

Thesis submitted in partial fulfilment of the requirements for the degree of
Doctor of Philosophy in Management,
Hilary 2025

**DIGITAL TECHNOLOGY AND CHANGING WORK PRACTICES IN
LARGE LAW FIRMS**

IAN RODGERS

New College
Saïd Business School, University of Oxford

DIGITAL TECHNOLOGY AND CHANGING WORK PRACTICES IN LARGE LAW FIRMS

ABSTRACT

Existing research on digital technology and organized professional work examines technology as a tool for tasks or a medium of communication but tends to overlook its broader integration within professional work systems. This thesis addresses that blind spot. It explores how digital technology becomes – or fails to become – integrated into professional work practices within professional service firms (PSFs), using large law firms as exemplars. Informed by a practice-based perspective, this research investigates everyday activities associated with digital technology in organized professional work. Three distinct themes emerge across the thesis. First, digital technology problematises existing settlements of professional expertise and boundaries. Evidence includes professionals' boundary work around prompt-engineering expertise for generative artificial intelligence (AI), as well as operations managers' work practices to integrate technology into PSFs' workflows. Second, digital technology challenges the established balance between professional autonomy and managerial authority. Effective integration of digital technology often coincides with emerging forms of managerial authority (e.g., technologists, operations, or knowledge managers), who redesign or standardise work, altering the scope and nature of professional autonomy. Third, technology adoption and integration vary among professionals. Some engage with digital technology, reconfiguring their work practices for technology-inclusive service production. Others resist it, maintaining existing practices and traditional production methods. Still others adopt a middle ground. As such, this thesis provides novel empirical findings and theoretical contributions by examining technology relationally within a professional work system.

Keywords: Professional service firms; Learning pathways; Relational expertise; Boundary work; Artificial intelligence; Digitalization; Professional work

ACKNOWLEDGEMENTS

Special thanks go to my wife, Nathania, for putting up with me as I did this research. I couldn't have done it without your encouragement and support.

Similarly, I say a big thank you to my supervisor, Mari Sako, for far too many things to list here. Your guidance and wisdom have been invaluable.

This research would not have been possible without the help, time, and insights of the legal professionals and others who kindly and generously took part in it. Thanks to all of them. For confidentiality reasons, I can't do individual thank-yous to those in the firms. So, all I'll say here is that I'm enormously grateful to those who facilitated my access to such amazing research settings.

Thank you to the broader research community who helped with this thesis too. In particular, those at the Saïd Business School who have steered it away from the rocks, whether in research seminars, conferences, or examinations. The same goes for the wonderful people at EGOS, where I found my academic 'tribe'.

Finally, I want to thank everyone else who has made this research happen. I acknowledge your contributions, and I couldn't have done it without you. Thanks again.

TABLE OF CONTENTS

INTRODUCTION AND BACKGROUND	1
LITERATURE REVIEW – HOW TECHNOLOGY IS (OR IS NOT) TRANSFORMING LAW FIRMS	39
PAPER 1 – PROMPT ENGINEERING AS SUBSTANTIVE AND RELATIONAL EXPERTISE: LINKING PROFESSIONALS’ LEARNING PATHWAYS TO BOUNDARY WORK.....	78
PAPER 2 – “GETTING COMFORTABLE” WITH DIGITAL TECHNOLOGY: MAINTAINING, RECONSTITUTING, AND RECONFIGURING PROFESSIONAL WORK.....	128
PAPER 3 – ENHANCING PRODUCTIVITY IN PROFESSIONAL SERVICES: DEVELOPING OPERATIONS MANAGEMENT PRACTICES TO INTEGRATE DIGITAL TECHNOLOGY AND AI.....	185
CONCLUSIONS AND IMPLICATIONS.....	253

INTRODUCTION AND BACKGROUND

Personal motivation and context

It is often helpful to start at the beginning. To do this, at least in a sense, I set out below a few reflections outlining my personal motivation for doing this study in the first place. Before joining the Saïd Business School for this DPhil, I worked first as a litigation lawyer at a global law firm and later at a technology company whose customers were mainly professionals. In both jobs, I often noticed how day-to-day work changed – or at least could have changed – when new technology came along.

Two examples show what I mean. The first happened around 2015 when, as a lawyer, I worked on an investigation that used technology-assisted review. We trained a machine learning algorithm to mark documents as either ‘relevant’ or ‘not relevant’ based on a small sample. When we ran it over the whole dataset, the algorithm found just one more potentially relevant document. This allowed us to convince the regulator that manually reviewing the full set of documents would be unnecessary, saving our client significant time and money. During the project, I worked closely with colleagues to learn new ways of working and regularly talked to technologists from the vendor (for example, to set up the application, collect and process data, train the algorithm, quality-check its outputs, and explain the process to others). But communication was often difficult or unclear. I particularly remember an awkward meeting with the vendor’s president: we talked at cross-purposes, used jargon that got blank looks, and it was generally clear that no one in the room was on the same page. After this, my firm did not use that technology again on anything else I worked on while I was there.

About four years later, I was working at a technology company. I was in Amsterdam at the office of a global law firm, running a joint session involving technologists and legal professionals (a paralegal, an associate, and a partner). Our aim was to help the firm advise a Dutch telecom company managing its leases using an AI application (one that used machine

learning to identify and extract relevant clauses). Although we eventually used it to create an interactive dashboard that provided the client with new legal insights about their leases, the project felt like a failure. The client did not seem sure what to do with the new information, the law firm went over budget, and my company had to manually code many rules because of poor-quality data. Later, the partner said they regretted managing the project like a typical legal matter – taking the client’s instructions at the start and delivering the outcome based on these – instead of working more closely and iteratively with them. We did not work together again.

These examples highlight patterns I saw regularly. First, new technology was becoming available to and being used by professionals such as lawyers. This included both AI applications, such as document review programs using machine learning, and those without AI, such as cloud-based document management systems. These were often complicated enough themselves, but they often had to integrate with older, legacy systems, creating complex (and sometimes confusing) technology environments too. Second, new ways of working emerged around these technologies, changing not just how professionals did their jobs but also what those jobs involved. This included innovative activities such as sourcing new applications, working with technologists and the technology itself, managing and curating data, setting up quality checking procedures, and finding new ways to present information to clients. These new approaches often intertwined with existing ways of working, sometimes smoothly, sometimes not. Third, surprising or puzzling issues often arose when new technology met professional work. For instance, why did one firm embrace a new technology when a similar firm did not? How did one firm successfully get technologists and professionals to work together while others struggled? Why did professionals sometimes say one thing about technology but do something different?

I looked to professional and academic literature to understand what was happening (it was around 2019 to early 2020 at the time). Existing research – or perhaps I should say

‘available’ existing research, as much of it was inaccessible behind paywalls – provided helpful ideas about topics like how digital technology, including AI, might affect the legal industry’s business models (e.g., Armour and Sako 2020). But most studies that I found offered big-picture predictions without necessarily addressing everyday challenges (e.g., Susskind and Susskind 2015). Issues involved with the messy practicalities of integrating technology like AI into day-to-day professional work were mostly missing. This seemed like a blind spot to me. Soon after, I started this research to try and fill that gap, looking closely at how professionals actually use digital technology in their work and explaining how and why associated changes happen – or don’t – in PSFs.

Research problem

This research studies the relationships between technology and organised professional work. It focuses on (1) digital technology, including AI, and (2) PSFs, particularly large law firms, and the professional work that goes on in them. Its primary interest is in how those associated with these firms act in connection with digital technology as work gets done, paying attention to the bundles of activities that comprise professional work practices, and the implications of these practices for practitioners, managers, and organisations.

Prior studies provide insights into the relationships between technology and organised professional work. Research shows that professional work involves processes of diagnosis, inference, and treatment, performed within a jurisdiction reflecting a division of expertise (Abbott, 1988). This work is often performed within distinct organisations, PSFs, which provide professionals with a high degree of autonomy (von Nordenflycht, 2010). Professional service workflows typically have slow throughput and are highly variable, impacting their productivity (Schmenner, 2004).

Research also shows that, while technology and work are co-constituted (Orlikowski, 1992), technology can occasion changes in organised professional work by altering roles and

patterns of interaction between professionals and other occupations (Barley, 1986). Digital technology – broadly defined as electronic devices and systems that use binary methods to process data, information, or knowledge (Ceruzzi, 2013) – can also affect PSFs by enabling professional services to be delivered at lower levels of knowledge intensity (Kronblad, 2020) and through new business models (Armour and Sako, 2020). AI in particular can enable the automation and augmentation of professional work (Spring et al., 2022), typically accompanied by workflow changes if it is to be effective in an existing organisational setting (Amaya and Holweg, 2024).

However, while research such as this provides robust insights into certain aspects of the various relationships between technology and organised professional work, it tends to overlook others. Perhaps the most important of these is that prior research tends to view technology as a tool for doing tasks or a medium for communicating rather than situating it in a broader system of professional work (Anthony et al., 2023). This means that, while these studies may offer specific conclusions and broad predictions about digital technology (see, for example, Dell'Acqua and colleagues' (2023) widely cited research on generative AI and knowledge worker productivity and quality), they often fail to account for the practical, everyday approaches used and challenges encountered as digital technology is integrated into organised professional work.

We know relatively little, then, about the situated work practices that emerge, develop, and change when digital technology meets organised professional work. Recent studies are beginning to address this. For instance, Faulconbridge and colleagues (2023, 2024) have shown how professionals respond to AI through *intertwined boundary work* to protect their interests and resources, and explored how such algorithms may be accommodated in PSFs in spite of this. Koljonen and Chan (2024) have demonstrated how *intraprofessional segmentation* can allow organizations to navigate technology adoption while balancing professional autonomy

and managerial goals. Beane and Anthony (2023) have described how senior professionals use *inverted apprenticeships* to develop practical expertise with new technologies while maintaining their position over junior professionals.

Yet, while this research builds theory in some areas, substantive absences remain. For instance, studies have not fully addressed puzzles such as how new practices – like prompt engineering for generative AI – are developed and negotiated in a system of professional work, how organisationally situated professionals make sense of new digital technology in their day-to-day work, nor how professional workflows might practically transition from one mode to another to integrate digital technology. This study aims to contribute to research on these topics, further enhancing our understanding of the situated work practices that emerge, develop, and change when digital technology meets organised professional work.

Research question

The central question that guides this research is: “How does digital technology relate to professional work practices within PSFs?” This question is important because digital technology, such as AI, is linked – both theoretically and empirically – with substantive changes to PSFs and the situated work done within them. It is a deliberately broad question as it covers emerging phenomena – for instance including new technology, like generative AI, and new work practices, like prompt engineering – about which researchers must first establish the ‘what’ (that is, how things *are*) before they can theorise about the ‘how’ or the ‘why’. Providing answers to this basic question is likely to help researchers to build appropriate theory and practitioners to better act in the present and plan for a future in which digital technology and the professional work done in PSFs may be increasingly and differently connected.

Three objectives structure my research. (1) To explore how professionals’ work within PSFs involves (or does not involve) digital technology. (2) To examine why professional work in PSF changes (or does not change) when new digital technology becomes available. (3) To

analyse the work of professionals and others to navigate the introduction of emerging digital technology like generative AI within their firms. By fulfilling these objectives, this study will offer insights into the present and future of professional work, contributing to broader theoretical and practical discussions on managing digital technology and organizing professional work in PSFs.

Following others who have studied situated work as it emerges, develops, and changes when digital technology meets organised professional work (e.g., Koljonen and Chan 2024; Beane and Anthony 2023; Faulconbridge, Sarwar, and Spring 2023), I adopt a theoretical framework informed by a practice-based perspective. A practice-based perspective considers ‘practices’ as units of analysis when explaining social phenomena (Shove et al., 2012). A practice can be thought of as “*a routinized type of behaviour which consists of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, ‘things’ and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge*” (Reckwitz, 2002). In other words, in the context of this research, practices are the bundles of activities that comprise day-to-day professional work.

Practices can be divided into three elements for the sake of analytic tractability (Shove et al., 2012). One element is materials. This includes “*things, technologies, tangible physical entities, and the stuff of which objects are made*”. A second element is competences. This “*encompasses skill, know-how and technique*”. A third element is meanings. This includes “*symbolic meanings, ideas and aspirations*”. In short, the idea is that “*practices emerge, persist, shift and disappear when connections between elements of these three types are made, sustained or broken*” (Shove et al., 2012, pp. 14–15).

A practice-based perspective orientates the focus of research away from traditional concerns of technology as tools or mediums (Anthony et al., 2023), and toward relational collective assemblages associated with activities involved in a system of work (Bailey et al.,

2022). This makes it a suitable framework for investigating the activities performed – as well as the challenges encountered – as digital technology is, or is not, integrated into organised professional work. In other words, it is an appropriate theoretical framework for informing research into how digital technology relates to professional work practices within PSFs.

Research methods

This section explains my research design, justifies the empirical setting, describes the dataset and its use across the three papers of this integrated thesis, and details my analytic approach. Throughout, I situate these choices in the methods literature and explain how they jointly produce a robust design.

Research design

I adopted an inductive qualitative design to develop theory in response to my research interests (Creswell and Creswell, 2023). An inductive approach is appropriate when existing theory only partially explains a fast-moving emerging phenomenon (Eisenhardt et al., 2016; O'Mahony and Cohen, 2022) – in this case, the processes by which emerging digital technology relates to organized professional work. This design supports the discovery of concepts and relationships grounded in participants' accounts (Gioia et al., 2013). By contrast, a deductive quantitative design is better suited to testing rather than building theory (Langley, 1999; Miles et al., 2020).

I considered and rejected competing designs. A deductive survey or experiment would have required stable constructs and plausible hypotheses, which were not available given the novelty of the research questions in each paper (Locke, 2003). An ethnography – observing research participants' face-to-face interactions and providing a thick description of the field (Golden-Biddle and Locke, 1993; Hammersley and Atkinson, 2007; Van Maanen, 2011) – was methodologically attractive but proved impractical. The research occurred in the wake of COVID-19 lockdowns, when professionals worked largely on hybrid schedules (Empson,

2021). Much work shifted to digitally mediated encounters, limiting opportunities for traditional ethnographic observation (Akemu and Abdelnour, 2020). In addition, organizational data protection and security policies, increasingly sensitised by developments such as the General Data Protection Regulation (GDPR), made access particularly difficult – especially in professional service firms such as law firms. Although ethnographic access is always negotiated (Feldman et al., 2004), securing access sufficient for an ethnography involving digital technology applications was not feasible in the circumstances. I also explored a mixed-methods design, but similar access constraints, such as limited availability of organizational usage logs, precluded it.

In short, my inductive qualitative research design balanced rigour with pragmatism better than its alternatives. This maximised my study’s potential for theoretical contributions across the three papers.

Empirical setting

My research was set primarily in large law firms where professionals engage with digital technology in their daily work. These firms are central actors in the global economy, shaping international business transactions (Beaverstock et al., 1999; Faulconbridge et al., 2008; Flood, 1996, 2007). They exemplify *classic PSFs*: highly knowledge-intensive, low in capital intensity, and staffed by a professionalised workforce (von Nordenflycht, 2010). Although digital technology, including AI, is increasingly available to PSFs, adoption by professionals remains uneven (Faulconbridge, 2025; Ogunde, 2024; Rodgers et al., 2023).

Large law firms operate within a wider system of professions in which jurisdictional settlements over complex expert knowledge are continually contested (Abbott, 1988). For example, in the English legal system, reserved activities, such as the exercise of a right of audience or the conduct of litigation, may be performed only by authorised persons, typically lawyers. Non-reserved activities – such as advising on contracts or structuring business

transactions – may be performed by anyone but are often undertaken by lawyers (Legg and Bell, 2020; Narayanan and Bennun, 1991). Non-legally trained professionals, including data scientists and project managers, now contribute to the provision of legal services by law firms, particularly where work is AI-mediated (Armour et al., 2022; Sako et al., 2020, 2022). As such, large law firms – as archetypal PSFs – provide instructive sites from which to theorise management and organisational concepts such as professional expertise, boundaries, and autonomy, especially as they relate to digital technology (Cooper et al., 1996; Empson et al., 2013; Pinnington and Morris, 2003; Smets et al., 2012).

I used theoretical and purposeful sampling to select my research sites, concentrating on cases most likely to be theoretically informative and controlling for variation extraneous to the focal phenomena (Eisenhardt, 1989). The core setting comprised three large law firms (Firms 1–3) that made digital technology – including information technology (IT) and AI – available to professionals, and a legal technology provider (TechCo). Each firm offered a suite of applications, brought together traditional professionals (lawyers) with non-traditional specialists (data scientists, legal operations practitioners, and technologists), and served a similar corporate client base. Focusing on these well-defined cases allowed me to trace processes in depth and generate evidence for persuasive theorising (Siggelkow, 2007).

Empirical material

I drew on five types of evidence collected over nineteen months (October 2022–July 2024): interview, observational, documentary, multimedia, and ancillary data. Table 1 summarises these sources and provides details for each.

Interview data. The bulk of my data stems from 121 in-depth semi-structured interviews with 120 informants. One informant was interviewed twice; two sessions were conducted jointly at participants' request, and I count each participant's contribution as a separate interview. Interviews lasted between 15 and 62 minutes, around 37 minutes on average. This gave me

about 74 hours of interview material in total. I conducted all interviews; my supervisor occasionally joined and asked questions. In Firm 1, an administrative staff member was often present to facilitate logistics.

Participants spanned a diverse range of interviewees knowledgeable about my research interests. In Firm 1, I interviewed 21 in Practice (practising legal professionals), 25 in Legal Operations (legal business services practitioners), and 10 in Technology (the IT/technology function). Across Firms 2 and 3 and TechCo, I interviewed 11 Partners (senior lawyers), 38 Associates (more junior lawyers), 1 paralegal (an administrative legal assistant), 8 Knowledge Managers (those supporting lawyers with managing knowledge), and 6 Technologists (those whose primary role was technology related). Of the 121 interviews, 64 inform Paper 1, and 54 inform Paper 2 and 57 inform Paper 3; 54 interviews appear in more than one paper due to overlapping phenomena. See Table 1 for an overview and Appendix 1 for a detailed list.

I anonymised all organisations and interviewees. Firms are given pseudonyms and described only in generic terms because much of the material is potentially reputationally sensitive – an important concern for professional service firms (Greenwood et al., 2005). Interviewees are identified by pseudonymised roles to avoid inadvertent identification through distinctive job titles. I also omit personally identifiable details.

Most interviews were conducted via Microsoft Teams or Zoom. Although I initially planned in-person interviews to build relationship and rapport (Fujii, 2017), post-pandemic working patterns made remote interviews equally – often more – effective. Three factors were decisive: participants' high comfort with video-conferencing; greater scheduling flexibility for busy professionals; and smoother running of the interview in a stable online setup (Empson, 2021; Fujii, 2017; Weller, 2017). In short, conducting my interviews primarily through video-conferencing applications enabled me to build an effective relationship and rapport with my

participants, making my interviewing particularly useful for my research purposes (Empson, 2018; Fujii, 2017).

With participants' consent, I recorded and professionally transcribed interviews, except in three instances (two user errors and one technical interruption). In each exception, I produced an immediate write-up from my notes; on two occasions my supervisor's notes supplemented mine. Recording improved accuracy, reduced the need for constant typing (enabling me to look into the camera and engage fully with participants), and was minimally intrusive in the online setting (Fujii, 2017).

I used purposive sampling to identify participants with direct involvement in and knowledge of digital technology and organized professional work (Patton, 2002). Practice participants (including Partners and Associates) were current or intended users; Legal Operations participants (including Knowledge Managers and paralegals) worked to integrate technology into professional work; Technology participants (including Technologists) possessed in-depth knowledge of potentially relevant technology applications. I made sure to interview a broad range of participants to gain a variety of perspectives and help with triangulation among interviewees (Eisenhardt, 1989). I also triangulated responses with other data covering the time-period that I was studying, such as press releases or observations, which helped me to both get comfortable with the accuracy of participants' accounts and interpret them more effectively in context (Mathison, 1988).

Interviews followed a semi-structured protocol (Locke, 2003). I prepared a tailored version for each participant, combining core questions on the focal phenomena with targeted or ad hoc questions to build rapport and avoid "slavishly following a script" (Empson, 2018, p. 64). Given professional participants' demanding schedules, this preparation helped to facilitate efficient and productive interviews.

This research has been approved by the University of Oxford's Central University Research Ethics Committee (CUREC). This approvals process is in place to ensure appropriate ethical practice throughout all stages of a research project. My research strictly follows its guidelines. For example, I provided potential participants with a detailed information sheet and asked for and received informed consent from all participants prior to conducting interviews.

Observational data. I spent five days in the office of Firm 1 (four days in October 2022 and one day in March 2023). Although much access was limited to client meeting rooms, I observed the rhythms of work and informal interactions and joined staff for internal and external lunches. I also observed three structured activities: (1) an in-person meeting between Practice and Legal Operations on technology and resourcing; (2) a virtual team meeting on legal technology and innovation; and (3) a deal debrief on experiences using technology in live matters. These sessions allowed comparison between interview claims and work interactions and informed my reading of similar patterns in Firms 2 and 3 and TechCo.

Documentary data. I collected press releases and other public materials to identify relevant technology applications, work processes, and potential participants and to cross-check interview claims. Firm-specific documents from Firm 1 included organisation charts over time and materials on the firm's approach to generative AI. Where a focal application was under study, I gathered training and support materials and requested sample interactions to examine traces of use in practice. One firm (Firm 3) provided application-usage data prior to my interviews. I also collected and analysed 22 industry surveys on law firm technology (2020–2024), which supported my literature review and helped me to refine paper-specific research questions.

Multimedia data. Multimedia data sources included technology application walkthroughs within Firm 1 involving a screenshare and demonstrations of various technology applications available to users in the firm. TechCo also provided a recording of a training webinar and direct

access to their technology application. Hands-on use allowed me to mirror workflows described by participants and clarified technical terms. This helped me to interpret interview data, particularly where it involved complex accounts of work practices such as prompting a generative AI application.

Ancillary data. I conducted and reviewed an internal Firm 1 survey (62 responses in two tranches: October 2022 and September 2023). Although not used for formal analysis, it indicated a range of applications in use and diversity of user views, which informed my interpretation of interview data. I also conducted 16 recorded and transcribed interviews with members of two additional large law firms (“Firm X” and “Firm Y”); these interviews served only as contextual background. Finally, I held feedback sessions at each focal law firm (lasting between 30 and 90 minutes) to present preliminary findings and gather feedback. At Firms 2 and 3 this involved only facilitators and a few participants; at Firm 1, other potentially interested members also attended. I also drew reflexively on ten interviews that I had performed on an adjacent research project (between June and July 2021) with Practice, Legal Operations, and Technology participants in Firm 1, and on my prior professional experience in an elite large law firm (2011–2018) and in a technology company serving professional service firms (2019–2020, including Firm 1). These materials were not part of the formal analysis but helped me to situate and interpret the interview data.

Data type	Data extent	Data use(s)	Relevant paper(s)
Interview data	Total: 121 in-depth, semi-structured interviews with 120 participants; 15–62 minutes (mean ≈ 37); ≈ 74 total hours. By site: <i>Firm 1</i> – Practice 21; Legal Operations 25; Technology 10 (total 56 participants). <i>Firm 2</i> – Partners 6;	Identify relevant technologies, work processes, and practices; analyse relationships between digital technology and work practices; validate emerging themes and aggregate dimensions; triangulate within interviews and across data types.	Paper 1 (64 interviews). Papers 2 & 3 (57 interviews – 54 in Paper 2; all 57 in Paper 3).

Data type	Data extent	Data use(s)	Relevant paper(s)
	Associates 25; Knowledge Managers 6; Technologists 1 (total 38 participants). <i>Firm 3</i> – Partners 5; Associates 13; Knowledge Managers 2; Paralegal 1 (total 21). <i>TechCo</i> – Technologists 5 (total 5 participants).		
Observational data	Firm 1 only. <i>Five on-site days:</i> 6, 7, 12, 13 October 2022; 20 March 2023 (access primarily to client meeting rooms; accompanied visits to cafeteria/canteen and external lunches). <i>Structured observations:</i> (1) in-person Practice and Legal Operations meeting (1 hour, 12 October 2022); (2) virtual team meeting on legal technology and innovation (Microsoft Teams, 1 hour, 20 April 2023); (3) virtual deal debrief (Microsoft Teams, 30 minutes, 8 June 2023).	Build trust with access gatekeepers; understand physical and relational aspects of work and technology use; identify situated interaction patterns across professional categories; interpret interview data; triangulate and weigh anomalies.	Papers 2 & 3.
Documentary data	Press coverage: <i>Firm 1</i> (13 items, January 2022–October 2023); <i>Firm 2</i> (4 items, March–December 2023); <i>Firm 3</i> (11 items, March–December 2023). Firm-specific materials: <i>Firm 1</i> (two items on potential engagement with generative AI (as of 22 May 2023); two Legal Operations organisation charts showing change	Identify relevant technologies, processes, practices, and potential participants; understand material features and situated use; interpret and cross-check interview data; triangulate across sources and weigh anomalies; support literature review and refine paper-specific questions (industry surveys).	Paper 1 (press coverage; training/support materials; sample technology interactions; usage data). Papers 2 & 3 (press coverage; firm-specific materials). Literature review (industry surveys).

Data type	Data extent	Data use(s)	Relevant paper(s)
	over time (as of 3 March 2023)). Training/support materials: TechCo (4 items, February–May 2024). Sample technology interactions: <i>Firm 2</i> (23 February 2024); <i>Firm 3</i> (22 February 2024). Usage data: Firm 3 (individual-level application-usage counts, as of January 2024). Industry surveys: 22 surveys on law-firm technology (2020–2024).		
Multimedia data	Walkthroughs: Firm 1–two technology application walkthroughs (45 minutes each, 1 December 2022). Webinar: TechCo – training-webinar recording (accessed 11 December 2023). Application access: TechCo – direct access to an application.	Identify relevant technologies, processes, and practices; understand material features in simulated practice; aid interpretation of complex accounts.	Paper 1 (webinar; application access). Papers 2 & 3 (walkthroughs).
Ancillary data	Survey: Firm 1 – 62 responses to 22 questions (reported 7 October 2022 and 18 September 2023). Ancillary interviews: <i>Firm 1</i> (June 2021–June 2022): 10	Provide context for interpreting interviews; inform analysis (<i>not used for formal coding</i>).	Paper 1 (feedback sessions; experiential data). Papers 2 & 3 (survey; ancillary interviews; feedback sessions; experiential data)

Data type	Data extent	Data use(s)	Relevant paper(s)
	interviews (Practice, Legal Operations, Technologists); <i>Firm X</i> (June 2022–February 2023): Practice 3, Legal Operations 7 (total 10); <i>Firm Y</i> (June–July 2023): Legal Operations 6 (total 6). Feedback sessions: <i>Firm 1</i> (16 May 2023; 14 July 2023 – Teams, ~30 minutes each); <i>Firm 2</i> (30 July 2024 – Zoom, ~60 minutes); <i>Firm 3</i> (31 July 2024 – in-person, ~90 minutes). Experiential data: trainee/associate in an elite large law firm (2011–2018); technology-company role serving large law firms (2019–2020, including Firm 1).		

Table 1 – Empirical material

Empirical analysis

My analytic approach was inductive and iterative: cycles of analysis followed cycles of data collection, each informing the next (Corbin and Strauss, 2015; Eisenhardt, 1989). I compared instances and concepts, actively categorising the data to build theory (Eisenhardt et al., 2016; Grodal et al., 2021). Although this thesis comprises three distinct papers, my empirical analysis followed a common sequence of moves.

Move 1. My first move was to ask questions (Grodal et al., 2021). I started with a high-level interest in the distinct processes through which emerging digital technology relates to organized professional work. I approached potential research sites and got a general idea of the questions that they were most interested in. These often boiled down to similar concerns, such

as: *Why are professionals not using technology as much as might be expected given their potential for improving business effectiveness? How can a firm get its professionals to adopt technology more quickly and effectively?*

At around the same time, I also did a literature review to find out what was already known about digital technology and organized professional work in a manageable and interesting setting: law firms in the legal sector. This included reviewing both the management and organizational literature as well as industry surveys. This uncovered a range of questions, including (but not limited to): *What practical expertise is necessary for lawyers to use emerging technology, and how do they acquire it? How does the use of technology affect what lawyers do in relation to their core tasks of giving advice to clients? Are law firms developing new work practices to integrate technology – and if so, what are these practices, how are they developing, and why now?* Having articulated some potentially interesting questions, I selected research settings that might help me to understand more about my phenomena of interest.

Move 2. I deeply immersed myself in the data (Eisenhardt et al., 2016). This involved collecting a range of data types (see *Empirical Material* above) relating to my focal phenomena. I tried to keep an open – rather than an empty – mind about what could be useful or might be interesting (Siggelkow, 2007). Not all my activities proved to be valuable from a theory generation point of view. For example, I collected a lot of annual reports from law firms because I thought that the financial data in them might be productive for theory. This did not turn out to be the case. I also collected some data, such as doing a survey, that I had hoped would be more useful – but turned out to be ancillary to my focal theoretical interests as they developed. My main data collection method was interviews, and I spent a lot of time and effort analysing them as follows.

Move 3. I focused on puzzles – that is, the part of the data that was most surprising or salient to me (Grodal et al., 2021). For instance, when I started my interviews about digital technology

in a large law firm, I expected to talk primarily to lawyers (who would know about providing legal advice) and technologists (who would know about the digital technology available to lawyers). However, it soon became clear from participants and discussions with my colleagues that I also needed to talk to operations practitioners: ex-lawyers, consultants, or other adjacent professionals who were central to integrating digital technology in lawyers' workflows at the firm. This unexpected insight would help inform my research question for Paper 3: *How do PSFs develop operations management practices to integrate digital technology and AI?*

Move 4. I used codes to develop salient concepts emerging from my data. I first performed initial (open) coding to split my data into individually coded pieces (Saldana, 2025), using in vivo codes where participants' language was conceptually meaningful (Charmaz, 2006), and assigning preliminary labels to emerging themes (Gioia et al., 2013). I performed axial coding to link categories and subcategories, specifying properties and dimensions and iteratively refining, merging, splitting, sequencing, or contrasting categories (Grodal et al., 2021; Saldana, 2025), iterating between axial and initial (open) coding. I then used theoretical (selective) coding to refine categories, add descriptive detail, and unify them around a core category or theoretical framework (Corbin and Strauss, 1990; Langley, 1999). This activity enacted creativity and interpretation rather than simply rule-following (Locke, 2003; Suddaby, 2006). It involved a series of 'conceptual leaps' – consciously realized and abstract theoretical ideas in the context of an empirical study – to develop theory using abductive reasoning, or inference to a plausible explanation (Ketokivi and Mantere, 2010; Klag and Langley, 2013). This is an approach to generative theorizing that can complement an otherwise inductive research design (Mantere and Ketokivi, 2013; Sætre and Van de Ven, 2021), and provides a basis for selection between otherwise logically coherent alternative theoretical generalizations (Ketokivi and Mantere, 2010). My progression – from first-order codes to second-order themes to aggregate dimensions – thus enabled active categorisation and pattern identification, and ultimately

theory generation, grounded in the data. For each paper, I include a data structure that maps out how I performed this process (Gioia et al., 2013).

Move 5. I also wrote and circulated analytical and theoretical memos throughout the data analysis process. These presented thoughts and reflections about the categories that were developing, and their properties and connections. Memos of these type are typically considered central to qualitative, inductive research (Eisenhardt et al., 2016; Saldana, 2025). In preparing the memos I would consider my data as well as engage with existing literature to enhance my conceptual categories and tighten the theoretical logic between them. I would usually reflect on these individually or circulate them to my supervisors. Sometimes, I would present them at seminars or conferences, which often gave me useful feedback to help me revisit my data analysis, incorporating comments in subsequent rounds of coding and memo writing.

Move 6. Throughout the data analysis process I was actively and continually developing or dropping working theories (Eisenhardt et al., 2016; Grodal et al., 2021). For instance, for Paper 1 my initial data collection and analysis highlighted the ‘prompt engineer’ as a central boundary spanning role enabling expertise with emerging technology applications. I problematized this emerging theoretical understanding by exposing it to further data collection and analysis. This challenged my underlining assumption of a singular learning pathway and led me to focus on the various pathways emerging from my data analysis instead. This move enabled me to enhance my concepts and led to a better understanding of relationships between them and richer processes about important phenomena grounded in my empirical data, which is reflective of strong theory (Eisenhardt et al., 2016).

Move 7. I considered the quality of my research before, during, and after conducting it. Quality (or goodness) criteria for research are not absolute but vary across research designs (Denzin and Lincoln, 2017). For qualitative, inductive research – such as mine presented here – Creswell & Creswell (2023) outline two particularly relevant criteria: validity and reliability.

Qualitative validity is concerned with whether findings are accurate – whether from the viewpoint of the researcher, participants, or another audience. I used various procedures to enhance and check validity (see *Empirical Material* above). While spending prolonged time in the field collecting data, I triangulated within interviews and across different data types. My findings were composed using a rich, thick description, including clear, verbatim quotes illustrating themes and concepts relating to how emerging digital technology relates to organized professional work. Member checking was done through feedback sessions with the law firms, as I presented findings and themes back to participants and providing them an opportunity to comment on them. I also did peer debriefing, providing my research to my supervisors and presenting it at seminars or conferences, to involve interpretation beyond just myself as the researcher and incorporating their feedback into my study. As part of my data analysis, I repeatedly exposed my research to negative or discrepant information that ran counter to emerging themes (see *Moves 4-6* above). For instance, in Paper 1 I had initially identified three learning pathways leading to boundary work practices. Yet, as I collected and analysed data further, it became evident that certain exceptions existed. I updated my theoretical framework to account for these.

Qualitative reliability is concerned with checking if research is reliable (that is, consistent or stable). I used various procedures to enhance and check reliability. This included checking my transcripts to make sure they did not contain evident mistakes, even though I had had them professionally transcribed. I also repeatedly compared my data with my codes and wrote analytical memos on this to help ensure that codes' meanings remained consistent. At a higher level, I documented my research design and the moves I employed to ensure other researchers can understand and follow my research choices.

Finally, it is important to re-state that my research was iterative. It did not proceed linearly from data collection to analysis to theory generation and robustness checks; many activities occurred concurrently. With that said, the research involved each move set out above.

Thesis structure

Adopting an integrated three-paper approach, this thesis investigates the situated work practices that emerge, develop, and change when digital technology meets organised professional work. This section provides a summary of the literature review and each paper.

Literature review

The literature review explores the impact of digital technology on US and UK law firms, focusing on machine learning and AI. Considering extant literature (including material from academic journals in law, management, and organisation theory, as well as industry surveys), it shows how technology has not so far led to the end of law firms in their current guise. Adoption of AI remains in its early stages, in the sense that it is not yet generally used intensively by individual professionals or extensively across the profession. Its impact has been constrained by the limited scope of use cases for which it is well-suited, although generative AI can be expected to substantively loosen this constraint. However, even without taking into account the ongoing developments relating to generative AI, technology has already been transforming law firms by: (i) moving to the front office from the back office (i.e., getting in the hands of the lawyers themselves as they do their legal work), affecting lawyers' core professional work of solving legal problems for their clients; (ii) providing opportunities for lawyers to follow new alternative career paths incorporating technology-related skills and expertise; and (iii) giving law firms the option to adopt business models creating value from nonhuman capital (i.e., from technology) and nonlegal human capital (i.e., from adjacent professionals, such as legal technologists). These three themes and research puzzles associated with them inform the papers that follow.

Paper 1 – Prompt engineering as substantive and relational expertise: Linking professionals’ learning pathways to boundary work

This paper develops themes identified in the literature review. It focuses on professional boundaries in light of technology-related implications for professional expertise, work, and jurisdiction. It investigates the research question: How do professionals perform boundary work while acquiring prompt engineering expertise for generative AI? Drawing on 64 interviews with lawyers, knowledge managers, and technologists at two large law firms and a technology company, the paper identifies three learning pathways linked to different boundary work practices: (i) *engaging*, which develops *human-to-machine relational expertise* (i.e., situated and contextual knowledge of interacting with a specific technology), affording *reinforcing* boundary work (i.e., professionals claiming and performing prompt engineering themselves); (ii) *connecting*, which develops *human-to-human relational expertise* (i.e., situated and contextual knowledge of interacting with other professionals), affording *relating* boundary work (i.e., professionals claiming and performing prompt engineering in collaboration with others); and (iii) *avoiding*, where professionals do not develop prompt engineering expertise, constraining them to *resisting* boundary work (i.e., professionals not claiming or performing prompt engineering). Exceptionally, relational expertise from *engaging* or *connecting* may also afford *resisting* boundary work, when professionals develop a sufficient understanding of prompt engineering and generative AI to deem its use problematic, typically for a specific use case rather than as a technology.

This paper makes the following contributions. First, it develops a typology of prompt engineering expertise in a professional context, demonstrating empirically that generative AI’s use does not necessarily reduce reliance on substantive professional expertise. While prompt engineering is often portrayed as a technical skill (Acar, 2023; Boussioux et al., 2024; Liu et al., 2023; McAfee et al., 2023), this paper’s findings show an interplay among substantive and

relational expertise in four steps: (1) diagnosing and framing a professional problem, (2) translating that problem into prompts aligned with generative AI's capabilities, (3) iteratively assessing and validating outputs using domain-specific criteria, and (4) combining those outputs with professional judgment to deliver client services.

Second, it models how professionals develop practical expertise – prompt engineering – for emerging technology – generative AI – and apply it as they redefine their professional boundaries. By linking learning pathways (Beane, 2019; Beane and Anthony, 2023; Kaynak, 2024; Rostain and Huising, 2023), through relational expertise (Barley, 1996; Pakarinen and Huising, 2023; Sandefur, 2015), to boundary work (Faulconbridge et al., 2023; Langley et al., 2019), the model explains how modes of practical expertise acquisition shape professionals' boundary responses to emerging technology. These contributions enhance our understanding of professional responses to technology such as generative AI and address an important but underexplored topic in research on technology and organizing in professional work contexts (Anthony et al., 2023; Faulconbridge et al., 2023; Koljonen and Chan, 2024; Perner and Werr, 2023; Scarbrough et al., 2024).

Paper 2 – “Getting comfortable” with digital technology: How professionals maintain, reconstitute, and reconfigure work practices

Where the first paper largely focuses on a specific emerging technology (generative AI) and associated practical expertise (prompt engineering), the second paper takes a broader view to explore digital technology and professional work practices. Building on themes identified in the literature review, it examines how digital technology is affecting professionals' core professional work of solving problems for their clients, and the implications of this for PSFs' digitalisation. To do so, it asks the research question: How does digital technology including AI maintain, change, or recreate professional work – and with what implications for organizational digitalization? It examines this in an elite large law firm, where technology is

transforming some, though not all, aspects of professional work (Faulconbridge, 2025; Rodgers et al., 2023).

Using qualitative methods, I collected and analyzed data including 54 interviews, providing a view of the work processes and practices through which professionals engage with and navigate digital technology in a PSF. The findings identify a process of “getting comfortable” with digital technology. This involves professionals performing four distinct work practices: (i) *assessing* the technology for potential relevance and usefulness for their work; (ii) *evaluating* its compatibility with their professional identity and expertise; (iii) *validating* its appropriateness for their live client work through testing or other trial use; and (iv) *reflecting* iteratively on the technology’s continuing appropriateness for their work. Professionals’ process of “getting comfortable” with digital technology in this way was associated with three different responses. Some performed *maintaining* work practices by excluding or minimizing technology; others performed *reconstituting* practices by integrating technology while preserving professional identity and expertise; while others performed *reconfiguring* practices by integrating technology while adjusting professional identity or expertise. These distinctive responses form the basis for theorizing how professionals “getting comfortable” with digital technology variably shapes PSFs’ digitalization.

This study contributes to the literature on digitalization and professional work within PSFs in three ways. First, the research develops a process model linking work practices to PSFs’ digitalization. In line with the relational turn in studying technology and organizing (Anthony et al., 2023; Bailey et al., 2022; Monteiro et al., 2024), it shows how professionals *assessing*, *evaluating*, *validating*, and *reflecting* on digital technology within a system of professional work collectively shape a PSF’s digitalization trajectory through work practices enacting variable professional responses. This adds to the literature dealing with digital technology and organized professional work by systematically relating core concepts

associated with it – digital technology, professional expertise, and professional identity – to organizational digitalization (Goto et al., 2025; Kronblad and Jensen, 2023; Pakarinen and Huising, 2023; Perner, 2021; Scarbrough et al., 2024; Spring et al., 2022). Second, the study extends research on digitalization emphasizing the diversity of responses to digital technology based on professionals’ anticipations, decisions, and activities (Amaya and Holweg, 2024; Faulconbridge et al., 2023; Goto, 2023; Koljonen and Chan, 2024; Perner, 2021; Perner and Werr, 2023). By theorizing how professionals “getting comfortable” with digital technology leads to their *maintaining*, *reconstituting*, or *reconfiguring* work practices, the study outlines a mechanism that helps to explain the diversity of these responses. Third, the study theorises how digital technology, mediated through professionals’ work practices involved with “getting comfortable” with it, can lead to variable outcomes for PSFs. Rather than a unidirectional process (e.g., Kronblad, 2020; Susskind & Susskind, 2022), digitalization may involve maintaining, increasing, or decreasing a PSF’s knowledge intensity, depending on how professionals navigate, engage with, and integrate digital technology into their work. Together, these contributions address gaps in our understanding of how and why digitalization unfolds as it does in PSFs.

Paper 3 – Enhancing productivity in professional services: Developing operations management practices to integrate digital technology and AI

The third paper explores digital technology and organised professional work in terms of work practices and operations – that is, the activities involved in the process of converting inputs to outputs in a PSF. It is informed by the dual insights from the literature review that digital technology in law firms has been (i) providing opportunities for lawyers to follow new alternative career paths incorporating technology-related skills and expertise, and (ii) giving PSFs the option to adopt business models creating value from nonhuman capital and nonlegal

human capital. The paper's research question is: How do PSFs develop operations management practices to integrate digital technology and AI?

This research question arises from a distinct puzzle in the literature. On one hand, researchers have traditionally viewed PSFs as resistant to changes that would standardize their autonomous professionals' customized client services. On the other hand, recent studies and theory imply significant shifts in professional services driven by digital technology and AI, indicating a move towards standardizing professionals' work and workflows. This paper seeks to resolve this puzzle by examining how PSFs navigate or resolve these tensions. Do they simply use their existing professional service operations management practices to try to integrate digital technology and AI with "gentle nudges", which focus on persuading professionals to adopt and use digital technology and AI in their workflows? Or do they develop new, or simply use more mainstream, approaches as they seek to accommodate such technology?

To do so, this paper examines how PSFs develop operations management practices to integrate digital technology and AI through a case study of a large law firm, which included 56 interviews with legal operations practitioners, lawyers, and technologists. The findings show the use of process mapping, work modelling, project management, and performance evaluation to enable professionals to integrate these technologies, bridging them to ancillary resources (such as potentially relevant technology applications or adjacent expertise) while buffering them from low value or routine work (such as by automating repetitive aspects of their workflows or preventing them from disruptive interventions relating to technology itself). Operations practitioners also develop *transitioning* work practices that legitimize operations managements' role and build their credibility, facilitating a shift from customised traditional methods to a more standardised technology-inclusive mode of production for professional services.

This paper contributes a process model theorizing how PSFs develop operations management practices to integrate digital technology and AI into their professional service operations. It also reframes PSFs’ distinctive “gentle nudges” (Goodale et al., 2008; Harvey et al., 2016; Malhotra et al., 2006), showing how these practices are accompanied by and sometimes transitioned to mainstream operations management practices to integrate digital technology and AI. This addresses an under-theorised area of the literature relating to how PSFs can move up the diagonal of the service matrix from professional service towards service factory for a more swift, even flow that enhances productivity (Schmenner, 1986, 2004; Schmenner and Swink, 1998). In addition, the study adopts a work-based, practice-sensitive perspective focusing on core process-embedded practitioners to address contemporary concerns within the wider operations management literature about the exclusion of peripheral practitioners, which can lead to missing out on critical insights (Angelopoulos et al., 2023; Bendoly and Oliva, 2024). In these ways, this study advances an emerging discourse on operations and technology management in the context of PSFs integrating digital technology and AI into their professional work and workflows (e.g., Amaya and Holweg, 2024; Heim et al., 2021; Sampson and Pires dos Santos, 2023; Spring et al., 2022).

Roadmap and final reflections

In sum, this research seeks to answer how digital technology is integrated into professional work practices in PSFs (as well as how and why this may not occur), with particular focus on large law firms as exemplars. Each paper addresses a different but related angle of this research interest. As will be explored in more depth in the conclusion to this thesis, three distinct themes arise from the papers. First, digital technology problematises existing settlements of professional expertise and boundaries. Evidence includes professionals’ boundary work around prompt-engineering expertise for generative AI, as well as operations managers’ work practices to integrate technology into PSFs’ workflows. Second, digital

technology challenges the established balance between professional autonomy and managerial authority. Effective integration of digital technology often coincides with emerging forms of managerial authority (e.g., technologists, operations, or knowledge managers), who redesign or standardise work, altering the scope and nature of professional autonomy. Third, technology adoption and integration vary among professionals. Some engage with digital technology, reconfiguring their work practices for technology-inclusive service production. Others resist it, maintaining existing practices and traditional production methods. Still others adopt a middle ground. Together, these themes highlight the complex, complicated, and dynamic relations between digital technology and organised professional work, and outline how digital technology is part of a system of professional work.

Of course, this thesis is not the first research to consider the relations between technology, work, and organization generally, or even specifically digital technology, professional work, and PSFs. With that said, previous studies interested in similar questions have mainly looked at specific technologies (e.g. KMS or AI applications) or organizational characteristics (e.g. knowledge intensity or business models) within PSFs. My research extends this approach within the literature by considering professionals' learning pathways for practical expertise (prompt engineering) and their use of emerging technology (generative AI) in their work, as well as by examining how professional service operations can practically integrate digital technology by transitioning from one mode of production to another more technologically inclusive mode. My research also differs from much of the extant literature by examining various digital technology applications situated in a system of work, for example, offering a distinct perspective on how professional work practices in this organizational setting involve digital technology in different ways, with unexpected outcomes for PSFs' digitalisation.

The literature review, three papers, and conclusion of this thesis follow this section sequentially. While I do not claim that they perfectly or comprehensively answer my central research question, they represent my ongoing progress in doing so at this stage of my research journey while studying rapidly changing emerging phenomena. From when I first noticed and started to pay attention to how day-to-day professional work could change when new technology came along while in industry, through my review of the professional and academic literature to help me understand this further, to the empirical and theoretical contributions contained in this thesis, my initial ‘hunch’ that looking closely at how professionals actually engage with and use digital technology in their work could help with explaining how and why these developments and changes happen – or don’t happen – in PSFs has remained a resolute guide. I hope that you agree that it has pointed me in the right direction.

