automate non-routine work (Armour and Sako, 2020), and, importantly, knowledge-based work is susceptible to automation (Baker, 2018). AI’s capacity to perform tasks traditionally done by humans challenges the notion that only codifiable tasks are vulnerable to automation. Tackling unstructured data, AI now extends into generating unique ideas (Joosten *et al.*, 2024) and excels, even in emotionally charged domains like customer care (Huang and Rust, 2023). PSFs are therefore compelled to explore AI to re-evaluate the demand for specific services, the likely impact of revenue streams, and the change required of business models (Kronblad, 2020b) to retain a competitive advantage (Boone *et al.*, 2008; Perner, 2021). As work transforms, there are increased risks associated with an uncoordinated AI adoption process, which can lead to unintended consequences regarding explainability, privacy, the potential for reduced transparency and increased vulnerability to errors (Trincado-Munoz *et al.*, 2024).

Second, AI challenges the traditional value proposition of PSFs by shifting the focus from human expertise to AI-enhanced capabilities. For PSFs, people are the primary asset (Smets *et al.*, 2017), and this leads to a unique characteristic of PSFs known as knowledge intensity (Von Nordenflycht, 2010; Empson *et al.*, 2015a), where the knowledge and intellectual expertise of the firm reside within the human workforce as the firm's bedrock of value creation (Kronblad *et al.*, 2023). However, as firms invest in advanced AI technologies (Bezuidenhout *et al.*, 2022), the knowledge intensity currently residing in the professional workforce changes when knowledge is codified (Smets *et al.*, 2017). Knowledge is moving from the professional towards a "computer-centred, data-driven business model" (Fielt *et al.*, 2018, p. 1) or data-intensity (Bezuidenhout *et al.*, 2022) or "human-technology nexus" (Keating *et al.*, 2018, p. 767) and human-robot teams (Pemer, 2021). Therefore, as AI systems deliver more services, the skills required within PSFs shift towards higher-level strategic thinking, creativity, and AI management. This disrupts traditional career paths and business models and requires significant upskilling of staff (Armour and Sako, 2020; Sampson, 2021). Firms may be required to redefine their value to clients, blending AI-driven insights with human judgment and relationship-building.

Third, the nature of client engagement and client relationships change. The professional's knowledge of their clients is inherent in the knowledge attribute of PSFs, and firms are traditionally relationship marketing orientated, favouring face-to-face engagement to uncover the scope of complicated works (Amonini *et al.*, 2010). Where AI is used to increase efficiency and potentially reduce costs, personable relationships may be impaired when AI begins to augment tasks, negating the interpersonal contact of the human workforce (Goodman, 2019). Furthermore, client expectations may change as clients expect quicker, data-driven insights, and therefore, PSFs must adapt to these evolving expectations. As a result, there is consideration for AI augmenting rather than replacing human intelligence, particularly in enhancing empathetic competence within PSFs (Bévort *et al.*, 2024).

Fourth, AI introduces new technology providers to the market with specialised AI-driven services, challenging the dominance of traditional PSFs and delivering services through innovative digital business models (Pemer *et al.*, 2024). New entrants can offer niche services at lower costs, intensifying competition, yet do not currently need to comply with the exact professional governance requirements of PSFs. The professional identity within PSFs, also known as a professionalised workforce (Løwendahl, 1992; Greenwood, 2006; Von Nordenflycht, 2010; Smets *et al.*, 2017) or "professional ideology" (Von Nordenflycht *et al.*, 2015, p. 11), is determined through formal accreditation and continuous education (Empson *et al.*, 2015a), imposing barriers to entry for non-professionals (Greenwood, 2006; Von Nordenflycht *et al.*, 2015). Therefore, should non-accredited technology providers deliver services directly to clients of PSFs without professional accreditation, this raises concerns about the unlawful practices of technology providers (Webb, 2020).

Last, using AI within PSFs may impact societal expectations, particularly as these firms have societal responsibilities. For instance, legal services firms are expected to facilitate access to justice, yet the adoption of AI in tasks like legal research or document review may raise concerns about fairness, transparency, and the potential for bias in AI-driven decisions (London and Schreiber, 2020). Similarly, in accounting firms, which play a crucial role in ensuring financial governance, the use of AI in automating audits or financial reporting could lead to questions about the accuracy and reliability of AI-generated results, especially in cases of complex financial regulations where human judgment has traditionally been crucial (Alderman, 2019; Alles *et al.*, 2022; Goto, 2023). Exploring these firms and the changes specific to the context of PSF, as noted above, is essential because of AI's potential to substitute or digitise human intelligence (Pemer, 2021; Spring *et al.*, 2022) in knowledge-reliant sectors that are currently extremely reliant on human expertise (Makani and Marche, 2012).

3. Research Method

3.1. Qualitative systematic literature review

To explore literature at the nexus of AI within PSFs, a Systematic Literature Review (SLR) was conducted “to assess the collective evidence in a particular area of business research” (Snyder, 2019, p. 333) and uncover “the *status quo*” of the literature (Kraus *et al.*, 2023, p. 1025), allowing for RQ1 to be addressed. An SLR also identifies future research priorities, addressing RQ2 (Mariani *et al.*, 2023). An SLR is “a systematic, explicit, and reproducible method for identifying, evaluating, and synthesising the existing body of completed and recorded work” (Fink, 2019, p. 6) to deliver “unbiased scientific study” (Collins *et al.*, 2021, p. 3), by digesting volumes of research (Okoli, 2015; Fink, 2019). Biases are minimised through explicit search criteria, ensuring objective selection (Snyder, 2019). For example, during the initial data extraction phase, our search uncovered academic papers published between 1981 and 2022. This date range reflects the natural output of our systematic search and was not chosen arbitrarily. The range of years is determined by the relevance and availability of studies that meet our inclusion criteria. After completing the quality appraisal stage (discussed in detail below), which involved rigorous evaluation based on predefined criteria, the applicable papers ranged from 1988. The start year of 1988 was not subjectively selected; rather, it emerged from the rigorous process of filtering out papers that did not meet the required quality criteria. Therefore, the date range of included papers is a direct result of the scientific rigour applied throughout the SLR process.

To extract our results, we adopted thematic analysis (Braun and Clarke, 2019), and therefore, given the qualitative nature of this approach, we applied a structured systematic review process to collect data, then a qualitative approach was used to assess the journal articles, known as a “qualitative systematic review”

(Snyder, 2019, p. 334). As with all thematic analysis, subjectivity is inherent in the process and a valuable source of researcher context and knowledge; therefore, biases are unavoidable and, in fact, not sensible to eliminate (Braun and Clarke, 2021). The research follows Okoli's (2015) approach to conducting an SLR, informed by Collins *et al.* (2021), to improve rigour, as illustrated in Fig. 1.

3.2. Step 1: Purpose of the research

The purpose of this research is to understand and coherently present the historical academic debate on AI and regulated PSFs, systematically analysing and synthesising themes in the literature to answer RQ1 and RQ2 as listed above.

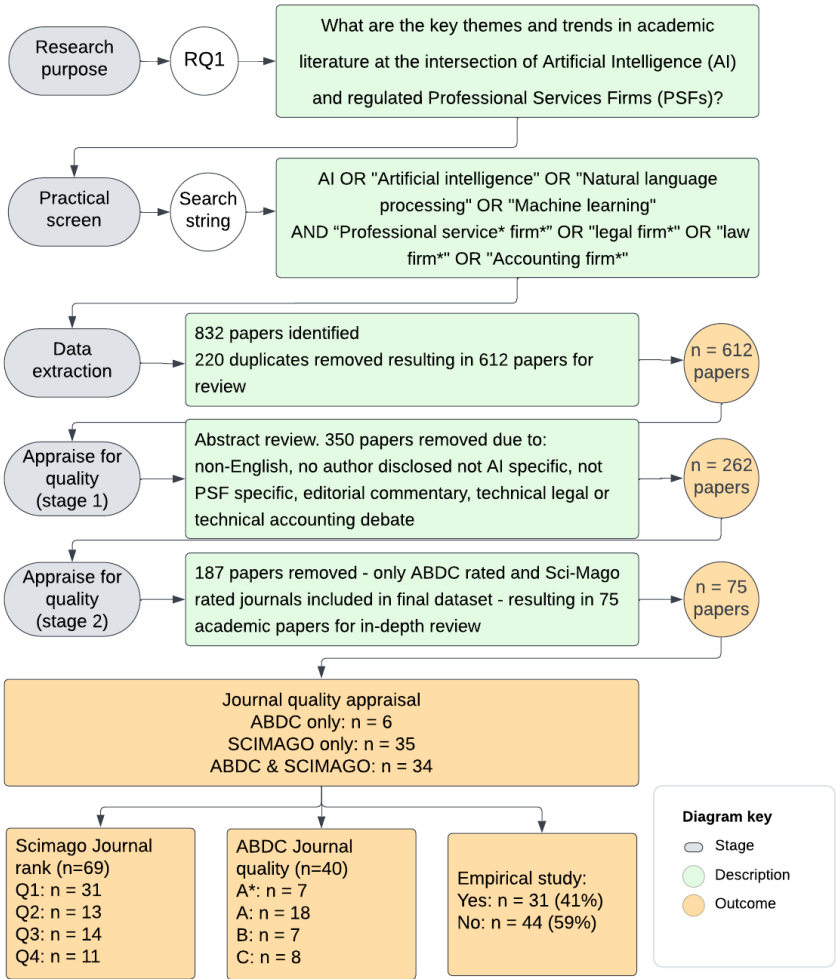


Fig. 1. Illustration of the SLR process adopted.

3.3. Step 2: Draft protocol and train the team

As there was only one reviewer, this step was not required (Okoli, 2015). Instead, deep planning and collaboration within the research team ensured alignment with the research questions and objectives. Such a team-based approach encourages diverse perspectives within a research team to enrich the analysis process (Saldana, 2014). By combining the different thinking styles and background specialities that individuals bring to research, teams can better identify the differences and complexities, which generates better analysis as a variety of insights from the research group emerge rather than relying on individual reflection (Saldana, 2014).

3.4. Step 3: Apply practical screen (or screening for inclusion)

Search terms were developed to meet “criteria-based selection” (Collins and Fauser, 2005, p. 103), based on the research questions stated above. A Boolean search term was created to identify relevant literature, as follows:

Search terms:
AI OR “Artificial intelligence” OR “Natural language processing” OR “Machine learning”
AND “Professional service* firm*” OR “legal firm*” OR “law firm*” OR “Accounting firm*”

To apply rigour to the approach, the search term includes synonyms (Collins et al., 2021); for example, the first line identifies AI-specific content, and therefore, “AI”, “Artificial intelligence”, as well as derivative forms of AI, such as “Natural language processing” and “Machine learning”, are included. ML and NLP are used interchangeably regarding AI (Beaney et al., 2019; Goodman, 2019; Rao and Verweij, 2019; Collins et al., 2021), and there is evidence of a “machine learning wave” in PSFs (Rodgers et al., 2023, p. 299). Other types of AI, such as RPA, GenAI, or Image Analytics, were not searched for individually as they are inherently discussed within the papers researched, as noted below in Table 2. The second string of the search term targets literature relevant to regulated PSFs, specifying “accounting firm*,” “law firm*,” or “legal firm*”.

3.5. Step 4: Search for literature

Using the university’s online library, 831 papers were identified. However, 219 duplicate papers were removed, resulting in 612 scholarly articles published between 1981 and 2022. The search results were imported into Excel for initial review, and the title and abstract were studied to confirm their relevance to the research objectives.

3.6. Step 5: Extract data

The 612 papers were imported into Endnote to maintain an academic record of the results. Descriptive attributes were captured for additional analysis, including author(s), year of publication, title, journal, publisher, type of journal, independent

quality indicator, keywords, abstract, empirical research (y/n), database, language, review decision, and the final reason for inclusion or exclusion.

3.7. Step 6: Appraise for quality

The quality appraisal, known as “screening for exclusion” (Okoli, 2015, p. 42), excluded editorials, books, and book chapters to focus on academic journals. The appraisal occurred in two stages, ensuring only peer-reviewed journals were included.