REFERENCES

- Abbott, A. (1988). *The system of professions: An essay on the division of expert labor*, Chicago: University of Chicago Press.
- Acar, O. A. (2023). 'AI Prompt Engineering Isn't the Future'. *Harvard Business Review*. <https://hbr.org/2023/06/ai-promptengineering-isnt-the-future>.
- Akemu, O. and Abdelnour, S. (2020). 'Confronting the Digital: Doing Ethnography in Modern Organizational Settings'. *Organizational Research Methods*, **23**, 296–321.
- Amaya, J. and Holweg, M. (2024). 'Using algorithms to improve knowledge work'. *Journal of Operations Management*, **70**, 482–513.
- Angelopoulos, S., Bendoly, E., Fransoo, J., Hoberg, K., Ou, C., and Tenhiälä, A. (2023). 'Digital transformation in operations management: Fundamental change through agency reversal'. *Journal of Operations Management*, **69**, 876–889.
- Anthony, C., Bechky, B. A., and Fayard, A.-L. (2023). "“Collaborating” with AI: Taking a System View to Explore the Future of Work'. *Organization Science*, **34**, 672–694.
- Armour, J., Parnham, R., and Sako, M. (2022). 'Augmented Lawyering'. *University of Illinois Law Review*, **1**, 71–138.
- Armour, J. and Sako, M. (2020). 'AI-enabled business models in legal services: from traditional law firms to next-generation law companies?'. *Journal of Professions and Organization*, **7**, 27–46.
- Bailey, D. E., Faraj, S., Hinds, P. J., Leonardi, P. M., and von Krogh, G. (2022). 'We Are All Theorists of Technology Now: A Relational Perspective on Emerging Technology and Organizing'. *Organization Science*, **33**, 1–18.
- Barley, S. R. (1986). 'Technology as an Occasion for Structuring: Evidence from Observations of CT Scanners and the Social Order of Radiology Departments'. *Administrative Science Quarterly*, **31**, 78–108.
- Barley, S. R. (1996). 'Technicians in the Workplace: Ethnographic Evidence for Bringing Work into Organizational Studies'. *Administrative Science Quarterly*, **41**, 404–441.
- Beane, M. (2019). 'Shadow Learning: Building Robotic Surgical Skill When Approved Means Fail'. *Administrative Science Quarterly*, **64**, 87–123.
- Beane, M. and Anthony, C. (2023). 'Inverted Apprenticeship: How Senior Occupational Members Develop Practical Expertise and Preserve Their Position When New Technologies Arrive'. *Organization Science*, **35**, 405–431.
- Beaverstock, J. V., Taylor, P. J., and Smith, R. G. (1999). 'The long arm of the law: London's law firms in a globalising world economy'. *Environment and Planning A*, **31**, 1857–1876.
- Bendoly, E. and Oliva, R. (2024). 'Holding North: Recognizing identity and advancing contribution in operations management'. *Journal of Operations Management*, **70**, 518–522.
- Boussiou, L., Lane, J. N., Zhang, M., Jacimovic, V., and Lakhani, K. R. (2024). 'The Crowdless Future? Generative AI and Creative Problem-Solving'. *Organization Science*, **35**, 1589–1607.
- Charmaz, K. (2006). *Constructing grounded theory*, London: SAGE.
- Cooper, D. J., Hinings, B., Greenwood, R., and Brown, J. L. (1996). 'Sedimentation and Transformation in Organizational Change: The Case of Canadian Law Firms'. *Organization Studies*, **17**, 623–647.
- Corbin, J. M. and Strauss, A. (1990). 'Grounded theory research: Procedures, canons, and evaluative criteria'. *Qualitative sociology*, **13**, 3–21.
- Corbin, J. M. and Strauss, A. L. (2015). *Basics of qualitative research: techniques and procedures for developing grounded theory.*, Los Angeles: SAGE.

- Creswell, J. W. and Creswell, J. D. (2023). *Research design: qualitative, quantitative, and mixed methods approaches*, Los Angeles: SAGE.
- Dell'Acqua, F., McFowland, E., Mollick, E. R., Lifshitz-Assaf, H., Kellogg, K. C., Rajendran, S., et al. (2023). 'Navigating the Jagged Technological Frontier: Field Experimental Evidence of the Effects of AI on Knowledge Worker Productivity and Quality'. *Harvard Business School Technology & Operations Mgt. Unit Working Paper*.
- Denzin, N. K. and Lincoln, Y. S. (2017). *The SAGE handbook of qualitative research*, Thousand Oaks, Calif: Sage Publications, 5th ed.
- Eisenhardt, K. M. (2021). 'What is the Eisenhardt Method, really?'. *Strategic Organization*, **19**, 147–160.
- Eisenhardt, K. M. (1989). 'Building Theories from Case Study Research'. *Academy of Management Review*, **14**, 532–550.
- Eisenhardt, K. M., Graebner, M. E., and Sonenshein, S. (2016). 'Grand Challenges and Inductive Methods: Rigor without Rigor Mortis'. *Academy of Management Journal*, **59**, 1113–1123.
- Empson, L. (2018). 'Elite interviewing in professional organizations'. *Journal of Professions and Organization*, **5**, 58–69.
- Empson, L. (2021). 'Researching the Post-Pandemic Professional Service Firm: Challenging our Assumptions'. *Journal of Management Studies*, **58**, 1383–1388.
- Empson, L., Cleaver, I., and Allen, J. (2013). 'Managing partners and management professionals: Institutional work dyads in professional partnerships'. *Journal of Management Studies*, **50**, 808–844.
- Faulconbridge, J. (2025). 'Trajectories of legal work in the context of machine learning AI: conceptualising mediated evolution'. *International Journal of the Legal Profession*, **32**, 97–120.
- Faulconbridge, J., Beaverstock, J., Muzio, D., and Taylor, P. (2008). 'Global Law Firms: Globalization and Organizational Spaces of Cross-Border Legal Work'. *Northwestern Journal of International Law and Business*, **28**, 455–488.
- Faulconbridge, J., Sarwar, A., and Spring, M. (2023). 'How Professionals Adapt to Artificial Intelligence: The Role of Intertwined Boundary Work'. *Journal of Management Studies*. <https://doi.org/10.1111/joms.12936>.
- Faulconbridge, J., Sarwar, A., and Spring, M. (2024). 'Accommodating Machine Learning Algorithms in Professional Service Firms'. *Organization Studies*, **45**, 1009–1037.
- Feldman, M. S., Bell, J., and Berger, M. T. (2004). *Gaining Access: A Practical and Theoretical Guide for Qualitative Researchers*, Ebook: AltaMira Press.
- Flood, J. (1996). 'Megalawyering in the global order: The cultural, social and economic transformation of global legal practice'. *International Journal of the Legal Profession*, **3**, 169–214.
- Flood, J. (2007). 'Lawyers as Sanctifiers: The Role of Elite Law Firms in International Business Transactions'. *Indiana Journal of Global Legal Studies*, **14**, 35–66.
- Fujii, L. A. (2017). *Interviewing in Social Science Research*, New York: Routledge.
- Gioia, D. A., Corley, K. G., and Hamilton, A. L. (2013). 'Seeking Qualitative Rigor in Inductive Research'. *Organizational Research Methods*, **16**, 15–31.
- Glaser, B. and Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*, London: Routledge.
- Golden-Biddle, K., & Locke, K. 1993. Appealing Work: An Investigation of How Ethnographic Texts Convince. *Organization Science*, 4(4): 595–616.

- Goodale, J. C., Kuratko, D. F., and Hornsby, J. S. (2008). 'Influence factors for operational control and compensation in professional service firms'. *Journal of Operations Management*, **26**, 669–688.
- Goto, M. (2023). 'Anticipatory innovation of professional services: The case of auditing and artificial intelligence'. *Research Policy*, **52**, 104828.
- Goto, M., Kotosaka, M., and Sako, M. (2025). 'When professionals become entrepreneurs: Identity construction of lawtech startup founders in Japan'. *Journal of Professions and Organization*, **12**, joae008.
- Greenwood, R., Li, S. X., Prakash, R., and Deephouse, D. L. (2005). 'Reputation, Diversification, and Organizational Explanations of Performance in Professional Service Firms'. *Organization Science*, **16**, 661–673.
- Grodal, S., Anteby, M., and Holm, A. L. (2021). 'Achieving Rigor in Qualitative Analysis: The Role of Active Categorization in Theory Building'. *Academy of Management Review*, **46**, 591–612.
- Hammersley, M. and Atkinson, P. (2007). *Ethnography: principles in practice*, London: Routledge.
- Harvey, J., Heineke, J., and Lewis, M. (2016). 'Editorial for Journal of Operations Management special issue on “Professional Service Operations Management (PSOM)”'. *Journal of Operations Management*, Special Issue on Professional Service Operations Management (PSOM), **42–43**, 4–8.
- Heim, G. R., Nair, A., and Bendoly, E. (2021). 'Aims and criteria for advancing technology management research at the Journal of Operations Management'. *Journal of Operations Management*, **67**, 920–925.
- Kaynak, E. (2024). 'Leveraging Learning Collectives: How Novice Outsiders Break into an Occupation'. *Organization Science*, **35**, 948–973.
- Ketokivi, M. and Mantere, S. (2010). 'Two Strategies for Inductive Reasoning in Organizational Research'. *Academy of Management Review*, **35**, 315–333.
- Klag, M. and Langley, A. (2013). 'Approaching the Conceptual Leap in Qualitative Research'. *International Journal of Management Reviews*, **15**, 149–166.
- Koljonen, T. and Chan, C. K. (2024). 'Balancing professional autonomy and managerial goals amid broad technology adoption pressures: Intraprofessional segmentation at a Finnish School'. *Academy of Management Journal*, **67**, 798–828.
- Kronblad, C. (2020). 'How Digitalization Changes our Understanding of Professional Service Firms'. *Academy of Management Discoveries*, **6**, 436–454.
- Kronblad, C. and Jensen, S. H. (2023). '“Being a professional is not the same as acting professionally”—How digital technologies have empowered the creation and enactment of a new professional identity in law'. *Journal of Professions and Organization*, **10**, 99–119.
- Langley, A. (1999). 'Strategies for Theorizing from Process Data'. *Academy of Management Review*, **24**, 691–710.
- Langley, A., Lindberg, K., Mørk, B. E., Nicolini, D., Raviola, E., and Walter, L. (2019). 'Boundary Work among Groups, Occupations, and Organizations: From Cartography to Process'. *Academy of Management Annals*, **13**, 704–736.
- Legg, M. and Bell, F. (2020). *Artificial intelligence and the legal profession*, Oxford: Hart Publishing.
- Liu, P., Yuan, W., Fu, J., Jiang, Z., Hayashi, H., and Neubig, G. (2023). 'Pre-train, Prompt, and Predict: A Systematic Survey of Prompting Methods in Natural Language Processing'. *ACM Computing Surveys*, **55**, 1–35.
- Locke, K. (2003). *Grounded Theory in Management Research*, London: SAGE Publications.

- Malhotra, N., Morris, T., and Hinings, C. R. (2006). 'Variation in Organizational Form among Professional Service Organizations'. In R. Greenwood and R. Suddaby (Eds.), *Professional Service Firms*, Research in the Sociology of Organizations, Emerald Group Publishing Limited, Vol. 24, 171–202.
- Mantere, S. and Ketokivi, M. (2013). 'Reasoning in organization science'. *Academy of Management Review*, **38**, 70–89.
- Martin, P. Y. and Turner, B. A. (1986). 'Grounded Theory and Organizational Research'. *The Journal of Applied Behavioral Science*, **22**, 141–157.
- Mathison, S. 1988. Why Triangulate? *Educational Researcher*, 17(2): 13–17.
- McAfee, A., Rock, D., and Brynjolfsson, E. (2023). 'How to capitalize on generative AI'. *Harvard Business Review*, **101**, 42–48.
- Miles, M. B., Huberman, A. M., and Saldaña, J. (2020). *Qualitative data analysis: a methods sourcebook*, Los Angeles: SAGE.
- Monteiro, P., Nicolini, D., Erickson, I., Cohen, L. E., Dokko, G., Corporaal, G. F., et al. (2024). 'Beyond the Buzz: Scholarly Approaches to the Study of Work'. *Journal of Management Inquiry*, **34**, 19–40.
- Narayanan, A. and Bennun, M. (1991). *Law, computer science, and artificial intelligence*, Norwood: Ablex Pub. Corp.
- von Nordenflycht, A. (2010). 'What Is a Professional Service Firm? Toward a Theory and Taxonomy of Knowledge-Intensive Firms'. *Academy of Management Review*, **35**, 155–174.
- Ogunde, F. (2024). 'Navigating the legal landscape: large language models and the hesitancy of legal professionals'. *International Journal of the Legal Profession*, **31**, 311–322.
- O'Mahony, S. and Cohen, S. (2022). 'Navigating the promises and perils of researching emerging phenomena in strategy and organizations'. *Strategic Organization*, **20**, 872–885.
- Orlikowski, W. J. (1992). 'The Duality of Technology: Rethinking the Concept of Technology in Organizations'. *Organization Science*, **3**, 398–427.
- Pakarinen, P. and Huising, R. (2023). 'Relational Expertise: What Machines Can't Know'. *Journal of Management Studies*. <https://doi.org/10.1111/joms.12915>.
- Patton, M. Q. (2002). *Qualitative Research & Evaluation Methods*, London: SAGE Publications.
- Pemer, F. (2021). 'Enacting Professional Service Work in Times of Digitalization and Potential Disruption'. *Journal of Service Research*, **24**, 249–268.
- Pemer, F. and Werr, A. (2023). 'Defusing Digital Disruption Through Creative Accumulation: Technology-Induced Innovation in Professional Service Firms'. *Journal of Management Studies*. <https://onlinelibrary.wiley.com/doi/abs/10.1111/joms.12972>.
- Pinnington, A. and Morris, T. (2003). 'Archetype Change in Professional Organizations: Survey Evidence from Large Law Firms'. *British Journal of Management*, **14**, 85–99.
- Reckwitz, A. (2002). 'Toward a Theory of Social Practices: A Development in Culturalist Theorizing'. *European journal of social theory*, **5**, 243–263.
- Rodgers, I., Armour, J., and Sako, M. (2023). 'How Technology Is (or Is Not) Transforming Law Firms'. *Annual Review of Law and Social Science*, **19**, 299–317.
- Rostain, M. and Huising, R. (2023). 'Vicarious Coding: Breaching Computational Opacity in the Digital Era'. *Academy of Management Journal*, **67**, 359–381.
- Sætre, A. S. and Van de Ven, A. (2021). 'Generating Theory by Abduction'. *Academy of Management Review*, **46**, 684–701.
- Sako, M., Armour, J., and Parnham, R. (2020). *Lawtech Adoption and Training: Findings from a Survey of Solicitors in England and Wales*.

- Sako, M., Qian, M., and Attolini, J. (2022). 'Future of professional work: evidence from legal jobs in Britain and the United States'. *Journal of Professions and Organization*, **9**, 143–169.
- Saldana, J. (2025). *The Coding Manual for Qualitative Researchers*, London: SAGE Publications.
- Sampson, S. E. and Pires dos Santos, R. (2023). 'Reengineering professional services through automation, remote outsourcing, and task delegation'. *Journal of Operations Management*, **69**, 911–940.
- Sandefur, R. L. (2015). 'Elements of Professional Expertise: Understanding Relational and Substantive Expertise through Lawyers' Impact'. *American Sociological Review*, **80**, 909–933.
- Scarbrough, H., Chen, Y., and Patriotta, G. (2024). 'The AI of the Beholder: Intra-Professional Sensemaking of an Epistemic Technology'. *Journal of Management Studies*. <https://onlinelibrary.wiley.com/doi/10.1111/joms.13065>.
- Schmenner, R. W. (1986). 'How Can Service Businesses Survive and Prosper?'. *Sloan Management Review*, **27**, 21–32.
- Schmenner, R. W. (2004). 'Service Businesses and Productivity'. *Decision Sciences*, **35**, 333–347.
- Schmenner, R. W. and Swink, M. L. (1998). 'On theory in operations management'. *Journal of Operations Management*, **17**, 97–113.
- Shove, E., Pantzar, M., and Watson, M. (2012). *The dynamics of social practice: Everyday life and how it changes*, London: SAGE Publications Ltd.
- Siggelkow, N. (2007). 'Persuasion with Case Studies'. *The Academy of Management Journal*, **50**, 20–24.
- Smets, M., Morris, T., and Greenwood, R. (2012). 'From Practice to Field: A Multilevel Model of Practice-Driven Institutional Change'. *Academy of Management Journal*, **55**, 877–904.
- Spring, M., Faulconbridge, J., and Sarwar, A. (2022). 'How information technology automates and augments processes: Insights from Artificial-Intelligence-based systems in professional service operations'. *Journal of Operations Management*, **68**, 592–618.
- Suddaby, R. (2006). 'From the editors: What grounded theory is not'. *Academy of Management Journal*, **49**, 633–642.
- Susskind, R. and Susskind, D. (2015). *The future of the professions: How technology will transform the work of human experts*, Oxford: Oxford University Press.
- Susskind, R. and Susskind, D. (2022). *The future of the professions: How technology will transform the work of human experts*, Oxford: Oxford University Press, Updated Edition.
- Van Maanen, J. (2011). 'Ethnography as Work: Some Rules of Engagement'. *Journal of Management Studies*, **48**, 218–234.
- Weller, S. (2017). 'Using internet video calls in qualitative (longitudinal) interviews: some implications for rapport'. *International Journal of Social Research Methodology*, **20**, 613–625.

APPENDIX 1 – DETAILS OF INTERVIEW SAMPLE

Interview Number	Interview Identifier	Firm	Participant Role	Length (mins)	Date	Mode	Paper Use
1	INT1	Firm 1	Legal Operations	15	06/10/2022	In-person	2,3
2	INT2	Firm 1	Practice (Other)	36	06/10/2022	In-person	2,3
3	INT3	Firm 1	Technology	45	06/10/2022	In-person	2,3
4	INT4	Firm 1	Technology	36	07/10/2022	In-person	2,3
5	INT5	Firm 1	Legal Operations	47	07/10/2022	In-person	2,3
6	INT6*	Firm 1	Legal Operations	49	07/10/2022	In-person	2,3
7	INT7*	Firm 1	Legal Operations	49	07/10/2022	In-person	2,3
8	INT8	Firm 1	Legal Operations	24	12/10/2022	Teams (on-site)	2,3
9	INT9	Firm 1	Legal Operations	27	12/10/2022	In-person	2,3
10	INT10**	Firm 1	Technology	30	12/10/2022	Teams (on-site)	2,3
11	INT11	Firm 1	Legal Operations	47	12/10/2022	In-person	2,3
12	INT12	Firm 1	Technology	32	13/10/2022	Teams (on-site)	2,3
13	INT13	Firm 1	Technology	20	20/10/2022	In-person	2,3
14	INT14	Firm 1	Legal Operations	22	20/10/2022	Teams (on-site)	2,3
15	INT15	Firm 1	Legal Operations	28	20/10/2022	In-person	2,3
16	INT16	Firm 1	Legal Operations	41	20/10/2022	Teams (on-site)	2,3
17	INT17	Firm 1	Legal Operations	23	22/11/2022	Teams	2,3
18	INT18	Firm 1	Legal Operations	25	22/11/2022	Teams	2,3
19	INT19	Firm 1	Legal Operations	27	22/11/2022	Teams	2,3
20	INT20	Firm 1	Legal Operations	30	22/11/2022	Teams	2,3

Interview Number	Interview Identifier	Firm	Participant Role	Length (mins)	Date	Mode	Paper Use
21	INT21	Firm 1	Legal Operations	24	24/11/2022	Teams	2,3
22	INT22	Firm 1	Legal Operations	30	24/11/2022	Teams	2,3
23	INT23	Firm 1	Legal Operations	32	24/11/2022	Teams	2,3
24	INT24	Firm 1	Practice	44	06/12/2022	Teams	2,3
25	INT25	Firm 1	Legal Operations	42	06/12/2022	Teams	2,3
26	INT26	Firm 1	Legal Operations	43	06/12/2022	Teams	2,3
27	INT27	Firm 1	Legal Operations	27	08/12/2022	Teams	2,3
28	INT28	Firm 1	Legal Operations	44	08/12/2022	Teams	2,3
29	INT29	Firm 1	Technology	28	14/12/2022	Teams	2,3
30	INT30	Firm 1	Technology	37	14/02/2023	Teams	2,3
31	INT31	Firm 1	Legal Operations	38	14/02/2023	Teams	2,3
32	INT32	Firm 1	Legal Operations	42	22/02/2023	Teams	2,3
33	INT33	Firm 1	Practice	39	10/03/2023	Teams	2,3
34	INT34	Firm 1	Practice	56	20/03/2023	In-person	2,3
35	INT35	Firm 1	Practice	43	20/03/2023	Teams (on-site)	2,3
36	INT36	Firm 1	Practice	43	20/03/2023	In-person	2,3
37	INT37	Firm 1	Practice	44	21/03/2023	Teams	2,3
38	INT38	Firm 1	Practice	46	22/03/2023	Teams	2,3
39	INT39	Firm 1	Legal Operations	28	27/03/2023	Teams	2,3
40	INT40	Firm 1	Practice	33	05/04/2023	Teams	2,3
41	INT41	Firm 1	Practice	53	11/04/2023	Teams	2,3
42	INT42	Firm 1	Practice	41	11/04/2023	Teams	2,3
43	INT43	Firm 1	Practice	40	11/04/2023	Teams	2,3
44	INT44	Firm 1	Practice	41	11/04/2023	Teams	2,3
45	INT45	Firm 1	Practice	36	12/04/2023	Teams	2,3
46	INT46	Firm 1	Practice	43	12/04/2023	Teams	2,3
47	INT47	Firm 1	Practice	44	13/04/2023	Teams	2,3
48	INT48	Firm 1	Practice	44	13/04/2023	Teams	2,3
49	INT49	Firm 1	Practice	43	18/04/2023	Teams	2,3
50	INT50	Firm 1	Legal Operations	43	22/02/2023	Teams	2,3
51	INT51	Firm 1	Practice	45	24/04/2023	Teams	2,3
52	INT52	Firm 1	Practice	42	25/04/2023	Teams	2,3

Interview Number	Interview Identifier	Firm	Participant Role	Length (mins)	Date	Mode	Paper Use
53	INT10**	Firm 1	Technology	28	19/06/2023	Teams	2,3
54	INT53	Firm 1	Practice (Other)	23	12/06/2023	Teams	2,3
55	INT54	Firm 1	Technology	54	28/11/2023	Teams	3
56	INT55	Firm 1	Technology	55	28/11/2023	Teams	3
57	INT56	Firm 1	Technology	55	05/12/2023	Teams	3
58	INTA1	Firm 2	Knowledge Manager	45	16/11/2023	Zoom	1
59	INTA2	Firm 2	Partner	44	05/12/2023	Zoom	1
60	INTA3	Firm 2	Partner	37	06/12/2023	Zoom	1
61	INTA4	Firm 2	Associate	39	07/12/2023	Zoom	1
62	INTA5	Firm 2	Partner	37	07/12/2023	Zoom	1
63	INTA6	Firm 2	Partner	35	11/12/2023	Zoom	1
64	INTA7	Firm 2	Associate	34	11/12/2023	Zoom	1
65	INTA8	TechCo	Technologist	60	11/12/2023	Zoom	1
66	INTA9	Firm 2	Knowledge Manager	54	12/12/2023	Zoom	1
67	INTA10	Firm 2	Partner	46	14/12/2023	Zoom	1
68	INTA11	Firm 2	Associate	52	18/12/2023	Zoom	1
69	INTA12	Firm 2	Knowledge Manager	51	16/01/2024	Zoom	1
70	INTA13	Firm 2	Knowledge Manager	50	17/01/2024	Zoom	1
71	INTA14*	Firm 2	Knowledge Manager	54	17/01/2024	Zoom	1
72	INTA15*	Firm 2	Knowledge Manager	54	17/01/2024	Zoom	1
73	INTA16	Firm 2	Partner	62	18/01/2024	Zoom	1
74	INTA17	Firm 2	Technologist	30	15/02/2024	Zoom	1
75	INTA18	Firm 2	Associate	31	16/02/2024	Zoom	1
76	INTA19	Firm 2	Associate	29	16/02/2024	Zoom	1
77	INTA20	Firm 2	Associate	24	19/02/2024	Zoom	1
78	INTA21	Firm 2	Associate	30	19/02/2024	Zoom	1
79	INTA22	Firm 2	Associate	33	19/02/2024	Zoom	1
80	INTA23	Firm 2	Associate	36	19/02/2024	Zoom	1
81	INTA24	Firm 2	Associate	20	19/02/2024	Zoom	1
82	INTA25	Firm 2	Associate	34	20/02/2024	Zoom	1
83	INTA26	Firm 2	Associate	28	20/02/2024	Zoom	1
84	INTA27	Firm 2	Associate	26	21/02/2024	Zoom	1
85	INTA28	Firm 2	Associate	27	21/02/2024	Zoom	1
86	INTA29	Firm 2	Associate	31	21/02/2024	Zoom	1
87	INTA30	Firm 3	Associate	30	21/02/2024	Zoom	1
88	INTA31	Firm 3	Partner	31	21/02/2024	Zoom	1
89	INTA32	Firm 2	Associate	30	22/02/2024	Zoom	1
90	INTA33	Firm 2	Associate	29	22/02/2024	Zoom	1
91	INTA34	Firm 3	Partner	29	22/02/2024	Zoom	1
92	INTA35	Firm 3	Associate	24	22/02/2024	Zoom	1

Interview Number	Interview Identifier	Firm	Participant Role	Length (mins)	Date	Mode	Paper Use
93	INTA36	Firm 2	Associate	30	23/02/2024	Zoom	1
94	INTA37	Firm 2	Associate	30	23/02/2024	Zoom	1
95	INTA38	Firm 2	Associate	30	23/02/2024	Zoom	1
96	INTA39	Firm 3	Associate	40	23/02/2024	Zoom	1
97	INTA40	Firm 3	Associate	30	23/02/2024	Zoom	1
98	INTA41	Firm 3	Associate	29	23/02/2024	Zoom	1
99	INTA42	Firm 3	Associate	31	27/02/2024	Zoom	1
100	INTA43	Firm 3	Paralegal	23	27/02/2024	Zoom	1
101	INTA44	Firm 3	Associate	37	27/02/2024	Zoom	1
102	INTA45	Firm 2	Associate	26	28/02/2024	Zoom	1
103	INTA46	Firm 3	Associate	38	28/02/2024	Zoom	1
104	INTA47	Firm 3	Partner	29	28/02/2024	Zoom	1
105	INTA48	Firm 3	Partner	33	28/02/2024	Zoom	1
106	INTA49	Firm 3	Associate	44	01/03/2024	Zoom	1
107	INTA50	Firm 3	Associate	30	04/03/2024	Zoom	1
108	INTA51	Firm 2	Associate	36	05/03/2024	Zoom	1
109	INTA52	Firm 2	Associate	35	08/03/2024	Zoom	1
110	INTA53	Firm 2	Associate	29	18/03/2024	Zoom	1
111	INTA54	Firm 3	Knowledge Manager	32	18/03/2024	Zoom	1
112	INTA55	Firm 3	Knowledge Manager	34	18/03/2024	Zoom	1
113	INTA56	Firm 3	Partner	32	18/03/2024	Zoom	1
114	INTA57	Firm 2	Associate	30	19/03/2024	Zoom	1
115	INTA58	Firm 3	Associate	37	20/03/2024	Zoom	1
116	INTA59	Firm 3	Associate	32	22/03/2024	Zoom	1
117	INTA60	Firm 3	Associate	31	25/03/2024	Zoom	1
118	INTA61	TechCo	Technologist	53	05/04/2024	Zoom	1
119	INTA62	TechCo	Technologist	45	15/04/2024	Zoom	1
120	INTA63	TechCo	Technologist	47	02/05/2024	Zoom	1
121	INTA64	TechCo	Technologist	43	16/05/2024	Zoom	1

* INT6 and INT7, and INTA14 and INTA15, were interviewed jointly.

** INT10 was interviewed twice.

LITERATURE REVIEW – HOW TECHNOLOGY IS (OR IS NOT) TRANSFORMING LAW FIRMS

A version of this literature review was coauthored and published in the Annual Review of Law and Social Science (Rodgers, I., Armour, J., and Sako, M. (2023). 'How Technology Is (or Is Not) Transforming Law Firms'. Annual Review of Law and Social Science, 19, 299–317). Author(s) name(s) and affiliation(s) including email(s): Ian Rodgers (University of Oxford, ian.rodgers@sbs.ox.ac.uk), John Armour (University of Oxford, john.armour@law.ox.ac.uk), Mari Sako (University of Oxford, mari.sako@sbs.ox.ac.uk). It has been adapted and updated for inclusion in this thesis.

Introduction

What is the impact of technology¹, including artificial intelligence ('AI'), on law firms? This is a question both legal practitioners and academics ask.² This literature review answers it by considering technology more generally while focusing on the recent wave of AI, namely machine learning ('ML') made possible by a step-change in computing power and the availability of big data, as well as developments in AI algorithms.³ Together with COVID-19, which is associated with an extensive increase in law firms' technology use (Sako and Parnham, 2021, p. 5), advances in AI/ML – particularly since emergence of large language

¹ By 'technology', what is meant is digital technology and all that goes with it. See Ceruzzi (2013) for a historical account of the concept.

² For examples of legal practitioners exploring the issue see, for instance, interview quotations in Brooks et al. (2020) or in Armour et al. (2022). This literature review addresses academics' consideration of this question throughout.

³ This review article focuses on the uses, impact, and implications of AI and ML (which we refer to as 'AI/ML' to distinguish it from other approaches to AI such as rules-based expert systems) for law firms. It does not set out to consider the technology itself in-depth. For this, see Jordan and Mitchell (2015), reviewing the emergence of ML and its core methods. On deep learning, a popular sub-set of ML, see LeCun et al. (2015). The textbook for AI more generally is Russell and Norvig (2020).

models ('LLMs') and ChatGPT's launch in November 2022 – have stimulated greater interest in the topic.⁴ This explains the 'why now?' question for this review.

The approach is as follows. First, the review describes the types of technology that law firms may use and specifically the key features of emerging AI/ML use cases in legal services (Section 1). Then it examines how this technology is transforming – or has the potential to transform – what lawyers do (Section 2), before addressing the central topic of this review, its impact on law firms (Section 3). It reviews evidence primarily from two major English-speaking countries, the United States and the United Kingdom, large legal services markets in which law firms are expected to be materially impacted by technology (Henderson, 2014, pp. 18–29; Ribstein, 2010, pp. 780–787; Susskind and Susskind, 2022, pp. 84–89). The focus is on large law firms acting for corporate clients or other big organizations, rather than for individuals or small businesses.⁵ This is because the former segment has a higher reported rate of technology adoption (Armour and Sako, 2023, pp. 10–11) and a history of institutional change in adjacent areas such as human resource practices (Sherer and Lee, 2002, pp. 115–116) and cross border legal work (Smets et al., 2012, p. 880). A wide net is cast to identify key insights from articles published in top journals in law and in management studies. Industry surveys were also considered for evidence on the topic.⁶ Following a substantive review of the literature, further research on issues for which there are not yet good answers or evidence are highlighted.

⁴ This is evident from a review of the academic literature (see the methodological appendix for more details), showing a notable weighting towards materials on the topic after the emergence of AI/ML.

⁵ In making this distinction, this review follows the research of Heinz and Laumann and their colleagues (1998; 1982), reporting that the legal profession is divided into two 'hemispheres' along these lines. For a consideration of how technology may (not) level the playing field between the two, see Armour and Sako (2023).

⁶ See the methodological appendix for details of our review process and its outcomes.

What is meant by technology *transforming* law firms? First, a ‘transforming’ process involves a change from one form into another. That is, a change over time beyond the incremental or evolutionary, resulting in a material difference and an essentially different state (Sackmann, 1989, p. 464). For law firms, this might lead to a new configuration of commonly associated attributes. Galanter and Palay (1994, p. 4), for example, identified law firms transforming along these lines by showing how big firms emerged through changes in six categories: partners, other lawyers, relations to clients, work, support systems, and knowledge. These big firms were materially different from the ‘law offices’ that had preceded them, although they were still recognizable as a related form. This review considers whether technology might lead to material changes to law firms’ current forms, transforming them into legal service providers no longer called ‘law firms’. In this sense, it reviews whether technology has the potential to lead to the ‘end of law firms’ as much as the ‘end of lawyers’ (Susskind, 2008) as we know them today.

Second, there are other factors beyond technology that impact law firms and bring pressures for change, with implications for their transformation process and its outcomes. These other factors may be external to law firms, coming from sources such as clients (Gilson, 1990, pp. 901–903; Gilson and Mnookin, 1984, pp. 381–383; Regan Jr. and Heenan, 2009, pp. 2138–2139; Ribstein, 2012, pp. 308–309), competitors (Dzienkowski, 2013; Linna Jr., 2015, pp. 393–394; Ribstein, 2010, pp. 765–767), or governments and regulators (Barton, 2013; Hadfield, 2007; Thornton, 2021, pp. 246–247). Or they may be internal to law firms, such as changes in individuals’ working practices (Smets et al., 2012), their interpretations of organizational structures (Cooper et al., 1996), or the rise of new functions like legal operations (Keuning and Rainhart, 2018, pp. 77–83). This review is limited, in so far as is possible, to considering the role of technology. So, it is not intended to be comprehensive in covering these other factors and refers to them only when relevant to its central topic.

Third, when this review refers to technology *transforming* law firms, it is shorthand for the complex range of scenarios in which agents – individuals, organizations, or others – introduce, utilize, or otherwise interact with technology in a way that results in material change. Notwithstanding difficulties with causal inference in social science more generally (Pearl and Mackenzie, 2018) and legal studies in particular (Ho and Rubin, 2011, p. 20), identifying a causal impact of technology alone on law firms’ transformation is particularly challenging. Law firms are field-settings in which researchers rely on quasi-experimentation for causal inference rather than randomized controlled trials (Cook and Campbell, 1979). Access to law firms’ sensitive information, such as volume of billable hours, is difficult to obtain (Brivot et al., 2014, p. 816), and lawyers themselves can be challenging research subjects (Danet et al., 1980; Flood, 2022; Mungham and Thomas, 1981). Moreover, the most recent wave of technology adoption, the focus of this review, can be understood only in the broader context, with the diffusion of computers in law firms since at least the 1990s (Braithwaite, 1991, pp. 1113–1114). The phrase ‘technology transforming law firms’ is used in this review mindful of these difficulties with causal identification, hoping that it makes the literature more accessible.

At the outset, it is worth making an important caveat. AI/ML technology is continuing to develop rapidly, as is evidenced by the dramatic increase in performance very recently achieved by LLMs such as OpenAI’s ChatGPT. This means the literature studying its impact will likely trail its actual impact, as it takes time for data to be generated and studied. This review’s conclusions therefore are likely biased towards a conservative assessment of technology’s impact.

1. Law firms’ technology types and legal-AI/ML use cases

This section presents a typology of law firms’ technology and overviews their uses of AI/ML. Technology is categorized according to its technical architecture and specificity of

function. Emerging use cases within one of these categories are then considered, namely law firms using AI/ML in the practice or business of law.

Law firms' technology types

This review takes a law firm perspective, rather than considering 'legal technology' more generally, as others have done (Whalen, 2022), to classify their technologies into categories. The typology is based on technical basis and specificity of function. First, technical basis, by which is meant the technological components, subsystems, and platforms that enable a focal application to fulfil a particular purpose (Barley, 2020, p. 81). ML is a 'general purpose technology' distinct from pre-ML information technology systems (which are referred to as 'IT'), with the latter relying on manually coded computer programs, and the former applying an ML algorithm to training data (which are referred to as 'AI/ML') (Brynjolfsson and Mitchell, 2017, pp. 1530–1531). So, there are two potentially relevant technical bases: IT and AI/ML.

Second, specificity of function, by which is meant the extent to which a technology supports or enables law firms' provision of legal services or its distinct business processes (Armour and Sako, 2023, p. 7). A technology that is non-specific to supporting or enabling law firms' provision of legal services or its distinct business processes may be used for other functions, whereas one that is specific to it is typically limited to use in legal practice or business. So, adopting a binary approach for simplicity, it is possible to categorize this into four categories: non-specific IT ('Generic IT'); non-specific AI/ML ('Generic AI/ML'); specific IT ('Legal IT'); and specific AI/ML ('Legal AI/ML'). This typology is presented in Figure 1.

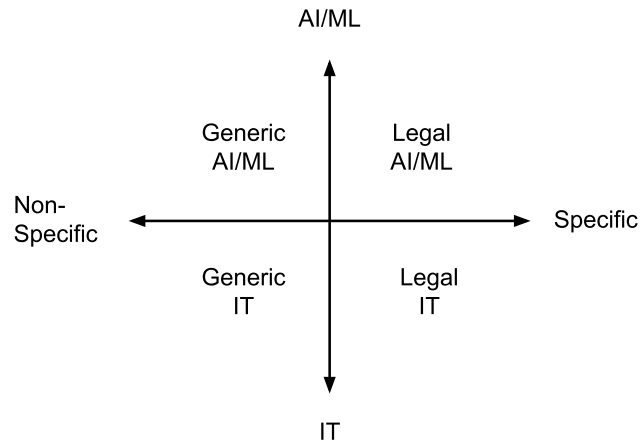


Figure 1 - Typology of law firms' technology

In this typology, this review's primary focus is on Legal IT and Legal AI/ML. This is contrasted with "Generic Technology", encompassing both Generic IT and Generic AI/ML, even though in practice it is difficult to distinguish between these in a law firm context. They often use platforms such as Microsoft's (ILTA, 2021), which intertwine different technology types (Bonina et al., 2021). While the potential importance of Generic Technology is noted and appreciated, this review concentrates its analysis below more on the transformative impact or potential of technology specific to legal practice or business.

Generic Technology

Generic Technology has been widely used in law firms for a long time (Braithwaite, 1991; Marcus, 2008, p. 1833). Computers, the internet, and associated applications, for example, transformed work in law firms in the 1990s and early 2000s, although it has not been possible to assess their direct effects cleanly given other pressures for change at the time, such as those coming from clients (Marcus, 2008, pp. 1834–1835). Emerging Generic Technologies that law firms may now also use include infrastructures like cloud computing (American Bar Association, 2021; Curran et al., 2019) or applications like video-conferencing (Skjølsvik and Breunig, 2018; Wolters Kluwer, 2021). For example, Microsoft's platform, which can combine these both with traditional productivity tools such word-processors, spreadsheets, or slide-

decks, appears from an industry survey to be a central foundation of many law firms' technology stacks (ILTA, 2021). In short, law firms use Generic Technology – like they did non-digital technologies such as telephones or typewriters before (Galanter and Palay, 1994, p. 7) – and this once again has the potential to transform them.

Legal IT

Legal IT applies non-AI/ML digital technology specifically to support or enable the provision of legal services or business. Legal IT typically addresses problems not adequately solved for law firms by Generic Technology. For example, it may be used for legal research (Wall and Johnstone, 1997, p. 103), knowledge management (Brivot et al., 2014; Janes et al., 2014), to record billable hours (Parker and Ruschena, 2011, p. 622), and so on. An example of Legal IT is iManage's document and email management system, Work, which aims to provide a safe and secure mode of legal content creation, storage, and retrieval (iManage, 2022a). Legal IT may also integrate with technologies in other categories. For instance, iManage's Work integrates with Microsoft's platform, a Generic Technology (iManage, 2022b). In other words, Legal IT is a means of using non-AI/ML digital technology which may be used by law firms when they consider that Generic Technology needs to be supplemented or adapted to support or enable them to provide services to their clients.

Legal AI/ML

The third category, and today's technological frontier, is Legal AI/ML. Law firms may use this to apply algorithmic, data-driven AI/ML to enable outcomes such as automation, pattern recognition, or prediction (Lehr and Ohm, 2017, p. 671). Within law firms, Legal AI/ML is typically used for finding specified items in a large volume of material, such as in technology assisted review, due diligence and contract analytics, legal research, or billing and utilization (Armour et al., 2022, pp. 86–91), although the range of potential use cases is likely expanding rapidly with the advent of generative AI to include performing actions including

preparing legal research memos, reviewing or summarizing documents, or drafting correspondence (Faulconbridge 2025; Ogunde 2024). An example related to due diligence and contract analytics is Litera’s contract review platform, Kira, which automatically extracts potentially relevant provisions in M&A or contract management scenarios (Kira, 2022). When law firms use Legal AI/ML, they may do so together with Generic Technology or Legal IT, to facilitate the marshalling of the data they need. For example, Litera’s Kira integrates with Intralinks, a provider of virtual data rooms that may be used in a due diligence process (Kira, 2021). Although Legal AI/ML differs from Legal IT as respects the underlying technology, it is similarly used by law firms to fill gaps in the capabilities of Generic Technology for supporting or enabling the provision of legal services.

Legal AI/ML use cases

Legal AI/ML is still at a relatively early stage of adoption in legal services markets (Armour et al., 2022, p. 106; Faulconbridge 2025). It may be used both for legal practice and for law firms’ business for a variety of reasons (Brooks et al., 2020, p. 150).⁷ Primary areas of Legal AI/ML application, or “use cases”, include technology-assisted review for discovery, due diligence and contract analytics, and legal research--all related to legal practice--and billing and utilization, related to law firms’ businesses (Armour et al., 2022, pp. 85–91).⁸ Salient aspects of these use cases are reviewed below.

⁷ For example, Sako and Parnham (2021, p. 28) found in a recent survey of English solicitors in law firms that the three top purposes for lawyers’ use of technology were to ‘improve service quality’ (71.5 per cent), to ‘improve efficiency of workflows’ (70.9 per cent), and to ‘allow staff to work more flexibly’ (43.9 per cent).

⁸ As noted above the range of potential use cases is likely expanding rapidly with the advent of generative AI to include performing actions including preparing legal research memos, reviewing or summarizing documents, or drafting correspondence (Faulconbridge 2025; Ogunde 2024). A review of industry surveys relating to generative AI (see the Methodological Appendix for further details), show that the main front-office use cases are legal research, document analysis (e.g., including due diligence, e-discovery, summarisation, etc.), and drafting materials. There are also a range of back-office use cases (e.g., admin, business development and marketing (e.g. newsletters, social media posts, etc.), and knowledge management). In terms of trends over time, legal research seems to be maturing

Technology-assisted review (‘TAR’) involves using ML to find potentially relevant material during a discovery exercise (see Armour, Parnham and Sako, 2022, pp. 87–88). The data comes from items collected for the purposes of discovery (e.g. from custodian repositories), and ML’s deployment is typically motivated by the volume of data, as smaller-scale productions could make TAR economically inefficient (Engstrom and Gelbach, 2020, p. 35). TAR primarily uses a supervised learning approach, with lawyers overseeing iterative rounds of coding, but may also include unsupervised clustering of items (Ashley, 2018, p. 1122). ML algorithms process the data and form a model that predicts whether a given item is potentially relevant. The output is a set of potentially relevant items, which are then handled in accordance with the procedural and ethical protocols of the discovery exercise and the parties’ preferences.

In certain circumstances, TAR can be more effective and efficient than manual review (Grossman and Cormack, 2011). It is hardly surprising that lawyers and legal professionals in the surrounding legal services environment generally attribute its rise to cost-cutting and improved performance (Kluttz and Mulligan, 2019, pp. 872–877). Yet, the extent of its impact on law firms may be limited by the scale of the work appropriate for this use case, with research finding that lawyers in large firms spent only 4.1 per cent of their time on document review (Remus and Levy, 2017, p. 531). As the authors of this potentially surprising finding themselves note, however, their “data suffer[ed] from a number of limitations”– for instance, that the task codes they used to arrive at the figures gave “lawyers significant discretion in how

as a use case (e.g., as it moves from being in standalone applications to being integrated into widely used and available legal research databases). The same goes for document analysis, particularly sub-use cases like due diligence or e-discovery, which are being incorporated into vertical applications (e.g., virtual data rooms). Drafting materials (e.g., legal documents, contracts, emails, etc.) continues to be a common use case, although it seems to be used more pervasively for drafting non-legal materials.

they record their time, painting at best a rough picture of time usage” and that it failed to include time spent by law firms’ contract lawyers or specialist document review providers, which may have been substantial when their data was collected in 2012-2015 (Remus and Levy, 2017, pp. 504–505; 507).⁹ There are also limited data on the extent of TAR’s use within law firms in practice. Although an industry survey found that 14 per cent of respondents in law firms used ‘e-discovery/e-disclosure/ technology assisted review’ (Sako et al., 2020, p. 7), this is again presents a rough picture: how often and to what extent law firms currently use TAR on their cases remains uncertain. In sum, there is evidence that TAR is a more effective and efficient approach than manual review in certain circumstances, but we cannot be sure that lawyers in large law firms still spend vast amounts of time on the types of work for which TAR substitutes. Nor can we yet be sure how often or to what extent law firms use TAR on their cases.

Legal AI/ML for legal practice: due diligence and contract analytics

This use case involves using ML to help find potentially relevant information in a due diligence or contract analytics exercise (see Armour et al. 2022, pp. 88–89). The data generally comes from items collected from a structured repository (e.g. from a virtual data room) but may be collected ad hoc and structured as part of the use case. It is not necessarily the volume of data that motivates ML’s use, but rather the volume of data-points that must be extracted from it for analysis (whether in one-go, as in some due diligence scenarios, or iteratively, as in some contract analytics scenarios such as extracting features from M&A documents to keep up with market trends). Like TAR, this use case primarily uses a supervised learning approach. ML algorithms process the data and utilize a model, which may have been pre-trained on publicly available data (in which case it may be said to work ‘out-of-the-box’). Systems of this type predict whether given items represent potentially relevant data-points. These are then

⁹ The expense of document review is still thought to be a major component of litigation costs (Kluttz and Mulligan, 2019, p. 863).

handled primarily according to the preferences of a law firm's users, with procedural or ethical protocols governing their use rarely important at this stage. However, it should be noted that where generative AI is used in a due diligence or contract analytics exercise, which is presumably becoming more common, ethics training and acceptable use policies are likely to be vital in preventing misuse (Ogunde 2024).

As with TAR, there is evidence suggesting that ML can be more effective and more efficient than manual review in this context (McPeak, 2019, pp. 466–467). However, the extent of its impact on law firms may be again limited by the scale of the work appropriate for this use case, with research finding that lawyers in large firms spent only 2 per cent of their time on due diligence (Remus and Levy, 2017, p. 531). As noted above, however, this study relied on a dataset that painted a rough picture of law firms' lawyers' use of time and did not include that of contract lawyers or alternative legal service providers. While a useful guide, therefore, such figures must also be treated with caution. Once more, there are also limited data on the extent of this use case within law firms in practice, although the same industry survey cited above found that 18.2 per cent of respondents in law firms used AI-assisted legal technology for 'due diligence' and 10.2 per cent for 'contract analytics' (Sako et al., 2020, p. 7). Accordingly, we find much the same thing for this use case as for TAR's: evidence for its effectiveness and efficiency as compared to manual review in certain circumstances, but potentially a limited scope for its application within law firms connected with the small amount of time lawyers spent working on matters associated with it, and – where data on it can be found – relatively patchy adoption figures.

Legal AI/ML for legal practice: legal research

This use case involves using ML to help find potentially relevant information in a legal research exercise (see Armour et al. 2022, pp. 89–90). The data comes from items collected from databases such as legal judgments, complete with metadata like citations, keywords, and

so on. Motivation for using ML may include the research exercise's size, complexity, unfamiliarity, or urgency, and so be actively selected, or it may be a passively received recommendation. This use case may deploy approaches that are either supervised (e.g. for mapping research queries to their answers) or unsupervised (e.g. for clustering citations), or generative (e.g. for preparing a legal research memo). ML algorithms process the data and utilize a model, which has sometimes been pre-trained on publicly available data or trained internally on proprietary data, which predicts whether a given item is potentially relevant to a user's legal research. For supervised and unsupervised approaches, the outcome is typically a set of potentially relevant suggested next steps, which are handled according to the preferences of the user. For generative approach, early-emerging tools went further, by analyzing a brief and finding a list of relevant cases (e.g. Casetext's C.A.R.A. AI product), or even generating a first draft of a legal research memo (e.g. Alexsei in North America). By 2024, popular generative AI applications for legal research included Westlaw AI-Assisted Research, CoCounsel, and Lexis+ AI (ILTA, 2024), which provided advanced more robust and developed iterations of these use cases, though challenges remain – particularly with hallucinations: that is, LLMs making up false information (Browning, 2024; Dahl et al., 2024; Kapoor et al., 2024; Magesh et al., 2024; Ogunde, 2024).

In an industry survey published in 2020, 25 per cent of respondents in law firms said they used AI-assisted legal technology for 'legal research' (Sako et al., 2020, p. 7). Similarly, industry surveys related to generative AI often put 'legal research' at or near the top of their lists of current applications (ILTA, 2024; LexisNexis, 2024). This suggests that it is the most widely adopted Legal AI/ML use case in law firms' legal practice. While until recently Legal AI/ML for legal research typically only helped at the periphery of the process – for instance by identifying and retrieving potentially relevant cases or statutes (Baker 2018, p. 21) – the latest

developments that succeed in actually generating legal arguments and preparing legal research are moving much closer to the core of the workflow.

Legal AI/ML for law firms' business: billing and utilization

This use case involves using ML to help with law firms' billing and utilization processes (see Armour et al. 2022, pp. 90–91). The data may come from items collected from lawyers (such as time-recording entries), clients (such as their bills), or another data source relating to a law firm's business. A law firm's motivation for using ML on this use case is typically to improve business performance, and may involve outcomes aimed at putting together more accurate fixed-fees or other output-based pricing models. Like for legal research, this use case may use approaches that are either supervised (e.g. mapping utilization data to a fee schedule) or unsupervised (e.g. clustering billing narratives for further analysis), although generative approaches are likely more ad hoc (e.g. conforming billing narratives to meet clients' e-billing requirements). In supervised and unsupervised approaches, ML algorithms process the data and utilize a model, which has sometimes been pre-trained on publicly available data or trained internally on proprietary data, which predicts whether items are potentially relevant to a firm's billing and utilization processes. The outcome of this use case is typically a set of potentially relevant suggested next steps or other generated ad hoc output, then handled according to a professional's or firm's preferences.

In an industry survey published in 2020, 10.2 per cent of respondents in law firms said they used AI-assisted legal technology for 'fee-earner utilization analytics and / or predictive billing' (Sako et al., 2020, p. 7). This suggests that law firms have so far focused more on using Legal AI/ML for legal practice use cases than to support their business. With that said, there seem to be a range of back-office use cases associated with generative AI that may include but not be limited to billing and utilization such as administration, business development and marketing (e.g. newsletters, social media posts, etc.), and knowledge management (e.g., ILTA,

2024; LexisNexis, 2024). While this suggests an enhanced engagement with AI/ML for law firms' business, it is likely that much of it falls under the remit of Generic Technology like ChatGPT or Microsoft Copilot (e.g., ELTA, 2023; ILTA, 2024).

Law firms' make-or-buy decisions

The basic make-or-buy problem is as follows: which transactions are more efficiently conducted within a firm than in a market (Coase, 1937)? Law firms face this problem when it comes to technology. They can develop it themselves internally, buy it from external vendors, or both. For Generic Technology, law firms generally have a simple solution: buy it. This is because they do not have any special requirements or knowledge to bring to bear on the problem. However, for Legal IT and Legal AI/ML (or, together, 'Legal Technology'), they might well have both. This, together with the wider increase in their use of technology – particularly with the expansion of the range of use cases associated with generative AI (Faulconbridge 2025) – makes the question of whether to make-or-buy Legal Technology increasingly relevant to law firms.

Law firms generally have the resources and capabilities to make Legal Technology. Armour, Parnham and Sako (2022, p. 107) found little evidence of capital constraints posing problems for law firms' investment in technology. When it comes to human resources and capabilities, an industry survey found that 78 per cent of respondents said their firms had internal technological development capabilities, with an additional 15 per cent saying they used outside resources to do this work: only 6 per cent said they had little or no need for this type of work (Linna Jr. and Curle, 2020, pp. 8–9). This implies a historic tendency to develop custom software internally or to configure existing solutions.

There are suggestions that law firms are moving away from this approach. An industry survey, for example, found “the ‘buy’ component of the ‘build versus buy’ decision winning in most cases [for law firms]” (ILTA, 2021, p. 24). There are several possible explanations.

First, the emergence of cloud-based architectures within the legal services market (American Bar Association, 2021) and their use by professionals within law firms (Bostick, 2012, p. 1375). Legal Technology is now being offered on a software-as-a-service (‘SaaS’) basis, as is Generic Technology more generally, presumably at competitive prices given their uptake by law firms. This may limit law firms’ customization or configuration options by raising the associated costs, pressuring them to standardized SaaS offerings. Second, there is the emergence of Legal AI/ML. As noted, this builds on a step-change in computing power, the availability of big data, and advances in algorithms. This may challenge firms’ existing technological development capabilities, for instance through new requirements for technical infrastructure (e.g. interoperability or information security) or skills (e.g. data science or prompt engineering). Accordingly, there may be a movement towards law firms buying technology that incorporates AI/ML, rather than making it internally.

Still, while there are some publicly available industry surveys (and more behind paywalls), there is limited academic research on law firms’ technological make-or-buy decisions. We do not know much about law firms’ options or how they take their decisions about it. For instance, are law firms substantively different from other organizations with regards to this, or are they more-or-less the same? Further research on this topic may help shed light not just on law firms, but the make-or-buy decision for professional services firms more generally in view of cloud and AI/ML technology.

2. Future of work for lawyers

In this section, the review examines the impact of digital technology through the lens of the “future of work” for lawyers (that is, what work and tasks lawyers do) and law firms’ relationship with non-human capital. It first spells out the three separate effects of digital technology, namely substitution, augmentation, and new task creation. It then provides evidence that the adoption of Legal AI/ML technology in law firms has been associated with

the existence of multi-disciplinary teams ('MDTs'). Such MDTs can take different forms, including lawyers themselves becoming coders and lawyers working with non-legal experts such as data scientists, and there is evidence that the US and UK have taken a slightly different route to achieving MDTs. Finally, it is noted that alternative career models are emerging within law firms and that lawyers may have a generally positive attitude towards them.

Technology's impact on lawyers: substitution, augmentation, and new task creation

Legal services are traditionally provided by lawyers, highly skilled professionals trained in the law (Armour et al., 2022, p. 73). Will this continue? On the one hand, some commentators argue that advances in Generic Technology, Legal IT, and especially Legal AI/ML, will transform legal services by making lawyers obsolete or less pervasive (Alarie et al., 2018; Katz, 2013; McGinnis and Pearce, 2014; Susskind and Susskind, 2022), with legal services purportedly being one of the most exposed industries to AI generally (Felten, Raj, and Seamans 2021) and LLMs particularly (Berg, Raj, & Seamans, 2023). Others have argued that these claims are overstated or produced evidence that does not show this degree of transformation (Hunter, 2020, pp. 1213–1221; Markovic, 2019; Remus and Levy, 2017). This debate centers on the question: “can machines replace lawyers?” Yet, technology has a more nuanced impact on lawyers. Its deployment may impact the work of lawyers in three ways (Armour et al., 2022, p. 75; Sako, 2020, p. 26). First, it may *substitute* for lawyers in legal tasks for which it is capable and cost effective. Second, it may *augment* the capacity of lawyers to perform associated legal tasks by enabling them to focus on aspects of the tasks for which they have a comparative advantage. Third, it may *create new tasks* for lawyers in producing Legal AI/ML, who apply their legal expertise to augment the technology.

The nature and extent of each of these impacts, however, is still to be fully determined. While there are conceptual frameworks (Armour and Sako, 2020, p. 31) and increasing empirical research on the topic (see the Methodological Appendix and citations throughout this

review article), we still have a limited appreciation of how lawyers actually understand and use Legal AI/ML for legal tasks in practice (Kluttz and Mulligan, 2019, p. 870), and what tasks are actually being substituted, augmented, or created by technology in law firms (Sako et al., 2021, p. 31). In terms of extent, as noted above, there are indications that the substitution effect for lawyers associated with technology has been less, or at least slower, than some might have expected. For instance, in their study of large US law firms Remus and Levy (2017) found that lawyers there spent only a small fraction of their time on document review or due diligence (although, as noted, this may have been done by contract lawyers, specialized document review providers, or alternative legal service providers, which were outside the scope of their study), at least according to billable hours invoiced to clients. This implies a relatively small scope for potential substitution of traditional lawyer roles in law firms associated with these common Legal AI/ML use cases. Similarly, Faulconbridge and colleagues (2021, pp. 217–218; 2021, p. 8) found few signs of Legal AI/ML displacing existing professionals in their study that included medium and large law firms in the UK, finding instead that lawyers were learning to work with it and that it was creating new tasks for them. This suggests a tendency towards augmentation both of lawyers' capacities and the technology itself. Still, deployment of Legal AI/ML is generally thought to be at an early stage of its use within law firms (Armour et al., 2022, p. 106) and has not yet deeply affected the practice of law (Nissan, 2017) – even generative AI has had a relatively slow uptake (Ogunde 2024), with a recent industry survey reporting that only 37 per cent of law firms used it as at 2024 (ILTA, 2024) – so such findings are perhaps better treated as useful waypoints on our journey toward better understanding technology's impact on lawyers, rather than the story's end.

Multi-disciplinary teams

As Legal AI/ML substitutes for lawyers, augments their capacities, or creates new tasks for them, it may also bring them into contact with other professionals. These professionals have

skills from disciplines other than law (Armour et al., 2021, pp. 75–78) – for example, IT or legal innovation specialists, legal project managers, data scientists, prompt engineers, or process-mapping experts. When lawyers work on a day-to-day basis with such professionals, they can be said to be working as part of a multi-disciplinary team (‘MDT’).

There is evidence that the adoption of Legal AI/ML technology in law firms is associated with the existence of MDTs. In their study of UK lawyers, for example, Sako and colleagues (2020, p. 3) found a strong association between MDTs and Legal AI/ML: lawyers working in them were more likely to use it for due diligence, contract analytics, and legal research than those not.¹⁰ Similarly, Faulconbridge and colleagues (2021, pp. 217–218; 2021, pp. 24; 26–28; Faulconbridge et al., 2023, 2024) found that technologists were emerging within law firms as a new group responsible for AI procurement, installation, running, and problem solving, as well as data curation. In their in-depth look at TAR, a primary Legal AI/ML use case, Kluttz and Mulligan (2019, p. 889) found that lawyers relied on non-lawyer support staff and vendor judgment for a variety of tasks, including system selection, configuration, and model-testing and evaluation, and concluded that “the broader set of complex, ML-based legal technologies entering the profession has brought new entities and technical experts into the legal services ecosystem who are mediating the relationship between lawyers and clients”.

Such MDTs can take different forms, including lawyers themselves becoming coders and lawyers working with non-legal experts. For lawyers themselves, this seems to be a non-issue. Sako and colleagues (2020, pp. 15–16) explored lawyers’ preferences between these skills mix types by asking to what extent they agreed with the statement: “I prefer to work with ‘lawyer coders’ than with ‘non-lawyer technologists’”. They found that no overall preference emerged, with most respondents being neutral on the issue. However, it may be more of a

¹⁰ It should be noted, however, that it is not yet clear if MDTs cause the deployment of Legal AI/ML or if the deployment of Legal AI/ML causes MDTs, nor – if it is the former – through what mechanism(s) MDTs facilitate its deployment.

practical issue for law firms, which anecdotally face the decision when forming an MDT between teaching lawyers enough about technology for them to get by, or non-legal experts enough about legal services work. There does not yet seem to be a clear answer for law firms one way or the other. When, how, and why law firms do – and, perhaps, should – go about developing MDTs and get them to work effectively to integrate and facilitate technology? These are important questions for further research.

There is also evidence that firms in the US and UK have taken slightly different routes to implementing MDTs. In their analysis of online job adverts, Sako and colleagues (2022) found (among other things) a significant difference in the proportion of job ads for lawyers and paralegals specifying digital skills: during 2014-2021, the proportion remained higher in the US than in the UK. This suggests that US law firms may be relying more on using lawyers with digital skills to facilitate MDTs, while UK law firms are more prone to rely on non-lawyers for digital skills in MDTs. Moreover, lawyer jobs with digital skills commanded higher pay than those without in the UK, while they attracted lower pay in the US. It is possible that the lower pay in the US relates to the nature of digital skills specified, e.g. more substitutable digital tasks (such as labelling and annotation) in the US than in the UK. But the overall US-UK difference may also be related to differential professional control: the US has tighter rules set by the American Bar Association than does the UK with its Legal Services Act 2007, making it harder for US law firms to recruit and retain non-legal talent than their UK counterparts. Thus, factors like professional control may influence the development of MDTs and, consequently, the impact of technology on law firms.

Changing careers in law firms

A traditional view of law firm careers is that of the ‘tournament’, in which young lawyers are hired with a view to the most proficient becoming partners and the others leaving under the ‘up or out’ principle (Galanter and Henderson, 2008, p. 1873; Galanter and Palay,

1990). Empirical research from a decade or so ago found that, although the ‘up or out’ principle still operated as customary norm, alternative career models – such as Of Counsel, Permanent Associates, or Professional Support Lawyers – may be “justified on rational grounds as being consistent with new business conditions” but that “few associates are attracted to these roles” (Malhotra et al., 2010, pp. 1410–1411).

However, there are reasons to think not only that the range of alternative career models is expanding in line with the new business conditions brought about in part by technological change, but also that associates’ attitudes are changing. First, alternative career models. It is claimed that technology will lead to new jobs for lawyers, including (among others): the legal knowledge engineer, the legal technologist, the legal hybrid, the legal process analyst, the legal project manager, the legal data scientist, the research and development (‘R&D’) worker, the online dispute resolution (‘ODR’) practitioner, the legal management consultant, and the legal risk manager (Susskind, 2017, p. 135). Research has found contemporary law firms recruiting for roles such as a ‘Legal Solutions Specialist Paralegal’ and ‘Data Analyst’ (Sako et al., 2021, pp. 18–19), and anecdotal evidence suggests a range of new roles for lawyers in legal project management, legal operations, innovation, prompt engineering, and so on. Second, changing associates’ attitudes. There is, admittedly, much less evidence for this beyond the anecdotal. However, interviews with lawyers in these emerging alternative career models have found a generally positive attitude towards them – although it should be noted that such interviews have generally had little contact with associates or counsel without a connection to technology in law firms (e.g. Armour et al., 2022).

Still, there is a sense that some of these alternative career models in innovation, legal operations, and so on, are considered relatively high-status and sought-after positions viewed as generating particularly valuable human capital for participants. Further research to establish the nature and extent of alternative career models connected with Legal Technology, or the

attitudes of the lawyers in their firms towards those in these emerging roles may be useful. This might shed light on potentially interesting items such as the nature of professional status and how it changes, or have broader implications for our understandings of the “tournament of lawyers”.

3. Transformation of law firms

This section is organized as follows. First, it spells out the nature of what has been called the legal technology business model that relies significantly on non-human capital, as an alternative to the legal advisory business model that relies almost solely on human capital. Second, it examines complementary organizational practices to this new business model in the form of MDTs, career paths, and ownership form. Third, it draws implications of combining business models for how law firms draw their organizational boundaries. These three steps touch on, but do not dwell on, a potentially long list of facilitators of and barriers to law firms’ technology adoption.

Law firms’ business models

As noted above, law firms may rely increasingly on non-human technological capital for value creation. Law firms’ traditional human capital centric business model and its traditional organizational form (i.e. lawyer-only partnership) has not ceased to exist (Armour et al., 2022, p. 75; Callier and Reeb, 2015, pp. 858–860; Greenwood and Empson, 2003), although there are arguments that it is breaking down in places (Kobayashi and Ribstein, 2011, pp. 1217–1218). This has been called the ‘legal advisory’ business model (Armour and Sako, 2020, pp. 32–34). In it, lawyers meet customer needs by providing bespoke, customized advice to clients’ legal problems, typically using input-based pricing such as the billable hour, relying on their firm’s reputation and clients’ trust to win and retain business (Armour and Sako, 2020, p. 33).

Yet, there may be alternative business models for law firms. By ‘business model’ what is meant is how organizations create and capture value (Teece, 2010). These alternatives include what has been called the ‘legal technology’ business model (Armour and Sako, 2020, pp. 33–34). Firms adopting this model do not provide clients with bespoke, customized legal advice, but instead deliver legal services through productized, technological solutions. Subscription or licensing replaces input-based pricing. Such firms win and retain business by relying on technical platforms with superior intellectual property to meet their clients’ requirements (Armour and Sako, 2020, p. 34). As has been shown elsewhere (Armour and Sako, 2020, pp. 38–40; Spring et al., 2022, pp. 599–605), law firms are adapting to and experimenting with this legal technology business model in practice. Legal technology deployed by law firms is essentially software applications for a variety of use cases such as matter management and legal research (see Section 1); a selection of the technology has the characteristics of a transactional platform (Cusumano et al., 2019), in which buyers and suppliers are brought together in a marketplace. For example, on-demand lawyer platforms, used by lawyers to find project-based work either at law firms or at corporate departments, exhibit network effects in which the larger the coverage of both sides of the market, the better the match-making benefits brought about to users.

Given network effects, this platform-based business model gives incentives to scale, because value creation opportunities increase with scaling. Consequently, if the adoption of the legal technology business model diffuses, then a likely impact on the legal services industry structure is consolidation and concentration at least in the market segment serving corporate clients.

Organizational complementarities

To derive the full benefit from adopting new business models, it is necessary to consider what other organizational practices must co-exist as complements (Brynjolfsson and Milgrom,

2012). Two or more activities or practices are complementary if the marginal benefit of each increases in the level of the others (Siggelkow, 2002). Specifically, this review identifies three key organizational practices as complements to the ‘legal technology’ business model: MDTs with lawyers and non-lawyers working together; career progression paths offered to both lawyers and non-lawyers; and ownership forms that offer both lawyers and non-lawyers a stake in managing and owning the firm.

First, well-functioning MDTs require an organization structure in which human capital of all types – not just lawyers, but also project managers, process mapping experts, legal engineers, data scientists, or prompt engineers – are given opportunities for reward and promotion. As discussed in Section 2, recruitment and retention of non-legal talent is a challenge in traditional law firms in which the associate-to-partner route is the only promotion path that is institutionalized. As an organizational complement to the legal technology business model, law firms would be expected to offer career paths for non-legal talent, for example in the form of hiring trainees in legal engineering.

Moreover, the lawyer-only partnership is a barrier to implementing MDTs as a prerequisite for Legal AI/ML adoption. Technology adoption that is facilitated by MDTs is easier for providers which are not law firms, organized using the corporate form, because this ownership form provides reward and recognition for employees who are lawyers as well as for those who are not. It also enables access to financial capital from sources other than partner equity. This organizational complement, however, requires changes to traditional restrictions on lawyer profit-sharing with non-lawyers, for example the alternative business structures (ABSs) permitted by the Legal Services Act 2007 in England and Wales.

Implications for organizational boundaries

The above discussion implies a proposition concerning organizational boundaries. Given different and potentially conflicting organizational complementarities required by each

business model, combining more than one business model under one roof is challenging (Armour and Sako, 2020). One solution to this dilemma is for law firms to adopt a single business model. A single business model firm is likely easier to manage than a multi-business model firm. Thus, if a law firm decides to retain the legal advisory business model, the firm can focus on recruiting and retaining top legal talent; the easiest way to access legal technology in this case is via buying in technology and outsourcing its development and maintenance. By contrast, if a firm decides to focus on a legal technology business model, it could promote the adoption of all the complementary organizational practices necessary to derive value from the chosen business model. Some of the so-called alternative legal service providers (ALSPs) are exemplary in exploiting the complementary practices of MDTs, with multiple career paths, and LLC or plc ownership forms. ALSPs provide services that range from legal operations, legal technology-enabled services, and consulting on operations and technology.

A study of ALSPs in 2021 identified three types of players in the sector: independent ALSPs, law firm captive ALSPs, and the Big Four auditing and accounting firms. Among these, independent ALSPs are by far the largest segment (with revenues of some \$12 billion) and law firm captive ALSPs – those entities created within law firms – are the smallest (with about \$480 million in revenues). Interestingly, however, law firm captives are also the fastest growing segment of the market, having grown by some 60 per cent over two years. This growth rate suggests some law firms are attempting to pre-empt the threat of ALSPs by creating competitive services of their own using the ALSP model (Jones and Sako, 2021). The same study also found extensive usage of ALSPs: 79 per cent of law firms surveyed said they were using ALSPs, along with 71 per cent of corporate law departments.

Adopting both business models – legal advisory and legal technology -- under one roof is not impossible, and has been attempted by major law firms. But the firm would be challenged by the ambidexterity needed to keep all resources – human, technological, and financial –

integrated and aligned. This challenge is in part met by law firms partnering with ALSPs and legal technology providers. Various partnering possibilities are also explored and experimented with in state-level regulatory sandboxes in the United States. With respect to generative AI, it is yet to be seen how this will play out, as requirements such as prompt engineering expertise may make it difficult for law firms to keep resources external to the firm.

Conclusion and future research

Technology has not yet ushered the ‘end of law firms’ as we know them today. Adoption of Legal AI/ML, for instance, is in its early stages, and its impact has been constrained by the limited use cases for which it is so far well-suited. That is not to say that it does not have the *potential* to lead to this outcome, only that the evidence available so far shows that it has not yet done so, and generative AI can be expected to substantively revise this view should it prove itself more general-purpose than other AI-based IT found in law firms, which have generally been “point solutions” used for particular data-processing tasks (Eloundou et al., 2024; Faulconbridge, 2025; Spring et al., 2022, p. 599). Technology is nevertheless transforming law firms, in the sense of leading to material changes to their current forms. Indeed, it has been doing this incrementally for at least the past half century. But as this review has found and sought to demonstrate, what distinguishes the current phase of transformation are (a) the use of technology not only in the back office but in the front office, affecting what lawyers do in relation to core tasks of giving advice to clients; (b) the resulting opportunities for lawyers to pursue alternative career paths with different skill sets within or across the profession; and (c) the emerging option for law firms to adopt business models that rely on value creation from non-human capital and non-legal human capital. Law firm transformation, and perhaps their survival or death, depends on how they manage governance and other organizational complementarities within the firm. It also depends on how law firms, and those in them, draw their professional and organizational boundaries and navigate a variety

of alliances and partnerships with technology and data providers in an increasingly complex ecosystem.

Given these findings and conclusions, topics for future research might include the following (beyond those already raised in the body of the literature review). How does the use of technology affect what lawyers do in relation to their core tasks of giving advice to clients? What expertise is necessary for lawyers to use emerging technology such as generative AI, and how do they acquire it? How does the way lawyers acquire expertise for such emerging technology affect their work boundaries? Are law firms developing new work practices to integrate technology – and if so, what are these practices, how are they developing, and why now? What opportunities are there to institutionalize alternative career paths for those working in law firms, both for lawyers and those with other skill sets? How and why do law firms make decisions about or implement business models that rely on value creation from non-human capital or non-legal human capital? How and why do they identify and manage organizational complementarities within the firm? What is the process by which law firms draw their organizational boundaries and navigate their technology alliances and partnerships? When does it make sense for a law firm to take on an alternative organizational structure or form? In short, future research should continue to investigate the question of technology's impact on law firms and how it is (or is not) transforming them. There is still much to be done.

METHODOLOGICAL APPENDIX

To conduct this review, three databases were searched for law or management studies journals (HeinOnline, Scopus, and Web of Science) using keywords ("artificial intelligence" OR "machine learning" OR "legal tech*" OR "legaltech" OR "lawtech" OR "law tech" AND "law firm*") in Scopus and Web of Science, and only "legal tech*" AND "law firm*" in HeinOnline, due to its limited search capabilities). This exercise was conducted on 12-13 July 2022. After deduplication, this provided a set of 743 journal articles. By excluding items from 2009 or before to focus on the most recent wave of AI, and by retaining only items from journals listed in the Academic Journal Guide 2021 for management studies, or in the top 400 (US) or 100 (non-US) of the Washington and Lee Law Journal Rankings 2021 for law, 210 journal articles were left (law: 123; management studies: 87). The most relevant in relation to the review's focus on law firms in the US and the UK were read and analysed, forming a substantive part of the literature reviewed for this piece. Of the 210 items, over 10 per cent are cited as references to this review.

Second, this review also set out to identify potentially relevant recent 'industry surveys' to seek concrete evidence on this topic (Mania, 2023). In the absence of a searchable repository for these industry surveys, the first step was to search the academic literature for any systematic reviews of survey evidence, founding one book chapter, albeit on a slightly different topic (Weinstein, 2022). The survey sources used in this book chapter were considered. A Google search for 'legal technology survey' was also performed and results considered that were *prima facie* relevant for inclusion in the review. The basic criteria for inclusion were as follows: i) the survey's dominant purpose related to the research question; ii) it had sufficient responses to give confidence in its reliability (a rule of thumb was that it needed 100 or more responses); iii) it was published in or since 2020, to keep the information up-to-date; and, iv) for surveys annually, the most recent version at the time of writing were used (Summer 2022). For industry

surveys behind paywalls, our approach was to use publicly available material from these paywall-protected items (e.g., an executive summary for ILTA's 2021 Technology Survey, and a series of 'TechReports' for the 2021 ABA Legal Technology Survey Report). Following this approach, 10 industry surveys were in-scope, listed in Table 1.

Third, this systematic search and identification of industry surveys was supplemented with materials that were considered from experience particularly relevant to the research topic. This involved including articles, books, reports, that were not necessarily responsive to the search parameters, but which still merited inclusion based on a subjective view of their impact, contribution, or other potentially relevant factors. Together, this approach has enabled a wide net to be cast to identify key insights from across the law or management studies literature, while also retaining the flexibility to draw on other sources of evidence where necessary.

Table 1 – In-scope industry surveys (original)

Author	Survey name	Published date	Survey date	Survey methodology
American Bar Association (Goncharov, 2021)	2021 ABA Legal Technology Survey Report	21 October 2021	April to June 2021	The ABA's Legal Technology Resource Center conducted a survey of more than 40,000 private practice attorneys from April through June 2021.
Bloomberg Law (2022)	Legal Ops + Tech Survey	2022	March 2022	Bloomberg Law surveyed 190 legal professionals (113 law firm and 77 in house) about legal operations and legal technology, including technology usage, efficiencies, barriers, metrics, decision-making responsibilities, and practice management.
Dashboard Legal (2022)	Attorney Technology Satisfaction Survey	2022	May 2022	Participation was solicited via legal-specific Instagram accounts, and Starbucks gift cards were raffled to incentivize responses. Typeform was used to collect responses to 21 questions, where respondents were asked to self-identify as attorneys (verified by email addresses) before replying to the

Author	Survey name	Published date	Survey date	Survey methodology
				survey; 954 respondents partially completed the survey, and 558 answered all 21 questions.
International Legal Technology Association (ILTA, 2021)	ILTA's 2021 Technology Survey	August 2021	<i>Not specified</i> (annual report)	The survey focused on law firm technology; 460 firms responded, including 134 firms of fewer than 50 lawyers and 38 firms of more than 700 lawyers. A total of 250K users were represented.
Legatics (2021) (funded by Innovate UK)	Barriers to Legal Technology Adoption	June 2021	<i>Not specified</i> (research project ran from August 2019 to April 2021)	The survey was answered anonymously by 133 lawyers across at least 10 leading law firms. Although participation predominately was from UK-based transactional lawyers, Legatics circulated the survey through LinkedIn; subsequently, the results may include some responses from lawyers outside the UK or from different practice areas.
Litera (2022)	The Changing Lawyer Report (2022)	August 2022	<i>Not specified</i> (annual report)	The survey covered 300 lawyers at law firms (80 employees minimum) and 100 “allied professionals” in law firms, working in operations, data management, or project management and other roles. The respondents were based in North America, the UK, DACH (Germany, Austria, Switzerland), France, Benelux, and Italy.
University of Oxford commissioned by the Solicitors Regulation Authority (SRA) (Sako & Parnham, 2021)	Technology and Innovation in Legal Services: Final Report for the Solicitors Regulation Authority	July 2021	April 2021	Researchers conducted an online survey of SRA-authorized firms to ask about innovation, the current and future uses of legal technology, and the drivers and barriers faced by innovators and adopters of legal technology. In total, 891 valid responses were received.

Author	Survey name	Published date	Survey date	Survey methodology
Thomson Reuters (in collaboration with Northwestern University's Daniel W. Linna, Jr.) (Linna & Curle 2020)	Large Law Firm Technology Survey: Law Firm Leader Perceptions of the Value of Technology	2020	June to September 2019	This research consisted of 112 survey interviews with legal technology decision makers in 66 different global large law firms. All respondent firms had a minimum of 100 attorneys and averaged 1,409 attorneys. Of the firms, 45% had fewer than 1,000 lawyers, and 55% had 1,000 lawyers or more; 60% were based in North America and 40% in the UK. The vast majority of respondents were partners.
University of Oxford (in association with the Law Society of England & Wales) (Sako et al. 2020)	Lawtech Adoption and Training: Findings from a Survey of Solicitors in England and Wales	March 2020	November 2019 to January 2020	The online survey yielded a total of 353 valid responses. It focused exclusively on the lawtech experiences and needs of qualified solicitors regulated by the SRA.
Wolters Kluwer (2021)	The 2021 Wolters Kluwer Future Ready Lawyer	June 2021	March 2021	The survey included insights from 700 legal professionals across 9 European countries and the US. The survey examined issues and trends affecting the future of law as organizations work to both rebound from the challenges of the past year and position themselves for higher performance ahead.

An updating approach was taken to consider generative AI for this review. The systematic search not repeated as it was deemed appropriate to supplement this with materials that were already known to the author at the time and that were potentially relevant to the research topic. However, more research was undertaken with the intention of again identifying potentially relevant recent ‘industry surveys’. This was performed in a way like the original but with some adjustments for practicality. The main adjustment was focusing on surveys that

distinguished generative AI separately from other technology types. In other respects, it followed a similar approach to the original, including focusing on: (i) lawyers and law firms (e.g., while there are some potentially relevant surveys on professionals more generally or doing a deep dive into corporate legal in-house departments, these were excluded from the review); (ii) surveys primarily addressing technology (e.g., while there are some potentially relevant surveys on law firms more generally but not specifically with a technology dimension, these were also excluded); and (iii) surveys primarily relating to law firms in the US and UK (i.e. those which including respondents from common law jurisdictions). Following this approach, 12 industry surveys were in-scope for the update, listed in Table 2.

Table 2 – In-scope industry surveys (updated)

Author	Survey name	Published date	Survey date	Survey methodology
Bloomberg Law (2024)	Legal Ops + Tech Survey	2024	January 2024	Surveyed 168 legal professionals about legal operations and technology usage, efficiencies, barriers, metrics, decision-making responsibilities, and practice management.
European Legal Tech Association (ELTA, 2023) (in collaboration with Lefebvre Sarrut)	Generative AI Global Report 2023	2023	June – July 2023	Surveyed 234 legal professionals across 37 countries. Respondents included law firms, legal departments, alternative legal service providers (ALSPs), and academic/public sector professionals.
ILTA (ILTA, 2023) (International Legal Technology Association)	2023 ILTA Technology Survey	2023	<i>Not specified</i> (annual report)	Surveyed 532 firms representing over 155,000 attorneys and approximately 311,000 total users.
ILTA (ILTA, 2024) (International Legal Technology Association)	2024 ILTA Technology Survey	2024	<i>Not specified</i> (annual report)	Surveyed 536 ILTA member firms representing over 138,000 attorneys and approximately 271,000 total users.

Author	Survey name	Published date	Survey date	Survey methodology
International Bar Association (IBA) (IBA, 2024) (in collaboration with The Center for AI and Digital Policy)	The Future is Now	2024	April – May 2024	Surveyed 333 law firms, including smaller firms and those with over 500 lawyers. Additional interviews and literature reviews were conducted. Firms spanned jurisdictions including Europe, the US, and other global regions.
LexisNexis (2023a)	Generative AI & the Legal Profession 2023 Survey Report	2023	15–16 March 2023	Surveyed 4,180 respondents, including 1,176 lawyers, 1,239 law students, and 1,765 consumers in the United States.
LexisNexis (2023b)	International Legal Generative AI Report	2023	March – July 2023	Surveyed 7,950 respondents, including 3,752 lawyers, 1,239 law students, and 2,959 consumers across the US, UK, France, and Canada. Surveys conducted in English and French using the Forsta survey platform.
LexisNexis (2023c)	Generative AI and the future of the legal profession	2023	24 May – 6 June 2023	Surveyed 1,175 lawyers and legal support workers in the UK. Responses collected via the Pollfish/Forsta survey platform.
LexisNexis (2024)	Lawyers cross into the new era of generative AI	2024	3 January – 19 January 2024	Surveyed 1,225 lawyers and legal support workers across the United Kingdom. Participants included large law firms, academic institutions, and in-house legal teams.
Thomson Reuters Institute (2023)	ChatGPT & Generative AI within Law Firms	2023	21 March – 31 March 2023	Surveyed 443 legal professionals from midsize and large law firms in the US, UK, and Canada. Respondents included partners (34%), associates (30%), and other lawyers (26%).
Wolters Kluwer (2023)	The Wolters Kluwer Future Ready Lawyer Report	2023	17 May – 4 June 2023	Surveyed 700 lawyers across the US and nine European countries – the United Kingdom, Germany, the Netherlands, Italy, France, Spain, Poland, Belgium, and Hungary – to examine client expectations, technology, and market trends.

Author	Survey name	Published date	Survey date	Survey methodology
Wolters Kluwer (2024)	The Wolters Kluwer Future Ready Lawyer Report	2024	6 May – 28 May 2024	Surveyed 712 lawyers across the US and nine European countries – Germany, the Netherlands, the United Kingdom, Belgium, France, Italy, Spain, Poland, and Hungary – to examine client expectations, technology, and market trends.

REFERENCES

- Alarie, B., Niblett, A., and Yoon, A. (2018). 'How Artificial Intelligence Will Affect the Practice of Law'. *University of Toronto Law Journal*, **68**, 106–124.
- Armour, J., Parnham, R., and Sako, M. (2021). 'Unlocking the Potential of AI for English Law'. *International Journal of the Legal Profession*, **28**, 65–83.
- Armour, J., Parnham, R., and Sako, M. (2022). 'Augmented Lawyering'. *University of Illinois Law Review*, **1**, 71–138.
- Armour, J. and Sako, M. (2020). 'AI-enabled business models in legal services: from traditional law firms to next-generation law companies?'. *Journal of Professions and Organization*, **7**, 27–46.
- Armour, J. and Sako, M. (2023). 'Lawtech: Levelling the Playing Field in Legal Services?'. In D. Engstrom (Ed.), *Legal Tech and the Future of Civil Justice*, Cambridge: Cambridge University Press.
- Ashley, K. D. (2018). 'Automatically Extracting Meaning from Legal Texts: Opportunities and Challenges'. *Georgia State University Law Review*, **35**, 1117–1152.
- Barley, S. R. (2020). *Work and Technological Change*. Clarendon Lectures in Management Studies, Oxford: Oxford University Press.
- Barton, B. H. (2013). 'The Lawyer's Monopoly-What Goes and What Stays'. *Fordham L. Rev.*, **82**, 3067–90.
- Berg, J., Raj, M., and Seamans, R. (2023). 'Capturing Value from Artificial Intelligence'. *Academy of Management Discoveries*, **9**, 424–428.
- Bloomberg Law. (2022). 2022 legal ops & tech survey. Rep., Bloomberg Law, Arlington, VA
- Bloomberg Law. (2024). 2024 legal ops & tech survey. Rep., Bloomberg Law, Arlington, VA
- Bonina, C., Koskinen, K., Eaton, B., and Gawer, A. (2021). 'Digital platforms for development: Foundations and research agenda'. *Information Systems Journal*, **31**, 869–902.
- Bostick, K. L. (2012). 'Pie in the Sky: Cloud Computing Brings an End to the Professional Paradigm in the Practice of Law'. *Buffalo Law Review*, **60**, 1375–1416.
- Braithwaite, W. T. (1991). 'How Is Technology Affecting the Practice and Profession of Law?'. *Texas Tech Law Review*, **22**, 1113–1158.
- Brivot, M., Lam, H., and Gendron, Y. (2014). 'Digitalization and Promotion: An Empirical Study in a Large Law Firm'. *British Journal of Management*, **25**, 805–818.
- Brooks, C., Gherhes, C., and Vorley, T. (2020). 'Artificial intelligence in the legal sector: pressures and challenges of transformation'. *Cambridge Journal of Regions, Economy and Society*, **13**, 135–152.
- Browning, H. J. G. (2024). 'Robot Lawyers Don't Have Disciplinary Hearings - Real Lawyers Do: The Ethical Risks and Responses in Using Generative Artificial Intelligence'. *Georgia State University Law Review*, **40**, 917–956.
- Brynjolfsson, E. and Milgrom, P. (2012). 'Complementarity in organizations'. *The Handbook of Organizational Economics*, Princeton: Princeton University Press, 11–55.
- Brynjolfsson, E. and Mitchell, T. (2017). 'What can machine learning do? Workforce implications'. *Science*, **358**, 1530–1534.
- Callier, M. and Reeb, A. (2015). 'The Industrial Age of Law: Operationalizing Legal Practice Through Process Improvement'. *Oregon Law Review*, **93**, 853–880.
- Ceruzzi, P. (2013). 'The Historical Context'. *The SAGE Handbook of Digital Technology Research*, London: SAGE Publications Ltd.
- Coase, R. H. (1937). 'The Nature of the Firm'. *Economica*, **4**, 386–405.

- Cook, T. D. and Campbell, D. T. (1979). 'Causal interference and the language of experimentation'. *Quasi-experimentation: design and analysis issues for field settings*, Chicago: Rand McNally College, 1–36.
- Cooper, D. J., Hinings, B., Greenwood, R., and Brown, J. L. (1996). 'Sedimentation and Transformation in Organizational Change: The Case of Canadian Law Firms'. *Organization Studies*, **17**, 623–647.
- Curran, K., McNamee, E., McCaroll, N., Chaurasia, P., and McBrearty, S. (2019). 'The Security Considerations in Cloud Adoption for Legal Firms'. *ICSET 2019 – International Conference on Science, Engineering & Technology, Tel Aviv, Israel, 29–30th March 2019*.
- Cusumano, M. A., Gawer, A., and Yoffie, D. B. (2019). *The business of platforms: strategy in the age of digital competition, innovation, and power*, New York: Harper Business.
- Dahl, M., Magesh, V., Suzgun, M., and Ho, D. E. (2024). 'Large Legal Fictions: Profiling Legal Hallucinations in Large Language Models'. *Journal of Legal Analysis*, **16**, 64–93.
- Danet, B., Hoffman, K. B., and Kermish, N. C. (1980). 'Obstacles to the study of lawyer-client interaction: the biography of a failure'. *Law & Soc'y Rev.*, **14**, 905–922.
- Dashboard Legal. (2022). *Attorney Technology Satisfaction Survey*. <https://www.advocatie.nl/content/uploads/Attorney-Tech-Satisfaction-Survey-June-2022.pdf>.
- Dzienkowski, J. S. (2013). 'The Future of Big Law: Alternative Legal Service Providers to Corporate Clients'. *Fordham Law Review*, **82**, 2995–3040.
- Eloundou, T., Manning, S., Mishkin, P., and Rock, D. (2024). 'GPTs are GPTs: Labor market impact potential of LLMs'. *Science*, **384**, 1306–1308.
- ELTA. (2023). *European Legal Tech Association (in collaboration with Lefebvre Sarrut): Generative AI Global Report 2023*. <https://elta.org/generative-ai-global-report-2023/>.
- Engstrom, D. F. and Gelbach, J. B. (2020). 'Legal Tech, Civil Procedure, and the Future of Adversarialism'. *University of Pennsylvania Law Review*, **169**, 1001–1099.
- Faulconbridge, J. (2025). 'Trajectories of legal work in the context of machine learning AI: conceptualising mediated evolution'. *International Journal of the Legal Profession*, **32**, 97–120.
- Faulconbridge, J., Sarwar, A., and Spring, M. (2023). 'How Professionals Adapt to Artificial Intelligence: The Role of Intertwined Boundary Work'. *Journal of Management Studies*. <https://doi.org/10.1111/joms.12936>
- Faulconbridge, J., Sarwar, A., and Spring, M. (2024). 'Accommodating Machine Learning Algorithms in Professional Service Firms'. *Organization Studies*, **45**, 1009–1037.
- Faulconbridge, J., Henriksen, L. F., and Seabrooke, L. (2021). 'How professional actions connect and protect'. *Journal of Professions and Organization*, **8**, 214–227.
- Faulconbridge, J., Spring, M., and Sarwar, A. (2021). *Next Generation Professional Services: Towards AI technology adoption in mid-tier accountancy and law firms*. <https://www.nextgenpsf.co.uk/home>.
- Flood, J. (2022). 'Traditions, symbols, and the challenges of researching the legal profession: the case of the cab rank rule and the Bar's responses'. *International Journal of the Legal Profession*, **29**, 3–32.
- Galanter, M. and Henderson, W. (2008). 'The elastic tournament: A second transformation of the big law firm'. *Stan. L. Rev.*, **60**, 1867–1930.
- Galanter, M. and Palay, T. (1994). *Tournament of lawyers: The transformation of the big law firm*, Chicago: University of Chicago Press.
- Galanter, M. and Palay, T. M. (1990). 'Why the Big Get Bigger: The Promotion-to-Partner Tournament and the Growth of Large Law Firms'. *Virginia Law Review*, **76**, 747–811.

- Gilson, R. J. (1990). 'The devolution of the legal profession: A demand side perspective'. *Modern Law Review*, **49**, 869–916.
- Gilson, R. J. and Mnookin, R. H. (1984). 'Sharing among the human capitalists: An economic inquiry into the corporate law firm and how partners split profits'. *Stan. L. Rev.*, **37**, 313–392.
- Goncharov, S. ed. (2021). 2021 ABA Legal Technology Survey Report. Chicago: Am. Bar Assoc.
- Greenwood, R. and Empson, L. (2003). 'The professional partnership: Relic or exemplary form of governance?'. *Organization Studies*, **24**, 909–933.
- Grossman, M. R. and Cormack, G. V. (2011). 'Technology-Assisted Review in E-Discovery Can Be More Effective and More Efficient Than Exhaustive Manual Review'. *Richmond Journal of Law and Technology*, **17**, 1–48.
- Hadfield, G. K. (2007). 'Legal barriers to innovation: The growing economic cost of professional control over corporate legal markets'. *Stanford Law Review*, **60**, 1689–1733.
- Heinz, J. P. and Laumann, E. O. (1982). *Chicago Lawyers: The Social Structure of the Bar*, New York: Russell Sage Foundation.
- Heinz, J. P., Laumann, E. O., Nelson, R. L., and Michelson, E. (1998). 'The changing character of lawyers' work: Chicago in 1975 and 1995'. *Law & Soc'y Rev.*, **32**, 751–776.
- Henderson, W. D. (2014). 'From Big Law to Lean Law'. *International Review of Law and Economics*, **38**, 5–16.
- Ho, D. E. and Rubin, D. B. (2011). 'Credible Causal Inference for Empirical Legal Studies'. *Annual Review of Law and Social Science*, **7**, 17–40.
- Hunter, D. (2020). 'The death of the legal profession and the future of law'. *University of New South Wales Law Journal*, **43**, 1199–1225.
- IBA. (2024). *International Bar Association (in collaboration with The Center for AI and Digital Policy): The Future is Now*. <https://www.ibanet.org/document?id=The-future-is%20now-AI-and-the-legal-profession-report>.
- ILTA. (2021). *ILTA's 2021 Technology Survey: Executive Summary*. https://higherlogicdownload.s3.amazonaws.com/ILTANET/ce7f3e74-fb70-402e-a1b35dc0abe72260/UploadedFiles/HSSw0D2FSay8S6HWWUlp_ExecutiveSummary.pdf.
- ILTA. (2023). *ILTA's 2023 Technology Survey: Executive Summary*. <https://legaltechnology.com/2023/09/29/iltas-annual-tech-survey-2023-reveals-all-on-collaboration-tools-adoption-governance-and-yes-lots-on-gen-ai/>.
- ILTA. (2024). *ILTA's 2024 Technology Survey: Executive Summary*. https://lime.nl/media/zdihfchk/ilta_summary_24_final.pdf.
- iManage. (2022a). 'Work | iManage'. *iManage.com*. <https://imanager.com/products/work/>.
- iManage. (2022b). 'iManage forms strategic partnership with Microsoft to deliver innovative solutions that drive better outcomes for the legal profession and knowledge workers'. *GlobeNewswire News Room*. <https://www.globenewswire.com/en/news-release/2022/02/23/2390146/0/en/iManage-forms-strategic-partnership-with-Microsoft-to-deliver-innovative-solutions-that-drive-better-outcomes-for-the-legal-profession-and-knowledge-workers.html>.
- Janes, S. H., Keith, P., and Dotsika, F. (2014). 'Implementing a social intranet in a professional services environment through Web 2.0 technologies'. *The Learning Organization*, **21**, 26–47.
- Jones, J. W. and Sako, M. (2021). 'Can law firms compete effectively for ALSP services?'. *Industry Insights from Thomson Reuters Institute*.

- <https://www.reuters.com/legal/legalindustry/can-law-firms-compete-effectively-alsp-services-2021-07-09/>.
- Jordan, M. I. and Mitchell, T. M. (2015). 'Machine learning: Trends, perspectives, and prospects'. *Science*, **349**, 255–260.
- Kapoor, S., Henderson, P., and Narayanan, A. (2024). 'Promises and Pitfalls of Artificial Intelligence for Legal Applications'. *Journal of Cross-disciplinary Research in Computational Law*, **2**. <https://journalcrcl.org/crcl/article/view/62>
- Katz, D. M. (2013). 'Quantitative Legal Prediction, or How I Learned to Stop Worrying and Start Preparing for the Data Driven Future of the Legal Services Industry'. *Emory law journal*, **62**, 909–966.
- Keuning, J. and Rainhart, A. (2018). 'The Law Firm Operations Team: Collaborative Agent of Change in a Changing Profession'. *Mitchell Hamline L. Rev.*, **44**, 41–104.
- Kira. (2021). 'Partner Ecosystem'. <https://kirasystems.com/how-kira-works/partner-ecosystem/>.
- Kira. (2022). 'How Kira Works'. <https://kirasystems.com/how-kira-works/>.
- Kluttz, D. N. and Mulligan, D. K. (2019). 'Automated Decision Support Technologies and the Legal Profession'. *Berkeley Technology Law Journal*, **34**, 853–890.
- Kobayashi, B. H. and Ribstein, L. E. (2011). 'Law's information revolution'. *Ariz. L. Rev.*, **53**, 1169–1220.
- LeCun, Y., Bengio, Y., and Hinton, G. (2015). 'Deep learning'. *Nature*, **521**, 436–444.
- Legatics. (2021). *Barriers to Legal Technology Adoption*. <https://events.legatics.com/hubfs/Barriers%20to%20Legal%20Technology%20Adoption.pdf>.
- Lehr, D. and Ohm, P. (2017). 'Playing with the Data: What Legal Scholars Should Learn About Machine Learning'. *UCDL Rev.*, **51**, 653–717.
- LexisNexis. (2023a). *Generative AI & the Legal Profession 2023 Survey Report*. https://www.lexisnexis.com/pdf/ln_generative_ai_report.pdf
- LexisNexis. (2023b). *International Legal Generative AI Report*. <https://www.lexisnexis.com/pdf/lexisplus/international-legal-generative-ai-report.pdf>.
- LexisNexis. (2023c). *Generative AI and the future of the legal profession*. <https://www.lexisnexis.co.uk/insights/generative-ai-and-the-future-of-the-legal-profession/index.html>.
- LexisNexis. (2024). *Lawyers cross into the new era of generative AI*. <https://www.lexisnexis.co.uk/insights/lawyers-cross-into-the-new-era-of-generative-ai/index.html>.
- Linna Jr., D. W. (2015). 'What We Know and Need To Know About Legal Startups'. *South Carolina Law Review*, **67**, 389–418.
- Linna Jr., D. W. and Curle, D. (2020). *Large Law Firm Technology Survey: Law Firm Leader Perceptions of the Value of Technology*.
- Litera. (2022). *The Changing Lawyer Report 2022*. <https://info.litera.com/rs/046-QLX-552/images/Litera-The-Changing-Lawyer-Report-2022.pdf>.
- Malhotra, N., Morris, T., and Smets, M. (2010). 'New career models in UK professional service firms: from up-or-out to up-and-going-nowhere?'. *The International Journal of Human Resource Management*, **21**, 1396–1413.
- Magesh, V., Suzgun, M., Surani, F., Manning, C. D., Dahl, M., and Ho, D. E. (2024). 'Hallucination-Free? Assessing the Reliability of Leading AI Legal Research Tools'. arXiv preprint arXiv:2405.20362.
- Mania, K. (2023). 'Legal Technology: Assessment of the Legal Tech Industry's Potential'. *Journal of the Knowledge Economy*, **14**, 595–619
- Marcus, R. L. (2008). 'The impact of computers on the legal profession: Evolution or revolution'. *Nw. UL Rev.*, **102**, 1827–1868.