Stage 1 — The abstract and keywords of the 612 papers were assessed to determine if the results were appropriate to regulated PSFs and the domain of AI. Approximately half the papers (350 papers or 57%) were irrelevant to the research objectives and excluded (Collins and Fauser, 2005, p. 103), where the paper did not apply to PSFs but to other industries (19%), the issue discussed is a technical accounting or technical legal debate (17%), the technology is not AI specific (8%), the paper is editorial commentary or does not disclose the authors (7%), and the paper is not an academic article (6%). After stage 1 of the quality appraisal, 262 papers remained relevant.

Stage 2 — To capture highly regarded peer-reviewed scholarship, as adopted by Petrescu *et al.* (2022) in exploring AI innovation in B2B marketing, only journals ranked in the Australian Business Deans Council list (ABDC, 2021) or Scimago (Scimago, 2022) were selected. Of the 262 papers, 187 were published in unranked journals. Therefore, the final scope of the study comprises 75 papers published across 60 interdisciplinary journals. The journals are listed in Appendix A, and a summary of the journal domain and whether the study is empirical or not is provided below in Table 1.

Table 1. Journal type and empirical research papers identified from the SLR.

Type of journal	Count of papers (<i>n</i> = 75)		
	Empirical (No/Yes)		Total
	No	Yes	
Accounting	0%	4%	4%
Business/Management	5%	5%	11%
Economics	0%	1%	1%
Engineering	1%	3%	4%
Human Resources	1%	1%	3%
Information Systems	3%	3%	5%
Legal	40%	12%	52%
Professional Services	1%	0%	1%
Sciences	0%	1%	1%
Services	1%	4%	5%
Technology	5%	7%	12%
Total	59%	41%	100%

Interestingly, legal journals produced half of the papers ($n=39$ or 52%), yet 77% of the legal-focused papers are not empirically developed, revealing a potential gap in the extant literature. In contrast, most papers from other disciplines in accounting, economics, engineering, pure sciences, and services journals present empirical findings.

3.8. Step 7: Execution

The Execution step includes an analysis of findings and a written review of the 75 papers identified in the SLR. Both steps are discussed in Sec. 4. The primary analysis was completed using NVivo, a Qualitative Data Analysis Software (QDAS), to identify and code themes, allowing for qualitative insights and a quantitative assessment of the frequency of themes. NVivo aids researchers in analysing large volumes of texts, allowing them to create links, visualise connections, and identify gaps in the literature (O'Neill et al., 2018). For example, to uncover the content, as well as the quantitative analysis for the impact of AI on marketing practices, numerous terms relevant to marketing were searched for across the dataset, such as CRM or client relationship management, marketing, branding, promotion, pricing or billing and client relationships. In addition, papers were manually coded to these coded terms (known as Nodes in NVivo), as each was read to develop the thematic analysis. A significant advantage of NVivo is that journal articles can be directly imported from reference management software (such as Endnote), and it automatically retains bibliographical information, such as the name of the journal, the author, and the date of publication, allowing for comprehensive cross coding queries, where the thematic codes can be assessed against this metadata (O'Neill et al., 2018).

Therefore, when we discuss our findings, we can also present a quantitative perspective, providing a measure of the frequency at which a specific code is identified across the data.

3.9. Step 8: Write the review

The final step, confirmed by Okoli (2015), is the written review, which follows, providing insights from the extant literature (Collins and Fauser, 2005).

4. Findings and Discussion: Key Themes and Trends

The findings and discussion sections are combined, as encouraged by Braun and Glina (2006), who discuss how qualitative research benefits from combining the findings and discussion because thematic analysis requires immediate interpretation of the data within the context of the identified themes. Furthermore, Nowell et al. (2017) also confirm such an approach when presenting thematic analysis, as the interpretation is closely linked with the descriptive data, making a combined approach more practical and effective to allow for nuanced interpretation of the data.

4.1. *Type of firm*

All journal articles mention the types of firms being debated. Therefore, as foundational context for the balance of the thematic study, it is important to know if the findings that follow apply to different types of firms. Within the final literature ($n=75$), through assessing the abstract, we identify that accounting or auditing firms are discussed in 24% of the papers ($n=18$), legal firms are discussed in 63% of the papers ($n=47$), and both legal and accounting firms (which we call PSFs) are discussed in 13% of the papers ($n=10$). Therefore, it is essential to understand if the findings are relevant across these different types of firms or if some results might be more applicable to the legal or accounting sector. Therefore, a correlation analysis was conducted across the data to test if the key findings revealed below are indeed applicable and relevant to both legal and accounting firms. This information is presented as foundational context before the findings are revealed so that the results can be understood with the correlation analysis in mind.

The correlation analysis reveals a strong positive correlation between the accounting and legal sectors, with a correlation coefficient of 0.754. The correlation between accounting and PSFs is also strong and positive, with a coefficient of 0.744. Finally, the correlation between the legal and PSFs is strong and positive, with a coefficient of 0.760. Given the attributes of legal and accounting firms are homogenous, as confirmed in the defining commentary, both legal and accounting firms face similar consequences. For instance, both types of firm value building personal relationships with clients, often engaging in face-to-face discussions to unpack complex issues. Both are characterised by deep knowledge intensity within their respective specialisations. Both are currently labour-intensive, where people are considered the firm's primary asset. Therefore, this correlation analysis confirms that the findings discussed below apply to both legal and accounting firms, as these firms face similar challenges and have similar ethical, strategic and risk constraints.

4.2. *Primary themes*

In addressing RQ1, which is: What are the key themes and trends in academic literature at the intersection of AI and regulated PSFs?, we identify several themes, as follows: First, AI's evolving role in the context of PSFs, which includes the temporal maturity of AI, various types of AI identified, numerous and potential confusing definitions of AI and motivations for PSFs to use AI. Second, the challenges and limitations of AI for PSFs include practical limitations and database errors and biases. Third, we identify AI issues in the day-to-day business context of firm operations, including an impact on pricing models, transforming marketing and promotion activity, changing client relationships, and productivity. Fourth, a key theme relates to human and AI interaction, including discussion on labour replacement, task augmentation, and professionalism and ethical considerations. Fifth, we identify a theme related to the strategic impact for firms and the impact on business models. These findings form the basis of an integrated illustration

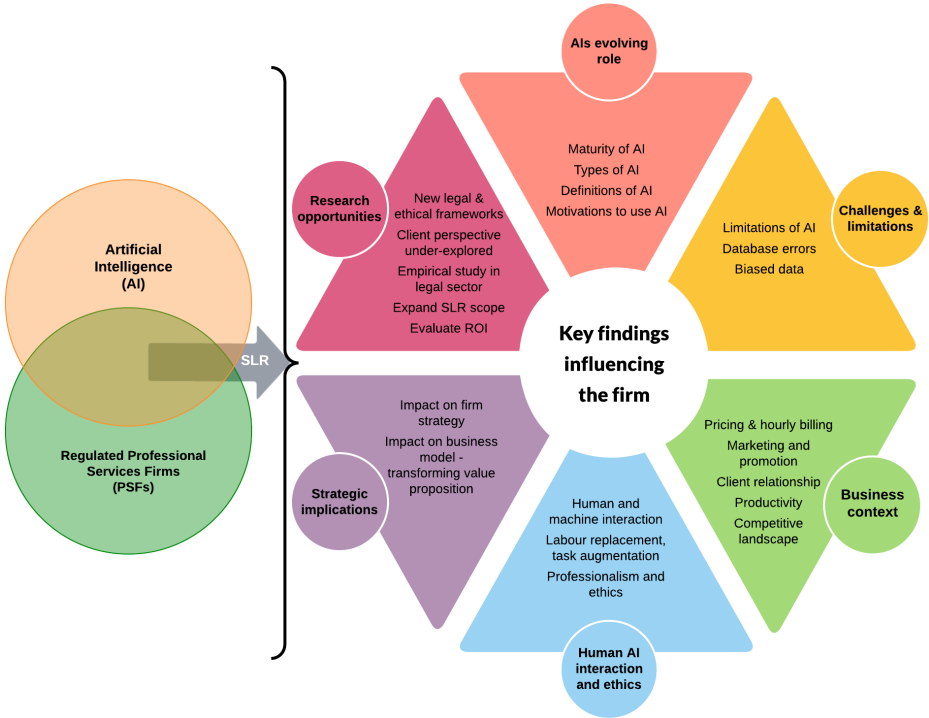


Fig. 2. AI in PSFs: Key insights from a qualitative systematic review.

(Fig. 2), revealing a material contribution that AI has a deeper impact on firms than initially considered, with numerous issues and business functions likely to be impacted, individually and collectively, which is a challenge for PSFs. Each primary theme is discussed next.

4.2.1. *AI's evolving role: definitions, technologies, and motivations to use AI in PSFs*

4.2.1.1. *Temporality — Maturity of AI*

Reviewing publications over time indicates a shift in the emphasis of AI and PSF research. For example, in the late 1980's and early 1990's, early forms of AI were discussed, such as expert systems (Abdolmohammadi and Bazaz, 1991; Brown, 1991; Chase and Shim, 1991; Denna *et al.*, 1991; O'Leary, 1991; Malone, 1993). The term "algorithm" was first used in 1991 (Denna *et al.*, 1991), then in 1993 (Malone, 1993), and then frequently only from the mid-2010s (Harbert, 2013; Remus, 2013; Simpson, 2016). Near the end of the 2010's the debate was still around understanding and justifying the use of AI in PSFs, with papers discussing how AI might impact services, professional roles and professional education (Socha, 2017; Tredinnick, 2017; Alarie *et al.*, 2018; Reid, 2018). Contemporary AI terms, such as "Big data", "Predictive analytics", "Machine learning", "Supervised learning" and

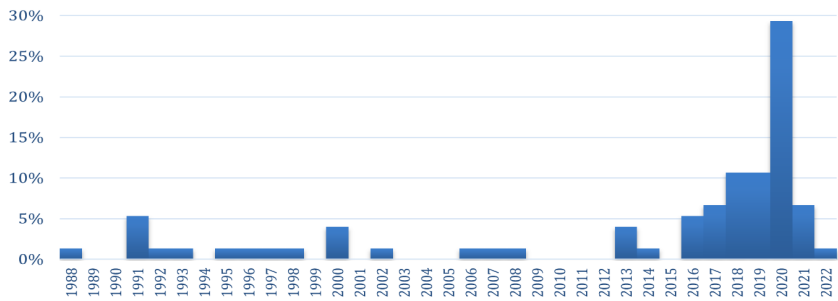


Fig. 3. Frequency of academic paper publication over time ($n=75$).

“Speech recognition”, first appeared in the literature in 2013, with “chatbot” only appearing in 2017. In the early 2020s, there is an increase in techno-terms, such as “robot-lawyer” (Xu and Wang, 2019) or “robo-advisors” (Condon, 2020; Gravett, 2020; Bakarich and O’Brien, 2021; Wexler and Oberlander, 2021) and importantly, “ethics” is firmly on the agenda (Davis, 2020; Munoko *et al.*, 2020; Shope, 2021). In 2020, almost 30% ($n=23$) of the reviewed papers were published, indicating a spike in academic interest and confirming that AI is a hot topic (see Fig. 3). However, there is also an alarmist tone to publications in 2020, such as “Humanity is doomed” (London and Schreiber, 2020, p. 97) or “under threat” (Kronblad, 2020a, p. 1), that AI is causing “explosive labour market disruptions”, “reshaping” the sector and resulting in the need for “re-training” (Shaffer *et al.*, 2020, p. 41). Furthermore, papers published in 2020 warned of “transformation”, “pressure” (Brooks *et al.*, 2020, p. 135), “disruption” (Billings and Campbell, 2020; Campbell, 2020; Webb, 2020), and dramatically, even “death” (Hunter, 2020, p. 1199).

4.2.1.2. Types of AI identified

Numerous terms are used to discuss AI, often interchangeably, confirming AI is a nebulous concept (see Table 3). Table 2 provides the frequency of various AI types. Given the study was conducted in January 2023, GenAI is not discussed in the papers we assessed.

4.2.1.3. Literature definitions of artificial intelligence

AI is defined within 49% of the papers ($n=37$ papers), and the consensus aligns with the literature that a definition is important, yet due to the dynamic nature of AI, definitions change as technology matures. Some authors cite the 1956 founding definition originally coined by Professor John McCarthy as “the science and engineering of making intelligent machines, especially intelligent computer programs” (Rajaraman, 2014, p. 206), yet such a definition is broad and potentially irrelevant, as indeed the wave of GenAI and other applications described above already proves. As such, a definition is an academic issue and potentially confusing for PSFs, as seen from the numerous examples provided in Table 3.

Table 2. Different AI types and technologies discussed in the extant literature, as well as frequency of occurrence (using NVivo to code literature).

AI search term	Number of papers	Frequency of discussion
AI OR Artificial Intelligence	67	89%
Algorithm	48	64%
Machine Learning	47	63%
Natural Language Processing	33	44%
Image Recognition	24	32%
Expert Systems	19	25%
Predictive Analytics	19	25%
Emotion Recognition	17	23%
Autonomous Vehicles	14	19%
Speech Recognition	11	15%
Reinforcement Learning	8	11%
Robotic Process Automation	5	7%

Table 3. AI-related terms and definitions in academic literature.

AI or Artificial Intelligence definitions provided	Reference
“ AI is an umbrella term for machines capable of perception, logic, and learning . In other words, AI allows computers ‘to do things that normally require human intelligence.’ Therefore, as AI programs are fed data and then access the data, they learn from each experience and can improve upon their accuracy and efficiency every time they are utilized”.	Reid (2018)
AI is “systems that think and act like humans or that are capable of unsupervised learning”. Another definition is simply “technologies that use computers and software to create intelligent, human-like behavior”. A third recognizes that AI, cognitive computing, and machine learning are “generally interchangeable terms that all refer to how computers learn from data and adapt with experience to perform tasks”. In summary, “AI covers a gamut of technologies from simple software to sentient robots, and everything in between, and unavoidably includes both algorithms and data”.	Goodman (2019)
“It has long been a daunting task for scientists and engineers to capture what AI is”, and “an operative definition of AI still eludes many other countries when contemplating their new laws or policies”.	Liu and Lin (2020)
“Most [definitions] seem to share the view that the concept of AI is a generic one encompassing various technologies-algorithms, big data, expert systems, machine learning, deep learning or robotics”.	
“Artificial intelligence” is the “theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages”.	
“AI roughly refers to man-made systems with a certain degree of capacity to learn and apply knowledge”.	
“Science and engineering of making intelligent machines”.	

(Continued)

Table 3. (Continued)

AI or Artificial Intelligence definitions provided	Reference
“Artificial intelligence is a general term that currently refers to a cluster of technologies and approaches to computing focussed on the ability of computers to make flexible rational decisions in response to often unpredictable environmental conditions”.	Tredinnick (2017)
“Artificial intelligence is the simulation of human intelligence processes by computer systems and other machines. These processes include machine learning (essentially the acquisition of data and rules for using the data), reasoning and use of the rules to reach conclusions, as well as an element of self-correction”.	Chan (2017)
“Recognising that ‘AI’ may denote widely different systems and models, we use the term here loosely to refer to the collection of computational methods which are being used in the practice of law”.	Legg and Bell (2019)
“Coined in the 1950s, ‘artificial intelligence’ is a unifying term for various technologies (including robotics, speech and vision functions, machine learning and expert systems), but there is no clear consensus on a precise definition”.	
“McCarthy coined the term ‘AI’ in the mid-1950s, referring to it as the science and engineering of making intelligent machines, especially intelligent computer programs”.	Brooks <i>et al.</i> (2020)
“AI is a somewhat nebulous branch within computer science that seeks to build machines capable of what humans would regard as ‘intelligent’ behaviour, yet what ‘intelligent’ means exactly in this context is still up for debate”.	
“Artificial intelligence (AI) is defined as synthetic intelligence or computer system intelligence that simulates intellectual functions”.	Shaffer <i>et al.</i> (2020)
“Although we recognize that there is a lot of debate about what AI is and is not, we defer to the definition from the Future of Artificial Intelligence Act of 2017 (H.R. 4625) that AI is any artificial system that performs tasks under varying and unpredictable circumstances, without significant human oversight, or that can learn from their experience and improve their performance... They may solve tasks requiring human-like perception, cognition, planning, learning, communication, or physical action”.	Makridis and Mishra (2022)
“AI has been defined as the ability of machines to execute tasks and solve problems in ways normally attributed to humans”.	Simshaw (2018)
“AI involves the use of computer systems to perform tasks normally requiring human intelligence”.	Armour and Sako (2020)

4.2.1.4. Motivations to use AI

The motivation to use AI is discussed within 56% ($n=42$) of the literature, and several terms are used to describe the “use” of AI, such as: AI application (Armour and Sako, 2020), AI-powered techniques (Katyal and Kesari, 2020), automation (Hanson, 2002; Issa *et al.*, 2016; Makridis and Mishra, 2022), AI deployment (Armour *et al.*, 2021), digital transformation (Nissan, 2018), digital

or digitalised or digitalisation (Kronblad, 2020c; Webb, 2020; Perner, 2021), disruptive innovation or disruptive technology (Mountain, 2007; Issa *et al.*, 2016; Sourdin, 2018), embraces technology (Campbell, 2020), incorporating AI (Legg and Bell, 2019; Janoski-Haehlen and Starnes, 2020; Bakarich and O'Brien, 2021), AI implementation (Kluttz and Mulligan, 2019; Armour *et al.*, 2021; Bakarich and O'Brien, 2021), AI integration (Norton, 2020), interaction (Legg and Bell, 2019), robots (Harris, 1992), systematise (Kronblad, 2020c), technology adoption (Gottschalk, 2000; Billings and Campbell, 2020), transformation (Davis, 2020; Kronblad, 2020c; Bakarich and O'Brien, 2021), utilisation (Bakarich and O'Brien, 2021), and creatively, the "Google-ization" of PSF data (Knapp and Willey, 2016, p. 124).

Profitability, as a motivation, is discussed in 56% ($n=42$) of the papers, often within the context of the traditional hourly billing model, where AI is seen as a tool to increase billable hours on advisory work. However, a quantifiable return on the investment is only discussed in vague terms, such as an improvement in $x\%$ or a reduction in x time. Descriptive examples include: "AI is not just about profits, it is about power" (London and Schreiber, 2020, p. 102) and "Profit in the legal operations model is captured by enhancing efficiency with key assets in project and process management" (Armour and Sako, 2020, p. 33). Other statements like "a certain percentage of their profit [is] recurring revenue on licensing" (Nissan, 2018, p. 205) and "innovative practices are not only possible but profitable" (Kronblad, 2020a, p. 13) illustrate the potential benefits without quantifying them. Investments in AI technologies have increased substantially (Liu and Lin, 2020), yet the literature often omits details about the monetary or time investments required, making it challenging to assess the materiality of improvements. Understandably, the information is confidential to the firm, but its absence highlights an omission in the literature and a need for further research (Table 4).

4.2.2. Challenges and limitations of AI use for PSFs

Challenges and limitations in the literature are discussed more frequently than the motivations to use AI, as PSFs are considered risk-averse (Ferguson, 1996; Fielt *et al.*, 2018; Franck, 2018). Motivations are mentioned across half of the papers; however, challenges, risks, and limitations are discussed within 85% ($n=64$), including the practical limitations of AI and the risk of database errors and data biases. The use of AI by PSFs has considerable advantages; however, there is the risk of failure (Liker and Sindi, 1997).

4.2.2.1. Practical limitations of AI

Limitations of AI are frequently discussed in the literature, as AI is a maturing technology, not fully developed (Davis, 2020; Bakarich and O'Brien, 2021). There are shortcomings in "creative intelligence" (Armour *et al.*, 2021, p. 67) to support

Table 4. Summary of motivations for PSF to use AI, ranked by frequency.

Motivations to use AI	References	Number of papers
Allows for streamlining client acceptance procedures	Reid (2018).	1 (1%)
Increases competitive advantage	Alles and Gray (2020), Boone <i>et al.</i> (2008), Legg and Bell (2019) and Shaffer <i>et al.</i> (2020).	4 (5%)
Improves the technology skills of professionals and career prospects	Alles and Gray (2020), du Plessis and du Toit (2006), Issa <i>et al.</i> (2016), Knapp and Willey (2016), Liker and Sindi (1997) and Simpson (2016).	6 (8%)
Reduces labour intensity	Armour and Sako (2020), Hunter (2020), Kronblad (2020a), Liker and Sindi (1997), Nissan (2018), Sampson (2021), Simpson (2016) and Sourdin (2018).	8 (11%)
Eliminates repetitive menial tasks and saves time	Brooks <i>et al.</i> (2020), Campbell (2020), Klemens (1988), Legg and Bell (2019), London and Schreiber (2020), Munoko <i>et al.</i> (2020), Reid (2018), Sawhney (2016) and The Economist (2018).	9 (12%)
Results in organisational transformation	Alles and Gray (2020), Armour <i>et al.</i> (2021), Armour and Sako (2020), Brooks <i>et al.</i> (2020); Campbell (2020), Goodman (2019), Kronblad (2020a, 2020c), Sawhney (2016) and Webb (2020).	10 (13%)
Improves quality and transparency and reduces bias	Abdolmohammadi and Bazaz (1991), Alarie <i>et al.</i> (2018), Armour and Sako (2020), Chase and Shim (1991), Goodman (2019), Harris (1992), Ionescu (2019), Issa <i>et al.</i> (2016), Klemens (1988), Kluttz and Mulligan (2019), Kronblad (2020a), London and Schreiber (2020), Makridis and Mishra (2022), Munoko <i>et al.</i> (2020), Pickard <i>et al.</i> (2013), Sawhney (2016) and Steponenaite and Valcke (2020).	17 (23%)
Improves value to clients through additional advisory or consulting services and demonstrates innovation	Alarie <i>et al.</i> (2018), Brooks <i>et al.</i> (2020), Campbell (2020), Ionescu (2019), Klemens (1988), Kronblad (2020a, 2020c), Legg and Bell (2019), Munoko <i>et al.</i> (2020), Nelson (2000), Nissan (2018), O’Leary (1998), Reid (2018), Sampson (2021), The Economist (2018), Thomson <i>et al.</i> (2000) and Webb (2020).	17 (23%)
Reduces costs or increases profitability	Alarie <i>et al.</i> (2016, 2018), Armour and Sako (2020), Bakarich and O’Brien (2021), Brooks <i>et al.</i> (2020), Campbell (2020), Chase and Shim (1991), Klemens (1988), Kluttz and Mulligan (2019), Knapp and Willey (2016), Mountain (2007), Munoko <i>et al.</i> (2020), O’Leary (1998), Pickard <i>et al.</i> (2013), Reid (2018), Remus (2013), Sawhney (2016), Sourdin (2018), Steponenaite and Valcke (2020) and The Economist (2018).	20 (27%)
Increases productivity or efficiency to scale up service delivery	Abdolmohammadi and Bazaz (1991), Alarie <i>et al.</i> (2016, 2018), Armour and Sako (2020), Bakarich and O’Brien (2021), Brooks <i>et al.</i> (2020), Campbell (2020), Denna <i>et al.</i> (1991), Goodman (2019), Hanson (2002), Hunter (2020), Katyal and Kesari (2020), Kluttz and Mulligan (2019), Kronblad (2020a) Legg and Bell (2019), London and Schreiber (2020), Makridis and Mishra (2022), Munoko <i>et al.</i> (2020), Nissan (2018), Remus (2013), Sampson (2021), Sawhney (2016), Shaffer <i>et al.</i> (2020), Simpson (2016) and Sourdin (2018).	25 (33%)