- Markovic, M. (2019). 'Rise of the Robot Lawyers'. *Arizona Law Review*, **61**, 325–350.
- McGinnis, J. O. and Pearce, R. G. (2014). 'The Great Disruption: How Machine Intelligence Will Transform the Role of Lawyers in the Delivery of Legal Services'. *Fordham Law Review*, **82**, 3041–3066.
- McPeak, A. (2019). 'Disruptive Technology and the Ethical Lawyer'. *University of Toledo Law Review*, **50**, 457–476.
- Mungham, G. and Thomas, P. A. (1981). 'Studying lawyers: aspects of the theory, method and politics of social research'. *British Journal of Law and Society*, **8**, 79–96.
- Nissan, E. (2017). 'Digital technologies and artificial intelligence's present and foreseeable impact on lawyering, judging, policing and law enforcement'. *AI & Society*, **32**, 441–464.
- Ogunde, F. (2024). 'Navigating the legal landscape: large language models and the hesitancy of legal professionals'. *International Journal of the Legal Profession*, **31**, 311–322.
- Parker, C. and Ruschena, D. (2011). 'The Pressures of Billable Hours: Lessons from a Survey of Billing Practices inside Law Firms'. *University of St. Thomas Law Journal*, **9**, 619–664.
- Pearl, J. and Mackenzie, D. (2018). *The Book of Why: The New Science of Cause and Effect*, New York: Penguin Books Limited.
- Regan Jr., M. C. and Heenan, P. T. (2009). 'Supply Chains and Porous Boundaries: The Disaggregation of Legal Services'. *Fordham Law Review*, **78**, 2137–2192.
- Remus, D. and Levy, F. (2017). 'Can Robots Be Lawyers? Computers, Lawyers, and the Practice of Law'. *The Georgetown Journal of Legal Ethics*, **30**, 501–538.
- Ribstein, L. E. (2010). 'The death of big law'. *Wis. L. Rev.*, **2010**, 749–816.
- Ribstein, L. E. (2012). 'Delawyerizing the corporation'. *Wis. L. Rev.*, **2012**, 305–332.
- Russell, S. and Norvig, P. (2020). *Artificial Intelligence: A Modern Approach*, New York: Pearson.
- Sackmann, S. (1989). 'The Role of Metaphors in Organization Transformation'. *Human Relations*, **42**, 463–485.
- Sako, M. (2020). 'Artificial Intelligence and the Future of Professional Work'. *Commun. ACM*, **63**, 25–27.
- Sako, M., Armour, J., and Parnham, R. (2020). *Lawtech Adoption and Training: Findings from a Survey of Solicitors in England and Wales*.
- Sako, M. and Parnham, R. (2021). *Technology and Innovation in Legal Services: Final Report for the Solicitors Regulation Authority*.
- Sako, M., Qian, M., and Attolini, J. (2022). 'Future of professional work: evidence from legal jobs in Britain and the United States'. *Journal of Professions and Organization*, **9**, 143–169.
- Sherer, P. D. and Lee, K. (2002). 'Institutional Change in Large Law Firms: A Resource Dependency and Institutional Perspective'. *Academy of Management Journal*, **45**, 102–119.
- Siggelkow, N. (2002). 'Misperceiving interactions among complements and substitutes: Organizational consequences'. *Management Science*, **48**, 900–916.
- Skjølsvik, T. and Breunig, K. J. (2018). 'Virtual law firms: an exploration of the media coverage of an emerging archetype'. *International Journal of Law and Information Technology*, **26**, 64–88.
- Smets, M., Morris, T., and Greenwood, R. (2012). 'From Practice to Field: A Multilevel Model of Practice-Driven Institutional Change'. *Academy of Management Journal*, **55**, 877–904.
- Spring, M., Faulconbridge, J., and Sarwar, A. (2022). 'How information technology automates and augments processes: Insights from Artificial-Intelligence-based

- systems in professional service operations'. *Journal of Operations Management*, **68**, 592–618.
- Susskind, R. (2008). *The End of Lawyers?: Rethinking the Nature of Legal Services*, Oxford: Oxford University Press.
- Susskind, R. (2017). *Tomorrow's lawyers: an introduction to your future*, Oxford: Oxford University Press, Second Edition.
- Susskind, R. and Susskind, D. (2022). *The future of the professions: How technology will transform the work of human experts*, Oxford: Oxford University Press, Updated Edition.
- Teece, D. J. (2010). 'Business Models, Business Strategy and Innovation'. *Business Models*, **43**, 172–194.
- Thomson Reuters Institute. (2023). *ChatGPT & Generative AI within Law Firms*.
<https://www.thomsonreuters.com/en-us/posts/wp-content/uploads/sites/20/2023/04/2023-Chat-GPT-Generative-AI-in-Law-Firms.pdf>.
- Thornton, M. (2021). 'Legal professionalism in a context of Uberisation'. *International Journal of the Legal Profession*, **28**, 243–263.
- Wall, D. S. and Johnstone, J. (1997). 'The industrialization of legal practice and the rise of the new electric lawyer: The impact of information technology upon legal practice in the UK'. *International Journal of the Sociology of Law*, **25**, 95–116.
- Weinstein, S. (2022). 'Lawyers' Perceptions on the Use of AI'. In B. Custers and E. Fosch-Villaronga (Eds.), *Law and Artificial Intelligence: Regulating AI and Applying AI in Legal Practice*, The Hague: T.M.C. Asser Press.
- Whalen, R. (2022). 'Defining legal technology and its implications'. *International Journal of Law and Information Technology*, **30**, 47–67.
- Wolters Kluwer. (2021). *The 2021 Wolters Kluwer Future Ready Lawyer*. Survey Rep., Wolters Kluwer, Alphen aan den Rijn, Neth
- Wolters Kluwer. (2023). *The 2023 Wolters Kluwer Future Ready Lawyer*. Survey Rep., Wolters Kluwer, Alphen aan den Rijn, Neth
- Wolters Kluwer. (2024). *The 2024 Wolters Kluwer Future Ready Lawyer*. Survey Rep., Wolters Kluwer, Alphen aan den Rijn, Neth.

PAPER 1 – PROMPT ENGINEERING AS SUBSTANTIVE AND RELATIONAL EXPERTISE: LINKING PROFESSIONALS’ LEARNING PATHWAYS TO BOUNDARY WORK

This paper was coauthored. Author(s) name(s) and affiliation(s) including email(s): Ian Rodgers (University of Oxford, ian.rodgers@sbs.ox.ac.uk) and Mari Sako (University of Oxford, mari.sako@sbs.ox.ac.uk).

ABSTRACT

How do professionals perform boundary work while acquiring prompt engineering expertise for generative artificial intelligence (genAI)? We address this question by interviewing 64 lawyers, knowledge managers, and technologists at two large law firms and a technology company. We identify three learning pathways linked to different boundary work practices. Professionals *engaging* with genAI develop *human-to-machine relational expertise*, affording *reinforcing* boundary work. Those *connecting* with other professionals develop *human-to-human relational expertise*, affording *relating* boundary work. Those *avoiding* genAI do not develop relational expertise for prompt engineering, constraining them to *resisting* boundary work. Exceptionally, relational expertise from *engaging* or *connecting* learning pathways also affords *resisting* boundary work. We contribute a prompt engineering expertise typology and process model theorizing how professionals develop and apply it to redefine their boundaries. Linking learning pathways to boundary work highlights the importance of framing professionals’ responses to emerging technology as an interaction between substantive and relational expertise.

Keywords: boundary work, generative AI, learning pathways, prompt engineering, professional service firms, relational expertise

INTRODUCTION

How does the way professionals acquire expertise for generative artificial intelligence (genAI) affect their work boundaries? Although genAI in this context is relatively new (Berg et al., 2023), a robust literature explains how professionals learn to use technology effectively (Heimstädt et al., 2024; Ward et al., 2019). Researchers identify various learning pathways – or modes of expertise acquisition – such as learning collectives (Kaynak, 2024), shadow learning (Beane, 2019), and vicarious learning (Rostain and Huising, 2023). These pathways emphasize situated learning in the workplace within a teaching–learning ecology (Bailey and Barley, 2011; Kellogg et al., 2021; Lave and Wenger, 1991).

Under situated learning’s typical conditions, experienced professionals who have significant knowledge about practicing a profession (seniors) teach inexperienced newcomers (juniors) as they perform work (Cook and Brown, 1999; Lave and Wenger, 1991). However, emerging technology that changes rapidly and unpredictably can disrupt this dynamic (Bailey et al., 2022). As emerging technology undermines existing expertise, a new teaching-learning ecology emerges for its effective utilization (Kellogg et al., 2021). Consequently, juniors may acquire technology-related expertise faster and more effectively than senior colleagues since they face fewer or lesser risks to their status or identity (Beane, 2019; Beane and Orlikowski, 2015; Korica and Molloy, 2010; Leonardi, 2007; Nelson and Irwin, 2014; Pachidi et al., 2021). This dynamic can lead to what Beane and Anthony (2023) call “inverted apprenticeships”, where seniors learn from junior professionals rather than vice-versa.

Despite shedding light on how professionals might acquire expertise for genAI, this literature leaves two issues unresolved. First, it generally assumes that technology-related expertise is independent of substantive professional expertise (Barley, 1996; Kellogg et al., 2025; Pakarinen and Huising, 2023; Sandefur, 2015), implying that juniors’ lack of deep professional knowledge is no obstacle to them learning to effectively use genAI. Second, it

does not explicitly address how different learning pathways for acquiring technology-related expertise influence professionals' boundary work. While this research often focuses on professional qualification or career advancement, it has little to say about how or why these modes of learning might affect the boundaries of professional practice. This gap is striking given that earlier work suggests that expertise in various technologies can shift professional roles and affect jurisdictional boundaries (Barley, 1986; Barrett et al., 2012; Beane and Orlikowski, 2015; Bechky, 2003; Black et al., 2004).

Research on boundary work helps to address this gap. Drawing on well-established theories of professional boundaries (e.g., Abbott, 1988; Gieryn, 1983; Lamont and Molnár, 2002; Langley et al., 2019), and generally regarding technology either as a tool for performing work or a medium of organizing (Anthony et al., 2023; Bailey et al., 2022), this literature defines boundary work in this context as involving adapting to, accommodating, or contesting technology within, across, or by redefining boundaries (Barley, 1986; Barrett et al., 2012; Faulconbridge et al., 2023, 2024). Yet, while this literature highlights how professionals adjust their boundary activities in response to technology, it hardly considers how different ways in which they acquire requisite expertise affect boundary work. This is puzzling because acquiring new expertise is often necessary for using emerging technology effectively in professional work and changes in expertise are likely to have boundary implications (Anteby et al., 2016; Barley, 1986; Black et al., 2004; Greenwood et al., 2019).

In short, the learning pathways literature focuses on modes of expertise acquisition yet overlooks their impact on boundary work, while the boundary work literature examines professionals' responses to emerging technology without considering how acquiring associated expertise influences boundaries. We argue that this separation creates a blind spot – particularly in understanding how different types of expertise interrelate and shape professional boundaries. We therefore integrate the two strands by asking: What expertise is necessary for professionals

to use genAI, and how do they acquire it? Why do professionals learn expertise for genAI in diverse ways, and how do these modes affect their boundary work?

Our empirical context involves lawyers, knowledge managers, and technologists at two large U.S. law firms and their technology provider learning prompt engineering for a genAI application using a large language model (LLM). Our analysis identifies three distinct learning pathways, expertise configurations, and associated boundary work. We label these: (i) *engaging*, which develops *human-to-machine relational expertise*, affording *reinforcing* boundary work (i.e., professionals claiming and performing prompt engineering themselves); (ii) *connecting*, which develops *human-to-human relational expertise*, affording *relating* boundary work (i.e., professionals claiming and performing prompt engineering in collaboration with others); and (iii) *avoiding*, where professionals do not develop prompt engineering expertise, constraining them to resisting boundary work. Exceptionally, relational expertise from *engaging* or *connecting* may also afford *resisting* boundary work.

Our study makes the following contributions. First, we develop a typology of prompt engineering expertise in a professional context, demonstrating empirically that genAI's use does not necessarily reduce reliance on substantive professional expertise. While prompt engineering is often portrayed solely as a technical skill (e.g., Acar, 2023; Boussieux et al., 2024; Liu et al., 2023; McAfee et al., 2023), our findings show an interplay among substantive and relational expertise in four steps: (1) diagnosing and framing a professional problem, (2) translating that problem into prompts aligned with genAI's capabilities, (3) iteratively assessing and validating outputs using domain-specific criteria, and (4) combining those outputs with professional judgment to deliver client services. Specifically, this expertise comprises three interrelated elements: *professional substantive expertise* (abstract and principled knowledge for a profession, such as law), *technological substantive expertise* (abstract and principled knowledge of a technology, such as LLMs), and *human-to-machine*

relational expertise (situated and contextual knowledge of interacting with a specific technology). Prompt engineering expertise may be also scaffolded by *human-to-human relational expertise* (situated and contextual knowledge of interacting with other professionals), as it may be concentrated in one profession or distributed across several.

Second, we model how professionals develop prompt engineering expertise for genAI and apply it as they redefine their professional boundaries. By linking learning pathways (Beane, 2019; Beane and Anthony, 2023; Kaynak, 2024; Rostain and Huising, 2023), through relational expertise (Barley, 1996; Pakarinen and Huising, 2023; Sandefur, 2015), to boundary work (Faulconbridge et al., 2023; Langley et al., 2019), our model explains how expertise acquisition modes shape professionals' agentic responses to emerging technology (Anthony et al., 2023; Faulconbridge et al., 2023; Koljonen and Chan, 2024; Perner and Werr, 2023; Scarbrough et al., 2024). These contributions enhance our understanding of professional responses to technology such as genAI and address an important but underexplored topic in research on technology and organizing in professional work contexts.

THEORETICAL BACKGROUND

Professionals' boundary work responses to generative AI

Boundary work refers to efforts by individuals or groups to influence the boundaries – social, symbolic, material, or temporal boundaries – that differentiate entities such as professions and their teams or organizations (Gieryn, 1983; Langley et al., 2019). Langley and colleagues (2019) identify three categories of boundary work: *competitive*, defending, contesting, and creating boundaries to distinguish oneself from others to gain an advantage; *collaborative*, cooperating across boundaries to achieve common goals; and *configurational*, reshaping boundaries to guide emerging patterns of competition and collaboration. These intertwine as professionals engage in interdependent forms of boundary work to delimit,

expand, cross, or redefine boundaries (Faulconbridge et al., 2023; Köktener and Tunçalp, 2021).

Boundary work is central to professionals because professions are socially constructed entities, distinguishing themselves by convincing others – such as clients, governments, and society – that they possess distinct specialized knowledge and expertise that enables them to handle a set of problems more effectively than anyone else (Anteby et al., 2016). Professionals operate within a system where they claim and enforce the boundaries of their jurisdiction – which represents the extent of work that professionals claim and control – and which is subject to change due to factors including new technology (Abbott, 1988, 1995). Professional work involves diagnosis, inference, and treatment (Abbott, 1988), and adopting technology like AI can influence each modality, affecting professional boundaries (Sako, 2024).

To gain insights into professional responses to emerging technology like genAI, it is helpful to consider it as a relational counterpart in a system of work (Anthony et al., 2023; Bailey et al., 2022). In this view, technology is a situated artifact within an assemblage that provides an occasion for change in professional work (Barley, 1986; Orlikowski, 2007). This change unfolds as agentic practitioners perform work practices in response to a technology's material affordances and their own competences and meanings (Leonardi, 2011; Orlikowski, 1992, 2000; Shove et al., 2012), while overcoming established work practices' inertia within a broader regime of knowing (Amaya and Holweg, 2024; Bechky, 2020; Pachidi et al., 2021). Professionals' boundary work responses to technology involve accommodating, adapting to, or contesting these technologies within, across, or reconfiguring their boundaries (Barley, 1986; Barrett et al., 2012; Faulconbridge et al., 2023, 2024; Köktener and Tunçalp, 2021).

GenAI is an emerging technology and type of AI (Berg et al., 2023; Raisch and Fomina, 2024). Emerging technology changes rapidly and unpredictably, with high potential for scale and impact, and its uses and effects have yet to stabilize (Bailey et al., 2022). AI has distinct

properties of invisibility and inscrutability (Anthony et al., 2023), incorporating the ability to learn and act in ways that mirror human intelligence, providing professionals with a means to adjust or enhance their expertise (Anthony, 2018; Bailey et al., 2022; Pachidi et al., 2021; Raisch and Krakowski, 2021; Scarbrough et al., 2024).

Recent interest in genAI, including LLMs, since ChatGPT's launch in November 2022, has been due in part to its novel capacity to generate new outputs, especially text (Berg et al., 2023), and its potential for enhancing professional productivity or quality (Dell'Acqua et al., 2023). On one hand, this makes it potentially suitable for text-intensive professionals like lawyers. On the other hand, LLMs have distinct, salient properties with implications for our study (Vaswani et al., 2017). First, LLMs are directable, meaning that they can be influenced to generate content in a certain way through prompts – typically instructions in natural language text (Liu et al., 2023). Second, they are non-deterministic, so the same or similar prompt may lead LLMs to produce significantly different results (Wei et al., 2022). Third, they are probabilistic, meaning that LLMs can make up false information (often referred to as hallucinations) (Dahl et al., 2024; Kapoor et al., 2024; Magesh et al., 2024). These make professionals' engagement with LLMs distinctively challenging, raising questions about expertise for their use in professional work (Goh et al., 2024; Guha et al., 2023; Zamfirescu-Pereira et al., 2023).

How do professionals learn how to use genAI effectively in their work? And with what implications for their professional boundaries? This literature does not yet provide material guidance on these questions. In short, while this research highlights how professionals can redefine their work boundaries in response to technology, it has yet to explore in depth how acquiring technology-related expertise affects these boundary work practices. A logical step is therefore to consider the existing literature on how professionals acquire expertise, particularly related to technology like genAI.

Learning pathways to acquire prompt engineering expertise

The concept of expertise encompasses the cognitive and practical skills and competencies for accomplishing professional work, including tacit and explicit knowledge, professional judgment, and the ability to apply these effectively in context (Heimstädt et al., 2024; Ward et al., 2019). Professional expertise to perform their work competently can be analytically distinguished as substantive and relational (see Figure 1).

Substantive expertise refers to abstract, principled knowledge (Barley, 1996; Sandefur, 2015). It comprises *professional substantive expertise* and *technological substantive expertise*. *Professional substantive expertise* is abstract and principled knowledge relating to a profession, such as foundational legal knowledge – including black letter law and legal reasoning – or the equivalent in data science, such as statistical methods, mathematical logic, and data structures (Avnoon, 2024; Sandefur, 2015). *Technological substantive expertise* is abstract and principled knowledge relating to technology, such as core technical knowledge, including coding languages, algorithms, and LLM architectures. This expertise is not limited to professions such as computer science or data science but is also found in more unexpected places, such as with lawyers who know how to code (Avnoon, 2024; Susskind and Susskind, 2022).

Relational expertise is situated and contextual, involving understanding and acting within the social distribution of activities and relationships through which actual work takes place (Barley, 1996; Pakarinen and Huising, 2023; Sandefur, 2015). It comprises *human-to-human relational expertise* and *human-to-machine relational expertise*. *Human-to-human relational expertise* is situated and contextual knowledge of interacting with other professionals, such as lawyers' or data scientists' relationships with their colleagues, clients, or others (Avnoon, 2021; Borchhardt et al., 2025; Sandefur, 2015). *Human-to-machine relational expertise* is situated and contextual knowledge of interacting with a specific, concrete technology, such as lawyers' familiarity with Boolean searching online legal research

databases like Westlaw or LexisNexis, or software developers’ use of Stack Overflow to debug an application (Fang et al., 2023; Kaynak, 2024).

In practice, substantive and relational expertise are accumulated and integrated into specific expertise configurations (Black et al., 2004; Eyal, 2013; Pakarinen and Huising, 2023; Suchman, 2007). These expertise configurations comprise the specialized expertise central to professions’ claims and performance of work distinguishing their boundaries both apart from one another and from other occupations (Abbott, 1988; Anteby et al., 2016).

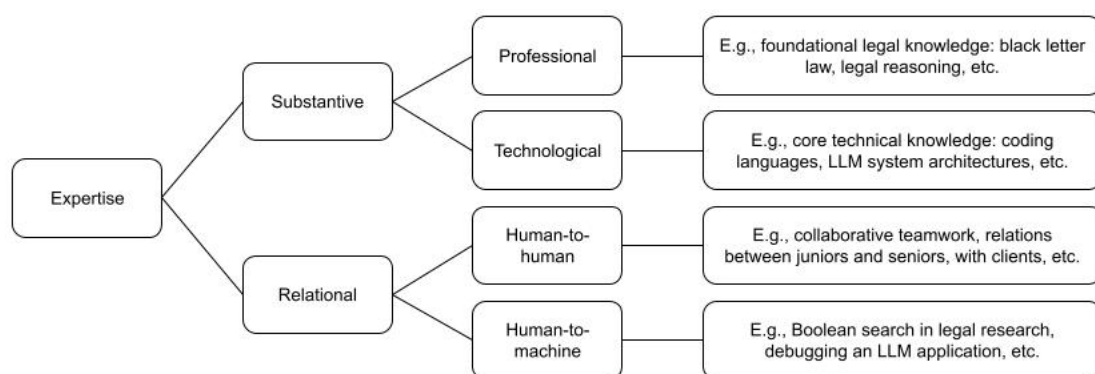


Figure 2 - Typology of Expertise

Competently accomplishing work using genAI such as LLMs requires specialized expertise in prompt engineering (Brown et al., 2020; Schmidt et al., 2024). Prompt engineering involves finding an appropriate prompt to allow an LLM to solve a given task (Liu et al., 2023). While at first glance LLMs’ ability to engage in natural language conversation – typically without requiring expertise in computer or data science – can make them seem universally accessible, the situation is in fact more complicated (Clavié et al., 2023; Jo, 2023). Nascent research suggests that prompt engineering typically requires a baseline understanding of genAI technology and associated techniques for prompting it such as shot or few-shot prompting or chain-of-thought processes (Boussiou et al., 2024; Brown et al., 2020; Wei et al., 2022), as well as specialized knowledge and expertise in a given domain (Jiang et al., 2022; Knoth et al.,

2024; Raisch and Fomina, 2024). In other words, prompt engineering involves distinct expertise.

Professionals acquire such types of expertise through various mechanisms, commonly referred to as *learning pathways* (Kaynak, 2024; Rostain and Huising, 2023). These pathways typically involve formal training and situated learning in the workplace within a teaching-learning ecology (Abbott, 1988; Anteby et al., 2016; Bailey and Barley, 2011; Barley, 1996; Kellogg et al., 2021; Lave and Wenger, 1991). In such settings, learners join a community of practice through socialization (Brown and Duguid, 1991, 2001; Nicolini et al., 2022; Van Maanen, 1975). Specific pathways include shadow learning – where professionals engage with emerging technology to challenge existing norms and policies (Beane, 2019) – vicarious learning, which involves observing others solve problems with technology (Rostain and Huising, 2023), or learning collectives that develop professional skills via group interaction (Kaynak, 2024).

Under typical conditions within such learning pathways, experienced professionals who have significant knowledge about practicing a profession (seniors) teach inexperienced newcomers (juniors) as they perform work (Cook and Brown, 1999; Lave and Wenger, 1991). However, where emerging technology undermines existing expertise, a new teaching-learning ecology may emerge for its effective utilization (Kellogg et al., 2021). In these circumstances, juniors may acquire technology-related expertise more rapidly and with fewer risks to their status or identity than senior colleagues (Beane, 2019; Beane and Orlikowski, 2015; Korica and Molloy, 2010; Leonardi, 2007; Nelson and Irwin, 2014; Pachidi et al., 2021). This dynamic can lead to what Beane and Anthony (2023) call “inverted apprenticeships”, where seniors learn from junior professionals rather than vice-versa, configuring struggle and restructuring interactions with them to develop expertise but keep their position.

This literature on learning pathways helps us understand how professionals acquire technology-related expertise and its effects on qualification and career advancement. But it does not substantively address how learning pathways for such expertise relate to professionals' boundary work. Prior research suggests that expertise in various technologies can shift professional roles and alter jurisdictional boundaries (Barley, 1986; Barrett et al., 2012; Beane and Orlikowski, 2015; Bechky, 2003; Black et al., 2004). Yet, despite this, the specific links between expertise acquisition and professional boundaries has not been a focus in this strand of literature.

Knowledge gap and research questions

In summary, while the boundary work literature addresses professionals' boundary work responses to new technology without examining the role of acquiring associated expertise in such boundary work, the learning pathways literature focuses on modes of expertise acquisition but overlooks their potential impact for boundary work. This separation leads to a blind spot in how different types of expertise relate to each other. We therefore bring the two strands together by asking: What expertise is necessary for professionals to use genAI, and how do they acquire it? Why do professionals learn expertise for genAI in diverse ways, and how do these modes affect their boundary work? By addressing these important but under-researched questions, we investigate how professionals' learning pathways for expertise associated with emerging technology are linked to their boundary work practices in professional organizations.

RESEARCH METHODS

Research Setting

We studied use of genAI, including prompt engineering practices, in professional service firms (PSFs) by interviewing lawyers, knowledge managers, and technologists at law firms and a technology provider. Our units of analysis are individuals and their various "use

cases” – that is, their application of a given technology for a specific work purpose (Maghazei et al., 2022; Spring et al., 2022). Two large law firms in the US agreed to participate in the study in late 2023. One firm (Firm 1) provided legal services across various practice areas and sectors, with over 1000 lawyers. The other firm (Firm 2) provided legal services related to a specific practice area, employment, across various sectors, with around 500 lawyers. Both firms were classic PSFs with a professional partnership organizational form for contemporary legal services (Greenwood et al., 1990; Malhotra et al., 2021; von Nordenflycht, 2010), and their business model was legal-advisory (Armour and Sako, 2020).

Both firms had offices in various locations across the US. The US regulatory regime mandates legally competent representation and generally prohibits those without legal qualifications from providing legal services or owning law firms (Sako et al., 2022). It also typically obliges lawyers to be technologically competent (Armour et al., 2022), although when we collected our data there was no formal regulatory guidance for genAI. At US law school, students typically attend mandatory courses on using technology including online legal research databases such as Westlaw or LexisNexis (Fang et al., 2023). These databases generate search results based on keywords or Boolean searches, those that combine words and operators like “AND,” “OR,” and “NOT” to limit search results (Yamane, 2020). While many law schools offer optional legal technology classes, not many then covered prompt engineering for genAI. This is what one would expect from our study’s timeframe, with ChatGPT only released in November 2022, and our most junior informants (first year associates) joining their firms in October 2023.

Within the law firms, there were three different types of professionals and other occupational groups in-scope: lawyers, knowledge managers, and technologists. First, *lawyers* are legally qualified, fee-earning professionals who work to solve clients’ legal problems. The firms’ lawyers comprised partners, who owned the firm, and associates, salaried employees.

Both firms' lawyers regularly used digital technology in their legal practice, although their previous involvement with AI was typically limited, which is common within large law firms (Faulconbridge, 2025; Ogunde, 2024; Rodgers et al., 2023). They remained professionally responsible for the competence of their client work when they used technology (or worked with others doing so), including remaining vigilant to genAI's potential or actual false outputs – something which US lawyers have been sanctioned for failing to do, for instance in the *Mata v. Avianca, Inc.* case (Browning, 2024). Considering this, the lawyers at both firms got training that included the basics of using genAI in practice, as well as modules on genAI and legal ethics and the firms' acceptable use policies.

Second, *knowledge managers* constitute a significant occupational group in contemporary large law firms (Armour et al., 2022). Knowledge managers are generally responsible for ensuring that knowledge is captured and shared within firms (Evans and Price, 2017), and for training lawyers on the relevant technology for this (Janeček et al., 2021). Most of them at both law firms were legally qualified but non-practicing professionals, while a small number were specialists in adjacent disciplines to knowledge management, such as information systems. At both firms the knowledge managers implemented and owned the relevant genAI application, acting as its “product managers” with the application's successful deployment as their objective (Davenport et al., 2023).

Third, *technologists* in law firms play a variety of roles (Faulconbridge, 2025). One is “legal technologist” with the ability to frame legal problems in ways that have technological solutions (Janeček et al., 2021; Susskind, 2017). For AI generally, “data scientists” have come to the fore (Davenport and Patil, 2012). For genAI specifically, a new type of technologist has emerged: the “prompt engineer” (Davenport and Mittal, 2022). Both law firms had access to a prompt engineer from the technology company that provided the genAI software (TechCo). This prompt engineer was involved in training the firms' lawyers on the strengths and

weaknesses of genAI generally and assisted with specific projects upon request. The firms also had some internal legal technologists who might act as prompt engineers, although at the time of our research there was no distinct “prompt engineer” role within either firm.

Both firms had a genAI application (LegalGPT) provided by TechCo. LegalGPT was a best-in-class LLM made available through the chatbot interface that was the release paradigm dominant by mid-2023 (Eloundou et al., 2024). The application was first available for use “in production” in Spring 2023, although both firms had access to it for a short time before this as “beta-testers”. LegalGPT enabled users to generate content to perform actions including preparing a legal research memo, reviewing or summarizing documents, and drafting correspondence. This range of LegalGPT’s capabilities was more general-purpose than other AI-based IT found in law firms, which were generally “point solutions” used for particular data-processing tasks (Eloundou et al., 2024; Faulconbridge, 2025; Spring et al., 2022, p. 599).

TechCo tailored LegalGPT for legal use cases by (a) fine-tuning it with expert legal feedback through reinforcement learning through human feedback (RLHF) to enhance its performance in legal domains (Sako, 2024), and (b) using retrieval-augmented generation (RAG) (Chen et al., 2024; Lewis et al., 2020), a technique enabling LLMs to draw on retrieved firm- or legal domain-specific legal data to produce more accurate answers. RAG mitigated hallucinations (that is, LLMs making up false information), though challenges remained (Dahl et al., 2024; Kapoor et al., 2024; Magesh et al., 2024; Ogunde, 2024). TechCo also used system prompts (Clavié et al., 2023), i.e. backend prompts to LegalGPT that enabled the guiding of LegalGPT towards useful outputs in a legal context. System prompts and prompt engineering expertise associated with them were out of scope for our study because they are relevant for designing and building genAI applications rather than using them in professional work.

Data Collection

Our study involved collecting and analyzing qualitative data from which to inductively develop our theory (Charmaz, 2006; Gioia et al., 2013; Glaser and Strauss, 1967). We thought this approach apt when studying expertise relating to genAI, a novel, impactful technology, as such methods “enable broad research questions that probe [...] unexplored settings, and highly significant phenomena” (Eisenhardt et al., 2016, p. 1119).

We used semi-structured interviews with lawyers at two firms as our main data source. We supplemented this by interviewing other occupational members at these firms and at their genAI application provider. We also collected ancillary data about genAI use, training, support, and press coverage, as well as using the application ourselves to provide context for our data interpretation.

We selected interviewees using purposive sampling to interview people in our target population (Patton, 2002), meaning those using genAI for client work in PSFs. We used the firms’ ancillary data about genAI use to inform our choices (e.g., LegalGPT’s usage data). For instance, this data indicated to us that users were primarily litigation lawyers. We then used theoretical sampling to interview people who could speak to our theoretical interest (O’Reilly et al., 2012), the relationship between acquiring expertise and boundary work.

We interviewed 64 people between November 2023 and May 2024. Questions from our interview protocol included, but were not limited to, the following. “Can you outline your role and where [LegalGPT] fits in or doesn’t? If you have been using it, what have you been using it for and how do you use it? How did you learn to use it like that? Do you work with others when using it? How do you see [LegalGPT] influencing your career?” We did interviews using Zoom. Interviews generally lasted between 30 to 45 minutes, resulting in around 40 hours of interview recordings. We kept interviewing until we reached theoretical saturation (Charmaz, 2006). This encompassed participation from a range of lawyers – including partners and

associates – as well as knowledge managers and technologists (see Table 1 for details on interviewees).

Table 1: Details of Interview Sample

Interview Identifier	Firm	Interviewee Role	Interview Date	Length (Mins)
INTA1	Firm 1	Knowledge manager	16/11/2023	45
INTA2	Firm 1	Lawyer (Partner)	05/12/2023	44
INTA3	Firm 1	Lawyer (Partner)	06/12/2023	37
INTA4	Firm 1	Lawyer (Associate)	07/12/2023	39
INTA5	Firm 1	Lawyer (Partner)	07/12/2023	37
INTA6	Firm 1	Lawyer (Partner)	11/12/2023	35
INTA7	Firm 1	Lawyer (Associate)	11/12/2023	34
INTA8	TechCo	Technologist	11/12/2023	60
INTA9	Firm 1	Knowledge manager	12/12/2023	54
INTA10	Firm 1	Lawyer (Partner)	14/12/2023	46
INTA11	Firm 1	Lawyer (Associate)	18/12/2023	52
INTA12	Firm 1	Knowledge manager	16/01/2024	51
INTA13	Firm 1	Knowledge manager	17/01/2024	50
INTA14	Firm 1	Knowledge manager	17/01/2024	54*
INTA15	Firm 1	Knowledge manager	17/01/2024	54*
INTA16	Firm 1	Lawyer (Partner)	18/01/2024	62
INTA17	Firm 1	Technologist	15/02/2024	30
INTA18	Firm 1	Lawyer (Associate)	16/02/2024	31
INTA19	Firm 1	Lawyer (Associate)	16/02/2024	29
INTA20	Firm 1	Lawyer (Associate)	19/02/2024	24
INTA21	Firm 1	Lawyer (Associate)	19/02/2024	30
INTA22	Firm 1	Lawyer (Associate)	19/02/2024	33
INTA23	Firm 1	Lawyer (Associate)	19/02/2024	36
INTA24	Firm 1	Lawyer (Associate)	19/02/2024	20
INTA25	Firm 1	Lawyer (Associate)	20/02/2024	34
INTA26	Firm 1	Lawyer (Associate)	20/02/2024	28
INTA27	Firm 1	Lawyer (Associate)	21/02/2024	26
INTA28	Firm 1	Lawyer (Associate)	21/02/2024	27
INTA29	Firm 1	Lawyer (Associate)	21/02/2024	31
INTA30	Firm 2	Lawyer (Associate)	21/02/2024	30
INTA31	Firm 2	Lawyer (Partner)	21/02/2024	31
INTA32	Firm 1	Lawyer (Associate)	22/02/2024	30
INTA33	Firm 1	Lawyer (Associate)	22/02/2024	29
INTA34	Firm 2	Lawyer (Partner)	22/02/2024	29
INTA35	Firm 2	Lawyer (Associate)	22/02/2024	24
INTA36	Firm 1	Lawyer (Associate)	23/02/2024	30
INTA37	Firm 1	Lawyer (Associate)	23/02/2024	30
INTA38	Firm 1	Lawyer (Associate)	23/02/2024	30
INTA39	Firm 2	Lawyer (Associate)	23/02/2024	40
INTA40	Firm 2	Lawyer (Associate)	23/02/2024	30
INTA41	Firm 2	Lawyer (Associate)	23/02/2024	29

Interview Identifier	Firm	Interviewee Role	Interview Date	Length (Mins)
INTA42	Firm 2	Lawyer (Associate)	27/02/2024	31
INTA43	Firm 2	Lawyer (Associate)	27/02/2024	23
INTA44	Firm 2	Lawyer (Associate)	27/02/2024	37
INTA45	Firm 1	Lawyer (Associate)	28/02/2024	26
INTA46	Firm 2	Lawyer (Associate)	28/02/2024	38
INTA47	Firm 2	Lawyer (Partner)	28/02/2024	29
INTA48	Firm 2	Lawyer (Partner)	28/02/2024	33
INTA49	Firm 2	Lawyer (Associate)	01/03/2024	44
INTA50	Firm 2	Lawyer (Associate)	04/03/2024	30
INTA51	Firm 1	Lawyer (Associate)	05/03/2024	36
INTA52	Firm 1	Lawyer (Associate)	08/03/2024	35
INTA53	Firm 1	Lawyer (Associate)	18/03/2024	29
INTA54	Firm 2	Knowledge manager	18/03/2024	32
INTA55	Firm 2	Knowledge manager	18/03/2024	34
INTA56	Firm 2	Lawyer (Partner)	18/03/2024	32
INTA57	Firm 1	Lawyer (Associate)	19/03/2024	30
INTA58	Firm 2	Lawyer (Associate)	20/03/2024	37
INTA59	Firm 2	Lawyer (Associate)	22/03/2024	32
INTA60	Firm 2	Lawyer (Associate)	25/03/2024	31
INTA61	TechCo	Technologist	05/04/2024	53
INTA62	TechCo	Technologist	15/04/2024	45
INTA63	TechCo	Technologist	02/05/2024	47
INTA64	TechCo	Technologist	16/05/2024	43

*INTA14 and INTA15 were interviewed jointly.

Data Analysis

We recorded interviews with our interviewees' consent and had them professionally transcribed. Transcripts ran to about 350,000 words (around 550 pages). We summarized interviewees' responses to each question from our interview protocol, actively categorizing our empirical data (Grodal et al., 2021). We also discussed the interviews and our thoughts about them in regular meetings.

We pooled rather than compared data from our in-scope firms, as we noted substantial similarities within them (Bechky and O'Mahony, 2015). We open coded data, defining what we saw in it (e.g., lawyers learning prompt engineering) (Corbin and Strauss, 1990). To analyze, or code, our data into refined categories, we developed preliminary labels for themes that we saw in the data by staying close to the language of the participants and using "in vivo"

codes to describe passages of text as clearly as possible (Charmaz 2006). We also engaged in axial coding or linking categories to subcategories by specifying their properties and dimensions (Corbin and Strauss, 1990). As we coded, we created and updated a coding dictionary with “parent codes” (main categories) and “children codes” (subcategories). Finally, we engaged in selective coding, filling in categories with descriptive detail and unifying all categories around a core category (Corbin and Strauss, 1990). The core category represents our study’s central phenomenon, the relationship between learning pathways and boundary work. A data structure with interviewees’ representative quotes, emerging themes, and overarching concepts is included at Figure 2.

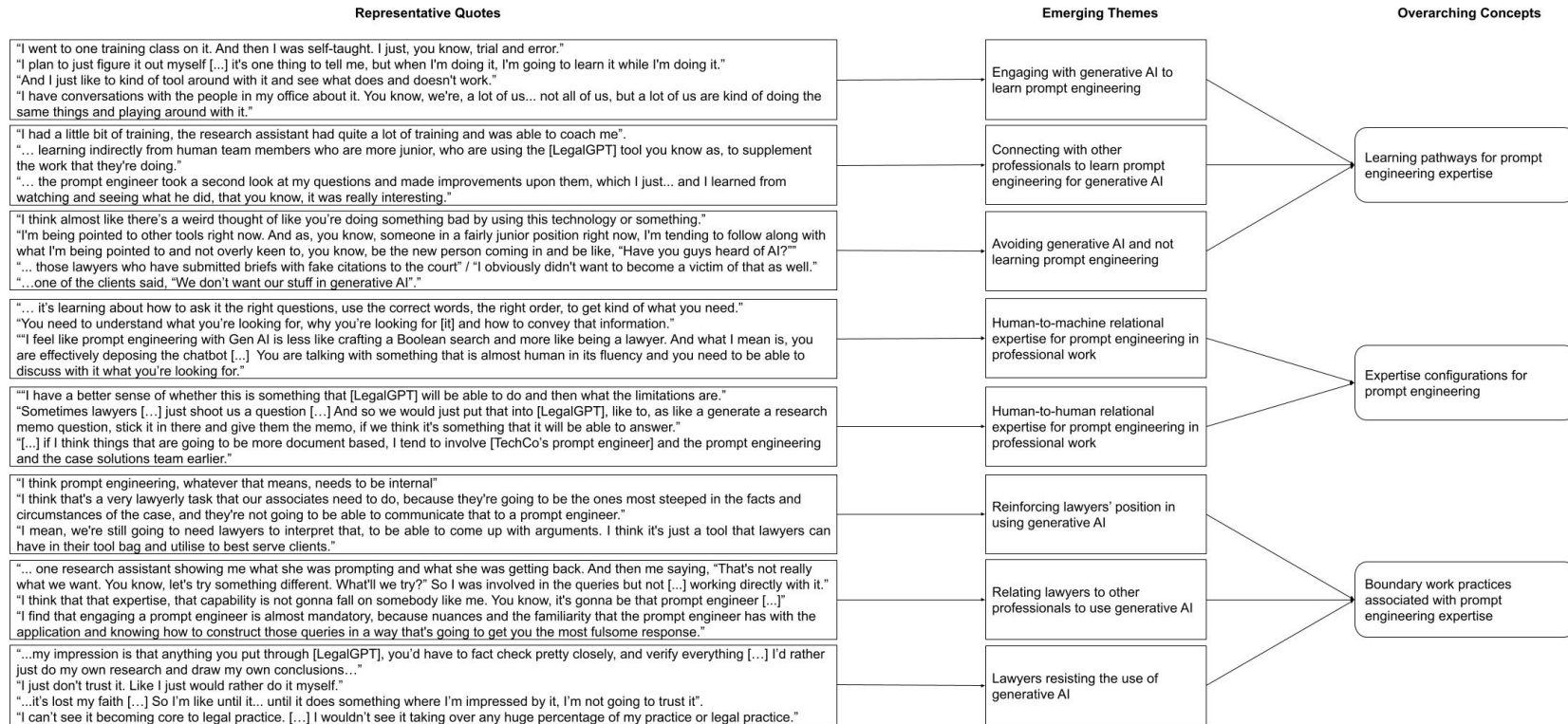


Figure 2 - Data Structure

Use of AI in this paper

Our academic institution conducted a genAI pilot during our writing stage. The first author participated in this pilot due to our interest in genAI and prompt engineering. An earlier version of this paper was subject to copy editing, using a prompt such as: “*Apply the principles from The Elements of Style by Strunk and White to improve the clarity, conciseness, and readability of this paragraph: [insert paragraph]*”. The output was then carefully reviewed, and changes made only if we decided that they enhanced these fundamental principles of good writing. Thus, the ideas put forward in this paper are solely those of the authors. We also avoided less robust use cases of genAI such as academic referencing (Gatrell et al., 2024).

FINDINGS

Our research identifies three distinct learning pathways related to prompt engineering expertise: *engaging* directly with genAI, *connecting* with other professionals, and *avoiding* genAI altogether. The next sections present evidence of each learning pathway, its expertise configuration, and associated boundary work practices. Interestingly, while *engaging* is associated with *human-to-machine relational expertise* acquisition, *connecting* with *human-to-human relational expertise* acquisition, and *avoiding* with neither, in exceptional circumstances, *resisting* boundary work occurred when certain lawyers had developed a sufficient understanding of prompt engineering and genAI to deem its use problematic, typically for a specific use case rather than as a technology.

Engaging: human-to-machine relational expertise, and reinforcing boundary work

Learning pathway: engaging with generative AI

Lawyers received foundational training sessions and ongoing support from knowledge managers and prompt engineers. Yet, for most lawyers, learning prompt engineering was largely an individual activity. They developed prompt engineering expertise by “trial and error” or “playing around” with LegalGPT to “see what does and doesn’t work” for legal practice.

This hands-on approach involved them testing prompts on hypothetical assignments or real client matters, implicitly comparing and assessing it against their existing work practices. This was typically an iterative experience as they titrated their prompts. “It’s learning about how to ask it the right questions, use the correct words, the right order, to get kind of what you need”, one lawyer explained. This iterative approach enabled them to adjust the complexity, breadth, or nuance of their prompts to improve their evaluation of LegalGPT’s output quality.

Lawyers’ level of engagement with genAI at the firms was unprecedented, indicating a significant shift in how they approached genAI relative to other technology. This strong engagement with LegalGPT was reflected by one of the lawyers, who told us that they had said to their firm: “If you take this [i.e. LegalGPT] away from me, I’m going to quit.”

Expertise configuration: human-to-machine relational expertise for prompt engineering

Some lawyers developed *human-to-machine relational expertise* in prompt engineering through their direct engagement with genAI. This involved knowing how and being able to phrase questions and structure prompts to elicit useful responses from LegalGPT. This was emphasized by TechCo’s prompt engineer, who told us that “weak prompting” led to “weak results” with LegalGPT. It also involved knowing how to review their prompts’ results and iteratively refine them to improve accuracy, relevance, or suitability. This might be done by rewording prompts, adjusting terminology, or exploring different angles of a legal issue. A lawyer recalled: “There have been plenty of times where I entered it one way, and I’ll even sleep on it, and then come back, try it again the next day in like a diff’ ... rewording it, switching words round, using different words”.

Human-to-machine relational expertise was particularly important when the application produced answers that appeared correct but contained inaccuracies. The lawyers learned how to resolve this challenge to their satisfaction, verifying outputs against legal research databases such as Westlaw or LexisNexis, or their own knowledge base. This

underscored the importance of their *professional substantive expertise* like legal knowledge and judgment in validating and interpreting AI-generated content, enabling the lawyers to integrate the application into their client work.

These lawyers also learned *technological substantive expertise* such as aspects of computer and data science, including a basic understanding of LLM models (such as OpenAI's GPT-4), their algorithms (such as their probabilistic architecture), in-scope data (such as the proprietary legal resources LegalGPT made available), and their relative "weaknesses" (such as their limitations with mathematical calculations). This was not in-depth knowledge, more a basic awareness.

As the lawyers learned how to scope, formulate, and iterate prompts, and to evaluate and interpret LegalGPT's outputs, they were able to place it in their situated legal work, such as how and when to use it and for what. For instance, a lawyer explained that after using it, "I've kind of honed in on, like, it's a little bit of a good cross-checking tool and a little bit of a good open-ended research tool." Another noted: "the bottom line is, [LegalGPT's] a useful tool as a starting point."