“strategy, creativity, judgment and empathy” (Gravett, 2020, p. 24), as well as “evaluation and flair” (Simpson, 2016, p. 51) as these cannot yet be automated. There are limitations of AI understanding natural language (Baker, 2018), and PSFs are advised to be cautious (Remus, 2013) because AI may lack intuition, conversational semantics, cultural interpretations (Pickard *et al.*, 2013), grammatical (Knapp and Willey, 2016) and contextual insights (Sourdin, 2018). Given the nature of the work of PSFs in communicating advice, this poses a significant risk for client retention and the achievement of professional standards when human professionals do not vet AI-generated output. ML, which uses pattern recognition to present a recommendation, features within 63% ($n=47$) of papers, and the literature confirms that there are challenges with automated text mining (Sailaja *et al.*, 2022) and it is unsuitable for new, bespoke, and complex scenarios requiring flexibility or creativity and where historical data is not predictive of a future scenario (Surden, 2014; Tredinnick, 2017; Baker, 2018; Legg and Bell, 2019; Armour and Sako, 2020; Armour *et al.*, 2021). AI is ineffective when data is insufficient or undocumented (Surden, 2014; Issa *et al.*, 2016; Simshaw, 2018); therefore, data correlations and predictions cannot occur (Delacroix, 2018). This limitation of access to big data is exacerbated as professionals have a duty to safeguard confidential client data (Issa *et al.*, 2016), and therefore, using client data in AI systems may be an infringement in terms of Privacy Act regulations, particularly if data is processed in foreign sovereign jurisdictions. AI remains undeveloped in legal case planning, strategy development (Goodman, 2019), social client-facing settings (Armour and Sako, 2020), and where empathy is required (Delacroix, 2018). The lack of transparency in algorithmic outputs (known as a black box) prevents professionals from explaining or justifying recommendations (Knapp and Willey, 2016; Ashley, 2019; London and Schreiber, 2020; Steponenaite and Valcke, 2020; Yu, 2020). Emerging technologies, like XAI, may reduce this risk (Ribeiro *et al.*, 2016; Arrieta *et al.*, 2020). AI is currently unable to transfer learnings from one domain to another (Armour and Sako, 2020) and, therefore, cannot replicate a range of human capabilities (Simshaw, 2018). For example, an AI tool used to improve an audit process, or a legal research project could not be applied to anything else. In contrast, humans can interpret, transferring their skills, experience, and intuition across different scenarios.

Last, firms with insufficient capital (Mountain, 2007) struggle with the significant investment costs for AI technology, including ongoing development (Klemens, 1988; Armour *et al.*, 2021), integration costs with legacy systems (La Roque-Doherty, 2019), user training, testing, cybersecurity, and user adoption costs (Harris, 1992; Reid, 2018; Brooks *et al.*, 2020; Shaffer *et al.*, 2020; Steponenaite and Valcke, 2020; Webb, 2020). Substantial time is required for purchase, setup, and business model adjustments to leverage AI’s potential (Klemens, 1988; Rhim and Park, 2019), as sceptical professionals need time to overcome psychological hurdles to improve user engagement (Norton, 2020). Indeed, PSFs have failed by rushing the adoption process, not allowing enough time to test and integrate AI into their business processes (Birkinshaw and Lancefield, 2023).

4.2.2.2. Risk of database errors and data biases

The output of an AI tool depends on its training database. Without data, there is no AI, and a significant risk, noted in 51% ($n=38$) of the literature, is database errors and biases (Armour and Sako, 2020). These include sexism, racism, cultural stereotypes, language biases, age discrimination, database design biases (Shope, 2021), algorithmic biases (Norton, 2020; Yu, 2020) and gender stereotypes, which generate biased results (Liu and Lin, 2020), affecting professionals' judgment relying on AI output (Hanson, 2002; Remus, 2013; Baker, 2018; Reid, 2018; Simshaw, 2018; Goodman, 2019; Rhim and Park, 2019; Munoko *et al.*, 2020; Steponenaite and Valcke, 2020; Yu, 2020). Biases can develop unintentionally, as "human categorisation can be flawed by biases", and may be magnified by algorithms at scale (London and Schreiber, 2020). Professionals, being humans, are susceptible to biases affecting data categorisation (Kokina and Davenport, 2017; Alarie *et al.*, 2018; Gravett, 2020). Errors may still occur even with unbiased data when language is ambiguous (Liu and Quan, 2022), algorithmic criteria change (Kluttz and Mulligan, 2019), and when data is poorly structured (Kokina and Davenport, 2017; Katyal and Kesari, 2020). Furthermore, integrating other databases, such as practice management systems, marketing, CRM systems and client information datasets, may also lead to errors if databases are not efficiently integrated or do not have aligned taxonomies (O'Leary, 1998; Nelson, 2000; Hanson, 2002; du Plessis and du Toit, 2006). Correcting biased data requires increased investment, even larger datasets (Simshaw, 2018) of more "good" data, and increased auditing of algorithms (Goodman, 2019, p. 177). The impact on firms is significant; any initial efficiency advantage is lost, client engagements need to be reworked, and firms could face litigation where "reliance on, or delegation to AI systems" occurs incorrectly (Giuffrida, 2019, p. 440). Therefore, the firms' reputation is at stake if professionals rely on AI outputs from biased data (Flood and Robb, 2019; Perner and Skjølsvik, 2019). Furthermore, who takes responsibility, given numerous parties develop AI software, including: "AI developers; algorithm trainers; data collectors, controllers, [data] processors; manufacturers of the devices incorporating the AI software; [or] owners of the software" (Giuffrida, 2019, p. 87)?

4.2.3. AI in the business context of PSFs

The literature reveals several issues that impact the day-to-day business operations of firms, including a predicted consequence on pricing and hourly billing practices, how marketing and promotions are being revolutionised, changing client relationships, the influence on firm strategy, productivity, and the competitiveness of the firm.

4.2.3.1. Pricing and hourly billing

AI significantly influences the traditional hourly billing model of firms, discussed in 39% ($n=29$) of the literature. Traditionally, PSFs have focused solely on the

time that knowledge workers invest in production as the primary factor in pricing their services (Kronblad, 2019), and therefore, cost is contingent on the number of hours of production, and the rate applied depends on the seniority of the professional (Maister, 1996; Susskind and Susskind, 2015; Alarie *et al.*, 2018; Gravett, 2020). However, today, AI can dramatically reduce the time required for tasks, such as reviewing a legal contract in 26 s compared to a human's 92 min (London and Schreiber, 2020). Productivity gains of up to 80% are noted in legal due diligence and document review (The Economist, 2018). In accounting, "AI-based audit systems automatically read clients' journal entries", dramatically reducing the processing time of labouring through thousands of transactions (Spring *et al.*, 2022, p. 602). These efficiencies reduce risk and enhance competitive pricing (Chase and Shim, 1991). Clients are driving the shift towards lower fees (Nissan, 2018; Brooks *et al.*, 2020; Davis, 2020; Gravett, 2020), and the billable-hour model is described as "doomed" (Gravett, 2020, p. 13), and "long overdue for a disruption" (Mountain, 2007; Goodman, 2019, p. 156). Therefore, PSFs are developing scalable, output-based pricing models (Armour *et al.*, 2021) which include: fixed fees or per-unit fee approaches (Armour and Sako, 2020; Brooks *et al.*, 2020), value-based, transaction-based, outcome-based pricing (Sawhney, 2016), risk-sharing pricing models or contingency fees (Alarie *et al.*, 2018), service-differentiated pricing models, licensing content arrangements (Mountain, 2007), and some firms even accept shares/equity in lieu of fees, often with start-up organisations that do not have cash-flow (Kronblad, 2020a).

It may seem counter-intuitive for professionals to reduce time in an engagement when fees are generated by the hour. However, the literature suggests that improved efficiency gained from AI greatly outweighs the variation. Firms can be more competitive in pricing (Sawhney, 2016; Alarie *et al.*, 2018), serve new markets (Gravett, 2020) with lower fees, at lower cost, and win more work through fixed pricing when competing with firms who do not offer such alternatives (Mountain, 2007; Sawhney, 2016). Internal barriers, such as operational inefficiency (Sawhney, 2016), policy restrictions, partner rewards geared towards billable-hour volume, and adequate capitalisation to invest in AI, are required if firms "advance and undercut the billable hour" (Mountain, 2007). The billable hour persists where firms aim to signal high-quality work, using high hourly rates as a proxy for quality (Kronblad, 2020c). Where work is complex or unpredictable for bespoke, advisory services pricing continues on an hourly basis (Alarie *et al.*, 2018), because AI is not yet advanced enough to provide "strategy, creativity, judgment and empathy" (Gravett, 2020, p. 24).

4.2.3.2. Marketing and promotions

AI significantly impacts PSF marketing practices, as discussed in 39% ($n=29$) of the literature (Ionescu, 2019; Huang and Rust, 2020; Kronblad, 2020a; Makridis and Mishra, 2022). AI significantly allows firms to improve understanding, prediction,

and engagement with their clients (Campbell *et al.*, 2020). This is attributed to “[t]he digitisation of business-to-business (B2B) marketing result[ing] in the generation and curation of big data”, considered the backbone of AI (Moradi and Dass, 2022, p. 300). The impact of AI on various marketing practices of PSFs is discussed, including client relationship management, promotional tactics and the effect on client relationships (Bezuidenhout *et al.*, 2022). AI in marketing is seen as one of the greatest areas for growth (Katyal and Kesari, 2020; Norton, 2020) because it supports persuasive writing (Campbell, 2020), complex document assembly (Mountain, 2007), generates research insights (Norton, 2020), improves mass digital marketing (Goodman, 2019), increases access to digital information, (Kronblad, 2020c), improves client data management (Armour *et al.*, 2021) and search engine optimisation (Sawhney, 2016). These innovations require new marketing and sales tactics to position the firm innovatively as a “digital pioneer” (Kronblad, 2020a). As billing practices change and digital marketing channels increase, firms must revise promotion practices to communicate new value propositions and therefore, marketing and sales teams are integral to the efficacy of AI for PSFs (Armour and Sako, 2020). AI enables “productising” services (Christensen *et al.*, 2013; Sawhney, 2016; Baker, 2018; Huang and Rust, 2018; Sklyar *et al.*, 2019; Kronblad, 2020c), and firms are adopting new forms of engagement like online portals (Gottschalk, 2000; Janoski-Haehlen and Starnes, 2020; Webb, 2020), to increase transparency and improve communication (Kokina and Davenport, 2017) and “platform-based collaboration and delivery models” (Kronblad, 2020a, p. 9), which deliver templates and self-assessment checklists to clients (Kronblad, 2020c).

Risk is identified in the literature for AI-generated marketing campaigns when retargeting prospects (Ionescu, 2019) if AI decisions are not transparent (London and Schreiber, 2020, p. 127). Further risks identified that are not successfully managed by firms include: digital confidentiality, data security, data management, client data analytics (Steponenaite and Valcke, 2020) and the inappropriate “comingling” of client data when numerous databases are merged (du Plessis and du Toit, 2006; Issa *et al.*, 2016; Munoko *et al.*, 2020; Bakarich and O’Brien, 2021). When bots are used in marketing, this is often not disclosed and “humans have the right to know that they are interacting with an AI system” (London and Schreiber, 2020, p. 127). Finally, Goodman (2019) warns that gender biases occur in marketing campaigns if data is not managed judiciously. Therefore, this insight points to additional skills needed in a marketing of data scientists and technology specialists (Kronblad, 2020c).

4.2.3.3. Client relationships

Client relationships are central to PSFs, whose “very existence depends on having client relationships”, yet only discussed in 31% ($n = 23$) of the papers (Broschak, 2015, p. 304). AI can enhance relationships by completing routine work faster, allowing more time for creativity (Goodman, 2019) and advisory insights (Baker,

2018). For example, an AI research tool known as ROSS Intelligence provided legal professionals with quick research results (Baker, 2018), and decision support systems interrogate vast volumes of data in e-discovery (Kluttz and Mulligan, 2019, p. 853). Ironically, ROSS Intelligence ceased trading in 2020 after being sued for copyright infringement (Ross Intelligence, 2020). In the accounting sector, “embodied conversational agents” (also known as Avatars) create rapport and demonstrate active listening when interviewing people for audit insights (Pickard *et al.*, 2013, p. 162). These AI tools reshape relationships between clients and professionals, improve communication efficiency (du Plessis and du Toit, 2006), create new processes and new outputs, and create tech-savvy professionals (Kluttz and Mulligan, 2019).

Most relationship components of professional work are not yet under threat because AI is not mature enough (Huang and Rust, 2018) to fully replicate interpersonal activities (Goodman, 2019; Armour *et al.*, 2021; Sampson, 2021) such as trust (Alles and Gray, 2020; Wexler and Oberlander, 2021), judgement, flexibility, emotional intimacy, creativity, bespoke services (Simshaw, 2018; Legg and Bell, 2019; Armour and Sako, 2020; Perner, 2021), “negotiating deals, interviewing witnesses, and mediating disputes” (Reid, 2018, p. 479). In the near term, there is consensus that people will “deliver emotional and relational tasks while being supported by service robots doing analytical tasks” (Perner, 2021, p. 252). Where high levels of creativity and high interpersonal skills are required, this will lead to “interpersonal expert work” delivered by the professional, as AI cannot simultaneously deliver on both requirements (Sampson, 2021, p. 129).

4.2.3.4. Productivity

As PSFs embrace AI technology at a “faster rate” (Campbell, 2020, p. 297), professionals’ productivity is impacted, discussed within 51% ($n=38$) of the papers. AI outperforms human activity in various tasks (The Economist, 2018; Kluttz and Mulligan, 2019; Bakarich and O’Brien, 2021), improves data management (Reid, 2018), reduces costs (Chase and Shim, 1991; Katyal and Kesari, 2020; Steponenaite and Valcke, 2020; Bakarich and O’Brien, 2021), increases efficiency at scale (Chase and Shim, 1991; Remus, 2013; Issa *et al.*, 2016; Baker, 2018; Sourdin, 2018), improves accuracy (Pickard *et al.*, 2013; Norton, 2020) and improves profitability (Klemens, 1988; Kokina and Davenport, 2017; Baker, 2018; Goodman, 2019; Armour and Sako, 2020; Brooks *et al.*, 2020; Gravett, 2020; London and Schreiber, 2020; Armour *et al.*, 2021).

Operational procedures become standardised, improving the volume, quality, efficiency and transparency of client engagement (Chase and Shim, 1991; Thomson *et al.*, 2000; Flood and Robb, 2019), leading to reduced costs for clients (Mountain, 2007; Pickard *et al.*, 2013; Alarie *et al.*, 2018; Kluttz and Mulligan, 2019). AI particularly benefits smaller firms, enabling them to compete with larger firms without the increased staff overhead (Gravett, 2020).

4.2.3.5. Competitiveness and competitive landscape

AI is a key driver of competitiveness in PSFs (Brooks *et al.*, 2020), discussed in 27% ($n=20$) of the papers, transforming the competitive landscape through new technologies and disruptive tech firms (Thomson *et al.*, 2000; Billings and Campbell, 2020). The competitive landscape for PSFs is evolving, motivated by fierce competition between firms (Chase and Shim, 1991; Denna *et al.*, 1991; du Plessis and du Toit, 2006; Boone *et al.*, 2008), and the rise of disruptive law-tech or legal-tech (Reid, 2018; Simshaw, 2018; Sourdin, 2018; Rhim and Park, 2019; Campbell, 2020; Janoski-Haehlen and Starnes, 2020; Webb, 2020) and accounting-tech providers (Ionescu, 2019; Alles and Gray, 2020).

Increased competition occurs from global offshore providers targeting new virtual markets (Hunter, 2020); and from technology developers that market directly to clients of the firm, potentially displacing incumbent PSFs (Kluttz and Mulligan, 2019; Alles and Gray, 2020). The literature discusses 28 technology brands as examples and case studies, confirming intense competitive development. The tech brands cited most frequently include LexisNexis, Lex Machina, IBM Watson, LegalZoom, Ross Intelligence, Thomson Reuters, WestlawNext, Kira systems, Siri, Lawgeex, Hotdocs, Luminance, RAVN, Rocket Lawyer, MYOB, Xero and Quickbooks.

New digitally centric firms, considered to be innovative and agile, enter the market (Brooks *et al.*, 2020), causing “increasing competitive pressures from a new ‘breed’ of law firms” (Kronblad, 2020a). In response, firms are digitising their processes and acquiring or partnering with technology developers to enhance client experiences and remain competitive (Pemer, 2021; Bezuidenhout *et al.*, 2022). Strong personal relationships are no longer enough to retain competitive advantage, as clients expect PSFs to be up to date and cutting-edge (Klemens, 1988; Pemer, 2021). Therefore, new tech-based services have a material benefit for clients (Pemer, 2021). Smaller firms often lack the capital to invest in AI technologies and improve efficiency, which places smaller firms at a competitive disadvantage against those that have invested; however, those smaller firms that do invest find they can compete without significant labour overheads (Hunter, 2020). Therefore, AI can “create competitive advantages for adopters” (Munoko *et al.*, 2020, p. 20), particularly early adopters (Nelson, 2000; Simshaw, 2018). However, if all PSFs use AI (which is far from the current reality), it “become(s) ubiquitous without being disruptive” (Webb, 2020, p. 11).

4.2.4. Human–AI interaction and ethical considerations

4.2.4.1. Human and machine interaction

Human and machine interaction, discussed in 43% ($n=32$) of the literature, highlights the collaborative approach required for AI in PSFs, known as “human–AI teams” (Pemer, 2021, p. 250) to provide technology-integrated services (Issa *et al.*, 2016; Sawhney, 2016; Kokina and Davenport, 2017; Flood and Robb, 2019; Billings and Campbell, 2020; Gravett, 2020; Kronblad, 2020c; Armour *et al.*, 2021; Bakarich

and O'Brien, 2021; Makridis and Mishra, 2022). This collaboration involves leveraging a multidisciplinary mix of human capital and technological assets (Armour and Sako, 2020, p. 27), where “humans can provide intuitive intelligence while being supported by the superior analytical capacity of machines” (Kronblad, 2020a, p. 4). This is a new skill set for PSFs, often undeveloped, as the technology is new (Brooks *et al.*, 2020), prompting firms to invest in technology education for both entry-level and practising professionals (Kokina and Davenport, 2017; Reid, 2018; Campbell, 2020; Davis, 2020; Janoski-Haehlen and Starnes, 2020; Armour *et al.*, 2021; Bakarich and O'Brien, 2021). The demand for AI skills is increasing significantly, with studies showing a rise in job postings for AI skills across various sectors from 2012 to 2018 (Calvino and Fontanelli, 2023). Patents for AI technologies have surged since 2010, indicating future demand (Webb *et al.*, 2018), and the workforce profile of PSFs is changing, with many new roles now required, including digital “translators” (Pemer, 2021, p. 260), digital experts (du Plessis and du Toit, 2006; Campbell, 2020), change management specialists, AI or machine-learning experts (Alarie *et al.*, 2018), project management capability, design-thinking (Armour *et al.*, 2021), software developers (Makridis and Mishra, 2022), cybersecurity specialists and data scientists (Armour and Sako, 2020).

Working with advanced technology enhances professionals' ability to identify data connections and provide valuable business insights (Goodman, 2019) not previously discovered by a purely human workforce (Pickard *et al.*, 2013). Importantly, Professionals remain crucial in the decision-making process, ensuring legal accountability (Alles and Gray, 2020), reducing data biases (Goodman, 2019), and aligning “machine reasoning with professional logic and ethics” (Kluttz and Mulligan, 2019, p. 854).

4.2.4.2. Labour replacement and task augmentation

Labour replacement or augmentation is discussed in 64% ($n=48$) of the papers, significantly impacting PSFs due to their labour-intensive nature. The risk of automation and augmentation in legal work is estimated at 23% to 39% of jobs (and 50% for tasks) (Simpson, 2016; Reid, 2018; Flood and Robb, 2019; London and Schreiber, 2020). The finance function faces higher risks, with estimates around 54%, and accounting firms have a “94% probability that automation will replace accountants and auditors” (Alles and Gray, 2020, p. 1). AI can reduce overhead costs by automating repetitive tasks (Malone, 1993; Hanson, 2002; Pickard *et al.*, 2013; Simpson, 2016; Kokina and Davenport, 2017; Socha, 2017; Tredinnick, 2017; Baker, 2018; Delacroix, 2018; Diamantis, 2019; Goodman, 2019; Legg and Bell, 2019; Gravett, 2020; Hunter, 2020; Katyal and Kesari, 2020; Spring *et al.*, 2022). It is important to note that “jobs are bundles of tasks” (Sampson, 2021, p. 24) and therefore, the task is at risk of automation, not the entire job (Armour and Sako, 2020; Pemer, 2021). The scale of automation is contingent on the degree of creative and interpersonal skill requirements of the task (Sampson, 2021). However,

this does not mean high-skilled jobs with high interpersonal qualities cannot be automated, as the tasks that comprise the role are the focus, not the entire role. Approximately 61% ($n=46$) of the papers reviewed provide examples of AI use in legal and accounting firms, demonstrating task augmentation. For instance, AI allows common tax work to be performed by non-accountants and automates legal document drafting (Sampson, 2021). Corporate examples include automating corporate tax returns in the US, UK, and Brazil (Susskind and Susskind, 2015), using predictive analytics for investments (Baker, 2018), and AI-driven legal systems that “evaluate input against existing information, draw inferences, make conclusions, and recommendations, and provide the reasoning” (Baker, 2018, p. 13), and potentially the prediction of financial fraud (Wang and Zhu, 2024). In legal case preparation, AI research tools, using ML techniques and simple keyword searches, deliver legal archive data, relevant case precedents, contracts and statutes previously delivered by lawyers or knowledge managers in law firms (Boone *et al.*, 2008; Alarie *et al.*, 2018; Ashley, 2019), and even provide a platform to debate or discuss “legal ideas with AI technology” and instruct software to “draft patents and detect [legal] errors and formatting defects” (Reid, 2018, p. 480).

The upside is that this frees professionals to focus on higher-margin analytics and advisory work (Shaffer *et al.* 2020; Kronblad, 2020c; Armour *et al.*, 2021; Perner, 2021; Spring *et al.*, 2022), increases volumes of work (Brooks *et al.*, 2020), improves synergy between professionals (Billings and Campbell, 2020), and increases efficiency (Nissan, 2018; Hunter, 2020), leading to reduced costs for the firm and its clients (Malone, 1993; Simpson, 2016; Hunter, 2020).

Beyond job augmentation, technology providers aim to displace the professional entirely by providing services directly to the end user (Kluttz and Mulligan, 2019) or integrating compliance into the end product to be done by the client (Simpson, 2016). For example, in completing tax returns (Huang and Rust, 2018; Shaffer *et al.*, 2020), drafting “non-disclosure agreements”, “appeal[ing] against parking tickets or draw[ing] up rental leases without incurring legal expenses” (The Economist, 2018, p. 3). These services, while potentially basic compliance matters, augment the professional and introduce alternative competitors to the client.

Junior professionals face higher augmentation risks as their roles often involve repetitive tasks (Kokina and Davenport, 2017; Davis, 2020; Gravett, 2020; Norton, 2020), leading to fewer new hires, and reduced junior training, so junior staff take longer to gain practical experience (Reid, 2018; Katyal and Kesari, 2020). “The need for these types of services has not necessarily decreased, but the need for human workers has been replaced with effective customer-interactive technologies” (Sampson, 2021, p. 122), and therefore this impacts client relationships, as it changes how firms interact with their clients (Katyal and Kesari, 2020; Perner, 2021). Importantly, AI-enabled systems are designed to support or supplement professionals responsible for providing interpretation, context, judgement and advice (Surden, 2014; Alarie *et al.*, 2018; Sourdin, 2018; Flood and Robb, 2019; Webb, 2020).