Boundary work practice: reinforcing professional boundaries

Many of the lawyers pursuing the *engaging* pathway considered prompt engineering expertise essential for the effective use of genAI in legal services, which they anticipated becoming part of their professional practice. Lawyers, they claimed, needed to understand how to scope, formulate, and iterate prompts and evaluate and interpret outputs, all with an informed understanding of specific cases or legal issues and obligations considering client needs.

They believed that prompt engineering expertise was adjacent to core legal practice. As one lawyer put it, "You need to understand what you're looking for, why you're looking for [it] and how to convey that information. And it might just be the process, you know, through law school and where they teach you to think like a lawyer, and having that understanding of

a case.” They said it was difficult to delegate this expertise to those without legal qualification and practice experience. One lawyer explained, “I think that’s a very lawyerly task that our associates need to do, because they’re going to be the ones most steeped in the facts and circumstances of the case, and they’re not going to be able to communicate that to a prompt engineer.” They continued: “I think prompt engineering, whatever that means, needs to be internal [...] I think associates need to understand what they’re doing and craft their searches with an understanding of the specific case and the legal issue.”

This perspective aligned with lawyers performing prompt engineering for LegalGPT, viewing it as an additional “tool in the toolkit” rather than a replacement for their expertise. While they acknowledged that while LegalGPT could and should help with routine or labor-intensive aspects (“grunt work”) – one lawyer summed this up attitude when he said: “I don’t know why all attorneys aren’t using [LegalGPT], every firm” – prompting it and the evaluation, interpretation, and application of its outputs still required their substantive legal expertise. As one lawyer summed up:

“... it still requires the lawyer to interpret it, to apply to the facts. [LegalGPT] isn’t doing that, just kind of doing the grunt work for you [...] So I think going forward, I mean, we’re still going to need lawyers to interpret that, to be able to come up with arguments. I think it’s just a tool that lawyers can have in their tool bag and utilize to best serve clients.”

As they integrated LegalGPT into client services, lawyers also compared prompt engineering expertise to what they already knew well from law school and legal practice, namely Boolean search in legal research databases such as LexisNexis and Westlaw. They generally recognized that prompt engineering with genAI involved a more conversational and iterative process, requiring them to develop new expertise. One lawyer put this vividly:

“I feel like prompt engineering with genAI is less like crafting a Boolean search and more like being a lawyer. And what I mean is, you are effectively deposing the chatbot. And so it’s not a one and done – I set up a nice little mathematical little formula that’s going to capture sentences that matter to me and pull those cases. You are talking with something that is almost human in its fluency and you need to be able to discuss with it what you’re looking for. So my interactions with [LegalGPT] have been very Socratic and iterative.”

In learning and performing prompt engineering and claiming it for themselves, these lawyers reinforced their professional boundaries by asserting their privileged epistemic position – based on their *professional substantive expertise* – to put prompt engineering expertise into practice in using genAI effectively in legal services. They acted to claim and control genAI’s integration into their professional work. This approach enabled them to get comfortable that the technology was being used in legal practice appropriately according to their own professional standards.

Connecting: interactive expertise, and relating boundary work

Learning pathway: connecting with other professionals

Some lawyers developed prompt engineering expertise by connecting and collaborating with other professionals, such as knowledge managers and prompt engineers. While these lawyers had received basic training on LegalGPT and may have used the application too, they recognized that others possessed necessary or more advanced expertise relevant to prompt engineering. They connected and worked with these professionals, learning as they integrated their contributions into the process of using genAI when providing their clients’ legal services.

These lawyers might work with knowledge managers, who were typically legally qualified and had extensive training and experience using the LegalGPT application. This was typically under special circumstances, such as when lawyers felt uncomfortable using the

application or got unexpected outcomes. One lawyer characterized these situations as requiring “bread and butter” prompt engineering expertise. Another described their experience as follows: “One research assistant [was] showing me what she was prompting and what she was getting back. And then me saying, “That’s not really what we want. You know, let’s try something different.”

These lawyers also typically acknowledged that prompt engineers played an important role in ensuring they had necessary and sufficient expertise to assess and use LegalGPT effectively. Prompt engineers typically had some legal knowledge (for instance, a law degree or experience working in a law firm) with additional backgrounds in technology, data science, or analytics. The lawyers generally reported connecting with prompt engineers when they were working on complex or high-volume matters, or needed sophisticated prompts.

They described this process of working with knowledge managers and prompt engineers in terms of coaching or vicarious learning to understand the application’s capabilities and how it could be used effectively in practice. One lawyer described their experience as follows: “the prompt engineer took a second look at my questions and made improvements upon them, which I just... and I learned from watching and seeing what he did, that you know, it was really interesting. His... the responses to his questions were much improved.”

Expertise configuration: human-to-human relational expertise for prompt engineering

Through connecting and collaborating, these lawyers developed a foundational level of familiarity with LegalGPT and learned to work effectively with specialists such as knowledge managers and prompt engineers to integrate it into their professional practices. It involved recognizing that others had specialized knowledge, knowing when to involve them, and how to work with them. They learned that other professionals could help them use the application even when they felt uncomfortable doing so on their own (whether because they lacked

familiarity with LegalGPT or they had a particularly sophisticated, high-volume use case) or were getting unexpected outcomes. For instance, one lawyer explained that the familiarity that:

“... the prompt engineer has with the application and knowing how to construct those queries in a way that’s going to get you the most fulsome response. I think that’s something that’s going to be challenging for your rank-and-file lawyer to do.”

The lawyers also learned when to involve other professionals, such as on complex or high-volume matters or for sophisticated prompts. As one lawyer told us about the firm’s own “prompt engineers”: “We don’t call them prompt engineers, but that’s what they do basically. And, but we use them not for day-to-day stuff, but like sophisticated investigations. You know, really tough problems where we deploy them.” A knowledge manager explained that if:

“I think things that are going to be more document based, I tend to involve [TechCo’s prompt engineer] and the prompt engineering and the case solutions team earlier. Because I know that we’re going to be headed in that direction anyway. And I know that getting a really good prompt with a lot of context and the right level of detail is gonna be important and outcome determinative.”

These lawyers also developed an understanding of how to interact with other professionals to integrate genAI into their client work. This might involve working together through a problem or asking them for a second opinion. In short, it involved learning who to involve and when, and how to work with them to collaboratively integrate genAI into their work practices.

Boundary work practice: relating across professional boundaries

Some lawyers performed boundary work by connecting and collaborating with prompt engineers and knowledge managers to integrate prompt engineering expertise for genAI into their legal practice, claiming this was an effective way to do so given the capabilities of the technology and the specialized skills required to use it effectively for certain use cases.

These lawyers saw value in working with knowledge managers or prompt engineers who had in-depth familiarity and experience with LegalGPT. These specialists could help them to identify use cases for LegalGPT, formulate prompts that elicited helpful responses, and help ensure outputs were evaluated, interpreted, and incorporated into legal practice effectively. These actions could be challenging for lawyers alone, particularly on complex or high-volume matters. In such circumstances, as one lawyer opined: “I find that engaging a prompt engineer is almost mandatory”.

Some of these lawyers anticipated that prompt engineering might become a specialized role within the legal profession. They envisioned that early in their careers, some legal professionals would choose to become prompt engineers, complementing their legal training with deeper prompt engineering expertise. This combination would enhance their ability to work with lawyers who did not have the expertise to use genAI effectively themselves in a legal services context. As one lawyer reflected, “I think that that expertise, that capability is not gonna fall on somebody like me. You know, it’s gonna be that prompt engineer”. They continued:

“I think every, any firm is gonna actually have to have people who are well trained in this [...] you want somebody who has legal experience and understanding. They understand the nature of our work and the types of tasks and information that lawyers are looking for. But then they need to understand the application. [...] So I think, and I suspect that we will need prompt engineers ...”

By performing prompt engineering together with other professionals and claiming this as an effective way to integrate genAI into their legal services work, lawyers tried and, to an extent, succeeded in reshaping professional boundaries and relating to others across them. While connecting with and relying on the expertise of prompt engineers and knowledge managers, they maintained control over the integration of genAI into their work by ensuring

that LegalGPT's use was part of a wider collaborative process that incorporated their substantive legal expertise and professional judgment into the services they provided for clients.

Avoiding: lacking prompt engineering expertise, and resisting boundary work

Learning pathway: avoiding generative AI

Some lawyers avoided genAI and did not develop prompt engineering expertise. They neither engaged with LegalGPT nor connected with professionals who had potentially relevant expertise. This avoidance effectively stopped genAI's integration into their professional work.

These lawyers avoiding genAI preferred sticking to "tried and true" methods. This included manually drafting or summarizing documents and using existing legal research or document review applications. For some, this meant amending contracts with pen and paper; for others, it involved using sophisticated legal technology and predictive AI for document review.

Under these circumstances, some lawyers explained, it made sense not to change their practices to accommodate another new technology. This might be because they felt comfortable with their existing ways of working and that it was easier to stick with them. The application might not have access to the data they needed, such as niche employment panels or new international sanctions. Or it could be that the need to check genAI's output so carefully in a legal context negated any potential benefits. For instance, a junior lawyer explained:

"... it's so hard because law's so precise, you always want, you need to fact check everything, you need to verify everything. So, no matter what answer you get or how much it [i.e., LegalGPT] helps you, you're still going back through the entire thing yourself to make sure everything's precise and accurate."

This view that existing methods were suitable for the firms' ongoing work and that using LegalGPT was not a priority may have been influenced by senior lawyers. For instance,

a junior lawyer explained to us that they were being directed by their seniors towards other ways of working and were “not overly keen to, you know, be the new person coming in and be like, “Have you guys heard of AI?”” Another lawyer noted some negative perceptions around using genAI, reflecting that “there’s a weird thought of like you’re doing something bad by using this technology or something [...] I think it has that weird connotation to it.” This sentiment was repeatedly said to be prevalent among senior lawyers at the firm. For instance, we were told by a junior lawyer that they had “heard some of the older people kind of like snidely, you know, be like “Oh, AI” and like [be] very wary of it.”

Some lawyers also expressed distrust in genAI generally or LegalGPT specifically. One lawyer stated, “I’m certainly not at the point where I, I trust what it’s saying is true”. Regarding legal drafting, another remarked, “I don’t ever think I’d be someone who would want AI to draft something for me [...] there’s a lot of bias in AI, a lot of things like that, where I don’t trust it in that sense.” Many also mentioned the story of lawyers submitting fake citations generated by AI in their cases, with one expressing, “I obviously didn’t want to become a victim of that as well.”

Boundary work practice: resisting the use of generative AI

In this pathway, lawyers’ boundary work involved resisting the use of genAI in legal services. They claimed that it was problematic to integrate genAI into their professional work, sometimes at all and other times only for specific use cases. They generally did not see genAI’s use or prompt engineering expertise becoming part of the legal profession or practice of law.

We identified two groups of lawyers resisting the use of genAI. The first group consisted of those reluctant even to try genAI for certain aspects of legal services, typically with underlying concerns about replacement of their jobs. They voiced theoretical concerns about genAI’s capabilities. This included doubts about the quality of its outputs (i.e., “hallucinations”), the need to intensively verify outputs, or concerns about bias or information

security. In their view, these kinds of issues limited the usefulness of genAI, like LegalGPT, by undermining its value proposition. As one such lawyer explained: “...my impression is that anything you put through [LegalGPT], you’d have to fact check pretty closely, and verify everything [...] I’d rather just do my own research and draw my own conclusions”. There was a sense among these lawyers that their existing work practices were satisfactory, and that their high-quality legal advice based on these practices could (and should) continue, with genAI not being substantively transformative.

The second group included those who had tried genAI but found it problematic. They encountered practical problems discovered through use. For instance, they might have tried to use LegalGPT for a specific use case and found it ineffective for their own purposes. Some had difficulties scoping, formulating, or evaluating the prompts they tried, which limited their ability to get comfortable with LegalGPT. “I wasn’t sure I was crafting them in a way to get the most useful information. I wasn’t sure if it was me or, or [LegalGPT]”, one lawyer recalled. Others simply did not get the output that they had wanted or expected. One such lawyer remarked, “it’s lost my faith [...] So I’m like until it... until it does something where I’m impressed by it, I’m not going to trust it”. This experience was not uncommon. A knowledge manager related an illustrative example:

“One partner said to me, “I was disgusted because I ran this thing and it didn’t work.” And I’m looking at her prompt and I’m like, “That’s because your prompt doesn’t...” I mean, I could already see like five things wrong with what she did. And so it was already too late, right. Like, she’d already done it, got frustrated, walked away “disgusted”.”

Generally, by resisting the integration of genAI applications into their client-facing legal services, these lawyers maintained traditional methods, established practices, and existing professional boundaries. Prompt engineering expertise, whether directly through lawyers or

professionals working collaboratively, was seen as relatively unimportant for legal work, except where lawyers relied on their prompt engineering expertise to establish that genAI was unsuitable for certain work.

DISCUSSION AND CONCLUSIONS

This paper focuses on prompt engineering for genAI as distinctively new expertise, with learning pathways to acquire it influencing professionals' boundary work within PSFs. In this section, we first develop a typology of prompt engineering expertise in a professional context. We then theorize how learning pathways to acquire such prompt engineering expertise are linked to boundary work in professional organizations by developing a process model.

Typology of prompt engineering expertise in a professional context

Prompt engineering is about finding an appropriate prompt to allow genAI like an LLM to solve a given task (Liu et al., 2023). It is typically characterized as involving technical expertise to formulate prompts for genAI (e.g., Acar, 2023; Liu et al., 2023; McAfee et al., 2023), and associated with prompting techniques such as one-shot or few-shot prompting or chain-of-thought processes (Boussiou et al., 2024; Brown et al., 2020; Wei et al., 2022). In a professional context, however, our findings imply that prompt engineering involves four distinct steps incorporating a much broader range of expertise (see Table I).

First, professionals must first draw on substantive expertise to diagnose by identifying, scoping, and formulating a relevant professional problem (Abbott, 1988; Sandefur, 2015). This may involve defining a client problem with reference to genAI's capabilities or it may mean qualifying a problem's suitability for genAI's use. This is analogous to recognizing when and where expertise is needed, which is central to effective knowledge work (Faraj and Sproull, 2000).

Second, they then must translate this problem into a prompt, a natural language instruction input that guides genAI to generate a potentially applicable output. This requires

some understanding of genAI’s capabilities in relation to the professional problem (Liu et al., 2023; Zamfirescu-Pereira et al., 2023), and may include actions such as breaking down processes into steps or providing context (Boussioux et al., 2024; Wilson and Daugherty, 2024). Thus, this second step requires *human-to-machine relational expertise* over and above substantive expertise.

Third, professionals must evaluate and validate the output, assessing the genAI application’s response using inference criteria such as reasonableness, accuracy, relevance, or completeness in light of their problem framing and available professional methods (Abbott, 1988). As with other forms of AI, this evaluation may range from cursory – or even absent – to in-depth (Anthony, 2021; Kellogg et al., 2020; Pearce et al., 2022; Sako, 2024), and can be a non-trivial task (Kapoor et al., 2024). It may also involve iteratively refining prompts to improve the AI’s generated content (Boussioux et al., 2024; Eicke et al., 2024).

Finally, professionals must interpret the results and use them for their client’s treatment, deciding whether and how to accept, reject, or modify the results to inform their professional work (Abbott, 1988; Choudhary et al., 2025; Choudhury et al., 2020; Dell’Acqua et al., 2023; Lebovitz et al., 2022). This is analogous to but extends the notion of “judgment integration” – which is “about incorporating expert and ethical human discernment to make AI’s output more trustworthy, reliable, and accurate” (Wilson and Daugherty, 2024) – by showing how professionals must not only integrate their judgment into an AI’s output but also take that output and integrate it into their own professional judgment and other expertise to produce competent client services.

Given this analysis, we theorize that prompt engineering expertise in a professional context involves three distinct, interrelated elements: *professional substantive expertise*, *technological substantive expertise*, and *human-to-machine relational expertise*. Table I indicates which types of expertise are necessary in each of the four steps spelt out above, from

the perspective of individual professionals. Of course, prompt engineering expertise may be concentrated in one type of professional (lawyers in our case) or distributed among several professional types (lawyers and data scientists for example), scaffolded by *human-to-human relational expertise*. These elements are brought together in expertise configurations to enable prompt engineering in professional work. Taken in the round, this prompt engineering expertise is distinct from that required for non-generative AI systems (Oppenlaender et al., 2024), where professional expertise mostly influences model training and fine-tuning (Armour and Sako, 2020).

PE Step	Overview	Work activities	Expertise: Substantive/Relational
Diagnosis and Qualification	Diagnosing a relevant professional problem with reference to genAI.	Identifying, scoping, and formulating a relevant professional problem with reference to genAI.	- Professional Substantive Expertise: Deep domain knowledge to qualify matter as professionally relevant and diagnose and define the client problem. - Technological Substantive Expertise: Defining the client problem with reference to genAI's capabilities.
Translation and Instruction	Translating the professional problem into a genAI prompt.	Understanding genAI capabilities, breaking processes into steps, or providing context through prompting instructions.	- Technological Substantive Expertise: Understanding genAI's capabilities and constraints. - Human-to-Machine Relational Expertise: Bridging professional problems with genAI capabilities.
Evaluation and Validation	Assessing genAI output and refining prompts iteratively.	Assessing genAI output using criteria (e.g., reasonableness, accuracy, relevance, usefulness, and completeness); refining prompts iteratively to enhance results.	- Professional Substantive Expertise: Assessing output validity in light of professional criteria. - Technological Substantive Expertise: Understanding genAI's input-output mechanisms generally. - Human-to-Machine Relational Expertise: Understanding specific genAI application's input-output mechanisms.
Interpretation and Treatment	Combining genAI outputs with professional judgment to deliver client services.	Interpreting and deciding on genAI outputs' application to professional work, incorporating it into the delivery of client services work.	- Human-to-Machine Relational Expertise: Combining genAI outputs (or not) into professional workflow for specific use case. - Professional Substantive Expertise: Contextualizing and applying genAI results (or not) to professional work.

Table I - Prompt Engineering Expertise in Professional Contexts

Process model

The process model at Figure 3 theorizes how professionals' prompt engineering expertise learning pathways afford differentiated boundary work practices. Our units of analysis are individuals (that is, professionals) and their various use cases. Unfolding from left to right, our model highlights the links between learning pathways, prompt engineering expertise, and professional boundary work practices. It begins with a PSF introducing a genAI

application. Although this stage was out of scope, research provides a discussion on how and why PSFs introduce emerging technology such as AI (Armour and Sako, 2020; Faulconbridge et al., 2023; Goto, 2023; Perner and Werr, 2023; Spring et al., 2022).

In our model, we depict development and acquisition of prompt engineering expertise through a process with three distinct learning pathways. As outlined above, *engaging* is associated primarily with *human-to-machine relational expertise* acquisition, *connecting* with *human-to-human relational expertise* acquisition, and *avoiding* with neither. In exceptional circumstances, *resisting* boundary work occurred when some lawyers developed a sufficient understanding of prompt engineering and genAI to deem its use problematic, typically for a specific use case rather than as a technology.

While out of scope, antecedents at individual, project, and firm levels influence these learning pathways' development. Individual, or professional, attributes include factors such as experience, expertise, and judgment, which research shows can affect how professionals learn and interact with emerging technology including AI (Beane and Anthony, 2023; Kellogg et al., 2021; Lebovitz et al., 2022). Project attributes include factors such as clients, use cases, volume, complexity, which research suggests play an impactful role in technology-enabled professional work (Bechky, 2020; Faulconbridge et al., 2023; Nelson and Irwin, 2014; Spring et al., 2022). Firm attributes include factors like its ecosystem, strategy, structure, technology, training capabilities, and so on, which research shows might impact professionals' technological situated learning activities (Barley, 1986; Edmondson, 2003; Lebovitz et al., 2021). Even while controlling for these antecedents, our process model provides scope for varied learning pathways, consistent with our empirical findings.

In our process model, each learning pathway is likely to lead to a specific mode of expertise acquisition and boundary work practices. Specifically, the *engaging* learning pathway is linked to acquiring *human-to-machine relational expertise*, affording *reinforcing*

boundary work practices. The *connecting* pathway leads to acquiring *human-to-human relational expertise*, affording *relating* boundary work practices. The *avoiding* pathway is linked to *resisting* boundary work practices. There are also weak links (as they are on an exceptional basis) between *human-to-machine* and *human-to-human relational expertise* and *resisting* boundary work practices, as these may afford such practices when professionals have developed sufficient prompt engineering expertise to deem genAI problematic. Differentiated boundary work practices may also intertwine. For instance, *resisting* boundary work practices may bolster *reinforcing* boundary work practices by demarcating areas in which professionals will not tolerate use of genAI in their work.

While it was out of scope, our model includes professional identity (Ahuja, 2023; Nelson and Irwin, 2014) and jurisdictional control (Chown, 2020; Sako et al., 2022) as major affordance influences (and there are likely many more) on professionals' boundary work practices. Again, our model provides discretionary scope for varied learning pathways and boundary work within each type of identity or jurisdictional control.

Professional boundary work at the firm level is related to boundary work practices at a professions level (Feyereisen and Goodrick, 2019). Although this link was also out of scope, extant research provides a related discussion on how boundary work at a professions level occurs within a regime of knowing. A regime of knowing “comprises the specific knowing practices through which actors develop and use knowledge; the valuation schemes through which actions, people, and things are evaluated; and the authority arrangements that determine which actors have control over how the work is performed in certain tasks” (Howard-Grenville and Carlile, 2006; Pachidi et al., 2021, p. 2). Algorithmic technologies may trigger a readjustment in knowledge regime, and organizations that adjust their knowledge regime may engage in practices to update skill requirements (Amaya and Holweg, 2024). This provides a link between prompt engineering and boundary work at a professions level, which then feeds

back into firm-level boundary work influencing such as professional identity and jurisdictional control.

Through these learning pathways, their different prompt engineering expertise configurations, and corresponding differentiated boundary work practices, professionals actively respond to a PSF’s introduction of a genAI application by creating, maintaining, blurring, and transforming their professional boundaries within a dynamic system of work.

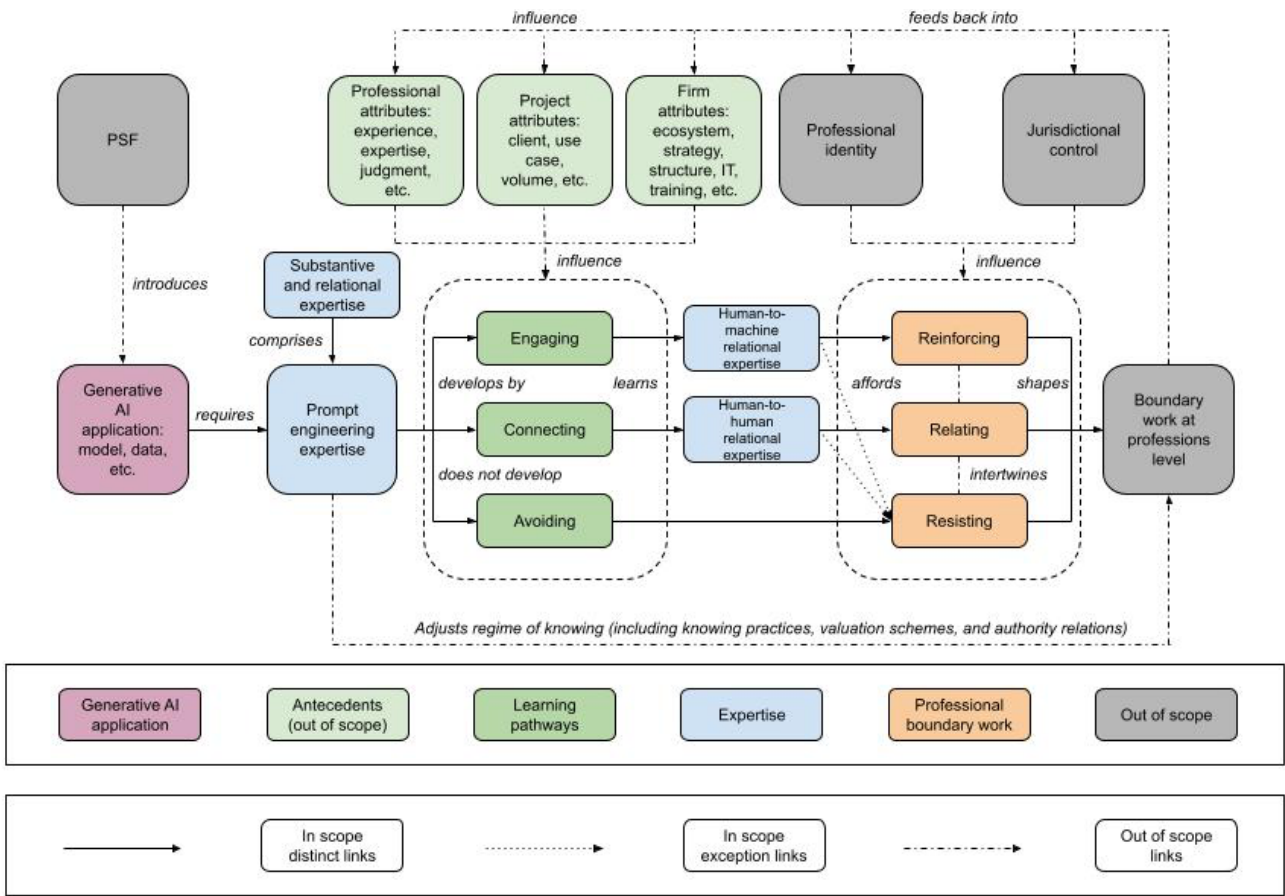


Figure 3 - Process model: How professionals’ prompt engineering expertise learning pathways afford boundary work practices

Contributions to the emerging technology and professional boundary work literature

Our findings contribute to the literature on how professionals adapt, accommodate, or contest technology (Anthony et al., 2023; Barley, 1986; Barrett et al., 2012; Faulconbridge et al., 2023; Koljonen and Chan, 2024; Perner and Werr, 2023; Scarbrough et al., 2024), by

highlighting the importance of identifying the mode of expertise acquisition for understanding and explaining these various practices.

Learning pathways affect boundary work through expertise configurations. Specifically, professionals who engage with genAI develop a machine-relational configuration of prompt engineering expertise which enables them to perform competitive boundary work, reinforcing and expanding their professional boundaries by appropriating the technology and integrating it into their work. Professionals who explore genAI in association with others develop a human-relational configuration of prompt engineering expertise, which enables them to perform collaborative boundary work, where professionals blur and span boundaries to work together with others. Professionals who avoid using genAI do not develop prompt engineering expertise. This constrains them to maintaining or defending their existing professional boundaries by resisting integrating it into their work practices.

Our findings align with Langley and colleagues' (2019) boundary work categories and explain these various outcomes, specifically showing that the same technology can trigger multiple, coexisting modes of boundary practice – *reinforcing*, *relating*, and *resisting* – depending on how expertise is acquired. These boundary work practices may intertwine as professionals engage in multiple interdependent modes (Faulconbridge et al., 2023), resulting in a complex bundling of boundary work practices. For instance, a professional may simultaneously engage with genAI for one use case while resisting its integration into their work for another (competitive boundary work), collaborate with others on a different use case (collaborative boundary work), and reshape boundaries to influence learning pathways and expertise (configurational boundary work). Our findings also suggest that further research may be useful to establish not just how boundary work practices intertwine but how they are bundled with other professional work practices (i.e., including those not typically considered as boundary work practices such as learning and expertise acquisition), which we show can be

relational practices that alter how professionals distinguish themselves with reference to their colleagues, other professionals, and technologies.

Contributions to learning pathways and professional expertise literature

We contribute to the professional expertise literature by identifying how professionals acquire prompt engineering expertise through *engaging*, *connecting*, and *avoiding* learning pathways. These pathways reflect and extend concepts from situated learning in the workplace within a teaching-learning ecology (Abbott, 1988; Anteby et al., 2016; Bailey and Barley, 2011; Barley, 1996; Kellogg et al., 2021; Lave and Wenger, 1991), where professionals join a community of practice through socialization (Brown and Duguid, 1991, 2001; Nicolini et al., 2022; Van Maanen, 1975). GenAI provides a distinct context for professional expertise acquisition, with its rapid and unpredictable changes, invisibility, and inscrutability giving rise to specific challenges (Anthony et al., 2023; Bailey et al., 2022; Raisch and Fomina, 2024). We enhance understanding of how professionals navigate these challenges through learning pathways for prompt engineering. Our elaboration of distinct learning pathways contributes to the growing discussion on how professionals acquire and integrate technology-related expertise, showing how professionals can learn the expertise to use genAI effectively through various modes – rather than through a single best practice – and in a way that reflects and shapes professional boundary work. This expands our understanding of how professionals develop the expertise to use and integrate emerging technology like genAI in their work, adapting and accommodating it despite challenges such as opacity, trust, or knowledge asymmetry (Anthony, 2021; Faulconbridge et al., 2023; Lebovitz et al., 2022; Spring et al., 2022; Waardenburg et al., 2022).

Comparing our findings with those of Anthony (2021), for instance, we observe key differences arising from the cross-professional nature of our study and the distinct types of AI technologies examined. While Anthony (2021) focuses on mono-disciplinary practices within

investment banking, our research encompasses both mono- and multi-disciplinary practices among lawyers, knowledge managers, and prompt engineers. This cross-professional context influences the degrees of “black boxing” (trusting their technologies without understanding how they work) and the nature of “validating practices” (actions that establish outputs as trustworthy) across the learning pathways. In the *engaging* pathway, lawyers exhibit minimal black boxing as they directly engage with genAI applications, developing practical understanding of prompt engineering through hands-on experience, validating the applications’ output against their own training and legal databases like Westlaw or LexisNexis. In contrast, the *connecting* pathway involves more black boxing by lawyers but potentially less overall, since knowledge managers and prompt engineers possess deeper technical expertise, with lawyers validating both the applications’ output and knowledge managers’ and prompt engineers’ contributions. In the *avoiding* pathway, lawyers neither engage in black boxing nor validating practices. Further, unlike predictive AI in Anthony’s (2021) study, where professionals had limited scope to influence content, genAI – in the form of an LLM – allows professionals to shape outputs through prompt engineering. This shift from solely validating outputs to also scoping and formulating effective inputs changes learning pathways for the required expertise and impacts how professionals integrate AI into their work.

Our study also develops the literature on expertise (Barley, 1996; Pakarinen and Huising, 2023; Sandefur, 2015), particularly relational expertise. We distinguish between two types: *human-to-machine relational expertise* which relates to the situated and contextual knowledge of interacting with a specific technology, and *human-to-human relational expertise* which relates primarily to interactions with other professionals. We show how the distinctive properties of LLMs – such as prompts, non-determinism, and hallucinations – matter for professionals’ boundary work is mediated by professionals learning to handle them (or failing to) through relational expertise developed through learning pathways, while drawing on

professional and technological substantive expertise. In doing so, we begin to unpack the notion of relational expertise in the context of genAI, highlighting the importance of understanding how professionals' work practices interact with machines in situ and in context.

Practical implications

Our findings offer two important practical implications for managing genAI integration in professional organizations. First, there is speculation that future genAI will no longer involve prompting specifically or that it will automate associated expertise more generally (Kraljic and Lahav, 2024; Morris, 2024). We show how prompt engineering involves substantive and relational expertise. This expertise enables professionals to effectively use genAI for their professional work. So, while genAI and prompt engineering will likely evolve to redefine prompting and automate aspects of professional expertise, and the relational expertise involved with interacting with genAI will likely change with it; the substantive expertise will not disappear or become materially less important in the short-to-medium term (i.e. for the duration of this “vintage” of genAI (Chari and Hopenhayn, 1991)). PSFs should therefore expect prompt engineering expertise – and its substantive professional expertise component – to continue to be a significant factor in their professionals' integration of genAI into their work.

Second, there may be an expectation that junior professionals might be better at prompt engineering than seniors. While our research did not address this question directly, the importance of substantive professional expertise for prompt engineering implies that senior professionals may, perhaps counterintuitively, have a non-trivial advantage when integrating genAI into their work. Experienced professionals' domain knowledge can enable them to better qualify matters as professionally relevant and diagnose and define the client problem, assess output validity in light of professional criteria, and know when (or when not) to integrate genAI into their professional work. PSFs should therefore expect to manage prompt engineering expertise differently than other technology-related expertise.

Limitations and opportunities for future research

Our research, while providing valuable insights into how professionals' learning pathways afford differentiated professional boundary work, has three limitations that future research could address. First, our units of analysis are individual professionals (i.e. lawyers, knowledge managers, and technologists) and their various use cases. While this approach enables us to generate theory on how learning pathways afford professional boundary work responses to genAI, there are other units that could shed light on our phenomena of interest. For instance, we know that junior-senior relationships and interactions are important for professionals learning new technologies including genAI (Anthony, 2018, 2021; Beane and Anthony, 2023; Yang et al., 2024). While we purposively sampled for both junior and senior professionals, we were unable to match-up more than a handful of junior-senior dyads. Future research could enrich our theorizing by exploring the impact of seniority or other status differentials on professionals' learning pathways and their implications.

Second, while our qualitative research design enabled us to uncover how professionals' prompt engineering expertise learning pathways afford differentiated professional boundary work practices through expertise configurations, we could not determine which learning pathway is more common or more effective for professional work. Part of this limitation derives from two boundary conditions limiting our theorizing (Busse et al., 2016), namely spatial limitations, as our participants were based in the US only (Wright et al., 2023), and temporal limitations, as our study was limited to a short time period while our focal emerging technology is likely to evolve substantively over time (Beane and Leonardi, 2022).

Third, we studied a single professional setting and a specific digital technology application associated with it (Malhotra and Morris, 2009; Orlikowski, 1992). There are other modes through which a firm may access genAI, such as autonomous artificially intelligent communication technologies (i.e. AI agents) (Endacott and Leonardi, 2022), and LLMs are

advancing rapidly, such as the emergence of “reasoning models” that use extra computation to plan responses step-by-step before generating them (Schwarcz et al., 2025). Moreover, by taking the perspective of a single profession (lawyers) whose boundary work practices assume no substantive change in jurisdiction, it has been out of scope of this study to anticipate the possibility of learning pathways such as entrusting (e.g., handing work over to other occupational members) or automating (e.g., handing work over to genAI without professional supervision). These developments might be expected, given previous findings around the automation of professional work (Spring et al., 2022), as well as expectations and theory around human-machine collaboration (Anthony et al., 2023; Woodruff et al., 2024). Thus, while we believe that some of our findings are generalizable across different professionals, we require further research on professionals other than lawyers working in “Classic PSFs” (von Nordenflycht, 2010), to examine the potential heterogeneity found across and within professional organizations (Malhotra and Morris, 2009).

Conclusion

In conclusion, our study shows how professionals in PSFs respond to genAI by adopting distinct learning pathways – *engaging*, *connecting*, and *avoiding* – that lead to different types of relational expertise – *human-to-machine* and *human-to-human* – and patterned boundary work practices – *reinforcing*, *relating*, and *resisting*. We advance theory by linking learning pathways to boundary work, contributing insights into how professionals’ mode of developing expertise shapes their agentic responses to genAI and redefines the boundaries of their work. In addition to our theoretical contributions, our findings highlight the practical importance of understanding the varied ways professionals acquire, apply, and claim new technological expertise for managing technology adoption and organizing professional work.

REFERENCES

- Abbott, A. (1988). *The system of professions: An essay on the division of expert labor*, Chicago: University of Chicago Press.
- Abbott, A. (1995). 'Things Of Boundaries'. *Social Research*, **62**, 857–882.
- Acar, O. A. (2023). 'AI Prompt Engineering Isn't the Future'. *Harvard Business Review*. <https://hbr.org/2023/06/ai-promptengineering-isnt-the-future>
- Ahuja, S. (2023). 'Professional Identity Threats in Interprofessional Collaborations: A Case of Architects in Professional Service Firms'. *Journal of Management Studies*, **60**, 428–453.
- Amaya, J. and Holweg, M. (2024). 'Using algorithms to improve knowledge work'. *Journal of Operations Management*, **70**, 482–513.
- Anteby, M., Chan, C. K., and DiBenigno, J. (2016). 'Three Lenses on Occupations and Professions in Organizations: Becoming, Doing, and Relating'. *Academy of Management Annals*, **10**, 183–244.
- Anthony, C. (2018). 'To Question or Accept? How Status Differences Influence Responses to New Epistemic Technologies in Knowledge Work'. *Academy of Management Review*, **43**, 661–679.
- Anthony, C. (2021). 'When Knowledge Work and Analytical Technologies Collide: The Practices and Consequences of Black Boxing Algorithmic Technologies'. *Administrative Science Quarterly*, **66**, 1173–1212.
- Anthony, C., Bechky, B. A., and Fayard, A.-L. (2023). "“Collaborating” with AI: Taking a System View to Explore the Future of Work'. *Organization Science*, **34**, 1672–1694.
- Armour, J., Parnham, R., and Sako, M. (2022). 'Augmented Lawyering'. *University of Illinois Law Review*, **1**, 71–138.
- Armour, J. and Sako, M. (2020). 'AI-enabled business models in legal services: from traditional law firms to next-generation law companies?'. *Journal of Professions and Organization*, **7**, 27–46.
- Avnoon, N. (2021). 'Data Scientists' Identity Work: Omnivorous Symbolic Boundaries in Skills Acquisition'. *Work, Employment and Society*, **35**, 332–349.
- Avnoon, N. (2024). 'The gates to the profession are open: the alternative institutionalization of data science'. *Theory and Society*, **53**, 239–271.
- Bailey, D. E. and Barley, S. R. (2011). 'Teaching-Learning Ecologies: Mapping the Environment to Structure Through Action'. *Organization Science*, **22**, 262–285.
- Bailey, D. E., Faraj, S., Hinds, P. J., Leonardi, P. M., and von Krogh, G. (2022). 'We Are All Theorists of Technology Now: A Relational Perspective on Emerging Technology and Organizing'. *Organization Science*, **33**, 1–18.
- Barley, S. R. (1986). 'Technology as an Occasion for Structuring: Evidence from Observations of CT Scanners and the Social Order of Radiology Departments'. *Administrative Science Quarterly*, **31**, 78–108.
- Barley, S. R. (1996). 'Technicians in the Workplace: Ethnographic Evidence for Bringing Work into Organizational Studies'. *Administrative Science Quarterly*, **41**, 404–441.
- Barrett, M., Oborn, E., Orlikowski, W. J., and Yates, J. (2012). 'Reconfiguring Boundary Relations: Robotic Innovations in Pharmacy Work'. *Organization Science*, **23**, 1448–1466.
- Beane, M. (2019). 'Shadow Learning: Building Robotic Surgical Skill When Approved Means Fail'. *Administrative Science Quarterly*, **64**, 87–123.
- Beane, M. and Anthony, C. (2023). 'Inverted Apprenticeship: How Senior Occupational Members Develop Practical Expertise and Preserve Their Position When New Technologies Arrive'. *Organization Science*, **35**, 405–431.

- Beane, M. and Leonardi, P. (2022). 'Pace Layering as a Metaphor for Organizing in the Age of Intelligent Technologies: Considering the Future of Work by Theorizing the Future of Organizing'. *Journal of Management Studies*. <https://doi.org/10.1111/joms.12867>.
- Beane, M. and Orlikowski, W. J. (2015). 'What Difference Does a Robot Make? The Material Enactment of Distributed Coordination'. *Organization Science*, **26**, 1553–1573.
- Bechky, B. A. (2003). 'Sharing Meaning Across Occupational Communities: The Transformation of Understanding on a Production Floor'. *Organization Science*, **14**, 312–330.
- Bechky, B. A. (2020). 'Evaluative Spillovers from Technological Change: The Effects of “DNA Envy” on Occupational Practices in Forensic Science'. *Administrative Science Quarterly*, **65**, 606–643.
- Bechky, B. A. and O’Mahony, S. (2015). 'Leveraging Comparative Field Data for Theory Generation'. In K. D. Elsbach and R. M. Kramer (Eds.), *Handbook of qualitative organizational research: Innovative pathways and methods*, New York: Routledge.
- Berg, J., Raj, M., and Seamans, R. (2023). 'Capturing Value from Artificial Intelligence'. *Academy of Management Discoveries*, **9**, 424–428.
- Black, L. J., Carlile, P. R., and Repenning, N. P. (2004). 'A Dynamic Theory of Expertise and Occupational Boundaries in New Technology Implementation: Building on Barley’s Study of CT Scanning'. *Administrative Science Quarterly*, **49**, 572–607.
- Borchhardt, G., Kovács, B., and Rogan, M. (2025). 'Competitive overlap as a signal in expert partner choice: Evidence from patent law firm selection'. *Strategic Management Journal*. <https://doi.org/10.1002/smj.3700>
- Boussioux, L., Lane, J. N., Zhang, M., Jacimovic, V., and Lakhani, K. R. (2024). 'The Crowdless Future? Generative AI and Creative Problem-Solving'. *Organization Science*, **35**, 1589–1607.
- Brown, J. S. and Duguid, P. (1991). 'Organizational Learning and Communities-of-Practice: Toward a Unified View of Working, Learning, and Innovation'. *Organization Science*, **2**, 40–57.
- Brown, J. S. and Duguid, P. (2001). 'Knowledge and organization: A social-practice perspective'. *Organization Science*, **12**, 198–213.
- Brown, T., Mann, B., Ryder, N., Subbiah, M., Kaplan, J. D., Dhariwal, P., et al. (2020). 'Language Models are Few-Shot Learners'. *Advances in Neural Information Processing Systems*, **33**, 1877–1901.
- Browning, H. J. G. (2024). 'Robot Lawyers Don’t Have Disciplinary Hearings - Real Lawyers Do: The Ethical Risks and Responses in Using Generative Artificial Intelligence'. *Georgia State University Law Review*, **40**, 917–956.
- Busse, C., Kach, A. P., and Wagner, S. M. (2016). 'Boundary Conditions: What They Are, How to Explore Them, Why We Need Them, and When to Consider Them'. *Organizational Research Methods*, **20**, 574–609.
- Chari, V. V. and Hopenhayn, H. (1991). 'Vintage Human Capital, Growth, and the Diffusion of New Technology'. *Journal of Political Economy*, **99**, 1142–1165.
- Charmaz, K. (2006). *Constructing grounded theory*, London: SAGE.
- Chen, J., Lin, H., Han, X., and Sun, L. (2024). 'Benchmarking Large Language Models in Retrieval-Augmented Generation'. *Proceedings of the AAAI Conference on Artificial Intelligence*, **38**, 17754–17762.
- Choudhary, V., Marchetti, A., Shrestha, Y. R., and Puranam, P. (2025). 'Human-AI Ensembles: When Can They Work?'. *Journal of Management*, **51**, 536-569.
- Choudhury, P., Starr, E., and Agarwal, R. (2020). 'Machine learning and human capital complementarities: Experimental evidence on bias mitigation'. *Strategic Management Journal*, **41**, 1381–1411.

- Chown, J. (2020). 'Financial Incentives and Professionals' Work Tasks: The Moderating Effects of Jurisdictional Dominance and Prominence'. *Organization Science*, **31**, 887–908.
- Clavié, B., Ciceu, A., Naylor, F., Soulié, G., and Brightwell, T. (2023). 'Large Language Models in the Workplace: A Case Study on Prompt Engineering for Job Type Classification'. *Natural Language Processing and Information Systems*, Switzerland: Springer, **13913**, 3–17.
- Cook, S. D. N. and Brown, J. S. (1999). 'Bridging Epistemologies: The Generative Dance Between Organizational Knowledge and Organizational Knowing'. *Organization Science*, **10**, 381–400.
- Corbin, J. M. and Strauss, A. (1990). 'Grounded theory research: Procedures, canons, and evaluative criteria'. *Qualitative sociology*, **13**, 3–21.
- Dahl, M., Magesh, V., Suzgun, M., and Ho, D. E. (2024). 'Large Legal Fictions: Profiling Legal Hallucinations in Large Language Models'. *Journal of Legal Analysis*, **16**, 64–93.
- Davenport, T. H., Holweg, M., and Jeavons, D. (2023). 'How AI Is Helping Companies Redesign Processes'. *Harvard Business Review*. <https://hbr.org/2023/03/how-ai-is-helping-companies-redesign-processes>
- Davenport, T. H. and Mittal, N. (2022). 'How generative AI is changing creative work'. *Harvard Business Review*. <https://hbr.org/2022/11/how-generative-ai-is-changing-creative-work>.
- Davenport, T. H. and Patil, D. J. (2012). 'Data scientist: The Sexiest Job of the 21st Century'. *Harvard Business Review*, **90**, 70–76.
- Dell'Acqua, F., McFowland, E., Mollick, E. R., Lifshitz-Assaf, H., Kellogg, K. C., Rajendran, S., et al. (2023). 'Navigating the Jagged Technological Frontier: Field Experimental Evidence of the Effects of AI on Knowledge Worker Productivity and Quality'. *Harvard Business School Technology & Operations Mgt. Unit Working Paper*, 24-013.
- Edmondson, A. C. (2003). 'Speaking Up in the Operating Room: How Team Leaders Promote Learning in Interdisciplinary Action Teams'. *Journal of Management Studies*, **40**, 1419–1452.
- Eicke, A.-K., Foege, J. N., and Nüesch, S. (2024). 'Iterative Alternative Evaluation within Human–Artificial Intelligence Problem-Solving: An Extension to Raisch and Fomina's "Combining Human and Artificial Intelligence"'. *Academy of Management Review*. <https://doi.org/10.5465/amr.2024.0135>.
- Eisenhardt, K. M., Graebner, M. E., and Sonenshein, S. (2016). 'Grand Challenges and Inductive Methods: Rigor without Rigor Mortis'. *Academy of Management Journal*, **59**, 1113–1123.
- Eloundou, T., Manning, S., Mishkin, P., and Rock, D. (2024). 'GPTs are GPTs: Labor market impact potential of LLMs'. *Science*, **384**, 1306–1308.
- Endacott, C. G. and Leonardi, P. M. (2022). 'Artificial Intelligence and Impression Management: Consequences of Autonomous Conversational Agents Communicating on One's Behalf'. *Human Communication Research*, **48**, 462–490.
- Evans, N. and Price, J. (2017). 'Managing information in law firms: Changes and challenges'. *Information Research*, **22**, 1–18.
- Eyal, G. (2013). 'For a Sociology of Expertise: The Social Origins of the Autism Epidemic'. *American Journal of Sociology*, **118**, 863–907.
- Fang, C., Wilkenfeld, J. N., Navick, N., and Gibbs, J. L. (2023). "AI Am Here to Represent You": Understanding How Institutional Logics Shape Attitudes Toward Intelligent Technologies in Legal Work'. *Management Communication Quarterly*, **37**, 941–970.