Concerns exist regarding the technological and ethical application of AI in education as technology advances faster than tertiary curriculum development (Simpson, 2016; Janoski-Haehlen and Starnes, 2020). Therefore, given the changes expected to the work of professionals, PSFs have a duty of care to reduce the “loss of human agency” (Kluttz and Mulligan, 2019, p. 857) to re-train and upskill their people for higher-order work (Kluttz and Mulligan, 2019; Sampson, 2021) and for new skills required in the future (Kokina and Davenport, 2017; Legg and Bell, 2019; Armour *et al.*, 2021), to be more imaginative (Simpson, 2016), because “human reasoning, at least some part of it, is going to be replaced by machine-based prediction” (Harbert, 2013, p. 32). Already, accounting firms are hiring non-accountants at an increased rate of 20% per annum (Bakarich and O’Brien, 2021). Job augmentation reduces hands-on learning, especially for junior roles, and creates confusion regarding accountability (Kluttz and Mulligan, 2019; Pemer, 2021), leading to negative economic and social consequences, including labour market inequality and polarisation (Liu and Lin, 2020; Makridis and Mishra, 2022), and AI is changing how firms manage and engage their workforce, requiring new roles and skill investments (Tewari and Pant, 2020).

4.2.4.3. Professionalism and ethics

The attribute of a professional workforce or “professional ideology” (Von Nordenflycht *et al.*, 2015, p. 11) is core to PSFs (Greenwood, 2006; Kronblad, 2020a), described as both membership in an identified profession and service delivery according to professional standards (Løwendahl, 1992). This characteristic shapes the ethical conduct rules for professionals (du Plessis and du Toit, 2006; Kluttz and Mulligan, 2019) and protects PSFs from non-accredited market entrants (Flood and Robb, 2019; Kronblad, 2020a).

Ethics is a material theme discussed in 60% ($n=45$) of the literature. In the legal sector, “there is currently no comprehensive guidance for attorneys on how AI should be developed, adopted, and used in ways that conform to a lawyer’s ethical obligations” (Simshaw, 2018, p. 173) and therefore, there is concern that AI-driven services may lead to unlawful practices (Remus, 2013; Beames, 2017; Baker, 2018; Hunter, 2020; Norton, 2020; Webb, 2020). AI systems cannot be trusted without an ethical foundation (Remus, 2013; Baker, 2018; London and Schreiber, 2020; Makridis and Mishra, 2022) and do not substitute for professional “humanity and ethics, which AI cannot provide” (Legg and Bell, 2019). Ethical misalignment in AI tool use and output is a major concern (Remus, 2013; Goodman, 2019; Kluttz and Mulligan, 2019; Liu and Lin, 2020; Steponenaite and Valcke, 2020; Shope, 2021), transferring “responsibility from employees to algorithms” (Diamantis, 2019, p. 893). The risks are high for professionals, for both use and failure of efficient use, including criminal and civil malpractice suits, the dereliction of quality standards (Beames, 2017; Alarie *et al.*, 2018; Davis, 2020), and failure to provide public protection (Baker, 2018; Sourdin, 2018). In contrast, unregulated technology

developers are not constrained by the same professional standards (London and Schreiber, 2020; Webb, 2020), and therefore, the “professional job requirements” have been natural “barriers to automation” (Simshaw, 2018; Huang and Rust, 2020).

Professional standards also guide the accounting sector, where AI use is aligned with regulators and policymakers to ensure suitable ethical frameworks (Beames, 2017; Munoko *et al.*, 2020; Yu, 2020) for “the adoption of such a disruptive technology to prevail” (Issa *et al.*, 2016, p. 9). Ethical codes for auditors do not reflect “the current or future use of emerging technologies such as AI” (Munoko *et al.*, 2020, p. 2). AI enables new types of auditing evidence and increased sampling, allowing auditors to focus on higher-risk elements and data analytics interpretation (Issa *et al.*, 2016). Given that accounting and audit services assure financial statements, high trust levels are crucial, and ethical AI use directly influences trust in the profession (Alles and Gray, 2020).

4.2.5. *Strategic implications for PSFs using AI*

4.2.5.1. Strategic impact

Changes to firm strategy as a direct result of AI are discussed within 51% ($n=38$) of the literature. As AI enables PSFs to perform both routine and non-routine tasks with machines (Delacroix, 2018; Flood and Robb, 2019), the “prevailing trade-offs between speed, cost, and quality” is broken (Alles and Gray, 2020, p. 8), freeing professionals to focus on higher-value intellectual and advisory work (Denna *et al.*, 1991; Reid, 2018; Perner and Skjølsvik, 2019; Gravett, 2020). Strategically, AI enhances the scalability of compliance tasks (Webb, 2020), since “algorithms do not tire [and] computers do not need to take time off” (Alarie *et al.*, 2018, p. 3). This allows for an improved value proposition, “increasing the relative value of exclusively ‘human’ skills” like professional judgement (Legg and Bell, 2019, p. 35), and potentially frees professionals from large firms because the large workforce, previously essential to delivering on volume, is augmented, allowing for the professional to increase focus on their specific areas of expertise (Alarie *et al.*, 2018; Gravett, 2020). The strategic impact for PSFs lies in new ways of working (Gravett, 2020; Kronblad, 2020c), the formation of multi-disciplinary teams (Webb, 2020), offering reduced cost options (The Economist, 2018) and leveraging big data (Issa *et al.*, 2016) for real-time economic benefits (Pickard *et al.*, 2013; Alarie *et al.*, 2018). AI also allows firms to explore new market segments needing only compliance services (Kronblad, 2020c).

With document review now possible in seconds, AI increases the speed, flexibility, and transparency of production (Sourdin, 2018; Gravett, 2020; Janoski-Haehlen and Starnes, 2020; Webb, 2020), creating opportunities for greater scale and the strategic advantage to accept more work (London and Schreiber, 2020). The challenge for firms is to find the balance between new technology-enabled practices and analogue processes because this influences business model design (Armour and Sako, 2020) and the opportunity to reduce costs while improving

service quality (Chase and Shim, 1991). Knowledge intensity in an AI environment is enhanced, promoting information sharing and moving knowledge from professionals into information products (du Plessis and du Toit, 2006; Bezuidenhout *et al.*, 2022) and codified knowledge management systems (Gottschalk, 2000; Boone *et al.*, 2008). Strategic changes are expected in workforce roles (Brooks *et al.*, 2020) and through increased collaboration with external technology developers (Pemer and Skjølsvik, 2019). Marketing strategies also need to evolve, as digital channels expand (Norton, 2020), new “products” are created (Sawhney, 2016), new markets are pursued, and tools like self-help websites and “bots” change how clients find information (Simshaw, 2018).

Consensus on the strategic timing of investment is a challenge for PSFs, because capital investment in technology requires a longer-term time view, yet seasoned professionals, closer to retirement, are reluctant to invest in longer-term capital projects (Brooks *et al.*, 2020). Therefore, younger leaders are expected to drive the AI strategy (Brooks *et al.*, 2020), to avoid business failure for firms that are out of date (Pemer and Skjølsvik, 2019), do not act (Hunter, 2020) or become uncompetitive (Billings and Campbell, 2020).

4.2.5.2. Impact on business model

Business models are “understood as [the] firms’ logic of value creation, delivery, and capture, to satisfy customer need” (Armour and Sako, 2020), and the impact of AI on business models is discussed in 35% ($n=26$) of the papers. AI is revolutionising firms (Chase and Shim, 1991), and businesses that innovate their models outperform their competition (Brooks *et al.*, 2020, p. 138). The PSF business model, based on meritocracy, rewards human expertise (du Plessis and du Toit, 2006). AI is “redefining how value is created, captured and delivered” (Brooks *et al.*, 2020, p. 138) and therefore, the literature confirms business models must change, as they are “the essence of strategy” (Sako, 2012, p. 24).

Adopting AI successfully requires measured risk, greater operational autonomy (Kronblad, 2020c), and increased technology investment (Issa *et al.*, 2016; Campbell, 2020; Wexler and Oberlander, 2021). The literature discusses how PSFs are changing business models to capitalise on the potential of AI (Simshaw, 2018), and increase the scale of service delivery (Armour and Sako, 2020). This requires significant capital investment, and therefore, where jurisdiction allows, firms are incorporating (moving away from the traditional partnership models (Smets *et al.*, 2017)) to raise funds through capital markets (Armour and Sako, 2020; Davis, 2020). As seasoned professionals prefer the *status quo* and are reluctant to embrace disruptive technologies (Pemer, 2021) or invest in new, unproven technologies (Armour and Sako, 2020), structural reconfiguration is necessary to persuade these profitable practices to adopt disruptive technologies like AI (Brooks *et al.*, 2020).

Change is driven by clients of the firm, demanding increased efficiency and cost reduction. The impact of such a business model change is described in the literature

as radical, disruptive, revolutionary, re-engineered, impactful and transformative (Mountain, 2007; Issa *et al.*, 2016; Kokina and Davenport, 2017; Alarie *et al.*, 2018; Klutetz and Mulligan, 2019; Webb, 2020; Bakarich and O'Brien, 2021) as the PSF sector undergoes. Where firms are embracing technology, new “AI-enabled business models” (Armour and Sako, 2020, p. 27) are emerging, including digital-only models (Kronblad, 2020a), to realign front-end and back-end operations (Brooks *et al.*, 2020, p. 135), including the sales process (Kronblad, 2020a). Critically, as noted by Mountain (2007), the new business model creates market disruption, not the technology itself.

5. Future Research Opportunities

This section supplements the key findings and answers the second research question by identifying future research opportunities in the scholarship on regulated PSFs using AI. We propose five avenues for future research: (i) emerging legal and ethical frameworks concerning AI, (ii) an emphasis on the client perspective, (iii) empirical research in specific regulated PSF domains, (iv) an expanded scope for future systematic reviews beyond the historical account post the GenAI hype, and (v) an empirical exploration of the significance of ROI of AI. These opportunities and proposed research questions are detailed in Table 5.

6. Implications for PSFs

Emerging from this systematic review of literature are numerous implications for PSFs. As Alles and Gray (2020, p. 32) noted, “If you think like a human, there are only certain things you can do. When you ‘think’ like a robot, many things are possible”. Therefore, the influence of AI, potentially redefining PSFs in the future, is highlighted below in the form of theoretical, practical and social implications.

6.1. Theoretical implications

This study provides valuable theoretical insights by integrating fragmented academic literature into a cohesive narrative. It uncovers how AI is reshaping PSF characteristics of capital intensity and knowledge intensity and, therefore, fundamentally influencing the role of professionals. For example, PSFs traditionally exhibit low capital intensity, which means these firms rely more on human than physical capital (Von Nordenflycht, 2010). However, evidence of increased investment in AI and AI skill development changes this characteristic (Bezuidenhout *et al.*, 2022; Spring *et al.*, 2022), where sophisticated AI tools augment or substitute for human capital in delivering services. AI influences knowledge intensity by moving knowledge from professionals into data systems, changing how information is applied and discovered (Simpson, 2016). These findings, supplemented with the key themes and trends presented in this paper, offer a foundational framework for future research on AI’s influence on PSFs, highlighting how automation and

Table 5. Research opportunities and proposed research questions for future research.