- Faraj, S. and Sproull, L. (2000). 'Coordinating Expertise in Software Development Teams'. *Management Science*, **46**, 1554–1568.
- Faulconbridge, J. (2025). 'Trajectories of legal work in the context of machine learning AI: conceptualising mediated evolution'. *International Journal of the Legal Profession*, **32**, 97–120.
- Faulconbridge, J., Sarwar, A., and Spring, M. (2023). 'How Professionals Adapt to Artificial Intelligence: The Role of Intertwined Boundary Work'. *Journal of Management Studies*. <https://doi.org/10.1111/joms.12936>
- Faulconbridge, J., Sarwar, A., and Spring, M. (2024). 'Accommodating Machine Learning Algorithms in Professional Service Firms'. *Organization Studies*, **45**, 1009–1037.
- Feyereisen, S. and Goodrick, E. (2019). 'Who is in charge? Jurisdictional contests and organizational outcomes'. *Journal of Professions and Organization*, **6**, 233–245.
- Gatrell, C., Muzio, D., Post, C., and Wickert, C. (2024). 'Here, There and Everywhere: On the Responsible Use of Artificial Intelligence (AI) in Management Research and the Peer-Review Process'. *Journal of Management Studies*, **61**, 739–751.
- Gieryn, T. F. (1983). 'Boundary-Work and the Demarcation of Science from Non-Science: Strains and Interests in Professional Ideologies of Scientists'. *American Sociological Review*, **48**, 781–795.
- Gioia, D. A., Corley, K. G., and Hamilton, A. L. (2013). 'Seeking Qualitative Rigor in Inductive Research'. *Organizational Research Methods*, **16**, 15–31.
- Glaser, B. and Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*, London: Routledge.
- Goh, E., Gallo, R., Hom, J., Strong, E., Weng, Y., Kerman, H., et al. (2024). 'Large Language Model Influence on Diagnostic Reasoning: A Randomized Clinical Trial'. *JAMA Network Open*, **7**, e2440969.
- Goto, M. (2023). 'Anticipatory innovation of professional services: The case of auditing and artificial intelligence'. *Research Policy*, **52**, 104828.
- Greenwood, B. N., Agarwal, Ritu, Agarwal, Rajshree, and Gopal, A. (2019). 'The Role of Individual and Organizational Expertise in the Adoption of New Practices'. *Organization Science*, **30**, 191–213.
- Greenwood, R., Hinings, C. R., and Brown, J. (1990). 'P2-Form' Strategic Management: Corporate Practices in Professional Partnerships'. *Academy of Management Journal*, **33**, 725–755.
- Grodal, S., Anteby, M., and Holm, A. L. (2021). 'Achieving Rigor in Qualitative Analysis: The Role of Active Categorization in Theory Building'. *Academy of Management Review*, **46**, 591–612.
- Guha, N., Nyarko, J., Ho, D., Ré, C., Chilton, A., K, A., et al. (2023). 'LegalBench: A Collaboratively Built Benchmark for Measuring Legal Reasoning in Large Language Models'. *Advances in Neural Information Processing Systems*, **36**, 44123–44279.
- Heimstädt, M., Koljonen, T., and Elmholdt, K. T. (2024). 'Expertise in management research: A review and agenda for future research'. *Academy of Management Annals*, **18**, 121–156.
- Howard-Grenville, J. A. and Carlile, P. R. (2006). 'The incompatibility of knowledge regimes: consequences of the material world for cross-domain work'. *European Journal of Information Systems*, **15**, 473–485.
- Janeček, V., Williams, R., and Keep, E. (2021). 'Education for the provision of technologically enhanced legal services'. *Computer Law & Security Review*, **40**, 105519.

- Jiang, E., Olson, K., Toh, E., Molina, A., Donsbach, A., Terry, M., et al. (2022). 'PromptMaker: Prompt-based Prototyping with Large Language Models'. *CHI Conference on Human Factors in Computing Systems Extended Abstracts*, 1–8.
- Jo, H. (2023). 'Decoding the ChatGPT mystery: A comprehensive exploration of factors driving AI language model adoption'. *Information Development*.
<https://doi.org/10.1177/02666669231202764>.
- Kapoor, S., Henderson, P., and Narayanan, A. (2024). 'Promises and Pitfalls of Artificial Intelligence for Legal Applications'. *Journal of Cross-disciplinary Research in Computational Law*, **2**. <https://journalcrcl.org/crcl/article/view/62>
- Kaynak, E. (2024). 'Leveraging Learning Collectives: How Novice Outsiders Break into an Occupation'. *Organization Science*, **35**, 948–973.
- Kellogg, K. C., Lifshitz, H., Randazzo, S., Mollick, E., Dell'Acqua, F., McFowland, E., et al. (2025). 'Novice risk work: How juniors coaching seniors on emerging technologies such as generative AI can lead to learning failures'. *Information and Organization*, **35**, 100559.
- Kellogg, K. C., Myers, J. E., Gainer, L., and Singer, S. J. (2021). 'Moving Violations: Pairing an Illegitimate Learning Hierarchy with Trainee Status Mobility for Acquiring New Skills When Traditional Expertise Erodes'. *Organization Science*, **32**, 181–209.
- Kellogg, K. C., Valentine, M. A., and Christin, A. (2020). 'Algorithms at Work: The New Contested Terrain of Control'. *Academy of Management Annals*, **14**, 366–410.
- Knoth, N., Tolzin, A., Janson, A., and Leimeister, J. M. (2024). 'AI literacy and its implications for prompt engineering strategies'. *Computers and Education: Artificial Intelligence*, **6**, 100225.
- Köktener, B. and Tunçalp, D. (2021). 'Old game, new rules and 'odd friends': Digitalization, jurisdictional conflicts, and boundary work of auditors in a 'big four' professional service firm'. *Journal of Professions and Organization*, **8**, 349–373.
- Koljonen, T. and Chan, C. K. (2024). 'Balancing professional autonomy and managerial goals amid broad technology adoption pressures: Intraprofessional segmentation at a Finnish School'. *Academy of Management Journal*, **67**, 798–828.
- Korica, M. and Molloy, E. (2010). 'Making sense of professional identities: Stories of medical professionals and new technologies'. *Human Relations*, **63**, 1879–1901.
- Kraljic, T. and Lahav, M. (2024). 'From Prompt Engineering to Collaborating: A Human-Centered Approach to AI Interfaces'. *Interactions*, **31**, 30–35.
- Lamont, M. and Molnár, V. (2002). 'The Study of Boundaries in the Social Sciences'. *Annual Review of Sociology*, **28**, 167–195.
- Langley, A., Lindberg, K., Mørk, B. E., Nicolini, D., Raviola, E., and Walter, L. (2019). 'Boundary Work among Groups, Occupations, and Organizations: From Cartography to Process'. *Academy of Management Annals*, **13**, 704–736.
- Lave, J. and Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation*, Cambridge: Cambridge University Press.
- Lebovitz, S., Levina, N., and Lifshitz-Assaf, H. (2021). 'Is AI Ground Truth Really True? The Dangers of Training and Evaluating AI Tools Based on Experts' Know-What'. *MIS Quarterly*, **45**, 1501–1526.
- Lebovitz, S., Lifshitz-Assaf, H., and Levina, N. (2022). 'To Engage or Not to Engage with AI for Critical Judgments: How Professionals Deal with Opacity When Using AI for Medical Diagnosis'. *Organization Science*, **33**, 126–148.
- Leonardi, P. M. (2007). 'Activating the Informational Capabilities of Information Technology for Organizational Change'. *Organization Science*, **18**, 813–831.

- Leonardi, P. M. (2011). 'When Flexible Routines Meet Flexible Technologies: Affordance, Constraint, and the Imbrication of Human and Material Agencies'. *MIS Quarterly*, **35**, 147–167.
- Lewis, P., Perez, E., Piktus, A., Petroni, F., Karpukhin, V., Goyal, N., et al. (2020). 'Retrieval-Augmented Generation for Knowledge-Intensive NLP Tasks'. *Advances in Neural Information Processing Systems*, **33**, 9459–9474.
- Liu, P., Yuan, W., Fu, J., Jiang, Z., Hayashi, H., and Neubig, G. (2023). 'Pre-train, Prompt, and Predict: A Systematic Survey of Prompting Methods in Natural Language Processing'. *ACM Computing Surveys*, **55**, 1–35.
- Magesh, V., Suzgun, M., Surani, F., Manning, C. D., Dahl, M., and Ho, D. E. (2024). 'Hallucination-Free? Assessing the Reliability of Leading AI Legal Research Tools'. arXiv preprint arXiv:2405.20362.
- Maghazei, O., Lewis, M. A., and Netland, T. H. (2022). 'Emerging technologies and the use case: A multi-year study of drone adoption'. *Journal of Operations Management*, **68**, 560–591.
- Malhotra, N. and Morris, T. (2009). 'Heterogeneity in Professional Service Firms'. *Journal of Management Studies*, **46**, 895–922.
- Malhotra, N., Zietsma, C., Morris, T., and Smets, M. (2021). 'Handling Resistance to Change When Societal and Workplace Logics Conflict'. *Administrative Science Quarterly*, **66**, 475–520.
- McAfee, A., Rock, D., and Brynjolfsson, E. (2023). 'How to capitalize on generative AI'. *Harvard Business Review*, **101**, 42–48.
- Morris, M. R. (2024). 'Prompting Considered Harmful'. *Communications of the ACM*, **67**, 28–30.
- Nelson, A. J. and Irwin, J. (2014). 'Defining what we do - All over again: Occupational identity, technological change, and the Librarian/Internet-search relationship'. *Academy of Management Journal*, **57**, 892–928.
- Nicolini, D., Pyrko, I., Omidvar, O., and Spanellis, A. (2022). 'Understanding Communities of Practice: Taking Stock and Moving Forward'. *Academy of Management Annals*, **16**, 680–718.
- von Nordenflycht, A. (2010). 'What Is a Professional Service Firm? Toward a Theory and Taxonomy of Knowledge-Intensive Firms'. *Academy of Management Review*, **35**, 155–174.
- Ogunde, F. (2024). 'Navigating the legal landscape: large language models and the hesitancy of legal professionals'. *International Journal of the Legal Profession*, **31**, 311–322.
- Oppenlaender, J., Linder, R., and Silvennoinen, J. (2024). 'Prompting AI Art: An Investigation into the Creative Skill of Prompt Engineering'. *International Journal of Human-Computer Interaction*, 1–23.
- O'Reilly, K., Paper, D., and Marx, S. (2012). 'Demystifying Grounded Theory for Business Research'. *Organizational Research Methods*, **15**, 247–262.
- Orlikowski, W. J. (1992). 'The Duality of Technology: Rethinking the Concept of Technology in Organizations'. *Organization Science*, **3**, 398–427.
- Orlikowski, W. J. (2000). 'Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations'. *Organization Science*, **11**, 404–428.
- Orlikowski, W. J. (2007). 'Sociomaterial Practices: Exploring Technology at Work'. *Organization Studies*, **28**, 1435–1448.
- Pachidi, S., Berends, H., Faraj, S., and Huysman, M. (2021). 'Make way for the algorithms: Symbolic actions and change in a regime of knowing'. *Organization Science*, **32**, 18–41.

- Pakarinen, P. and Huising, R. (2023). 'Relational Expertise: What Machines Can't Know'. *Journal of Management Studies*. <https://doi.org/10.1111/joms.12915>.
- Patton, M. Q. (2002). *Qualitative Research & Evaluation Methods*, London: SAGE Publications.
- Pearce, H., Ahmad, B., Tan, B., Dolan-Gavitt, B., and Karri, R. (2022). 'Asleep at the Keyboard? Assessing the Security of GitHub Copilot's Code Contributions'. *2022 IEEE Symposium on Security and Privacy (SP)*, 754–768.
- Pemer, F. and Werr, A. (2023). 'Defusing Digital Disruption Through Creative Accumulation: Technology-Induced Innovation in Professional Service Firms'. *Journal of Management Studies*. <https://doi/abs/10.1111/joms.12972>.
- Raisch, S. and Fomina, K. (2024). 'Combining Human and Artificial Intelligence: Hybrid Problem-Solving in Organizations'. *Academy of Management Review*. <https://doi.org/10.5465/amr.2021.0421>.
- Raisch, S. and Krakowski, S. (2021). 'Artificial Intelligence and Management: The Automation Augmentation Paradox'. *Academy of Management Review*, **46**, 192–210.
- Rodgers, I., Armour, J., and Sako, M. (2023). 'How Technology Is (or Is Not) Transforming Law Firms'. *Annual Review of Law and Social Science*, **19**, 299–317.
- Rostain, M. and Huising, R. (2023). 'Vicarious Coding: Breaching Computational Opacity in the Digital Era'. *Academy of Management Journal*, **67**, 359–381.
- Sako, M. (2024). 'How Generative AI Fits into Knowledge Work'. *Communications of the ACM*, **67**, 20–22.
- Sako, M., Qian, M., and Attolini, J. (2022). 'Future of professional work: evidence from legal jobs in Britain and the United States'. *Journal of Professions and Organization*, **9**, 143–169.
- Sandefur, R. L. (2015). 'Elements of Professional Expertise: Understanding Relational and Substantive Expertise through Lawyers' Impact'. *American Sociological Review*, **80**, 909–933.
- Scarbrough, H., Chen, Y., and Patriotta, G. (2024). 'The AI of the Beholder: Intra-Professional Sensemaking of an Epistemic Technology'. *Journal of Management Studies*. <https://doi/10.1111/joms.13065>.
- Schmidt, D. C., Spencer-Smith, J., Fu, Q., and White, J. (2024). 'Towards a Catalog of Prompt Patterns to Enhance the Discipline of Prompt Engineering'. *ACM SIGAda Ada Letters*, **43**, 43–51.
- Schwarcz, D., Manning, S., Barry, P. J., Cleveland, D. R., Prescott, J. J., and Rich, B. (2025). 'AI-Powered Lawyering: AI Reasoning Models, Retrieval Augmented Generation, and the Future of Legal Practice'. <https://www.ssrn.com/abstract=5162111>.
- Shove, E., Pantzar, M., and Watson, M. (2012). *The dynamics of social practice: Everyday life and how it changes*, London: SAGE Publications Ltd.
- Spring, M., Faulconbridge, J., and Sarwar, A. (2022). 'How information technology automates and augments processes: Insights from Artificial-Intelligence-based systems in professional service operations'. *Journal of Operations Management*, **68**, 592–618.
- Suchman, L. A. (2007). *Human-machine reconfigurations: plans and situated actions*, Cambridge: Cambridge University Press.
- Susskind, R. (2017). *Tomorrow's lawyers: an introduction to your future*, Oxford: Oxford University Press, Second Edition.
- Susskind, R. and Susskind, D. (2022). *The future of the professions: How technology will transform the work of human experts*, Oxford: Oxford University Press, Updated Edition.

- Van Maanen, J. (1975). 'Police socialization: A longitudinal examination of job attitudes in an urban police department'. *Administrative Science Quarterly*, **20**, 207–228.
- Vaswani, A., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., et al. (2017). 'Attention is All you Need'. *Advances in Neural Information Processing Systems*, **30**, 6000-6010.
- Waardenburg, L., Huysman, M., and Sergeeva, A. V. (2022). 'In the Land of the Blind, the One-Eyed Man Is King: Knowledge Brokerage in the Age of Learning Algorithms'. *Organization Science*, **33**, 59–82.
- Ward, P., Schraagen, J. M., and Roth, E. M. (2019). *The Oxford Handbook of Expertise*. Oxford Library of Psychology Series, Oxford: Oxford University Press.
- Wei, J., Wang, X., Schuurmans, D., Bosma, M., Ichter, B., Xia, F., et al. (2022). 'Chain-of-Thought Prompting Elicits Reasoning in Large Language Models'. *Advances in Neural Information Processing Systems*, **35**, 24824–24837.
- Wilson, H. J. and Daugherty, P. R. (2024). 'Embracing Gen AI at Work'. *Harvard Business Review*. <https://hbr.org/2024/09/embracing-gen-ai-at-work>
- Woodruff, A., Shelby, R., Kelley, P. G., Rousso-Schindler, S., Smith-Loud, J., and Wilcox, L. (2024). 'How Knowledge Workers Think Generative AI Will (Not) Transform Their Industries'. *Proceedings of the CHI Conference on Human Factors in Computing Systems*, 1–26.
- Wright, A. L., Irving, G., Zafar, A., and Reay, T. (2023). 'The Role of Space and Place in Organizational and Institutional Change: A Systematic Review of the Literature'. *Journal of Management Studies*, **60**, 991–1026.
- Yamane, N. (2020). 'Artificial Intelligence in the Legal Field and the Indispensable Human Element Legal Ethics Demands'. *Georgetown Journal of Legal Ethics*, **33**, 877–890.
- Yang, C. L., Allen, L., Restrepo-Amariles, D., and Troussel, A. (2024). 'GPT in the Loop: Evidence from the Field'. *Hawaii International Conference on System Sciences 2024 (HICSS-57)*, **4**, 4343-4352.
- Zamfirescu-Pereira, J. D., Wong, R. Y., Hartmann, B., and Yang, Q. (2023). 'Why Johnny Can't Prompt: How Non-AI Experts Try (and Fail) to Design LLM Prompts'. *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, 1–21.

PAPER 2 – “GETTING COMFORTABLE” WITH DIGITAL TECHNOLOGY: MAINTAINING, RECONSTITUTING, AND RECONFIGURING PROFESSIONAL WORK

ABSTRACT

How does digital technology maintain, change, or recreate professional work, and with what implications for professional service firms’ digitalization? This study examines these research questions in an elite large law firm. Drawing on literature about professional work, digital technology, and social practices, I analyze qualitative data, including 54 interviews. From this, I identify four practices – *assessing*, *evaluating*, *validating*, and *reflecting* – that professionals perform for “getting comfortable” with digital technology. I also find three distinct associated professional responses: 1) *maintaining* existing work practices by excluding or minimizing technology; 2) *reconstituting* work practices by incorporating technology while preserving professional identity and expertise; and 3) *reconfiguring* work practices by incorporating technology while adjusting professional identity or expertise. I theorize a process model linking these practices and responses to professional service firms’ digitalization trajectories. This study contributes to the literature on digitalization and professional work by explaining how professionals’ varying practices of “getting comfortable” with digital technology drive differences in its integration into professional work, shaping their firms’ digitalization trajectories. It also offers practical insights for effectively managing technology’s integration into professional work in professional service firms.

Keywords: digitalization, professional work, AI, technology adoption, practice theory

INTRODUCTION

How does digital technology – including artificial intelligence (AI) – maintain, change, or recreate professional work, and with what implications for professional service firms' (PSFs) digitalization? This study addresses these questions by examining how lawyers in an elite large law firm navigate and engage with digital technology in their work. Digitalization, defined as the adoption or increased use of digital technology, is associated with new ways of performing, organizing, and managing work (Kronblad, 2020; Leonardi and Treem, 2020; Perner, 2021). While much research focuses on digitalization as an external force or its implications for other outcomes such as innovation or strategy (e.g., Kronblad, 2020; Kronblad & Jensen, 2023; Leonardi & Treem, 2020; Perner & Werr, 2023; Wu & Kane, 2021), less attention has been paid to how professionals actually perform their work with digital technology in knowledge-intensive settings. This oversight is important because, in PSFs, digitalization is not just a result of technological advances or management mandates; it is typically enacted by professionals themselves – the lawyers, doctors, consultants, and so on – as they engage directly with digital technology (Faulconbridge et al., 2023; Koljonen and Chan, 2024; Pakarinen and Huising, 2023; Perner, 2021; Smets, Rodgers, et al., 2023). This study addresses this gap by theorizing the work-level processes through which professionals navigate and engage with digital technology in PSFs, informing understanding of how digitalization unfolds in these contexts.

Addressing this gap requires examining how professionals integrate digital technology in their work. This research adopts a practice lens to do this, viewing professional work as comprising social practices (Sandberg and Tsoukas, 2011, 2015). Social practices are defined as bundles of activities linked by interrelated materials, competences, and meanings, dynamically constituted and performed in specific contexts (Nicolini, 2017; Reckwitz, 2002; Schatzki, 1996; Shove et al., 2012). Existing work practices typically involve professional expertise (competences) and professional identity (meanings) (Abbott, 1988; Ahuja, 2023;

Goto, 2021; Pakarinen and Huising, 2023). Digitalization involves introducing new digital technology (materials), which can disrupt and reconfigure these existing professional work practices (Monteiro et al., 2024). As such, a practice lens attends to the relational work-level dynamics of digitalization (Anthony et al., 2023; Bailey et al., 2022), conceptualizing how professionals negotiate digital technology in the context of their system of professional work.

PSFs are characterized by their knowledge intensity – where production relies on complex human knowledge rather than that embedded in machines, routines, or other entities (Abbott, 1991; von Nordenflycht, 2010; Starbuck, 1992). Digital technology poses a distinctive challenge to PSFs because it eliminates or lessens material constraints associated with work (Leonardi and Treem, 2020), involving opaque processes and technical outputs that professionals may struggle to validate or interpret, with implications for professional identity and expertise (Anthony, 2021; Kronblad, 2020; Smets et al., 2017). This study examines the dynamics of digitalization in an elite large law firm, where technology is transforming some, though not all, aspects of professional work (Rodgers et al., 2023). Using qualitative methods, I collected and analyzed data including 54 interviews, providing robust visibility into the work-level processes through which professionals engage with and navigate digital technology.

The findings identify a process of “getting comfortable” with digital technology. This involves professionals performing four practices: *assessing* the technology for potential relevance and usefulness for their work; *evaluating* its compatibility with their professional identity and expertise; *validating* its appropriateness for their live client work through testing or other trial use; and *reflecting* iteratively on the technology’s continuing appropriateness for their work. Professionals “getting comfortable” with digital technology was associated with three distinct responses: *maintaining* work practices by excluding or minimizing technology; *reconstituting* practices by integrating technology while preserving professional identity and expertise; and *reconfiguring* practices by integrating technology while adjusting professional

identity or expertise. These findings form the basis for theorizing how the process of “getting comfortable” with digital technology shapes PSFs’ digitalization by driving differences in its integration into professional work.

This study contributes to the literature on digitalization and professional work, and PSFs in three ways. First, it extends research on digitalization emphasizing the diversity of responses to digital technology based on professionals’ anticipations, decisions, and activities (Amaya and Holweg, 2024; Faulconbridge et al., 2023; Goto, 2023; Koljonen and Chan, 2024; Perner, 2021; Perner and Werr, 2023). By theorizing how professionals get “comfortable” with digital technology, the study outlines a mechanism that helps to explain the diversity of these responses. Second, the research develops a process model linking work practices to PSFs’ digitalization. In line with the relational turn in studying technology and organizing (Anthony et al., 2023; Bailey et al., 2022; Monteiro et al., 2024), it shows how professionals’ work practices – assessing, evaluating, validating, and reflecting on digital technology within a system of professional work – collectively shape a PSF’s digitalization trajectory. This adds to the literature dealing with digital technology and organized professional work by systematically relating core concepts associated with it – digital technology, professional expertise, and professional identity (Goto et al., 2024; Kronblad and Jensen, 2023; Pakarinen and Huising, 2023; Perner, 2021; Scarbrough et al., 2024; Spring et al., 2022). Third, the findings and theory contribute to practice-based perspectives in which digital technology does not feature simply as an external force but rather as co-constitutive element of professional work (e.g., Faraj & Pachidi, 2021). The study shows that digitalization, when enacted through professionals’ work practices, can lead to variable outcomes. Rather than a unidirectional process (e.g., Kronblad, 2020; Susskind & Susskind, 2022), digitalization may involve maintaining, increasing, or decreasing a PSF’s knowledge intensity, depending on how professionals navigate, engage with, and integrate digital technology into their work. Together,

these contributions provide new insights into the dynamics of digitalization in knowledge-intensive settings and address gaps in our understanding of the processes through which digitalization unfolds in PSFs, informing theoretical and practical discussions on managing technology and organizing professional work.

THEORETICAL FRAMEWORK

Professional service firms and digitalization

PSFs apply specialized, expert knowledge to customize solutions to their clients' problems (Empson et al., 2015). Professionals are often the primary carriers and interpreters of this knowledge, applying it in their professional work (Abbott, 1988; Groysberg and Lee, 2009). So, a defining attribute of PSFs is their knowledge intensity – where service provision relies on complex human expertise rather than that embedded in machines, routines, or other entities (Abbott, 1991; von Nordenflycht, 2010; Starbuck, 1992). Managing this knowledge intensity gives rise to typical organizational responses, including implementing a division of expert labor and structuring themselves to provide bounded autonomy for professionals (Abbott, 1988; Anand et al., 2007; Mazmanian et al., 2013; von Nordenflycht, 2010).

Digitalization – the adoption or increased use of digital technology – provides new ways of performing, organizing, and managing professional work (Kronblad, 2020; Leonardi and Treem, 2020; Perner, 2021). This is linked to the capacity of digital technology – electronic devices and systems that use binary methods to process data, information, or knowledge (Ceruzzi, 2013) – to eliminate or lessen material constraints associated with work (Leonardi and Treem, 2020). This manifested historically through applications such as knowledge management systems and digital collaboration tools (Alavi and Leidner, 2001; Brivot, 2011; Hansen et al., 1999; Wu and Kane, 2021), and more recently as professionals respond to emerging algorithmic technology including AI (e.g., Anthony, 2021; Faulconbridge et al., 2023; Lebovitz, Lifshitz-Assaf, & Levina, 2022; Pachidi, Berends, Faraj, & Huysman, 2021; Spring et al., 2022; Waardenburg, Huysman, & Sergeeva, 2022).

In particular, digitalization can alter PSFs' knowledge intensity by replacing complex human knowledge with technological capital (Kronblad, 2020). In doing so, it can be expected to have ramifications for PSFs' organizational responses, including redefining the division of expert labor and diminishing professionals' autonomy (Kronblad, 2020; von Nordenflycht, 2010). This expectation has given rise to predictions about the future of organized professional work, such as the decline of today's professions and the emergence of replacements (Susskind and Susskind, 2022) or moves away from professional partnerships (Smets et al., 2017). In short, digitalization poses a distinctive challenge to PSFs as it potentially disrupts their reliance on knowledge work as the primary source of value (Kronblad, 2020; Smets et al., 2017).

However, while this research generally treats digitalization as an external force acting on firms or focuses on its implications for other outcomes such as innovation or strategy (Kronblad, 2020; Kronblad and Jensen, 2023; Leonardi and Treem, 2020; Perner and Werr, 2023), it overlooks how digitalization is enacted internally by professionals who engage directly with digital technology (Bailey and Leonardi, 2015; Koljonen and Chan, 2024; Pakarinen and Huising, 2023; Perner, 2021; Smets, Rodgers, et al., 2023), navigating its emergent affordances and use cases (Leonardi, 2011; Maghazei et al., 2022). This highlights the need to further investigate the process through which digitalization unfolds as these professionals enact it in ways that affect their firms' knowledge intensity.

Existing research into the processes through which digitalization unfolds within PSFs is limited to a relatively focused scope, typically at operational, professional, or organizational levels. For instance, we know that PSFs may proactively expand their domain of expertise in response to disruptive technology through competence expansion via a process of creative accumulation (Perner and Werr, 2023). Likewise, evidence suggests that PSFs double-down on their traditional strengths and client relationships when faced with potential disruption rather than making risky investments in new technologies (Birkinshaw, 2023). We also know that

PSFs selectively use technologies such as AI to automate or augment work in the context of professionals' robust defences and intertwined boundary work (Faulconbridge et al., 2023; Spring et al., 2022). While this literature provides compelling insights into certain processes through which digitalization unfolds within PSFs, beyond this not much is known about how professional work develops when potentially relevant digital technology becomes available or is introduced within these firms.

This provides a compelling area to generate theory about how professionals navigate and engage with digital technology in their work within PSFs, building on the developing literature on professionals' purposeful responses to developing digital technology (e.g., Faulconbridge et al., 2023; Perner & Werr, 2023), and challenging technological deterministic assumptions about the future of organized professional work (e.g., Susskind & Susskind, 2022). To do so, requires a work-level theoretical framework, which is introduced in the next section.

Work practices and professional service firms' digitalization

I take what goes on in PSFs as work. This involves concrete activities that the people doing them might call work (Barley and Kunda, 2001). It takes place in a system of professions, involving diagnosis, inference, and treatment (Abbott, 1988). Professional work is agentic, purposeful, intentional, and practical, incorporating a logic of competent professionalism (see e.g., Faulconbridge et al., 2023; Leicht & Fennell, 1997; Liu, 2018; Sandberg & Pinnington, 2009). It takes place in a situated, material organizational setting that encompasses and accommodates various connected knowledge and expertise domains (Anteby et al., 2016; Carlile, 2004; Heimstädt et al., 2024; Noordegraaf, 2020; von Nordenflycht, 2010; Pakarinen and Huising, 2023). Professionals make sense of and navigate their work (Goto, 2022; Scarbrough et al., 2024), interacting through reflective practice within their situations to perform or adjust their actions towards competence based on real-time feedback – reflection-in-action – and asynchronous feedback – reflection-on-action (Schön, 1983).

I view this reflective, situated professional work as comprised of social practices (Sandberg and Tsoukas, 2011, 2015; Schatzki, 1996, 2001, 2019). Social practices are bundles of activities with related attributes and situated performance (Nicolini, 2017; Reckwitz, 2002; Schatzki, 1996). In a work context, these are “work practices”.

Shove and colleagues (2012) outline a theory of social practice dynamics. Their theory suggests distinguishing for analytic purposes between social practices’ three elements. (1) Materials, including artifacts that we may refer to as “technology” in everyday life. (2) Competences, including knowledge in its various forms. (3) Meanings, including ideas, symbols, and aspirations. Their theory posits stability of or changes to the constitution and configuration of these three elements – materials, meanings, and competences – as core to the dynamics of social practices. Practitioners’ performances bring together the elements and enact social practices. As they do so, they account for and adjust connections with other social practices.

How can this approach be understood in the context of digitalization and professional work practices? Existing professional work practices typically involve professional expertise (competences), professional identity (meanings), and digital technology (materials) (Abbott, 1988; Ahuja, 2023; Goto, 2021; Pakarinen and Huising, 2023), subject to path dependence and the inertia of established ways of working (Bechky, 2020; Garud et al., 2010). Taking each in turn.

Professional work relies on professional expertise – the knowledge and skills necessary to perform certain tasks involving a degree of specialization and unequally distributed understanding (Sandefur, 2015). Professional work incorporates expertise for processes of diagnosis, inference, and treatment, and to distinguish it from others as professions claim and enforce their changing jurisdictional boundaries (Abbott, 1988, 1995; Anteby et al., 2016). So, professional expertise is a necessary aspect of professional work.

Professional identity is a person's self-definition as a member of a profession (Chen and Reay, 2021; Chreim et al., 2007). It is tightly coupled with the work that professionals do, meaning that one does not typically change without the other to retain fit between the two (Chen and Reay, 2021; Nelson and Irwin, 2014; Petrakaki et al., 2016; Pratt et al., 2006; Reay et al., 2017; Reay and Hinings, 2009). Professionals avoid change or embrace it to ensure consistency among their professional identity and work (Currie et al., 2012; Goodrick and Reay, 2010; Korica and Molloy, 2010; Kyratsis et al., 2017).

Professionals critically engage with the technology (materials) they use in their work, maintaining the credibility of their knowledge outputs and preserving their status as experts (Bailey and Barley, 2011; Kaplan, 2011; Knorr-Cetina, 1999). Digitalization involves introducing new digital technology, which – as it eliminates or lessens material constraints associated with work (Leonardi and Treem, 2020) – may involve opaque processes and technical outputs that professionals struggle to validate or interpret (Anthony, 2021). This can disrupt and reconfigure existing professional work practices (Monteiro et al., 2024).

A practice sensitivity attends to these relational work-based dynamics of digitalization by situating digital technology as a relational counterpart within a system of professional work (Anthony et al., 2023; Bailey et al., 2022). By conceptualizing how professionals in PSFs navigate and engage with digital technology in the context of their professional expertise and professional identity, this approach builds on and contributes to previous research on social practices in management and organization studies (e.g., Jarzabkowski, Kaplan, Seidl, & Whittington, 2016; Smets, Morris, & Greenwood, 2012).

Theory opportunity and research question

As set out above, the literature on PSFs and digitalization generally explores operational, professional, or organizational responses to digital technology, but it does not substantively address how such technology comes to be used or not used in professional work.

Adjacent literature on professional work conceptualizes it as agentic, purposeful, intentional, and practical, yet rarely pays attention to how this relates to digital technology or PSFs' digitalization. This creates an opportunity to build theory that examines how digital technology comes to be used – or not used – for professional work in PSFs. My research questions contribute to this by asking: How does digital technology maintain, change, or recreate professional work, and with what implications for PSFs' digitalization?

METHODS

Empirical setting: an elite UK large law firm

My empirical setting was a large UK-based law firm (the Firm). It made extensive digital technology – including cutting-edge AI applications – and ancillary resources (such as infrastructure and IT support) available to its lawyers. The Firm operated as a professional partnership with a largely advisory business model (Armour and Sako, 2020; Greenwood and Empson, 2003), incorporating billable hours and profit-per-equity partner metrics (Campbell and Charlesworth, 2012; Faulconbridge and Muzio, 2021): a “Classic PSF” (von Nordenflycht, 2010), with high knowledge intensity (Starbuck, 1992). It was organized into practice areas – groups of professionals sharing a particular form of expertise (Greenwood et al., 1990). As an elite law firm, other law firms can be expected to follow its lead (Malhotra et al., 2021). Collectively, these attributes made the Firm an exemplary setting for a “special” or “revelatory” case studying digitalization and organized professional work (Siggelkow, 2007; Smets, Peo, et al., 2023; Yin, 2014).

I focused on transactional legal services because it makes up most large law firms' businesses (Galanter and Palay, 1994), meaning that it is the work that most professionals in such firms are doing most of the time. It involves carrying out transactions such as drafting contracts or forming companies (Legg and Bell, 2020; Narayanan and Bennun, 1991). I studied the Firm's “Corporate” and “Capital Markets” practices areas. Other transactional legal services practice areas, such as Banking or Real Estate, were out of scope.

Lawyers are the main providers of an elite large law firm's transactional legal services, predominantly taking on the role of carrying, interpreting, and applying legal knowledge to solve clients' problems in their day-to-day work (Malhotra et al., 2016; Smets, Peo, et al., 2023). They tailor their work practices to deliver high-quality legal advice and services in this context, leveraging their legal knowledge and professional judgment to become trusted advisors to their clients (Galanter and Palay, 1994; Maister et al., 2000; Malhotra et al., 2016). Firms organize them in a hierarchy, which they typically base on lawyers' client relationships, legal knowledge, and professional judgment (Galanter and Henderson, 2008; Galanter and Palay, 1994). This means firms include lawyers at different ranks such as partners, counsel, senior associates, associates, and trainees (Malhotra et al., 2016). Firms bring these lawyers together into teams to manage and perform client work. These differentiated teams include a mix of legal expertise but are generally mono- rather than multi-disciplinary, with extra-team expertise accessed on a relatively ad hoc basis (Armour et al., 2022; Larson et al., 2023). My study focused on lawyers in these teams because they were at the center of the action within the Firm.

Others within an elite large law firm support these lawyers with client work. This includes legal or quasi-legal professionals such as knowledge lawyers, paralegals, or those in emerging 'translator' roles, such as technology lawyers whose remit is to enhance a firm's legal services using digital technology (Malhotra et al., 2010; Pemer, 2021). It also includes professionals who are not legally trained but are specialists in adjacent domains. These include project management, business development, operations, data analytics, or technology more generally (Armour et al., 2022). My study included these professionals and others supporting transactional legal services within the Firm because they can provide a valuable perspective on the action. A summary of how the Firm organized its various professionals is set out at

Appendix 1. (This is adjusted for firm anonymity by retitling, merging, or interpreting functions and roles to mask them, which also informs how I report my findings below).

Others outside a law firm are also involved when it provides transactional legal services. Clients play a central interactive role, providing instructions and exchanging information (Sandefur, 2001). Competitor law firms, technology providers, and others comprise a complex legal services ecosystem (Rodgers et al., 2023). This reflects the broader system of professions of which lawyers are part (Abbott, 1988; Adams, 2017; Leicht and Fennell, 1997). While my study did not explicitly include participants from this wider legal services ecosystem, I paid attention to my informants' accounts about their role in the empirical setting.

Research design and data collection

Recognizing the call “for a return to grounded studies of work and work practices as a way of revising organizational theory” (Rahman and Barley, 2017, p. 422), my study sought close encounters with daily activities to examine the association between work practices and PSFs' digitalization (Barley and Orlikowski, 2023). Consistent with this emphasis on attending to the scene of action (Nicolini, 2017), I primarily used a qualitative interview-based approach.

Interviews offer a valuable method to conduct research and build theory from practitioner accounts (Nicolini, 2017). My study was a single case study, which is suited to research that is focused on analytical rather than statistical generalization (Yin, 2014). Given that large law firms have higher rate of reported technology adoption (Rodgers et al., 2023), a documented history of work practice dynamics in areas adjacent to technology (e.g. Cooper *et al.*, 1996; Sherer and Lee, 2002; Lawrence, Malhotra and Morris, 2012; Smets, Morris and Greenwood, 2012; Malhotra *et al.*, 2021), as well as tendency to lead other law firms (Malhotra et al., 2021), I conducted interviews with 53 participants within an elite large law firm.

Interviews took place between October 2022 and June 2023. This temporally situated the study around a trigger for particular interest in digital technology and its use within law

firms: the release of OpenAI's ChatGPT in November 2022. Each interview lasted on average around 35 minutes, resulting in over 30 hours total of interview material that was recorded and professionally transcribed (coming to around 300,000 words, in over 500 single-spaced pages). I spent six days across four weeks in the law firm's offices conducting in-person (13) and on-site virtual (6) interviews using Microsoft (MS) Teams; remaining interviews were off-site virtual (35) also using MS Teams. Participants were purposively sampled to include representation across and within functional areas (i.e. in different departments and at different levels, including those in the Practice (21) – e.g. partner, senior fee-earner, fee-earner, and trainee, including two in-scope practice areas: Corporate (9) and Capital Markets (10) – also those in Legal Operations (25) – e.g., innovation manager, legal project managers, document automation specialist, and so on, and those in Technology (7) – e.g., software developer, enterprise architect, technology training, and so on) (see Table 1 for details on interviewees). This makes this qualitative study novel in its widespread coverage relating to digital technology and legal work within an elite large law firm.

Table 1: Details of Interview Sample

Interview Identifier	Interviewee Role	Practice Area	Format	Interview Date	Length (Mins)
INT1	Legal Operations	N/A	In-person	06/10/2022	15
INT2	Practice (<i>Other</i>)	N/A	In-person	06/10/2022	36
INT3	Technology	N/A	In-person	06/10/2022	45
INT4	Technology	N/A	In-person	07/10/2022	36
INT5	Legal Operations	N/A	In-person	07/10/2022	47
INT6*	Legal Operations	N/A	In-person	07/10/2022	49
INT7*	Legal Operations	N/A	In-person	07/10/2022	<i>(jointly with INT6)</i>
INT8	Legal Operations	N/A	MS Teams (on-site)	12/10/2022	24
INT9	Legal Operations	N/A	In-person	12/10/2022	27
INT10**	Technology	N/A	MS Teams (on-site)	12/10/2022 & 19/06/2023	30 & 28
INT11	Legal Operations	N/A	In-person	12/10/2022	47
INT12	Technology	N/A	MS Teams (on-site)	13/10/2022	32
INT13	Technology	N/A	In-person	20/10/2022	20
INT14	Legal Operations	<i>Other</i>	MS Teams (on-site)	20/10/2022	22
INT15	Legal Operations	Corporate	In-person	20/10/2022	28
INT16	Legal Operations	Capital Markets	MS Teams (on-site)	20/10/2022	41
INT17	Legal Operations	N/A	MS Teams	22/11/2022	23
INT18	Legal Operations	N/A	MS Teams	22/11/2022	25
INT19	Legal Operations	N/A	MS Teams	22/11/2022	27
INT20	Legal Operations	N/A	MS Teams	22/11/2022	30
INT21	Legal Operations	N/A	MS Teams	24/11/2022	24
INT22	Legal Operations	N/A	MS Teams	24/11/2022	30
INT23	Legal Operations	N/A	MS Teams	24/11/2022	32
INT24	Practice	Capital Markets	MS Teams	06/12/2022	44
INT25	Legal Operations	N/A	MS Teams	06/12/2022	42

INT26	Legal Operations	N/A	MS Teams	06/12/2022	43
INT27	Legal Operations	N/A	MS Teams	08/12/2022	27
INT28	Legal Operations	N/A	MS Teams	08/12/2022	44
INT29	Technology	N/A	MS Teams	14/12/2022	28
INT30	Technology	N/A	MS Teams	14/02/2023	37
INT31	Legal Operations	N/A	MS Teams	14/02/2023	38
INT32	Legal Operations	N/A	MS Teams	22/02/2023	42
INT33	Practice	Corporate	MS Teams	10/03/2023	39
INT34	Practice	Corporate	In-person	20/03/2023	56
INT35	Practice	Corporate	MS Teams (on-site)	20/03/2023	43
INT36	Practice	Corporate	In-person	20/03/2023	43
INT37	Practice	Corporate	MS Teams	21/03/2023	44
INT38	Practice	Corporate	MS Teams	22/03/2023	46
INT39	Legal Operations	Corporate	MS Teams	27/03/2023	28
INT40	Practice	Capital Markets	MS Teams	05/04/2023	33
INT41	Practice	Capital Markets	MS Teams	11/04/2023	53
INT42	Practice	Capital Markets	MS Teams	11/04/2023	41
INT43	Practice	Corporate	MS Teams	11/04/2023	40
INT44	Practice	Capital Markets	MS Teams	11/04/2023	41
INT45	Practice	Capital Markets	MS Teams	12/04/2023	36
INT46	Practice	Capital Markets	MS Teams	12/04/2023	43
INT47	Practice	Capital Markets	MS Teams	13/04/2023	44
INT48	Practice	Capital Markets	MS Teams	13/04/2023	44
INT49	Practice	Corporate	MS Teams	18/04/2023	43
INT50	Legal Operations	N/A	MS Teams	22/02/2023	43
INT51	Practice	Capital Markets	MS Teams	24/04/2023	45
INT52	Practice	Corporate	MS Teams	25/04/2023	42
INT53	Practice (<i>Other</i>)	N/A	MS Teams	12/06/2023	23

* Interviewee 6 and Interviewee 7 were interviewed jointly.

** Interviewee 10 was interviewed twice.

My questions focused on participants' everyday work practices. I asked about their work practices and if or how they were changing, with a focus on the roles of digital technology, knowledge, and their colleagues, as these items were relevant to my research questions and had previously been found to be linked to digital technology and AI adoption in legal services (Lehr and Ohm, 2017; Sako et al., 2020).

To triangulate findings (Mathison, 1988), I supplemented interviews with other data collection methods, including a survey (62) and observation (3), as well as documents (e.g., publicly available materials and a few firm specific materials, including a detailed outline of their potential engagement with generative AI). Following Greenwood and colleagues (2002), I also took into account material relating to large law firms that had been accumulated in previous research that I had been involved in (Armour et al., 2021; Rodgers et al., 2023; Sako and Parnham, 2021). This included ten interviews (of which four were subsequently re-interviewed as part of this data collection for this study) in June-July 2021 with the Firm including the managing partner, and my discussions with other large law firms' members (including 16 recorded and transcribed interviews with members of two other large law firms). I also drew on my own experience as a trainee then associate in an elite large law firm between 2011 to 2018 (primarily in a non-transactional capacity) and from working in a technology company with large law firm clients from 2019 to 2020, including the Firm. Collectively, these methods provided robust visibility into the situated dynamics of lawyers' and other professionals' work practices and the Firm's digitalization.

Data analysis

My data analysis followed an inductive approach to attain theory that addressed my research questions (Gioia et al., 2013; Glaser and Strauss, 1967). This involved a thematic analysis of my empirical data, actively categorizing my empirical data as I went along using NVivo (Grodal et al., 2021). The units of analysis were professionals and their work practices,

with digital technology and AI examined at the levels of application and use case. The process began with open coding, where I defined initial observations by identifying actions and patterns in the data, such as lawyers' engagements with digital technology. I used a mix of in vivo codes, for example when interviewees referred to their "challenges", process codes, such as for "negotiating" or "drafting", as well as more general pattern codes, for "adoption" or "expertise" (Charmaz, 2006; Saldaña, 2016). Next, I conducted axial coding, linking categories to subcategories by identifying their properties and dimensions. This stage helped refine the coding framework by specifying relationships within the data. As the analysis progressed, I created and iteratively organized themes into parent codes (main categories) and corresponding child codes (subcategories). Finally, I engaged in selective coding, integrating all categories around a core category: the relationship between digital technology and professional work practices. This core category unified the emerging themes and provided descriptive detail to support the central phenomenon of the study. To illustrate the analysis, Figure 1 presents a data structure that includes representative quotes from interviewees, emerging themes, and overarching concepts.

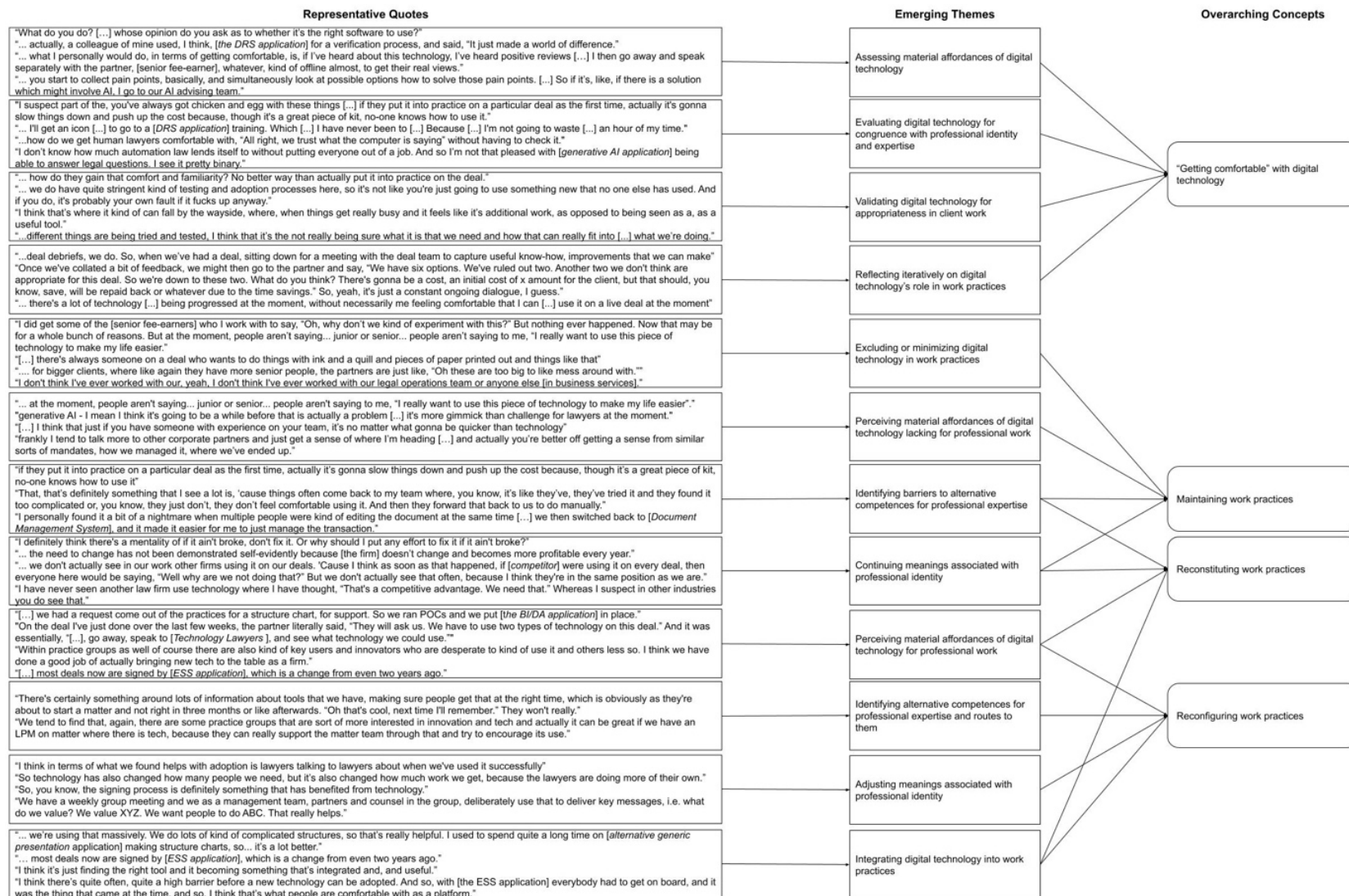


Figure 1 - Data Structure

FINDINGS

My findings indicate that lawyers perform four distinct practices – *assessing*, *evaluating*, *validating*, and *reflecting* – to get “comfortable” with digital technology. This process of “getting comfortable” prompts three distinct responses to digital technology: lawyers either *maintain* their work practices (largely excluding or minimizing new technology), *reconstitute* their work practices (selectively incorporating technology while preserving professional identity and expertise), or *reconfigure* their work practices (integrating technology in ways that involve substantively adjusting their professional identity or expertise). Below, I discuss each practice of “getting comfortable” and then outline how these are associated with the lawyers’ three distinct responses to digital technology.

“Getting comfortable” with digital technology

My findings identify practices for “getting comfortable” with digital technology in the Firm. This involves lawyers performing four distinct activities: *assessing* the technology for potential relevance and usefulness for their work; *evaluating* its compatibility with their professional identity and expertise; *validating* its appropriateness for their live client work through testing or other trial use; and *reflecting* iteratively on the technology’s continuing appropriateness for legal work. Each practice is described below.

Assessing practices

Lawyers at the Firm typically begin by assessing whether a given digital technology seems likely to provide practical benefits for their professional work. They consider what such an application might be able to do for them, identifying its core features and deciding whether it might make them better at their work, save time, or make their work easier.

Typically, this practice does not involve lawyers directly using digital technology. Rather, they communicate with others who knew about it or already used it. For instance, a lawyer who was considering using a document review system (DRS) application – which facilitates lawyers’ or trainees’ verification of transaction documents to ensure their accuracy

and completeness for regulatory purposes – talked to a colleague about it. They were told that: “It just made a world of difference”. However, this approach was not always feasible because much of the digital technology within the Firm was relatively new. A Knowledge Senior Lawyer summed up this difficulty:

“What do you do? [...] whose opinion do you ask as to whether it’s the right software to use? Funnily enough, if you ask the software developers they’ll say theirs is the best, you know? No shit. You can ask, obviously, I think a trusted [*Firm*] colleague who’s used the software many times but again, it’s chicken and egg. I don’t think our lawyers, anyone’s used a particular piece of software on many occasions, because it is all so new.”

Others, such as those in management or business services with an interest in digital technology adoption, were generally aware of this practice. So, they would try to make sure that “success stories” made their way to the lawyers. At the Firm, this was often done at group meetings. These were widely attended and provided a forum for promoting the potential practical benefits of digital technology for client legal work. However, the lawyers treated these accounts critically. For instance, a Senior Fee-Earner also explained that, “What I would say is, you, you always take these success stories with a pinch of salt [...] what I personally would do, in terms of getting comfortable, is, if I’ve heard about this technology, I’ve heard positive reviews [...] I then go away and speak separately with the partner, [*senior fee-earner*], whatever, kind of offline almost, to get their real views.” This type of approach enables lawyers to assess digital technology to decide whether it might provide practical benefits for their professional work without necessarily getting hands-on with an application.

When assessing digital technology, lawyers note whether it solves specific problems, such as eliminating duplicative data entry or reducing time spent on document review. For

instance, a Senior Fee-Earner explained to that they heard from juniors that a DRS application saved them time on a work practice that the Firm did not usually bill at full value:

“*[the DRS application]* is hugely beneficial, in the sense that it, you do... it highlights on kind of electronically, and then when a new version gets uploaded, those statements are already kind of moved across or picked up. So it saves an awful lot of time.”

In short, most lawyers want to see – or at least envision – a clear use case for digital technology in their own work that solves a “pain point” (e.g., Legal Operations Specialist) for a specific “use case” (e.g., Technology Lawyer) before investing time and effort in deeper investigation. They move beyond assessing only when they believe a digital technology’s potential gains outweigh the hassle of further engagement with it; if not, they simply ignore it.

Evaluating practices

After assessing a digital technology, lawyers at the Firm proceeded with evaluating it against with their professional identity and expertise. A concrete example helps illustrate this. Lawyers are generally responsible for the content of their work product. So, the lawyers at the Firm checked and double-checked their work. In this context, they evaluated digital technology for alignment with their values around professional competence. For instance, a Fee-Earner explained:

“I think it’s more how, how do we know that’s right? How do we know and not need to check it? And you know, lawyers love double checking things. You always ask the trainee to do something, but you have to check it. I send it to someone else, they’ll probably check my work. So there’s always a lot of checking going on, so I think that’s the bit where I feel like, I think tech definitely should, should be used more it’s just how do we get human lawyers comfortable with, “All right, we trust what the computer is saying” without having to check it.”

Similarly, a fundamental aspect of professional identity was to be client-centric. A Partner, for example, explained that the core of the Firm's work "... in our transactional world is helping clients [...] navigate the infinite possibilities of what might a deal look like." This desire to do what's best for their client informed how the lawyers evaluated digital technology. It manifested in different ways. One way was to encourage lawyers to engage with digital technology. For instance, a client might ask the Firm about its use of technology. This would drive the lawyers to evaluate digital technology positively. However, it could also lead to a risk aversion stemming from their reluctance to experiment with unproven digital technology, as simply expressed by a Senior Fee-Earner: "I guess no one wants to be the guinea-pig, right, where it goes wrong and things like that?" They emphasized the importance of "getting the deal done" (Smets et al., 2012), rather than exploring new technology. For instance, a Fee-Earner explained:

"There's a job to do, and if you don't do the job then, you know, it doesn't really matter why it hasn't got done, it doesn't matter whether [*a specific technology*] completely fucked up so you can't, you weren't able to do what you were supposed to do [...] the client doesn't really care on that."

As well as evaluating digital technology against pertinent facets of their professional identity, at this stage the lawyers also evaluate its alignment with their professional expertise. For instance, the Firm had a customer relationship management (CRM) application, which partners could check to avoid duplicating client business development activity. For this approach to be effective, the CRM needed populated with complete and up-to-date data about partners' client interactions. Yet, partners highly value this data about their client relationships: as an interviewee explained, "What makes a partner special is their knowledge and expertise and who they know [...] that's what makes them the partner, right. And they start to share a lot of that, and everyone else will have that" (Senior Technology Manager). So, as a Partner

explained: “The weak point is people actually putting the data in”, with lawyers reluctant to share such material. In other words, where a digital technology application affects their professional expertise, then the lawyers evaluate it on this basis and act accordingly.

Validating practices

If lawyers’ assessing and evaluating practices get them comfortable with digital technology, then they move on to validating it on their legal work. Often, they are involved in pilots, proof-of-concepts, or trialing and testing it on deals. As a Senior Knowledge Lawyer explained: “How do they gain that comfort and familiarity? No better way than actually put it into practice on the deal.” This shows the importance for the lawyers of using an application in a real or quasi-real environment. Direct hands-on experience, rather than abstract potential or reasoning, anchors their validating practices. This helped them with managing the remaining uncertainty in “getting comfortable” with digital technology. A Fee-Earner explained:

“So, I think, I think the want is there, and I think that, you know, where different things are being tried and tested, I think that it’s the not really being sure what it is that we need and how that can really fit into what’s, what we’re doing.”

The lawyers worked with other professionals at the Firm during the validation phase or, at least, benefited from their input. The Firm had, as a Fee-Earner explained, “quite stringent kind of testing and adoption processes here, so it’s not like you’re just going to use something new that no one else has used”, adding the corollary: “And if you do, it’s probably your own fault if it fucks up anyway.” This meant the lawyers relied to an extent on Business Services – such as Technology and Legal Operations – to provide them with access to digital technology applications validated at a technical level (e.g., core functionality, data security, system compatibility, etc.).

So, their validating practices were focused on digital technology’s appropriateness and suitability for their specific legal work. This might include considerations such as how the

application fitted with their existing workflows. For instance, a Fee-Earner explained how this could lead to the lawyers failing to validate it on the basis that it, say, added work rather than streamlined it: “I think that’s where it kind of can fall by the wayside, where, when things get really busy and it feels like it’s additional work, as opposed to being seen as a, as a useful tool.” In other words, lawyers could revert quickly if an application risks timely deal completion, proves unwieldy to use, is slow or error-prone, or for a range of other reasons leads to digital technology ‘failing’ validation. Conversely, where validating practices are perceived as a ‘success’ – complete with practical benefits that fit with lawyers’ existing or intended work practices – these can form the basis of widespread integration of digital technology into their legal work.

Reflecting practices

During and after assessing, evaluating, and validating phases, lawyers keep reflecting on a digital technology application’s suitability for their legal work. This reflection may be formal, such as in group meetings or post-deal debriefs, where lawyers and other professionals might discuss “improvements we can make next time” (Senior Knowledge Lawyer). Or it might be more informal, like ad hoc meetings with peers or colleagues, as part of “a constant ongoing dialogue” about what digital technology is appropriate for a given deal (Senior Fee-Earner).

These reflecting practices involve lawyers considering how digital technology can be used in current or future legal work based on their developing experiences and circumstances. They can place limitations on how a firm rolls out applications and their adoption. For instance, a Senior Fee-Earner explained: “There’s a lot of technology [...] being progressed at the moment, without necessarily me feeling comfortable that I can [...] use it on a live deal at the moment”. In other words, the lawyers reflected on digital technology’s suitability or otherwise for their legal work.

These reflecting practices could lead to different outcomes. On the one hand, reflection could promote substantive change as lawyers identified areas for improvement and enhancement. On the other hand, if an application slows progress or introduces other obstacles, lawyers reconsider and may opt to revert to their preexisting approach. Further, because neither the law nor digital technology tend to remain static, reflecting practices are effectively ongoing. As lawyers reflect, they may reengage earlier practices – assessing, evaluating, and validating – to confirm that their digital technology applications continue to be appropriate for their legal work.

Digitalization: maintaining, reconstituting, and reconfiguring work practices

My findings identify three distinct professional responses associated with the process of “getting comfortable” with digital technology: *maintaining* work practices by excluding or minimizing technology; *reconstituting* practices by integrating technology while preserving professional identity and expertise; and *reconfiguring* practices by integrating technology while adjusting professional identity or expertise. Each response is described further below.

Maintaining practices

Lawyers maintaining their work practices exclude or marginalize new digital technology applications. These lawyers typically perceive such digital technology as lacking affordances – that is, not providing practical benefits – for their legal work. For instance, generative AI for legal services during the study. Lawyers at the Firm soon assessed an application for its capabilities in giving the type of legal advice required by their clients. A Fee-Earner explained:

“I think a few lawyers [...] posed [...] questions, and sort of see what [*generative AI application*] came back with. And [...] their analysis of [*its*] responses was quite interesting. Sort of I’d say the overarching kind of thought being that [*it*] quite often misses the nuance that, that you might need in sort of legal interpretation.”

Generally, the fee-earning lawyers were not convinced by its applicability for their work and there was a sense that it would still be a while before the fee-earning lawyers had to really get to grips with integrating generative AI into their work practices. A Partner explained: “Generative AI ... I mean I think it’s going to be a while before that is actually a problem. I mean, it feels like it’s more gimmick than challenge for lawyers at the moment [...] I don’t think that will always be the case, but at the moment it is.” In such cases, a technology’s purported benefits – like automated legal analysis – went unrealized because the lawyers simply did not think it was up to the job.

Several lawyers also spoke about an AI-enabled DRS application – which was for document and contract review – that they initially tried but soon abandoned. A Partner explained: “We’ve not had more than a couple of successful uses of [*the AI-enabled DRS application*].” Various factors, including a lack of awareness or its benefits, technical limitations, the need for clients to agree, or the time investment required by busy lawyers to train the AI model, hindered its widespread use. A Legal Operations Specialist explained a typical cycle as follows:

“Yeah, so it can happen with [*the AI-enabled DRS application*] [...] I think it’s again one of those ones where you’ve sold it into the lawyer, you know, who that be the partner, whoever, and yeah they initially bought into the process. But then, this is where the challenge comes, right, which is, “Hold on. It’s got a little bit hairy here. I need to push through, learn how to fix the issue and carry on. But I can’t be bothered because I’m too busy. So I’m just going to revert to what I know best”.”

Lawyers maintaining their work practices regularly identified or experienced challenges to developing alternative competences for professional expertise required to use new digital technology. While training or conducting a pilot or proof-of-concept for an application might be helpful for the lawyers, the “acid test” was how it performed on live client

work (Capital Markets Partner). However, this came with practical challenges. A Senior Knowledge Lawyer explained core problem: “If they put it into practice on a particular deal as the first time, actually it’s gonna slow things down and push up the cost because, though it’s a great piece of kit, no-one knows how to use it”. This could lead either to a potential digital technology application being dropped during client work when these outcomes surfaced. This was something also reported by a Senior Legal Operations Specialist, who noted: “That, that’s definitely something that I see a lot is, ‘cause things often come back to my team where, you know, it’s like they’ve, they’ve tried it and they found it too complicated or, you know, they just don’t, they don’t feel comfortable using it. And then they forward that back to us to do manually”. In short, barriers to identifying and acquiring the requisite expertise for using digital technology was often associated with lawyers maintaining their work practices.

Lawyers maintaining their work practices noted continuing meanings associated with their professional identity. These lawyers did not find their professional identity problematic or see digital technology as a substantive enabler of an enhanced, redefined identity. For instance, they viewed their existing work practices as causative of their success. A Trainee summed this up: “I definitely think there’s a mentality of if it ain’t broke, don’t fix it. Or why should I put any effort to fix it if it ain’t broke?” Similarly, the Firm’s competitors did not typically drive them to use new digital technology:

“We don’t actually see in our work other firms using it on our deals. ‘Cause I think as soon as that happened, if [*competitor*] were using it on every deal, then everyone here would be saying, “Well why are we not doing that?” But we don’t actually see that often, because I think they’re in the same position as we are” (Partner).

Those lawyers maintaining practices often strongly identified with established ways of working. A Senior Fee-Earner, for instance, recounted how emailing draft documents back and forth felt “easier” than sharing them to a collaborative platform that could generate conflicting

edits, which a Fee-Earner explained was common practice: “We’ve got a bunch of [*word processing application*] documents that will be, we’ll be typing things into. Often we are sending those around by email which is a bit Stone Age but it’s what we do”. They generally had confidence in their existing methods, viewing them as safe and effective. Where they were working for bigger clients with more senior people, there was a tendency to take the view that, as a Fee-Earner explained, “these are too big to like mess around with.” Rather than risk unproven approaches, they chose reliability.

Lawyers also mentioned less tangible barriers, such as the absence of clear incentives to engage with or use new digital technology. Partners might see little upside in championing applications and their associated workflows that threatened their existing business model. Fee-Earners who billed by the hour were not necessarily motivated to streamline work that might reduce recorded hours, with a Partner explaining that there was nothing in place to directly incentivize the lawyers to use digital technology in their work:

“We have a weekly group meeting and we as a management team, partners and counsel in the group, deliberately use that to deliver key messages, i.e. what do we value? We value XYZ. We want people to do ABC. That really helps. [...] The tech... we’ve never said actually, “If you use new types of technology, we will reward you for that” actually. We’ve always said, “We think these types of technology are useful to help achieve this purpose.” But maybe that’s an interesting one. I’ll have to write that down. (*silence while they write in a book*) ... I suppose if we actually do want to get people to use technology more, then there’s no reason why we shouldn’t [...]”.

A concrete example illustrates the findings. An available but largely unused application at the Firm was a transaction review software (TRS) application. This application may be used to manage transactions through features such as workflow management, secure document sharing, real-time progress tracking, and automation of administrative tasks. However, there

was general agreement that lawyers' use of the TRS application was not widespread. The reasons for its non-use were myriad. Interviewees noted junior fee-earners not wanting to use it, the reverse (that it was senior fee-earners or partners blocking it), that clients did not like it, that competitors were not using it, that lawyers using it become like de facto IT consultants for clients, or that lawyers internally might just ignore it when collaborating, or those on the other side of a transaction might not use it properly with negative consequences for a deal. A Partner who had tried to mandate its use on certain matters, without much success in getting lawyers to integrate the TRS application into their work practices, explained:

“That’s a nut that we tried to crack in our team about five or six times in different ways. We’re about to launch into having yet another crack at it. I was talking to [*names technology lawyer*] about that yesterday. It’s one of those tools where we’ve done demo sessions and people have said, “Oh why aren’t we using this? It’s a great tool, it’s really easy to use.” And then you know, you ask the question next week, “Well have you used it on your most recent deal?” And they say, “No, I’ve just done it the way I’ve always done it.” So I think that’s inevitably continues to be the big challenge.”

In short, lawyers who maintain work practices exclude or minimize digital technology – using it, if at all, for well-established use cases like basic formatting, file sharing, or comparing documents. For them, maintaining tried-and-true work practices reflects the digital technology available to them and aligns with both their professional identity and expertise.

Reconstituting practices

By reconstituting their work practices, some lawyers selectively integrated digital technology without misaligning or substantively adjusting their professional identity or expertise. These lawyers typically frame new digital technology as making their legal work more effective. Reconstituting work practices commonly begins with a pragmatic search for practical benefits of using digital technology.

A concrete example illustrates this. A structure chart application, which enabled the drawing of legal structure diagrams, had become particularly popular with Fee-Earners after its recent implementation. A Senior Legal Operations Executive explained the practice area-led process through which it had come about: “We had a request come out of the practices for a structure chart, for support. So we ran POCs [*proof-of-concepts*] and we put [*the structure chart application*] in place.” A Fee-Earner affirmed its use and value, saying: “We’re using that massively. We do lots of kind of complicated structures, so that’s really helpful. I used to spend quite a long time on [*alternative generic presentation application*] making structure charts, so... it’s a lot better.” This application was integrated by lawyers into their work practices in a way that reduced the time they spent detailing or recording their thinking (which could be non-billable work) and freed them up to do more value-adding activities elsewhere on the matter. This example also illustrates how legal technology – that is, digital technology specific to supporting or enabling law firms’ provision of legal services or its distinct business processes (Rodgers et al., 2023) – might replace generic technology or, occasionally, pen and paper. As a Legal Operations Specialist explained to me: “People used to draw out the boxes and arrows, hand it to their secretaries and then turn it into [*a word processing application document*], and then obviously one box moves and everything is wrong.” In fact, as a Fee-Earner noted, these pen-and-paper work practices remained something that they had to accommodate, even now, joking, “There’s always someone on a deal who wants to do things with ink and a quill and pieces of paper printed out and things like that”.

Reconstituting work practices also generally involves no or trivial challenges to professional expertise or identity. Another concrete example illustrates this finding. A DRS application, which facilitates Fee-Earners or Trainees’ verification of documents to ensure their accuracy and completeness, had been substantively integrated into their work practices. The Firm introduced this DRS application through a process that allowed lawyers to use non-client

data to test and validate the technology, ensuring they were engaged from the outset. This marked a departure from the Firm's typical implementation processes at the time, which might be slower, involve client approvals, and get technology in the lawyers' hands later in the day. Training and peer-led support facilitated its use among junior Fee-Earners and Trainees, with a comfortable environment for its use across client-matter teams. A Fee-Earner explained that they found that it saved them time on a work practice that the Firm did not usually bill at full value:

“[*DRS application*] is hugely beneficial, in the sense that it, you do... it highlights on kind of electronically, and then when a new version gets uploaded, those statements are already kind of moved across or picked up. So it saves an awful lot of time.”

In short, reconstituting work practices sustains the core of legal expertise and lawyers' identity while integrating digital technology into their client work. It becomes an accepted, if bounded, part of their work practices. This approach is linked by lawyers to substantive enhancements and improvements to their legal work, particularly faster execution time (e.g., quicker structure diagramming or document reviewing). Unlike maintaining practices, it shows a willingness to integrate digital technology to realize its practical benefits, but unlike reconfiguring practices, it does not substantively challenge lawyers' identity or legal expertise.

Reconfiguring practices

Some lawyers reconfigured their work practices more radically, integrating digital technology into transformed workflows that reflected a substantive adjustment to their professional identity or expertise. These lawyers integrated digital technology into their work in ways that went beyond simply including it in their existing workflows. Instead, they redefined and reorganized their work practices to accommodate it.

An example illustrates this finding. Lawyers noted significant shifts in how they conduct signings and closings. The use of electronic signature software (ESS) to send, sign,

and manage transactions documents was a big recent change, largely replacing physical signing rooms. As a Fee-Earner explained: “Most deals now are signed by [*ESS application*], which is a change from even two years ago.” It was generally agreed that the Covid-19 lockdowns had a significant impact on its use and integration into work practices associated with signing and closing or executing legal transactions. This had continued even after the initial driver had fallen away. With that said, a Fee-Earner explained that it had not been plain-sailing for lawyers to integrate the technology into their work practices, even with the pressures associated with Covid-19:

“When the pandemic first came, there was a lot of panic about how things were going to be done, and [...] I think encouraging people to try a different platform can raise concerns about, you know, I think there’s a whole load of internal approvals that perhaps certain clients may need to go through. And there are also questions about the validity of the document, etcetera. So, I think there’s quite often, quite a high barrier before a new technology can be adopted. And so, with [*the ESS application*] everybody had to get on board, and it was the thing that came at the time, and so, I think that’s what people are comfortable with as a platform.”

In short, reconfiguring work practices represents a more disruptive approach than maintaining or reconstituting them. Rather than treating digital technology as an add-on, these lawyers adjusted their identity or legal expertise to redefine the boundaries of their client work, integrating it into core workflows. This approach could involve redeveloping roles, revamping training, reassuring clients, and other challenges to established ways of working. Still, for some lawyers, reconfiguring fundamental aspects of lawyering to integrate digital technology into their client work seemed to warrant acting to overcome such challenges.

DISCUSSION AND CONCLUSIONS

This study focuses on how digital technology maintains, changes, or recreates professional work, and the implications of this for PSFs’ digitalization. In this section, I

introduce a model of professional technology navigation, referred to as “getting comfortable” with digital technology. I then develop a process model linking these navigation practices to PSFs’ digitalization, theorizing how professionals’ engagement with digital technology shapes their work. The section concludes by outlining theoretical contributions, practical implications, and further research directions.

“Getting comfortable” with digital technology

A key finding of this study is that professionals neither passively adopt nor necessarily resist digital technology in PSFs. Instead, they engage in an iterative process to “get comfortable” with its role in their work, determining whether to incorporate or exclude specific applications from their practices. This process unfolds through four phases – *assessing*, *evaluating*, *validating*, and *reflecting* – which follow a teleological progression (van de Ven and Poole, 1995). While professionals may move between phases, each phase serves a distinct function in shaping whether digital technology ultimately *maintains*, *reconstitutes*, or *reconfigures* work practices.

The first phase of “getting comfortable” with digital technology involves professionals *assessing* an application’s relevance and usefulness within their work. This aligns with prior research on how professionals engage with new technology through the lens of their situated practices (Bailey and Barley, 2011; Kaplan, 2011; Knorr-Cetina, 1999; Suchman, 2007). In this phase, professionals attend to the practical benefits of an application, addressing “pain points” such as reducing non-billable work or minimizing errors in repetitive tasks (Karp, 2023; Kellogg et al., 2021; Miller et al., 2024; Scott and Orlikowski, 2022). Professionals do not necessarily try the digital technology for themselves at this point; rather, they gather information from peers, managers, or other sources. My findings identify the importance of “success stories” for both prompting professionals to assess digital technology and providing information for them to do so. Yet, these narratives are often questioned and contested rather

than accepted uncritically – a dynamic observed in broader discussions of data and datafication (Saifer and Dacin, 2021). Through assessing practices, professionals determine whether an application addresses a specific professional problem (Abbott, 1988). These practices include identifying an application’s potential benefits and judging its relevance to current or intended workflows for a “use case” (Maghazei et al., 2022). Importantly, professionals do not necessarily resist digital technology; they may simply ignore it when the perceived benefits fail to outweigh the effort required for further engagement (Edmondson et al., 2001; Lebovitz et al., 2022).

The second phase of “getting comfortable” with digital technology involves *evaluating* its compatibility with professional identity and expertise. These factors are central to how professionals engage with and navigate new digital technology (Bechky, 2020; Goto, 2022; Pakarinen and Huising, 2023; Perner, 2021; Scarbrough et al., 2024). This phase is particularly important because professionals typically view themselves as experts who control work within their jurisdiction (Abbott, 1988; Huising, 2023). If a technology appears to undermine professional identity or expertise, it is evaluated negatively. Conversely, if it is seen as reinforcing professional standards – such as thoroughness or analytical rigor – or as enhancing service to clients, patients, or other stakeholders, it is evaluated positively. For example, my findings highlight the continuing importance of “getting the deal done” for lawyers (Smets et al., 2012). Digital technology that supported this core application of expertise were generally well received, whereas those perceived as undermining it were not.

If a digital technology appears to offer practical benefits and aligns with professional identity and expertise, professionals enter the third phase: *validating* its appropriateness for professional work through testing or trial use. Prior research has examined how professionals validate technology through trials, involving initial uses of technology for actual work (Edmondson et al., 2001). Similarly, studies have documented professionals’ efforts to confirm

whether a technology-enabled work product meets professional standards – such as trustworthiness or reliability (Anthony, 2021; Lebovitz et al., 2022). However, much of this research assumes an organizationally planned and implemented technology (Bailey and Barley, 2011), and pays less attention to how professionals initially engage with it through their own choices and responses (Bailey and Leonardi, 2015). My study shows that validating practices – such as conducting pilot or proof-of-concept use cases and considering an application’s performance while testing it on live deals – occur in a liminal space between design and use (Bailey and Barley, 2020), as professionals navigate digital technology that has shown promise for their work. This direct, hands-on experience supplements the abstract reasoning of earlier phases, enabling professionals to confirm the technology’s fit or identify areas requiring adjustment in quasi-real or fully live work environments. For example, my findings highlight that a consistent challenge in this phase is the tension between client demands and the time required to learn and apply a new technology. When an application disrupts workflows or increases workload, professionals quickly revert to established practices. Conversely, if validation reveals enhanced workflows or improved work quality, professionals gain confidence in the technology’s potential for integration into their everyday work.

The fourth phase involves professionals *reflecting* iteratively on a technology’s ongoing appropriateness for their work. Prior research has examined reflecting practices in professional work more broadly (Schön, 1983), and in relation to technology specifically (Aristidou and Barrett, 2018; Compagni et al., 2015; Edmondson et al., 2001). My findings support this research, highlighting the role of reflecting practices in monitoring a technology’s long-term relevance, revisiting prior assumptions, and adjusting engagement to align with existing or evolving professional work. Professionals reflect in two distinct settings. The first is structured and formal, occurring for example in law firms in deal debriefs or group meetings, where professionals discuss potential improvements to their work practices. These settings

serve as fora for reflection-on-practice (Schön, 1983), often bringing together professionals and “exemplary users” (Compagni et al., 2015) in “reflective spaces” (Lunkka et al., 2022). Such spaces deliberately facilitate the diffusion of purported “best practices” for technology adoption (Greenwood et al., 2019). The second setting is informal and emergent, arising in ad hoc conversations among peers about a technology’s appropriateness for specific professional work. This reflects reflection-in-practice (Schön, 1983), where technology use itself induces professional reflection (Abdel-Karim et al., 2023). Because neither digital technology nor professional work remains static, reflection is an ongoing process. Changes – such as a new division of labor between firms and clients (Valentine et al., 2022) or shifts in technology trajectories (Nelson et al., 2023) – may prompt professionals to re-assess, re-evaluate, or re-validate a technology, effectively re-engaging with the entire process. So, “getting comfortable” with digital technology remains dynamic rather than a one-time event.

By outlining these *assessing*, *evaluating*, *validating*, and *reflecting* practices in the context of “getting comfortable” with digital technology, this study develops theory on how professionals navigate digital technology and how this navigation shapes its integration into professional work practices. Table 1 outlines a summary

Phase	Description	Indicative practices	Practice outputs	Concrete examples	Associated research
1. Assessing practices	Assessing the technology's potential relevance and usefulness for professional work.	- Identifying an application's potential benefits. - Judging its relevance to existing or intended use cases.	Determination of whether the technology addresses a specific professional problem or challenge in professional work.	- "Success stories": critically assessing narratives of an application's practical benefits for legal work.	Birkinshaw, 2023; Bailey & Barley, 2011; Kaplan, 2011; Knorr-Cetina, 1999
2. Evaluating practices	Evaluating the technology's compatibility with professional identity and expertise.	- Examining whether it aligns with professional identity and expertise. - Determining its potential impact on professional identity or expertise.	Recognition of whether the technology supports or undermines professional identity or expertise.	- "Getting the deal done": evaluating an application's implications for lawyers and their clients on a live deal.	Pakarinen & Huising, 2023; Scarbrough, Chen, & Patriotta, 2024; Perner, 2021; Goto, 2022; Bechky, 2020
3. Validating practices	Validating the technology's appropriateness for professional work through testing or trial use.	- Conducting pilot projects, proof-of-concept testing, or trial use. - Considering its performance (e.g., usability, reliability, alignment, etc.) on actual work.	Confirmation of the technology's fit or identification of areas requiring adjustment.	- "Put it into practice": validating an application through pilots, proof-of-concepts, or trailing it on live work tasks.	Anthony, 2021; Edmondson, Bohmer, & Pisano, 2001; Lebovitz, Lifshitz-Assaf, & Levina, 2022
4. Reflecting practices	Reflecting iteratively on the technology's ongoing appropriateness for professional work.	- Monitoring an application's longer-term relevance and appropriateness. - Revisiting earlier phases if challenges or opportunities arise.	Continuous adjustment to or refinement of technology use to align with developing work practices.	- "Deal debriefs": formal and structured group discussions on improving technology use. - "Ongoing dialogue": informal and ad hoc interactions with peers	Compagni, Mele, & Ravasi, 2015; Edmondson, Bohmer, & Pisano, 2001; Aristidou & Barrett, 2018

				about a technology's appropriateness for specific work tasks.	
--	--	--	--	---	--

Table 1 - The process of “getting comfortable” with digital technology

Process model

Figure 2 presents a process model that theorizes how professionals “getting comfortable” with digital technology relates to PSFs’ digitalization. The model unfolds from left to right, illustrating the links between digital technology, professional work practices, and PSFs’ digitalization.

The process begins when a digital technology becomes available to professionals within a PSF, initially distinct from their existing work practices. While this study does not examine the factors shaping technology availability or introduction within PSFs, prior research explores the broader context of contemporary professional work (Chen and Reay, 2021; Compagni et al., 2024; Koljonen and Chan, 2024; Sako et al., 2022), and the strategic and operational imperatives driving PSFs’ implementation of digital technology (Armour and Sako, 2020; Faulconbridge et al., 2023; Goto, 2023; Perner and Werr, 2023; Spring et al., 2022).

Professionals in a PSF navigate and engage with digital technology through a process of “getting comfortable” with its use. This process consists of four iterative phases: *assessing* the technology’s relevance and usefulness, *evaluating* its compatibility with professional identity and expertise, *validating* its appropriateness through testing or trial use, and *reflecting* on its ongoing suitability for professional work.

When professionals fail to “get comfortable” with digital technology, they tend to exclude or minimize its role in their work. This occurs when they perceive insufficient material affordances, encounter barriers to developing associated competencies for expertise, or preserve established professional identity meanings. In such cases, professionals *maintain* existing work practices, leading to no digitalization of their PSF.

When professionals “get comfortable” with digital technology while preserving the core of their professional identity and expertise, they tend to integrate it into their work incrementally. This approach involves recognizing material affordances for professional work

while still identifying barriers to alternative competencies for expertise and preserving professional identity meanings. As a result, professionals *reconstitute* work practices, incorporating technology while sustaining their existing expertise and identity. This can support a knowledge-intensive digitalization of their PSF – one that enhances knowledge intensity by allowing professionals to offload routine tasks, freeing time for higher-value, knowledge-based work.

When professionals “get comfortable” with digital technology while redefining core aspects of their professional identity or expertise, they tend to integrate it into their work more fundamentally. This involves perceiving material affordances, identifying alternative competencies and pathways to acquiring them, and adjusting professional identity meanings. As a result, professionals *reconfigure* work practices by integrating technology while reshaping their identity or expertise. This can support a capital-intensive digitalization, where technological capital replaces complex human knowledge, reducing the PSF’s reliance on human expertise and decreasing its knowledge intensity. It can also support a PSF’s knowledge-intensive digitalization.

So, through the process of “getting comfortable” with digital technology, professionals perform varied work practices that can shape distinct digitalization trajectories within PSFs.

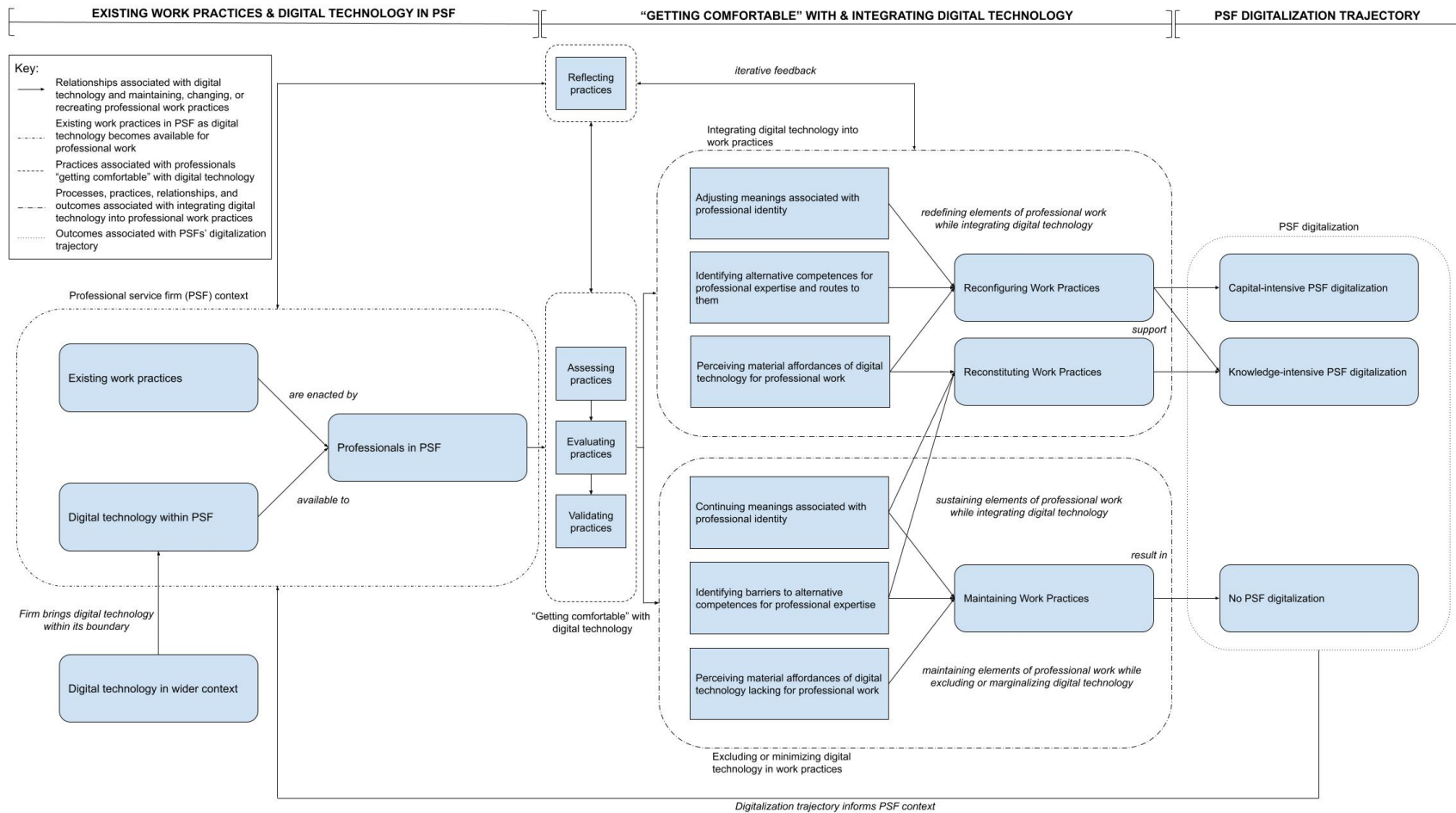


Figure 2 - Process model: How "getting comfortable" with digital technology relates to PSFs' digitalization

Theoretical implications

My findings enable me to build on and reconsider several theoretical assumptions and empirical findings in the digitalization and professional work, and PSF literatures.

Contributions to the digitalization and professional work literature

The study extends research on digitalization emphasizing the diversity of responses to digital technology based on professionals' anticipations, decisions, and activities (Amaya and Holweg, 2024; Faulconbridge et al., 2023; Goto, 2023; Koljonen and Chan, 2024; Perner, 2021; Perner and Werr, 2023). By theorizing how professionals get "comfortable" with digital technology, this study outlines a mechanism that accounts for the variation in these responses.

Additionally, the study develops a process model linking professionals' work practices to PSFs' digitalization. In line with the relational turn in research on technology and organizing (Anthony et al., 2023; Bailey et al., 2022; Monteiro et al., 2024), it shows how practices such as assessing, evaluating, validating, and reflecting on digital technology – within a broader system of professional work – shape a PSF's digitalization trajectory. This adds to the literature on digital technology and organized professional work by relating core concepts such as digital technology, professional expertise, and professional identity (Goto et al., 2025; Kronblad and Jensen, 2023; Pakarinen and Huising, 2023; Perner, 2021; Scarbrough et al., 2024; Spring et al., 2022).

Contributions to the professional service firm literature

The study also contributes to practice-based perspectives on PSFs (e.g., Jarzabkowski, Kaplan, Seidl, & Whittington, 2016; Smets, Morris, & Greenwood, 2012), positioning digital technology not as an external force but as a co-constitutive element of professional work (Faraj & Pachidi, 2021). The study theorizes that digitalization, when enacted through professionals' work practices, can lead to a diversity of outcomes. Rather than a unidirectional process (e.g., Kronblad, 2020; Susskind & Susskind, 2022), digitalization may result in maintaining,

increasing, or decreasing a PSF's knowledge intensity, depending on how professionals navigate, engage with, and integrate digital technology into their work. This informs emerging research on how PSFs accommodate potentially disruptive digital technology including AI (Birkinshaw and Lancefield, 2023; Faulconbridge et al., 2023; Perner and Werr, 2023).

Practical implications

My findings provide several practical implications for those managing technology and organizing work in knowledge-intensive PSFs, including elite large law firms. First, my study highlights the role of work practices in PSFs' digitalization. Managers looking to implement a technology change or digital transformation initiative would benefit from a deep dive into potentially in-scope professionals' existing day-to-day work practices and how these might interact with the proposed initiative to ensure the change is technically feasible as well as business and professionally valuable. This could be done for instance through visualization work such as process-mapping, which may provide an opportunity particularly in legal services (McLachlan and Webley, 2021). In short, professionals' work practices should be taken seriously and their objections not treated simply as resistance or ignorance.

Additionally, my study implies that professionals' work practices can give rise to a digitalization trajectory in PSFs that is more knowledge-intensive than their managers might expect. Professionals typically embody a PSF's knowledge-intensity, carrying, interpreting, and applying knowledge (Groysberg and Lee, 2009). My findings suggest that more, not fewer, professionals, as well as ancillary occupational members with domain-specific knowledge and expertise, may yet be found in PSFs, despite the promises of emerging digital technology such as generative AI to transform professional work. Organizations should consider what this means for their attributes such as organizational forms, internal structures, and incentives. Where PSFs become more rather than less knowledge-intensive, the professional partnership or a form emulating its organizational characteristics with an advisory business model provides

a compelling choice even as PSFs digitalize (Armour et al., 2022; Armour and Sako, 2020; Empson, 2021; Greenwood and Empson, 2003). With that said, organizations also may need to accommodate new work roles, such as ‘translators’ (Pemer, 2021), while managing the “turf wars” and tensions inherent in cross-professional work (Abbott, 1988). As such, these accommodation activities rather than a fundamental restructuring transformation are likely to keep PSFs’ managers busy in the near-to-medium term. Finally, managers would be sensible to thoughtfully reconsider their professionals’ incentives, where they want to direct them towards a technology change or digital transformation initiative. These could be financial (Chown, 2020), motivational (Friedrich et al., 2020), or other rewards.

Relatedly, professionals working in knowledge-intensive PSFs typically work on high-impact matters (Smets et al., 2012), in collective differentiated teams (Larson et al., 2023), and are busy and short on time (Lupu and Rokka, 2022). During technology change or digital transformation initiatives, organizations and their managers would do well to recognize the limiting implications of these demands on these professionals’ learning and competence-enhancement when it comes to engaging with emerging digital technology. In such circumstances, they should reconsider structures related to these, such as facilitating emerging digital technology’s use on lower-impact matters (as training alone is likely to be necessary but not sufficient), enhancing cross-functional support for those across all levels of differentiated teams, and reconsidering systems such as billable hours in relation to them.

Limitations and future research directions

My research provides valuable insights into how digital technology maintains, changes, or recreates professional work, and the implications of this for PSFs’ digitalization. However, it has three limitations that future research could usefully address.

First, my research stopped at my focal firm’s organizational boundary. This is a known issue for emerging work on technology use (Bailey and Barley, 2020). For instance, while I

was able to get a partial view on technology design being done in-house, I could not observe what happened at third parties such as technology vendors. This is known to be potentially relevant (Myers, 2023). Likewise, despite clients' potentially outsized impact (Chan and Hedden, 2023), their role in professionals' work practices and their firms' digitalization was difficult for me to fully discern. To extend my work, researchers could focus on these potentially influential associated practitioners individually or take an ecosystem approach to do so collectively.

Second, while my qualitative research design enabled me to uncover how lawyers get comfortable with and do or do not use digital technology in their day-to-day work, I largely could not determine quantitative metrics. To extend my study, researchers could use methods that enable such findings and additional analysis. Further qualitative research could also provide complementary perspectives. A longitudinal study could be particularly fruitful. Likewise, a historical perspective could add a lot too. Previous such research has shown how long it can take for professionals to integrate technology into their practices, even where it was demonstratively 'better' across objective metrics (e.g. Morison, 1966). Additional accounts would no doubt help better explain this puzzle.

Third, there are three boundary conditions to my theorizing. (1) Spatial, as my participants were predominantly based in the UK (Boussebaa, 2024). (2) Temporal, as my study was limited to short time period (Busse et al., 2016). (3) Contextual, as I studied a single PSF and specific digital technology associated with it (Dell'Acqua et al., 2023; Malhotra and Morris, 2009; Yang et al., 2024). Given the central role of organized professionals in my study, for example, I would not generalize beyond "Classic PSFs" (von Nordenflycht, 2010). I would encourage future research to examine the potential heterogeneity found across and within PSFs, recognizing industry and firm-level differences (Malhotra and Morris, 2009), and building out

different practices of “getting comfortable” and varieties of digitalization across professional settings.

Conclusion

The relationship between digital technology and legal work in particular has been the subject of much recent commentary (Susskind, 1996, 2008, 2017; Susskind and Susskind, 2022) and social science research (Armour et al., 2021, 2022; Armour and Sako, 2020; Faulconbridge et al., 2021, 2023; Remus and Levy, 2017; Rodgers et al., 2023; Sako et al., 2022; Spring et al., 2022). Technological advancements – particularly the development of generative AI – have drawn more focus onto digital technology and digitalization in this context. Recently, OpenAI’s GPT-4 has passed the US’s Uniform Bar Exam (Katz et al., 2024), and theory suggests that legal services are among the top industries exposed to advances in language modelling (Berg et al., 2023; Felten et al., 2023).

As digital technology – especially generative AI – continues to be framed as transformative for legal services work and professional work more generally (e.g., Alavi & Westerman, 2023; Hui, Reshef, & Zhou, 2023; Sako, 2024), it is important to critically assess how such technology actually shapes knowledge-intensive professional work and PSFs’ digitalization. The central questions remain: How does digital technology maintain, change, or recreate professional work. What are the implications for PSFs’ digitalization? These are pressing concerns for organizations, managers, professionals, and other knowledge workers, and they will remain so in the foreseeable future. This study shows that professionals’ varying practices of “getting comfortable” with digital technology drive differences in its integration into professional work, shaping digitalization trajectories within PSFs. By elaborating this process, the study lays the groundwork for further research that can help researchers and practitioners navigate these developments, offering insights that inform both professional work practices and firm strategy.

APPENDIX 1: IN-SCOPE LAW FIRM – ORGANIZED CATEGORIES OF PROFESSIONALS AND OTHER OCCUPATIONS

The in-scope law firm (the “Firm”) comprised three distinctly organized categories of professionals and other occupations. These were “Management”, the “Practice”, and “Business Services”, including “Legal Operations” and “Technology”. Management governed and administered the Firm. The Practice provided clients with legal services. Business Services supported the Practice and Management. Together, they ensured the Firm made a profit and operated effectively. Each of their distinct composition and functions are set out in more detail below.

Management included a Senior Committee and a Managing Committee. The Senior Committee, comprising elected Partners, served as the governing body. The Managing Committee acted as an executive body. It included Partners from the Practice and senior figures from Business Services. A “Senior Partner” chaired the Senior Committee, a “Managing Partner” the Executive Committee. These two were Partners who had shifted their focus from client work to managing the Firm. Various sub-committees provided support and guidance on specific areas, such as risk or innovation.

The Practice included client-facing, fee-earning legally trained professionals (i.e. lawyers). The Firm organized them in a hierarchy. At the top were “Partners”, who were in charge of winning and fulfilling client instructions. Next were “Senior Fee-Earners”, who did most of day-to-day managing and validating of client work. Then “Fee-Earners”, who were the rank-and-file doing most of the everyday client work. At the bottom were “Trainees”, who were still in training but learned by doing client work that would be then checked by someone else. Partners, Senior Fee-Earners, Fee-Earners, and Trainees together are the “fee-earning lawyers”. The Practice also included others who were not fee-earning lawyers but were legally trained. “Knowledge Lawyers” might help the fee-earning lawyers with legal research or

expertise. It also included those who were neither fee-earning nor legally trained. “Secretaries” helped fee-earning lawyers with tasks such as booking rooms or formatting documents.

Business Services included professionals and others supporting the Practice or Management. This involved a wide range, as expected for an elite large law firm. Two sub-functions were particularly relevant. First, Legal Operations, which functioned to make the Firm’s delivery of legal services more efficient and effective. It included various roles. “Technology Lawyers” were lawyers whose remit was to enhance the Practice’s provision of legal services using digital technology. “Knowledge Engineers” were also lawyers who helped to build and develop digital technology applications. “Legal Project Managers”, who might be lawyers or not, helped the Practice with managing especially large or complex client instructions. “Paralegals” supported the Practice or others in Legal Operations with quasi-legal work. They typically had a law degree but were not lawyers. Others were not necessarily lawyers but had ancillary specialisms. This included “Innovation Specialists”, “Process Improvement Specialists”, “Legal Technology Specialists”, and “Business Development Specialists”. Second, Technology, which focused on the Firm’s IT, managing and operating its technical infrastructure. It included “Software Developers”, “Enterprise Architects”, “Technology Trainers”, and others. Many had extensive experience of legal services through working at the Firm or other law firms. They were generally technology specialists, although the Firm was starting to hire ex-lawyers into a few select roles within Technology.