Research opportunity	Proposed research questions
(i) Impact of new legal guidelines and ethical frameworks	
Even though the construct of AI has been about since the mid-50s (Haenlein and Kaplan, 2019), we are only seeing ethical and legislative frameworks come to fruition in 2023, such as the European Commission publishing the first AI Act (European Commission, 2023), the Australian Federal Government inviting public participation to help “mitigate any potential risks of AI and support safe and responsible AI practices” (Australian Government, 2023, p. 1), and legislative developments occurring in the USA regarding a Blueprint for an AI Bill of Rights, providing guiding principles for AI deployment, design and use (White House, 2024, p. 1). This research is, therefore, timely. The content, adoption, development, and societal engagement of these legislative frameworks are untested empirically, and therefore, further research exploring new legal and ethical frameworks would provide valuable insights in the context of regulated PSFs and more broadly.	(1) How have the ethical and legislative frameworks recently introduced impacted the deployment and development of AI technologies within regulated PSFs? (2) How do PSF stakeholders perceive the effectiveness and sufficiency of current AI laws and ethical frameworks? (3) Given the global nature of PSFs, to what extent do the new AI laws and ethical guidelines encourage or discourage international collaboration in global PSFs? (5) Given the pace of AI developments, to what extent can legal guidelines and ethical frameworks be applied in practice in a professional services context? (6) What are the distinct ethical challenges faced by PSFs, and how can they be overcome, given current/emerging ethical frameworks?
(ii) The client perspective is under-explored	
The effective use of AI frees professionals from larger firms because the large workforce, previously essential to delivering on volume, is augmented by AI capabilities (Alarie <i>et al.</i> , 2018; Gravett, 2020). More importantly, the technology is also available to the firm’s clients, who have the same motivations mentioned above to find cost efficiencies by “reclaiming activities previously handled by outside firms” (Birkinshaw and Lancefield, 2023, p. 35). AI systems can already produce legal documents, answer legal questions and develop legal arguments for non-lawyers to handle their legal affairs (Susskind, 2023). This capability is also present in the advisory space, which most PSFs strive towards, with AI tools bypassing firms to match experts directly to client needs (Birkinshaw and Lancefield, 2023). Empirical research exploring the consequences of AI from the client’s perspective is a considerable gap in the literature, and the consequences for clients, not firms, are understated in the literature.	(1) How does using AI technologies affect trust and personal client relationships for legal and accounting services firms? (2) What are the primary concerns for the firm’s clients regarding their proprietary and confidential data when PSFs use this data across AI systems? (3) How do clients perceive the quality, reliability, and effectiveness of AI-generated legal and accounting documents and advice? (4) How could PSFs adapt their service models to align with their clients’ AI-driven needs and expectations? (5) What are the potential risks and challenges for clients relying on AI-generated services, and how can these be mitigated? (6) How and to what extent are client relationships impacted because of the use of AI in the PSF context? (7) How do PSFs determine the activities that should be automated versus those that should retain human involvement?

Research opportunity	Proposed research questions
<p>(iii) Empirical research in the legal sector lags other domains</p> <p>The debate seems very pressing in the legal environment, as AI could automate 25% of work tasks, yet this number increases to 44% for legal firms (Nathan <i>et al.</i>, 2023). As noted above, 43% of the papers we examined present empirical research findings. Different methods are adopted, including case studies, qualitative and quantitative assessments, and surveys, for example. However, only 23% of papers published by the legal journals identified through the SLR are empirically developed. Therefore, there appears to be an under-representation of empirical research in the legal sector, presenting a promising opportunity for future research.</p>	<ol style="list-style-type: none">(1) What factors contribute to the under-representation of empirical research in the legal sector, especially concerning AI applications?(2) Given the concern identified in the literature about potential unlawful practices where AI tools and software substitute for human–professional engagement, what is the scale of this issue, and can it be explored better with case study research?(3) How can empirical research inform the development and regulation of AI technologies in legal practices?(4) What methodologies and approaches could be most effective in conducting empirical research on AI in the legal sector?
<p>(iv) Expanded scope and timing of the SLR as AI is maturing fast</p> <p>This paper presents a detailed discussion, following an SLR of academic papers at the intersection of AI and regulated PSFs, to uncover the themes within the literature. Through the quality appraisal stage of the SLR, numerous publications were discounted to achieve the research objective of presenting literature from independently ranked, peer-reviewed journals. Therefore, the research provides a defined view. Building on the findings, future research could expand upon the selection criteria to present a broader view incorporating government and industry literature sources. Second, regarding the relentless pace of technology development, “there is no apparent finishing line”, as “GPT-5 is already under development, and watch out for Gemini by Google” (Susskind, 2023, p. 1). This is a persistent issue with fast-developing technology, developing at break-neck speed in the market, because empirical research lags application in practice (Pemer, 2021). There is no value in waiting until the technology matures, as there will perpetually be new iterations. Therefore, future academic studies should incorporate newer technological developments emerging from this dynamic environment.</p>	<ol style="list-style-type: none">(1) How can SLR methodologies be adapted to keep pace with the rapid development of AI technologies and their applications in PSFs?(2) What are the implications of the fast-paced development of AI technologies for setting research agendas in AI and law?(3) How might future research incorporate a broader range of sources, including government and industry literature, to provide a more comprehensive view of AI’s impact on business services?(4) How can academic research remain relevant and impactful in a constantly evolving technology landscape?(5) What are the challenges and opportunities of researching technologies in their nascent stages, such as GPT-5 and Gemini by Google (and the next big thing)?(6) How do researchers respond to the AI hype in a manner that results in balanced research?(7) How do researchers account for and incorporate the vast amounts of academic scholarship on the topic of AI?

(Continued)

Table 5. (Continued)

Research opportunity	Proposed research questions
(v) Empirical exploration of the ROI of AI	
A substantive limitation identified across the literature is the lack of research regarding the return on investment of AI, which is not deeply discussed because the investment itself is not disclosed. The lack of financial performance metrics is confirmed by Goto (2022, p. 90), where “no KPIs (key performance indicators) were set, because nobody knows what KPIs to set”. This lack of return on investment impairs the debate on AI for PSFs, as firms cannot make informed investment decisions without taking risks.	<ol style="list-style-type: none">(1) How can PSFs effectively measure the return on investment (ROI) of AI technologies in their operations?(2) What frameworks or models can be developed to guide PSFs in setting KPIs for AI investments? Have existing models or approaches been tested?(3) What are the key factors influencing the financial performance of AI technologies in PSFs, and how can they be measured?(4) How does the lack of disclosed investment in AI impact the strategic decision-making processes of PSFs?(5) How can empirical research contribute to a better understanding of the ROI of AI in professional service firms, facilitating more informed investment decisions?(6) How can PSFs best manage the risks associated with investments in AI, given the lack of research regarding the ROI of AI?

AI-driven decision-making challenge traditional service models. This research also contributes to the understanding of how AI affects professional–client relationships and knowledge-based work within regulated PSFs, providing a theoretical base for future exploration of human–AI collaboration and ethical implications of AI use in the context of PSFs.

6.2. *Implications for practice*

This study identifies significant implications for practice, confirming firms must strategically adopt AI solutions that balance efficiency with maintaining the human touch. By automating repetitive tasks, AI frees professionals to focus on more complex advisory services to improve client relationships and enhance service delivery. However, firms should be cautious about AI's limitations, such as the risk of reducing the competitive advantage inherent in interpersonal engagement and the potential for data biases that could negatively influence professional advice. To preserve their status as trusted advisors (Smets *et al.*, 2017), PSFs are deliberately shaping their AI strategies to ensure that AI complements, rather than replaces, human expertise. As part of this approach, many PSFs, alongside large tech organisations, have transformed their workplaces into physical and virtual “experience centres” (Birkinshaw and Lancefield, 2023, p. 35). These centres showcase the capabilities of AI-driven insights while fostering deeper client engagement through personalised services.

As AI matures and takes on higher-order tasks (Huang and Rust, 2018), it may displace the tasks of professionals, substituting interpersonal engagement with bots and commoditised services (Hunter, 2020), such as bot-generated legal advice (Flood and Robb, 2019; Rhim and Park, 2019), or where accounting firms apply “robo-advisors” (Kwon *et al.*, 2022) to propose wealth management strategies (Reid, 2018). Further, AI use is not limited to routine processes and is even adopted to enhance the human capabilities of relationship-building (Huang and Rust, 2023) and novel idea generation (Joosten *et al.*, 2024). Therefore, this research compels PSFs to continuously invest in AI training and skill development to remain competitive. This investment goes beyond technical training, encompassing themes such as ethics and regulation, which are deeply tied to the professional identity of PSFs (Von Nordenflycht *et al.*, 2015) and integral to upholding the highest standards of integrity and accountability in their work. Furthermore, PSFs should be aware of the competitive landscape, which is materially influenced by the introduction and use of AI. PSFs should be alert to more than just their direct competitors. As AI matures, tech developers are increasingly entering the competitive landscape. For example, banks such as Ideabank and ING provide reconciled payment data against accounting records (Yurcan, 2018), which may substitute for traditional accounting “services like accounts receivable management, factoring, accounting, and cash-flow analysis” (Khanna and Martins, 2018, p. 2). Several accounting software providers facilitate advisory insights and automation (MYOB, 2024; Xero, 2024), which may support or augment the role provided by accounting firms. Even tech giants, like Amazon, enter the legal sector with Intellectual Property tools (Carman, 2019),

and organisations with extensive data and client knowledge offer AI-driven solutions directly to in-house corporate legal teams (Legal.IO, 2024). This signals a shift from traditional professional service offerings, as these tech companies, traditionally service providers to PSFs, are now potential competitors through delivering adjacent services. Therefore, the role of the professional in managing the ethical and practical complexities of AI to improve service delivery and build client trust remains crucial in practice.

6.3. Social implications

The use of AI in PSFs may affect societal expectations, given these firms have a duty of care to bring independent expertise and technical insights to legal proceedings and diligence to financial reporting. AI's role in tasks like research or document review may raise concerns about fairness and bias in legal services (London and Schreiber, 2020). In accounting, AI-driven audits and financial reporting may prompt questions about reliability, especially in complex scenarios where human judgment has been vital (Alderman, 2019; Alles *et al.*, 2022; Goto, 2023). Therefore, trust, a primary motivation for engaging professionals in the first instance, could be undermined if AI leads to poorly delivered services, impacting the credibility of professionals (Alles and Gray, 2020). AI's broader societal impact on PSFs is evident, particularly in this sector where transparency, fairness, and ethical considerations are critical. Using AI in legal and accounting services could potentially affect access to justice and the integrity of financial reporting. Firms must consider the societal expectations and implications of ethical AI use, ensuring that AI tools adhere to professional standards. As AI becomes more ingrained in professional services, the responsibility to use it in a way that maintains public trust in the profession is paramount. This research confirms that regulatory oversight is crucial to safeguard fairness and accountability, ensuring that AI-driven services benefit society without compromising ethical standards.

7. Limitations

In addition to the limitations identified in Sec. 5, an inherent limitation in studies on technology is the timing of the research, as technology continues developing beyond the arbitrary date of a study. Significant developments have occurred since our January 2023 start date, particularly with GenAI and LLMs. While AI is rapidly maturing, "generative AI still tends to generate erroneous or fantastical outputs" (Frey and Osborne, 2023, p. 11). Therefore, this paper serves as a baseline for assessing new AI technologies. Such a stable baseline is valuable as it provides the historical context, allowing for a more nuanced understanding of trends and patterns that may not be immediately apparent with only the latest data. This stability is valuable in fields characterised by rapid advancements, offering a foundation to evaluate the impact of rapid change, which is crucial for developing long-term strategies and policies in PSFs. Last, this baseline study concluded before the

recent wave of “emergent AI” innovations (Perri, 2023). This means it may serve as a prelude to comparative analyses, where future researchers compare new findings to assess the impact and velocity of technological change in the sector.

8. Conclusion

This research demonstrates that the use of AI within regulated PSFs is an intensely debated topic in academic literature. Our SLR identified 612 scholarly papers on AI use in PSFs, with a deeper dive into 75 papers from highly rated journals. Our contribution lies in the identification and synthesis of five broad themes that persist in the literature, which include the context for AI’s evolving role within PSFs; the challenges, risks and limitations faced by PSFs using AI; the impact of AI on day-to-day operational and business practices of firms; human–AI interaction and ethical considerations; and the strategic consequences and impact on business models of firms. Collectively, these identified themes reflect the business model of PSFs, and therefore, a vital issue with AI’s disruption lies in the redefinition of their business models. PSFs contribute significantly to social and economic development by enhancing human capital, creating innovative services, and establishing standards in legal, accounting, and financial markets (Empson *et al.*, 2015b). PSFs have traditionally relied on human expertise, billed by the hour, to provide high-value services such as legal advice, consulting, and financial audits. AI, however, challenges this model in several critical ways. In addition, reflecting these changes collectively, an illustrated framework is developed to share the findings. Last, we identify five important future research opportunities. The study presents a synthesised view of how AI affects PSFs as a whole, and therefore, a coherent narrative is presented that confirms the role of the professional is significantly evolving.

Appendix A

Academic papers comprising the detailed analysis of the SLR are itemised in Table A.1, sorted alphabetically by journal.

Table A.1. Identified journals and journal papers.

Journal/publisher	Year	Author	Title
<i>ABA Journal</i>	1988	Klemens, Jon	Keening a competitive edge
<i>ABA Journal</i>	2019	La Roque-Doherty, Sean	Leading LPM software providers differ over allowing 3rd-party integrations, even as firms and lawyers demand it
<i>Academy of Management Discoveries</i>	2020	Kronblad, Charlotta	How digitalization changes our understanding of professional service firms

(Continued)

Table A.1. (Continued)

Journal/publisher	Year	Author	Title
<i>Alternative Law Journal</i>	2017	Beames, Emma	Technology-based legal document generation services and the regulation of legal practice in Australia
<i>Analysis and Metaphysics</i>	2019	Ionescu, Luminița	Big data, blockchain, and artificial intelligence in cloud-based accounting information systems
<i>Behaviour and Information Technology</i>	1996	Murphy, D. S.; Yetmar, S. A.	Auditor evidence evaluation: Expert systems as credible sources
<i>Berkeley Technology Law Journal</i>	2019	Kluttz, Daniel N.; Mulligan, Deirdre K.	Automated decision support technologies and the legal profession
<i>Berkeley Technology Law Journal</i>	2020	Katyal, Sonia K.; Kesari, Aniket	Trademark search, artificial intelligence, and the role of the private sector
<i>Business Information Review</i>	2017	Tredinnick, Luke	Artificial intelligence and professional roles
<i>Cambridge Journal of Regions, Economy and Society</i>	2020	Brooks, C.; Gherhes, C.; Vorley, T.	Artificial intelligence in the legal sector: Pressures and challenges of transformation
<i>Canadian Business Law Journal</i>	2017	Swansburg, Carla	Artificial intelligence and machine learning in law: The implications of lawyers' professional responsibilities for practice innovation
<i>Computers and Industrial Engineering</i>	1991	Chase, Michael D.; Shim, Jae K.	Artificial intelligence and big six accounting — A survey of the current uses of expert systems in the modern accounting environment
<i>Creativity and Innovation Management</i>	2020	Kronblad, Charlotta	Digital innovation in law firms: The dominant logic under threat
<i>Cybernetics and Systems</i>	2018	Nissan, Ephraim	Computer tools and techniques for lawyers and the judiciary
<i>Decision Support Systems</i>	2000	Nelson, K. M.; Kogan, A.; Srivastava, R. P.; Vasarhelyi, M. A.; Lu, H.	Virtual auditing agents: The EDGAR agent challenge
<i>Development and Learning in Organizations</i>	2020	Shaffer, Kathie J.; Gaumer, Carol J.; Bradley, Kiersten P.	Artificial intelligence products reshape accounting: Time to re-train

(Continued)

Table A.1. (Continued)

Journal/publisher	Year	Author	Title
<i>Duquesne law review</i>	2020	Janoski-Haehlen, Emily; Starnes, Sarah	The ghost in the machine: Artificial intelligence in law schools artificial intelligence: Thinking about law, law practice, and legal education
<i>Duquesne law review</i>	2020	London, Ashley M.; Schreiber, James B.	AI report: Humanity is doomed. Send lawyers, guns, and money! Artificial intelligence: Thinking about law, law practice, and legal education
<i>Expert Systems with Applications</i>	1991	Abdolmohammadi, M. J.; Bazaz, M. S.	Identification of tasks for expert systems-development in auditing
<i>Expert Systems with Applications</i>	1991	Brown, C. E.	Expert systems in public accounting — current practice and future-directions
<i>Expert Systems with Applications</i>	1995	Karan, V.; Murthy, U. S.; Vinze, A. S.	Assessing the suitability of judgmental auditing tasks for expert-systems development — an empirical-approach
<i>Florida Law Review</i>	2020	Yu, Peter K.	The algorithmic divide and equality in the age of artificial intelligence
<i>Georgetown Journal of Legal Ethics</i>	2021	Shope, Mark L.	Lawyer and judicial competency in the era of artificial intelligence: Ethical requirements for documenting datasets and machine learning models
<i>Harvard Business Review</i>	2016	Sawhney, Mohanbir	Putting products into services
<i>Harvard International law Journal</i>	2020	Liu, Han-Wei; Lin, Ching-Fu	Artificial intelligence and global trade governance: A pluralist agenda
<i>Hastings Law Journal</i>	2018	Simshaw, Drew	Ethical issues in robo-lawyering: The need for guidance on developing and using artificial intelligence in the practice of law
<i>IEEE Intelligent Systems and their Applications</i>	1998	O'Leary, Daniel	Using AI in knowledge management: Knowledge bases and ontologies
<i>IEEE Spectrum</i>	2013	Harbert, T.	The law machine
<i>IEEE Transactions on Knowledge and Data Engineering</i>	1991	Denna, E. L.; Hansen, J. V.; Meservy, R. D.	Development and application of expert systems in audit services

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Table A.1. (Continued)

Journal/publisher	Year	Author	Title
<i>Information and communications technology law</i>	2016	Simpson, Brian	Algorithms or advocacy: Does the legal profession have a future in a digital world?
<i>International Journal of Applied Management and Technology</i>	2020	Billings, Donald G.; Campbell, Douglas G.	Disruptive innovation within the legal services ecosystem
<i>International Journal of Information Management</i>	2006	du Toit, A. S. A.; du Plessis, T.	Knowledge management and legal practice
<i>International Journal of Law and Information Technology</i>	2000	Thomson, Ross; Huntley, John; Belton, Val; Li, Feng	The legal data refinery
<i>International Journal of Law and Information Technology</i>	2007	Mountain, Darryl	Disrupting conventional law firm business models using document assembly
<i>International Journal of the Legal Profession</i>	2021	Armour, John; Parnham, Richard; Sako, Mari	Unlocking the potential of AI for English law
<i>Iowa law review</i>	2014	Dana A. Remus	The uncertain promise of predictive coding
<i>ITNOW</i>	2017	Chan, C.; Walker-Osborn; C.	Artificial intelligence and the law
<i>Journal of Business Ethics</i>	2020	Munoko, Ivy; Brown-Liburd, Helen L.; Vasarhelyi, Miklos	The ethical implications of using artificial intelligence in auditing: JBE
<i>Journal of East Asia and International Law</i>	2019	Rhim, Young-Yik; Park, KyungBae	The applicability of artificial intelligence in international law issue focus: Artificial intelligence and international law
<i>Journal of Education for Business</i>	1993	Malone, David	Expert systems, artificial intelligence, and accounting
<i>Journal of Emerging Technologies in Accounting</i>	2016	Issa, Hussein; Sun, Ting; Vasarhelyi, Miklos A.	Research ideas for artificial intelligence in auditing: The formalization of audit and workforce supplementation
<i>Journal of Emerging Technologies in Accounting</i>	2017	Kokina, Julia; Davenport, Thomas H.	The emergence of artificial intelligence: How automation is changing auditing
<i>Journal of Emerging Technologies in Accounting</i>	2021	Bakarich, Kathleen M.; O'Brien, Patrick E.	The robots are coming ... but aren't here yet: The use of artificial intelligence technologies in the public accounting profession

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Table A.1. (Continued)

Journal/publisher	Year	Author	Title
<i>Journal of Engineering and Technology Management</i>	1997	Liker, J. K.; Sindi, A. A.	User acceptance of expert systems: A test of the theory of reasoned action
<i>Journal of Information Systems</i>	2013	Pickard, Matthew D.; Burns, Mary B.; Moffitt, Kevin C.	A theoretical justification for using Embodied Conversational Agents (ECAs) to augment accounting-related interviews
<i>Journal of Information Systems</i>	2020	Alles, Michael G.; Gray, Glen L.	Will the medium become the message? A framework for understanding the coming automation of the audit process
<i>Journal of Information Technology</i>	2000	Gottschalk, P.	Predictors of IT support for knowledge management in the professions: An empirical study of law firms in Norway
<i>Journal of Law, Information and Science</i>	1992	Harris, Vicky	Artificial intelligence and the law — Innovation in a laggard market
<i>Journal of Professions and Organization</i>	2020	Armour, J.; Sako, M.	AI-enabled business models in legal services: From traditional law firms to next-generation law companies?
<i>Journal of Service Research</i>	2021	Pemer, F.	Enacting professional service work in times of digitalization and potential disruption
<i>Journal of Service Research</i>	2021	Sampson, Scott E.	A strategic framework for task automation in professional services
<i>Journal of Service Research</i>	2022	Makridis, Christos A.; Mishra, Saurabh	Artificial intelligence as a service, economic growth, and well-being
<i>Journal of Service Theory and Practice</i>	2020	Wexler, M. N.; Oberlander, J.	Robo-advisors (RAs): The programmed self-service market for professional advice
<i>Judicature</i>	2017	George Socha	What will AI mean for you?
<i>Law Context: A Socio-Legal Journal</i>	2019	Ashley, Kevin D.	A brief history of the changing roles of case prediction in AI and law
<i>Law Library Journal</i>	2002	Hanson, F. Allan	From key numbers to keywords: How automation has transformed the law
<i>Law Library Journal</i>	2018	Baker, Jamie J.	2018: A legal research odyssey: Artificial intelligence as disruptor

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Table A.1. (Continued)


Journal/publisher	Year	Author	Title
<i>Legal Ethics</i>	2018	Delacroix, S.	Computer systems fit for the legal profession?
<i>Legal reference services quarterly</i>	2016	Knap, Melanie; Willey, Rob	Comparison of research speed and accuracy using WestlawNext and Lexis Advance
<i>Maastricht journal of European and comparative law</i>	2020	Steponenaite, Vilte Kristina; Valcke, Peggy	Judicial analytics on trial: An assessment of legal analytics in judicial systems in light of the right to a fair trial
<i>Management Science</i>	2008	Boone, Tonya; Ganeshan, Ram; Hicks, Robert L.	Learning and knowledge depreciation in professional services
<i>Melbourne University Law Review</i>	2020	Webb, Julian	Legal technology: The great disruption?
<i>North Carolina Law Review</i>	2019	Diamantis, Mihailis E.	The extended corporate mind: When corporations use AI to break the law
<i>Oklahoma Law Review</i>	2019	Goodman, Chris Chambers	AI/Esq.: Impacts of artificial intelligence in lawyer–client relationships symposium: Lawyering in the age of artificial intelligence
<i>Potchefstroom Electronic Law Journal</i>	2020	Gravett, W. H.	Is the dawn of the robot lawyer upon us? The fourth industrial revolution and the future of lawyers
<i>Revista Direito GV</i>	2020	Davis, Anthony E.	The future of law firms (and lawyers) in the age of artificial intelligence
<i>University of Bologna Law Review</i>	2020	Campbell, John	Ex Machina: Technological disruption and the future of artificial intelligence in persuasive legal writing articles and essays
<i>University of Miami Law Review</i>	2018	Flood, John Robb, Lachlan	Professions and expertise: How machine learning and blockchain are redesigning the landscape of professional knowledge and organization symposium: Hack to the future: How technology is disrupting the legal profession

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Table A.1. (Continued)

Journal/publisher	Year	Author	Title
<i>University of Miami Law Review</i>	2020	Norton, Katherine L. W.	The middle ground: A meaningful balance between the benefits and limitations of artificial intelligence to assist with the justice gap
<i>University of New South Wales Law Journal</i>	2018	Sourdin, Tania	Judge v. robot: Artificial intelligence and judicial decision-making
<i>University of New South Wales Law Journal</i>	2020	Hunter, D	The death of the legal profession and the future of law
<i>University of Toronto Law Journal</i>	2018	Alarie, Benjamin; Niblett, Anthony; Yoon, Albert H.	How artificial intelligence will affect the practice of law
<i>University of Toledo Law Review</i>	2018	Reid, Melanie	A call to arms: Why and how lawyers and law schools should embrace artificial intelligence
<i>University of Tasmania Law Review</i>	2019	Legg, Michael; Bell, Felicity	Artificial intelligence and the legal profession: Becoming the AI-enhanced lawyer
<i>Washington Law Review</i>	2014	Surden, Harry	Machine learning and law

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