REFERENCES

- Abbott, A. (1988). *The system of professions: An essay on the division of expert labor*, Chicago: University of Chicago Press.
- Abbott, A. (1991). 'The future of professions: Occupation and expertise in the age of organization'. *Research in the Sociology of Organizations*, **8**, 17–42.
- Abbott, A. (1995). 'Things Of Boundaries'. *Social Research*, **62**, 857–882.
- Abdel-Karim, B., Pfeuffer, N., Carl, K. V., and Hinz, O. (2023). 'How AI-Based Systems Can Induce Reflections: The Case of AI-Augmented Diagnostic Work'. *MIS Quarterly*, **47**, 1395–1424.
- Adams, T. L. (2017). 'Self-regulating professions: past, present, future'. *Journal of Professions and Organization*, **4**, 70–87.
- Ahuja, S. (2023). 'Professional Identity Threats in Interprofessional Collaborations: A Case of Architects in Professional Service Firms'. *Journal of Management Studies*, **60**, 428–453.
- Alavi, M. and Leidner, D. E. (2001). 'Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues'. *MIS Quarterly*, **25**, 107.
- Alavi, M. and Westerman, G. (2023). 'How generative AI will transform knowledge work'. *Harvard Business Review*. <https://hbr.org/2023/11/how-generative-ai-will-transform-knowledge-work>.
- Amaya, J. and Holweg, M. (2024). 'Using algorithms to improve knowledge work'. *Journal of Operations Management*, **70**, 482–513.
- Anand, N., Gardner, H. K., and Morris, T. (2007). 'Knowledge-Based Innovation: Emergence and Embedding of New Practice Areas in Management Consulting Firms'. *The Academy of Management Journal*, **50**, 406–428.
- Anteby, M., Chan, C. K., and DiBenigno, J. (2016). 'Three Lenses on Occupations and Professions in Organizations: Becoming, Doing, and Relating'. *Academy of Management Annals*, **10**, 183–244.
- Anthony, C. (2021). 'When Knowledge Work and Analytical Technologies Collide: The Practices and Consequences of Black Boxing Algorithmic Technologies'. *Administrative Science Quarterly*, **66**, 1173–1212.
- Anthony, C., Bechky, B. A., and Fayard, A.-L. (2023). "“Collaborating” with AI: Taking a System View to Explore the Future of Work". *Organization Science*, **34**, 1672–1694.
- Aristidou, A. and Barrett, M. (2018). 'Coordinating service provision in dynamic service settings: a position-practice relations perspective'. *Academy of Management Journal*, **61**, 685–714.
- Armour, J., Parnham, R., and Sako, M. (2021). 'Unlocking the Potential of AI for English Law'. *International Journal of the Legal Profession*, **28**, 65–83.
- Armour, J., Parnham, R., and Sako, M. (2022). 'Augmented Lawyering'. *University of Illinois Law Review*, **1**, 71–138.
- Armour, J. and Sako, M. (2020). 'AI-enabled business models in legal services: from traditional law firms to next-generation law companies?'. *Journal of Professions and Organization*, **7**, 27–46.
- Bailey, D. E. and Barley, S. R. (2011). 'Teaching-Learning Ecologies: Mapping the Environment to Structure Through Action'. *Organization Science*, **22**, 262–285.
- Bailey, D. E. and Barley, S. R. (2020). 'Beyond design and use: How scholars should study intelligent technologies'. *Information and Organization*, **30**, 100286.
- Bailey, D. E., Faraj, S., Hinds, P. J., Leonardi, P. M., and von Krogh, G. (2022). 'We Are All Theorists of Technology Now: A Relational Perspective on Emerging Technology and Organizing'. *Organization Science*, **33**, 1–18.

- Bailey, D. E. and Leonardi, P. M. (2015). *Technology Choices: Why Occupations Differ in Their Embrace of New Technology*, Boston: MIT Press.
- Barley, S. R. and Kunda, G. (2001). 'Bringing Work Back In.'. *Organization Science*, **12**, 76–95.
- Barley, S. R. and Orlikowski, W. J. (2023). 'Technologies change, the charge remains the same'. *Administrative Science Quarterly & MIS Quarterly Research Curation*.
<https://www.misqresearchcurations.org/asq-misq-curations>.
- Bechky, B. A. (2020). 'Evaluative Spillovers from Technological Change: The Effects of “DNA Envy” on Occupational Practices in Forensic Science'. *Administrative Science Quarterly*, **65**, 606–643.
- Berg, J., Raj, M., and Seamans, R. (2023). 'Capturing Value from Artificial Intelligence'. *Academy of Management Discoveries*, **9**, 424–428.
- Birkinshaw, J. (2023). 'How Incumbent Firms Respond to Emerging Technologies: Comparing Supply-Side and Demand-Side Effects'. *California Management Review*, **66**, 48–71.
- Birkinshaw, J. and Lancefield, D. (2023). 'How Professional Services Firms Dodged Disruption'. *MIT Sloan Management Review*, **64**, 34–39.
- Boussebaa, M. (2024). 'Unsettling West-centrism in the study of professional service firms'. *Human Relations*, **77**, 29–52.
- Brivot, M. (2011). 'Controls of Knowledge Production, Sharing and Use in Bureaucratized Professional Service Firms'. *Organization Studies*, **32**, 489–508.
- Busse, C., Kach, A. P., and Wagner, S. M. (2016). 'Boundary Conditions: What They Are, How to Explore Them, Why We Need Them, and When to Consider Them'. *Organizational Research Methods*, **20**, 574–609.
- Campbell, I. and Charlesworth, S. (2012). 'Salaried lawyers and billable hours: a new perspective from the sociology of work'. *International Journal of the Legal Profession*, **19**, 89–122.
- Carlile, P. R. (2004). 'Transferring, Translating, and Transforming: An Integrative Framework for Managing Knowledge Across Boundaries'. *Organization Science*, **15**, 555–568.
- Ceruzzi, P. (2013). 'The Historical Context'. *The SAGE Handbook of Digital Technology Research*, London: SAGE Publications Ltd.
- Chan, C. K. and Hedden, L. N. (2023). 'The Role of Discernment and Modulation in Enacting Occupational Values: How Career Advising Professionals Navigate Tensions with Clients'. *Academy of Management Journal*, **66**, 276–305.
- Charmaz, K. (2006). *Constructing grounded theory*, London: SAGE.
- Chen, Y. and Reay, T. (2021). 'Responding to imposed job redesign: The evolving dynamics of work and identity in restructuring professional identity'. *Human Relations*, **74**, 1541–1571.
- Chown, J. (2020). 'Financial Incentives and Professionals' Work Tasks: The Moderating Effects of Jurisdictional Dominance and Prominence'. *Organization Science*, **31**, 887–908.
- Chreim, S., Williams, B. E. (Bernie), and Hinings, C. R. (Bob). (2007). 'Interlevel Influences on the Reconstruction of Professional Role Identity'. *Academy of Management Journal*, **50**, 1515–1539.
- Compagni, A., Cappellaro, G., and Nigam, A. (2024). 'Responding to Professional Knowledge Disruptions of Unmitigable Uncertainty: The Role of Emotions, Practices, and Moral Duty among COVID-19 Physicians'. *Academy of Management Journal*, **67**, 829–861.

- Compagni, A., Mele, V., and Ravasi, D. (2015). 'How Early Implementations Influence Later Adoptions of Innovation: Social Positioning and Skill Reproduction in the Diffusion of Robotic Surgery'. *Academy of Management Journal*, **58**, 242–278.
- Cooper, D. J., Hinings, B., Greenwood, R., and Brown, J. L. (1996). 'Sedimentation and Transformation in Organizational Change: The Case of Canadian Law Firms'. *Organization Studies*, **17**, 623–647.
- Corbin, J. M. and Strauss, A. (1990). 'Grounded theory research: Procedures, canons, and evaluative criteria'. *Qualitative sociology*, **13**, 3–21.
- Currie, G., Lockett, A., Finn, R., Martin, G., and Waring, J. (2012). 'Institutional Work to Maintain Professional Power: Recreating the Model of Medical Professionalism'. *Organization Studies*, **33**, 937–962.
- Dell'Acqua, F., McFowland, E., Mollick, E. R., Lifshitz-Assaf, H., Kellogg, K. C., Rajendran, S., et al. (2023). 'Navigating the Jagged Technological Frontier: Field Experimental Evidence of the Effects of AI on Knowledge Worker Productivity and Quality'. *Harvard Business School Technology & Operations Mgt. Unit Working Paper*.
- Edmondson, A. C., Bohmer, R. M., and Pisano, G. P. (2001). 'Disrupted Routines: Team Learning and New Technology Implementation in Hospitals'. *Administrative Science Quarterly*, **46**, 685–716.
- Empson, L. (2021). 'Researching the Post-Pandemic Professional Service Firm: Challenging our Assumptions'. *Journal of Management Studies*, **58**, 1383–1388.
- Empson, L., Muzio, D., Broschak, J., and Hinings, B. (2015). *The Oxford Handbook of Professional Service Firms*, Oxford: Oxford University Press.
- Faulconbridge, J., Henriksen, L. F., and Seabrooke, L. (2021). 'How professional actions connect and protect'. *Journal of Professions and Organization*, **8**, 214–227.
- Faulconbridge, J. and Muzio, D. (2021). 'Valuation devices and the dynamic legitimacy-performativity nexus: The case of PEP in the English legal profession'. *Accounting, Organizations and Society*, **91**, 101224.
- Faulconbridge, J., Sarwar, A., and Spring, M. (2023). 'How Professionals Adapt to Artificial Intelligence: The Role of Intertwined Boundary Work'. *Journal of Management Studies*. <https://doi.org/10.1111/joms.12936>.
- Felten, E., Raj, M., and Seamans, R. (2023). 'How will Language Modelers like ChatGPT Affect Occupations and Industries?'. <http://arxiv.org/abs/2303.01157>.
- Friedrich, J., Becker, M., Kramer, F., Wirth, M., and Schneider, M. (2020). 'Incentive design and gamification for knowledge management'. *Journal of Business Research*, **106**, 341–352.
- Galanter, M. and Henderson, W. (2008). 'The elastic tournament: A second transformation of the big law firm'. *Stan. L. Rev.*, **60**, 1867–1930.
- Galanter, M. and Palay, T. (1994). *Tournament of lawyers: The transformation of the big law firm*, Chicago: University of Chicago Press.
- Garud, R., Kumaraswamy, A., and Karnøe, P. (2010). 'Path Dependence or Path Creation?'. *Journal of Management Studies*, **47**, 760–774.
- Gioia, D. A., Corley, K. G., and Hamilton, A. L. (2013). 'Seeking Qualitative Rigor in Inductive Research'. *Organizational Research Methods*, **16**, 15–31.
- Glaser, B. and Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*, London: Routledge.
- Goodrick, E. and Reay, T. (2010). 'Florence Nightingale Endures: Legitimizing a New Professional Role Identity'. *Journal of Management Studies*, **47**, 55–84.
- Goto, M. (2021). 'Collective professional role identity in the age of artificial intelligence'. *Journal of Professions and Organization*, **8**, 86–107.

- Goto, M. (2022). 'Accepting the future as ever-changing: professionals' sensemaking about artificial intelligence'. *Journal of Professions and Organization*, **9**, 77–99.
- Goto, M. (2023). 'Anticipatory innovation of professional services: The case of auditing and artificial intelligence'. *Research Policy*, **52**, 104828.
- Goto, M., Kotosaka, M., and Sako, M. (2025). 'When professionals become entrepreneurs: Identity construction of lawtech startup founders in Japan'. *Journal of Professions and Organization*, **12**, joae008.
- Greenwood, B. N., Agarwal, Ritu, Agarwal, Rajshree, and Gopal, A. (2019). 'The Role of Individual and Organizational Expertise in the Adoption of New Practices'. *Organization Science*, **30**, 191–213.
- Greenwood, R. and Empson, L. (2003). 'The professional partnership: Relic or exemplary form of governance?'. *Organization Studies*, **24**, 909–933.
- Greenwood, R., Hinings, C. R., and Brown, J. (1990). 'P2-Form' Strategic Management: Corporate Practices in Professional Partnerships'. *Academy of Management Journal*, **33**, 725–755.
- Greenwood, R., Suddaby, R., and Hinings, C. R. (2002). 'Theorizing Change: The Role of Professional Associations in the Transformation of Institutionalized Fields'. *Academy of Management Journal*, **45**, 58–80.
- Grodal, S., Anteby, M., and Holm, A. L. (2021). 'Achieving Rigor in Qualitative Analysis: The Role of Active Categorization in Theory Building'. *Academy of Management Review*, **46**, 591–612.
- Groysberg, B. and Lee, L.-E. (2009). 'Hiring Stars and Their Colleagues: Exploration and Exploitation in Professional Service Firms'. *Organization Science*, **20**, 740–758.
- Hansen, M. T., Nohria, N., and Tierney, T. (1999). 'What's Your Strategy for Managing Knowledge?'. *Harvard Business Review*, **77**, 106–116.
- Heimstädt, M., Koljonen, T., and Elmholdt, K. T. (2024). 'Expertise in management research: A review and agenda for future research'. *Academy of Management Annals*, **18**, 121–156.
- Hui, X., Reshef, O., and Zhou, L. (2023). *The Short-Term Effects of Generative Artificial Intelligence on Employment: Evidence from an Online Labor Market*. CESifo Working Paper.
- Huising, R. (2023). 'Professional Authority'. In G. Eyal and T. Medvetz (Eds.), *The Oxford Handbook of Expertise and Democratic Politics*, Oxford: Oxford University Press, 453–469.
- Jarzabkowski, P., Kaplan, S., Seidl, D., and Whittington, R. (2016). 'If you aren't talking about practices, don't call it a practice-based view: Rejoinder to Bromiley and Rau in Strategic Organization'. *Strategic Organization*, **14**, 270–274.
- Kaplan, S. (2011). 'Strategy and PowerPoint: An Inquiry into the Epistemic Culture and Machinery of Strategy Making'. *Organization Science*, **22**, 320–346.
- Karp, R. (2023). 'Gaining Organizational Adoption: Strategically Pacing the Position of Digital Innovations'. *Academy of Management Journal*, **66**, 773–796.
- Katz, D. M., Bommarito, M. J., Gao, S., and Arredondo, P. (2024). 'GPT-4 passes the bar exam'. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, **382**, 20230254.
- Kellogg, K. C., Myers, J. E., Gainer, L., and Singer, S. J. (2021). 'Moving Violations: Pairing an Illegitimate Learning Hierarchy with Trainee Status Mobility for Acquiring New Skills When Traditional Expertise Erodes'. *Organization Science*, **32**, 181–209.
- Knorr-Cetina, K. (1999). *Epistemic cultures: how the sciences make knowledge*, Cambridge: Harvard University Press.

- Koljonen, T. and Chan, C. K. (2024). 'Balancing professional autonomy and managerial goals amid broad technology adoption pressures: Intraprofessional segmentation at a Finnish School'. *Academy of Management Journal*, **67**, 798–828.
- Korica, M. and Molloy, E. (2010). 'Making sense of professional identities: Stories of medical professionals and new technologies'. *Human Relations*, **63**, 1879–1901.
- Kronblad, C. (2020). 'How Digitalization Changes our Understanding of Professional Service Firms'. *Academy of Management Discoveries*, **6**, 436–454.
- Kronblad, C. and Jensen, S. H. (2023). '“Being a professional is not the same as acting professionally”—How digital technologies have empowered the creation and enactment of a new professional identity in law'. *Journal of Professions and Organization*, **10**, 99–119.
- Kyratsis, Y., Atun, R., Phillips, N., Tracey, P., and George, G. (2017). 'Health Systems in Transition: Professional Identity Work in the Context of Shifting Institutional Logics'. *Academy of Management Journal*, **60**, 610–641.
- Larson, L. E., Harris-Watson, A. M., Carter, D. R., Asencio, R., DeChurch, L. A., Kanfer, R., et al. (2023). 'Staying Apart to Work Better Together: Team Structure in Cross-Functional Teams'. *Academy of Management Discoveries*, **9**, 320–338.
- Lawrence, T. B., Malhotra, N., and Morris, T. (2012). 'Episodic and Systemic Power in the Transformation of Professional Service Firms'. *Journal of Management Studies*, **49**, 102–143.
- Lebovitz, S., Lifshitz-Assaf, H., and Levina, N. (2022). 'To Engage or Not to Engage with AI for Critical Judgments: How Professionals Deal with Opacity When Using AI for Medical Diagnosis'. *Organization Science*, **33**, 126–148.
- Legg, M. and Bell, F. (2020). *Artificial intelligence and the legal profession*, Oxford: Hart Publishing.
- Lehr, D. and Ohm, P. (2017). 'Playing with the Data: What Legal Scholars Should Learn About Machine Learning'. *UCDL Rev.*, **51**, 653–717.
- Leicht, K. T. and Fennell, M. L. (1997). 'The Changing Organizational Context of Professional Work'. *Annual Review of Sociology*, **23**, 215–231.
- Leonardi, P. M. (2011). 'When Flexible Routines Meet Flexible Technologies: Affordance, Constraint, and the Imbrication of Human and Material Agencies'. *MIS Quarterly*, **35**, 147–167.
- Leonardi, P. M. and Treem, J. W. (2020). 'Behavioral Visibility: A new paradigm for organization studies in the age of digitization, digitalization, and datafication'. *Organization Studies*, **41**, 1601–1625.
- Liu, S. (2018). 'Boundaries and professions: Toward a processual theory of action'. *Journal of Professions and Organization*, **5**, 45–57.
- Lunkka, N., Jansson, N., Mainela, T., Suhonen, M., Meriläinen, M., Puhakka, V., et al. (2022). 'Professional boundaries in action: Using reflective spaces for boundary work to incorporate a new healthcare role'. *Human Relations*, **75**, 1270–1297.
- Lupu, I. and Rokka, J. (2022). '“Feeling in Control”: Optimal Busyness and the Temporality of Organizational Controls'. *Organization Science*, **33**, 1396–1422.
- Maghazei, O., Lewis, M. A., and Netland, T. H. (2022). 'Emerging technologies and the use case: A multi-year study of drone adoption'. *Journal of Operations Management*, **68**, 560–591.
- Maister, D. H., Galford, R., and Green, C. (2000). *The Trusted Advisor*, New York: Free Press, 20th Anniversary Edition.
- Malhotra, N. and Morris, T. (2009). 'Heterogeneity in Professional Service Firms'. *Journal of Management Studies*, **46**, 895–922.

- Malhotra, N., Morris, T., and Smets, M. (2010). 'New career models in UK professional service firms: from up-or-out to up-and-going-nowhere?'. *The International Journal of Human Resource Management*, **21**, 1396–1413.
- Malhotra, N., Smets, M., and Morris, T. (2016). 'Career pathing and innovation in professional service firms'. *Academy of Management Perspectives*, **30**, 369–383.
- Malhotra, N., Zietsma, C., Morris, T., and Smets, M. (2021). 'Handling Resistance to Change When Societal and Workplace Logics Conflict'. *Administrative Science Quarterly*, **66**, 475–520.
- Mathison, S. (1988). 'Why Triangulate?'. *Educational Researcher*, **17**, 13–17.
- Mazmanian, M., Orlikowski, W. J., and Yates, J. (2013). 'The Autonomy Paradox: The Implications of Mobile Email Devices for Knowledge Professionals'. *Organization Science*, **24**, 1337–1357.
- McLachlan, S. and Webley, L. C. (2021). 'Visualisation of law and legal Process: An opportunity missed'. *Information Visualization*, **20**, 192–204.
- Miller, A., O'Mahony, S., and Cohen, S. L. (2024). 'Opening the Aperture: Explaining the Complementary Roles of Advice and Testing When Forming Entrepreneurial Strategy'. *Organization Science*, **35**, 1–26.
- Monteiro, P., Nicolini, D., Erickson, I., Cohen, L. E., Dokko, G., Corporaal, G. F., et al. (2024). 'Beyond the Buzz: Scholarly Approaches to the Study of Work'. *Journal of Management Inquiry*, **34**, 19–40.
- Morison, E. E. (1966). *Men, Machines, and Modern Times, 50th Anniversary Edition*, Boston: MIT Press.
- Myers, J. E. (2023). 'When Big Brother is Benevolent: How Technology Developers Navigate Power Dynamics among Users to Elevate Worker Interests'. *Academy of Management Discoveries*, **35**, 438–462.
- Narayanan, A. and Bennun, M. (1991). *Law, computer science, and artificial intelligence*, Norwood: Ablex Pub. Corp.
- Nelson, A., Anthony, C., and Tripsas, M. (2023). "If I Could Turn Back Time": Occupational Dynamics, Technology Trajectories, and the Reemergence of the Analog Music Synthesizer'. *Administrative Science Quarterly*, **68**, 551–599.
- Nelson, A. J. and Irwin, J. (2014). 'Defining what we do - All over again: Occupational identity, technological change, and the Librarian/Internet-search relationship'. *Academy of Management Journal*, **57**, 892–928.
- Nicolini, D. (2017). 'Practice Theory as a Package of Theory, Method and Vocabulary: Affordances and Limitations'. In M. Jonas, B. Littig, and A. Wroblewski (Eds.), *Methodological Reflections on Practice Oriented Theories*, Cham: Springer International Publishing, 19–34.
- Noordegraaf, M. (2020). 'Protective or connective professionalism? How connected professionals can (still) act as autonomous and authoritative experts'. *Journal of Professions and Organization*, **7**, 205–223.
- von Nordenflycht, A. (2010). 'What Is a Professional Service Firm? Toward a Theory and Taxonomy of Knowledge-Intensive Firms'. *Academy of Management Review*, **35**, 155–174.
- Pachidi, S., Berends, H., Faraj, S., and Huysman, M. (2021). 'Make way for the algorithms: Symbolic actions and change in a regime of knowing'. *Organization Science*, **32**, 18–41.
- Pakarinen, P. and Huising, R. (2023). 'Relational Expertise: What Machines Can't Know'. *Journal of Management Studies*. <https://doi.org/10.1111/joms.12915>.
- Pemer, F. (2021). 'Enacting Professional Service Work in Times of Digitalization and Potential Disruption'. *Journal of Service Research*, **24**, 249–268.

- Pemer, F. and Werr, A. (2023). 'Defusing Digital Disruption Through Creative Accumulation: Technology-Induced Innovation in Professional Service Firms'. *Journal of Management Studies*.
<https://onlinelibrary.wiley.com/doi/abs/10.1111/joms.12972>.
- Petrakaki, D., Klecun, E., and Cornford, T. (2016). 'Changes in healthcare professional work afforded by technology: The introduction of a national electronic patient record in an English hospital'. *Organization*, **23**, 206–226.
- Pratt, M. G., Rockmann, K. W., and Kaufmann, J. B. (2006). 'Constructing professional identity: The role of work and identity learning cycles in the customization of identity among medical residents'. *Academy of Management Journal*, **49**, 235–262.
- Rahman, H. A. and Barley, S. R. (2017). 'Situated redesign in creative occupations—An ethnography of architects'. *Academy of Management Discoveries*, **3**, 404–424.
- Reay, T., Goodrick, E., Waldorff, S. B., and Casebeer, A. (2017). 'Getting Leopards to Change their Spots: Co-creating a New Professional Role Identity'. *Academy of Management Journal*, **60**, 1043–1070.
- Reay, T. and Hinings, C. R. (2009). 'Managing the Rivalry of Competing Institutional Logics'. *Organization Studies*, **30**, 629–652.
- Reckwitz, A. (2002). 'Toward a Theory of Social Practices: A Development in Culturalist Theorizing'. *European journal of social theory*, **5**, 243–263.
- Remus, D. and Levy, F. (2017). 'Can Robots Be Lawyers? Computers, Lawyers, and the Practice of Law'. *The Georgetown Journal of Legal Ethics*, **30**, 501–538.
- Rodgers, I., Armour, J., and Sako, M. (2023). 'How Technology Is (or Is Not) Transforming Law Firms'. *Annual Review of Law and Social Science*, **19**, 299–317.
- Saifer, A. and Dacin, M. T. (2021). 'Data and Organization Studies: Aesthetics, emotions, discourse and our everyday encounters with data'. *Organization Studies*, **43**, 623–636.
- Sako, M. (2024). 'How Generative AI Fits into Knowledge Work'. *Communications of the ACM*, **67**, 20–22.
- Sako, M., Armour, J., and Parnham, R. (2020). *Lawtech Adoption and Training: Findings from a Survey of Solicitors in England and Wales*.
- Sako, M. and Parnham, R. (2021). *Technology and Innovation in Legal Services: Final Report for the Solicitors Regulation Authority*.
- Sako, M., Qian, M., and Attolini, J. (2022). 'Future of professional work: evidence from legal jobs in Britain and the United States'. *Journal of Professions and Organization*, **9**, 143–169.
- Saldaña, J. (2016). *The coding manual for qualitative researchers*, Los Angeles: SAGE, 3rd edition.
- Sandberg, J. and Pinnington, A. H. (2009). 'Professional Competence as Ways of Being: An Existential Ontological Perspective'. *Journal of Management Studies*, **46**, 1138–1170.
- Sandberg, J. and Tsoukas, H. (2011). 'Grasping the Logic of Practice: Theorizing Through Practical Rationality'. *Academy of Management Review*, **36**, 338–360.
- Sandberg, J. and Tsoukas, H. (2015). 'Practice theory: What it is, its philosophical base, and what it offers organization studies'. *The Routledge companion to philosophy in organization studies*, Routledge, 184–198.
- Sandefur, R. L. (2001). 'Work and Honor in the Law: Prestige and the Division of Lawyers' Labor'. *American Sociological Review*, **66**, 382–403.
- Sandefur, R. L. (2015). 'Elements of Professional Expertise: Understanding Relational and Substantive Expertise through Lawyers' Impact'. *American Sociological Review*, **80**, 909–933.

- Scarbrough, H., Chen, Y., and Patriotta, G. (2024). 'The AI of the Beholder: Intra-Professional Sensemaking of an Epistemic Technology'. *Journal of Management Studies*. <https://onlinelibrary.wiley.com/doi/10.1111/joms.13065>.
- Schatzki, T. R. (1996). *Social practices: A Wittgensteinian approach to human activity and the social*, Cambridge: Cambridge University Press.
- Schatzki, T. R. (2001). 'Introduction: Practice theory'. In K. Knorr Cetina, T. R. Schatzki, and E. von Savigny (Eds.), *The Practice Turn in Contemporary Theory*, London: Taylor & Francis Group, 10–23.
- Schatzki, T. R. (2019). *Social Change in a Material World*, London: Taylor & Francis.
- Schön, D. A. (1983). *The Reflective Practitioner: How Professionals Think in Action*, London: Taylor & Francis.
- Scott, S. and Orlikowski, W. J. (2022). 'The Digital Undertow: How the Corollary Effects of Digital Transformation Affect Industry Standards'. *Information Systems Research*, **33**, 311–336.
- Sherer, P. D. and Lee, K. (2002). 'Institutional Change in Large Law Firms: A Resource Dependency and Institutional Perspective'. *Academy of Management Journal*, **45**, 102–119.
- Shove, E., Pantzar, M., and Watson, M. (2012). *The dynamics of social practice: Everyday life and how it changes*, London: SAGE Publications Ltd.
- Siggelkow, N. (2007). 'Persuasion with Case Studies'. *The Academy of Management Journal*, **50**, 20–24.
- Smets, M., Morris, T., and Greenwood, R. (2012). 'From Practice to Field: A Multilevel Model of Practice-Driven Institutional Change'. *Academy of Management Journal*, **55**, 877–904.
- Smets, M., Morris, T., von Nordenflycht, A., and Brock, D. M. (2017). '25 years since 'P2': Taking stock and charting the future of professional firms'. *Journal of Professions and Organization*, **4**, 91–111.
- Smets, M., Peo, J., and Rodgers, I. (2023). 'Professional Service Firms', Cheltenham, UK: Edward Elgar Publishing Limited.
- Smets, M., Rodgers, I., and Peo, J. (2023). 'Innovation in Professional Service Firms'. *Elgar Encyclopedia of Services*, Cheltenham, UK: Edward Elgar Publishing Limited.
- Spring, M., Faulconbridge, J., and Sarwar, A. (2022). 'How information technology automates and augments processes: Insights from Artificial-Intelligence-based systems in professional service operations'. *Journal of Operations Management*, **68**, 592–618.
- Starbuck, W. H. (1992). 'Learning by Knowledge-Intensive Firms'. *Journal of Management Studies*, **29**, 713–740.
- Suchman, L. A. (2007). *Human-machine reconfigurations: plans and situated actions*. Cambridge: Cambridge University Press.
- Susskind, R. (1996). *The Future of Law: Facing the Challenges of Information Technology*, Oxford: Clarendon Press.
- Susskind, R. (2008). *The End of Lawyers?: Rethinking the Nature of Legal Services*, Oxford: Oxford University Press.
- Susskind, R. (2017). *Tomorrow's lawyers: an introduction to your future*, Oxford: Oxford University Press, Second Edition.
- Susskind, R. and Susskind, D. (2022). *The future of the professions: How technology will transform the work of human experts*, Oxford: Oxford University Press, Updated Edition.

- Valentine, M. A., Asch, S. M., and Ahn, E. (2022). 'Who Pays the Cancer Tax? Patients' Narratives in a Movement to Reduce Their Invisible Work'. *Organization Science*, **34**, 1400-1421.
- van de Ven, A. H. and Poole, M. S. (1995). 'Explaining development and change in organizations'. *Academy of Management Review*, **20**, 567–582.
- Waardenburg, L., Huysman, M., and Sergeeva, A. V. (2022). 'In the Land of the Blind, the One-Eyed Man Is King: Knowledge Brokerage in the Age of Learning Algorithms'. *Organization Science*, **33**, 59–82.
- Wu, L. and Kane, G. C. (2021). 'Network-Biased Technical Change: How Modern Digital Collaboration Tools Overcome Some Biases but Exacerbate Others'. *Organization Science*, **32**, 273–292.
- Yang, C. L., Allen, L., Restrepo-Amariles, D., and Troussel, A. (2024). 'GPT in the Loop: Evidence from the Field'. *Hawaii International Conference on System Sciences 2024 (HICSS-57)*, **4**, 4343-4352.
- Yin, R. K. (2014). *Case study research: design and methods*, Thousand Oaks: Sage, 5th ed.

**PAPER 3 – ENHANCING PRODUCTIVITY IN PROFESSIONAL SERVICES:
DEVELOPING OPERATIONS MANAGEMENT PRACTICES TO INTEGRATE
DIGITAL TECHNOLOGY AND AI**

ABSTRACT

Professional service firms (PSFs) have traditionally been viewed as resistant to standardization, reflected in their customized service operations and distinct approach to professional service operations management (PSOM). Yet, digital technology and artificial intelligence (AI) may occasion a shift toward operations management (OM) practices that standardize professional work. This study examines how PSFs develop OM practices to integrate digital technology and AI through a case study of a large law firm, which included 56 interviews with legal operations practitioners, lawyers, and other staff. The findings show the use of process mapping, work modeling, project management, and performance evaluation to enable professionals to integrate these technologies while buffering them from low value or routine work. To facilitate a shift away from “gentle nudges”, the traditional approach to PSOM, operations practitioners develop *transitioning practices* that legitimize OM’s role and build their credibility. This research illustrates how OM practices facilitate technology integration, reframing PSOM as a blend of “gentle nudges” and mainstream OM practices. It extends current literature by theorizing the role of developing OM practices in integrating digital technology and AI within PSFs, enabling them to enhance their productivity and efficiency by standardizing certain operational processes for a more swift, even flow.

Keywords: professional services, customization, standardization, digital technology, artificial intelligence, AI, productivity, efficiency

INTRODUCTION

Are professional service firms (PSFs), such as law firms, developing operations management (OM) practices to integrate digital technology and artificial intelligence (AI)? If so, what are these practices, how are they developing, and why now? These questions are important. PSFs are under pressure to use increasingly capable emerging technologies to enhance the efficiency and effectiveness of their client services (see, for instance, Susskind, 2017; Susskind and Susskind, 2022). However, making this transition to integrating digital technology and AI can be challenging for these firms. Most PSFs rely much more on human knowledge rather than technology, organizing on this basis to provide their professionals with substantial autonomy (von Nordenflycht, 2010). Given this, PSFs' approach to professional service operations management (PSOM) has been characterized by flexible "subtle influences" and "guiding, nudging, and persuading" practices; I follow others and refer to these as "gentle nudges" (Goodale et al., 2008, p. 670; Harvey et al., 2016, p. 7; Malhotra et al., 2006, p. 175). Mainstream OM approaches, such as "standard operating procedures", are seen as being "ill-suited" for them (Kellogg and Nie, 1995, p. 330). In this environment, PSFs' expert professionals tend to customize their work for clients and resist challenges to their autonomy (Lewis and Brown, 2012; von Nordenflycht, 2010; Schmenner, 1986). This contributes to inefficient professional service operations (PSOs) – so much so that PSOs are conventionally characterized by high variability and slow throughput (Schmenner, 2004), making it difficult for PSFs to achieve a swift, even flow for productivity (Schmenner and Swink, 1998).

Yet, advancements in digital technology and AI may bring change to PSFs' PSOs and PSOM. AI-based technologies, for example, are now capable of performing core aspects of professional knowledge work (Spring et al., 2022). This creates opportunities for PSFs to augment or automate tasks, outsource work to remote professionals, or delegate greater responsibilities to semi-professional workers (Sampson and Pires dos Santos, 2023). But taking

advantage of these technological opportunities may require PSFs to transform their knowledge-intensive work and workflows. Such a transformation is typically linked to OM practices such as identifying and controlling process variation or standardizing tasks (Amaya and Holweg, 2024; Davis et al., 2011), changing how and by whom work gets done (Huckman et al., 2024).

This presents a puzzle. On one hand, research suggests that PSFs avoid practices that standardize their autonomous, expert professionals' customized client services. On the other hand, emerging evidence indicates that digital technology and AI are transforming knowledge work, making practices controlling process variation or standardizing tasks necessary for effective use of these technologies. This paper seeks to resolve this puzzle by examining how PSFs navigate or resolve these tensions. Do they simply use their existing PSOM practices to try to integrate digital technology and AI with “gentle nudges”? Or do they develop new, or more mainstream, OM practices as they accommodate these technologies?

My empirical analysis finds mainstream OM practices – in the sense that almost all operations managers would recognize them – such as process mapping, work modeling, project management, and performance evaluation involved with integrating digital technology and AI into operations within a PSF. These practices act as bridges and buffers, connecting professionals to technologies and ancillary resources while insulating them from low value or routine work. This occurs amid conditions creating challenges to the traditional “gentle nudges” approach to PSOM within a PSF: a changing environmental context, tensions over professional jurisdiction and autonomy, and organizational restructuring. To address these challenges and enable a transition from “gentle nudges” to mainstream OM practices where appropriate, operations practitioners – that is, those with a distinct operations remit, whether in managing or performing them – develop *transitioning practices*. These involve legitimizing OM's role in integrating technology and building credibility for operations practitioners to take on or support technology-related professional work. Together, these practices support the

integration of digital technology and AI – enabling a PSF to enhance its operations, improving productivity and efficiency by standardizing certain processes while leaving others more customized to their clients’ needs.

My study makes substantive contributions to the operations and technology management literature. First, a process model is inductively derived, theorizing how PSFs develop OM practices to integrate digital technology and AI into their PSOs. Second, the study reframes PSFs’ distinctive “gentle nudges” PSOM practices (Goodale et al., 2008; Harvey et al., 2016; Malhotra et al., 2006), showing how these practices are accompanied by and sometimes transitioned to mainstream OM practices to integrate digital technology and AI, enabling a more swift, even flow for enhancing productivity (Schmenner and Swink, 1998). Third, the study adopts a work-based, practice-sensitive perspective focusing on core process-embedded practitioners, extending the analysis to include peripheral practitioners who, while not traditionally central to PSOM, influence how PSOs are designed, deployed, executed, maintained, and enhanced. It also addresses contemporary concerns within the wider operations management literature about the exclusion of peripheral practitioners, which can lead to missing out on critical insights (Angelopoulos et al., 2023; Bendoly and Oliva, 2024). In these ways, my study advances an emerging discourse on operations and technology management in the context of firms integrating digital technology and AI into their knowledge work and workflows (e.g. Heim, Nair, and Bendoly 2021; Spring, Faulconbridge, and Sarwar 2022; Sampson and Pires dos Santos 2023; Amaya and Holweg 2024; Angelopoulos et al. 2023; Choi et al. 2022).

In sum, my study offers a detailed empirical investigation and a robust theoretical framework for understanding how PSFs develop operations management practices to integrate digital technology and AI. The findings present both a work-based, practice-sensitive view and a substantive theoretical contribution to the literature. The paper also proposes actionable OM

practices that PSF managers and professionals can use to integrate digital technology and AI to enhance their firms' PSOs.

THEORETICAL BACKGROUND

Operations and operations management practices

Operations refers to the activities involved in the process of converting inputs to outputs (Bendoly and Oliva, 2024; Holweg et al., 2018; Krajewski, 1980). This may seem like a broad definition – and it is. As noted in a recent editorial for the *Journal of Operations Management*, “operations occur everywhere”: “if work is being done and results are being produced, then there is a way that is happening” (2020, pp. 494; 496). In line with this broad perspective, I define operations management as the management of all activities involved in the process of converting inputs to outputs. This is a “a work-based view” that focuses on how work is performed and managed.

In this view of operations management, there are broadly two steps. First, understand what work is being done, how it is done, and the results it produces. Second, once the work operations have been “discovered, described, and understood”, they can be “improved, controlled, and prescribed” (Browning, 2020, p. 496). At this second stage, a key concern is often “why one operation [...] is more productive than another” (Schmenner and Swink, 1998, p. 100). A central explanation is that – all else being equal –operations with lower variability and faster throughput are more productive (Schmenner, 2004). Performing these operations leads to a swift, even flow, enhancing operational productivity (Schmenner and Swink, 1998). This view aligns with the traditional approach to operations management, which conceptualizes operations as a processual series of optimized tasks (Taylor, 1911).

However, as operations management increasingly takes place in complex, knowledge-based environments, such traditional task-oriented frameworks may fall short of capturing the nuanced, context-dependent nature of work. This is where a sensitivity to the concept of

practices becomes valuable. Drawing on its use elsewhere in the social sciences (Jarzabkowski et al., 2016; Shove et al., 2012; Smets et al., 2012), I define practices as shared, recognizable, often unconscious, ways of doing things. They consist of bundles of activities performed by practitioners based on their available materials, competences, and meanings. These practices are dynamic and context-dependent, shaped by their specific circumstances and practical environments. Operations management includes many well-established practices for discovering, describing, and understanding work operations, as well as improving, controlling, and prescribing them. Examples include process mapping, work modeling, project managing, and evaluating performance (Huising 2019; Petrakaki, Klecun, and Cornford 2016; Rogers, Dombkins, and Bell 2021; Browning 2010; Freidson and Rhea 1965).

Despite this, operations management literature has generally avoided using practices as a mode of analysis. This is surprising, given that researchers have noted how operations and operations management can differ significantly in ideal form versus actual performance (Lewis and Brown, 2012). When the literature has engaged with practices, it has typically been in a diluted form. For instance, Bromiley and Rau's (2016) focus on the utilization of specific operations management practices faced criticism for oversimplifying the complexity of practices (Jarzabkowski et al., 2016). Similarly, while Senot and colleagues (2016) accounted for practices in their study of professional collaboration in hospitals, they emphasized practical implications for hospital managers over conceptual considerations.

However, this may be changing. Amaya and Holweg's (2024) study on organizations leveraging algorithms to improve knowledge work shows how taking practices seriously can provide valuable insights for operations management research. Their theoretical framework recognizes that performing a task requires "practical expertise deeply rooted in social practices" (Amaya and Holweg, 2024, p. 486). By combining this with their empirical findings,

they develop a novel theory on how organizations can adopt algorithmic solutions to enhance their operations.

This is important because it highlights two key limitations of research lacking practice sensitivity. First, it shows that focusing narrowly on tasks can hinder firms' efforts to improve, control, and prescribe operations. In their case, the organization prioritized automating tasks over re-engineering processes, failing to recognize that "algorithms do not inherently deliver operational benefits; instead, these benefits materialize when they are seamlessly integrated into established work practices" (Amaya and Holweg, 2024, p. 505). Second, it challenges the assumption that tasks and processes are known entities simply waiting to be discovered by researchers. Instead, as practice theorists argue (Hui et al., 2016), tasks and processes are actively constructed by practitioners' situated performances. By broadening the research focus and questioning existing assumptions, a practice-sensitive approach can complement a work-based view of operations management, offering novel and substantive research insights that complement traditional approaches with more Taylorist premises.

Operations and operations management within professional service firms

Professional service operations within professional service firms

The operations management literature generally characterizes professional services by three features: (i) extensive client contact necessitating highly customized service; (ii) professionals' autonomy in defining quality outcomes and determining the means and ways to achieve them (Harvey et al., 2016; Schmenner, 1986); and (iii) the influence of the organizational setting, especially within PSFs (von Nordenflycht, 2010). I address each of these in turn below, focusing on how they can lead to PSOs that have high variability and slow throughput (Schmenner, 2004), making it challenging for PSFs to achieve a swift, even flow for productivity (Schmenner, 2004).

Clients and customization/standardization

Client input is both necessary and sufficient for service operations (Sampson and Froehle, 2006), co-producing them in a manner distinct from manufacturing operations (Bendoly and Oliva, 2024). PSOs are typically classified as having the highest level of client participation, interaction, or engagement in providing and processing this input (Kellogg and Nie, 1995; Schmenner, 1986; Silvestro et al., 1992). Ineffective client input can negatively impact PSOs (Damali et al., 2016), while excessive input or interference can be equally disruptive (Frei, 2006; Sampson and Chase, 2022).

PSOs are also generally classified as having the highest level of customization and the lowest level of standardization (Kellogg and Nie, 1995; Schmenner, 1986; Silvestro et al., 1992). In its ideal form, customization means that each client receives individual service tailored to their needs and preferences, both in terms of process and outcome (Sundbo, 2002; Thirumalai and Sinha, 2011). Standardization, by contrast, means providing generic services, again in both process and outcome (Sundbo, 2002). Standardization typically emerges from ongoing efforts to establish a uniform approach that can be repeatedly applied (Brunsson et al., 2012; Grillo et al., 2024).

In reality, PSOs typically involve a blend of customization and standardization (Maister, 1993; Spee et al., 2016), with a single PSF having a range of different service operations types within their organization (Schmenner, 2004). A concrete example helps illustrate this. One of the few empirical studies on the topic, conducted in a law firm, found a mix of customization and standardization both within and across client projects – including some matters¹¹ being based on relatively pro forma documents, with others being more variably

¹¹ A “matter” is a generic label used for a discrete client instruction in a PSF. For example, a matter might comprise a merger or acquisition of a target company for a client (that is, “M&A” activity). Or arranging a financing for a client (that is “financing” activity). A matter might also be referred to as a “deal” or “transaction” or “project”. I follow this standard terminology.

drafted; and within matters some stages were relatively standardized – such as information gathering, while others were highly customized – such as court appearances (Lewis and Brown, 2012).

The tendency in PSOs away from standardization and toward customization has been theorized to stem from client demands (e.g. Kellogg and Nie, 1995; Schmenner, 1986; Silvestro et al., 1992). This is intuitive and supported by data. Customization enables flexible responses in uncertain environments (Mills et al., 1983), improves client satisfaction (Thirumalai and Sinha, 2011), and standardization may fail to meet the needs of complex clients (Faraj and Xiao, 2006). However, while clients are key contributors to PSOs' customization, they are not the sole drivers. Evidence suggests that professionals also play a significant role in pushing for customization (Lewis and Brown, 2012).

Customization and standardization of PSOs also follow a dynamic lifecycle (Lawrence et al., 2016). Law firms' work, for instance, typically follows a path from customization to standardization – or, in industry terms, from bespoke to commoditized legal services (Susskind, 2008). This shift is often accompanied by service innovation, as professionals develop new practices to create novel, customized services for their clients (Barrett and Hinings, 2015; Smets et al., 2023). In such cases, firms may “lead the market” by offering a fully customized service (at a customized price) that incorporates reproducible, standardized elements (Maister, 1993, p. 30). When clients demand and are willing to pay for customization, PSOs can be tailored accordingly, allowing firms to charge higher prices than for standardized services, even within a relatively homogeneous professional services context (Hansen et al., 1999).

Professionals and means/ends autonomy

Inspired by Lewis and Brown's (2012, p. 10) insight that there may be “significant potential for traditional OM ‘interventions’ in legal service processes [...] but that these opportunities need to be understood in the context of significant inertial forces (e.g.

professionals ‘giving up’ certain activities)”, this research further considers professional autonomy – defined as the right to work without external interference (Huisin, 2023) – in an operations management context. Professionals, such as lawyers, accountants, and consultants, are individuals with specialized, abstract knowledge and expertise (Anteby et al., 2016). They apply this knowledge to diagnose and treat their clients’ problems (Abbott, 1988). Their expertise allows them to make complex decisions and take action based on inference and judgment (Tsoukas et al., 2024), especially when the connection between a client’s problem and its solution is not immediately obvious (Abbott, 1988).

Professionals typically have significant autonomy in defining both the processes they use (the “means”) and the outcomes they aim to achieve (the “ends”) when applying their knowledge and expertise (Harvey et al., 2016; von Nordenflycht, 2010). This autonomy introduces variability into operations, as each professional may approach the same client problem differently based on their interpretation and experience, making standardizing PSOs particularly challenging (Lewis and Brown, 2012). Autonomy is typically contained within professional jurisdiction, which represents the dynamic extent of work that professionals claim and control (Abbott, 1988). As a result, when professionals perceive attempts at standardization as infringing on their jurisdictional autonomy, resistance often follows (see e.g. Malhotra et al., 2021).

Professional service firms: Organizational setting for operations

PSFs are organizations that bring together clients and professionals to deliver knowledge-intensive services (Empson et al., 2015; von Nordenflycht, 2010). “Classic PSFs” – which I refer to simply as “PSFs” – are characterized by high knowledge intensity, low capital intensity, and a professionalized workforce (von Nordenflycht, 2010). These traits lead to various organizational responses, including most pertinently a tendency toward autonomy (von Nordenflycht, 2010).

PSFs are typically organized as professional partnerships (Empson et al., 2013; Greenwood et al., 1990; Greenwood and Empson, 2003), managed professional businesses (Brock, 2006, 2008; Cooper et al., 1996), or reconstructed professional firms (Ackroyd and Muzio, 2007). These structures often fuse ownership, management, and operational work within the professionals themselves (Smets et al., 2017). As a result, professionals in PSFs must perform various functions (e.g. professional, operations manager, sales person, etc.), comply with legal and regulatory requirements, and lead their autonomous peers (see e.g., Empson, 2017; Løwendahl, 2005; von Nordenflycht, 2010).

PSFs may also follow distinct strategies that influence their PSOs. One example is Maister's (1993) classification of work in PSFs into three modes: "Brains", "Grey Hair", and "Procedure". Brandon-Jones and colleagues (2016, p. 11) found that "these three types can be broadly interpreted using these dimensions: high variety but low volume work are key characteristics of the Brains mode; the Grey Hair mode is larger volumes, relying on accumulation and use of experience to manage towards low(er) variety, and; the Procedure mode is associated with still low(er) variety and higher volume". These modes shape operations, with firms focused on Brains work facing greater variability due to customization, while those focused on Procedure work tend toward standardization.

Linked to these strategies is PSFs' client focus. Focusing on specific client types can help mitigate the effects of client complexity by reducing operational variability (Thirumalai and Devaraj, 2024). Large law firms, for example, often prioritize corporate clients or other large organizations whose resources and ability to pay match their firms' strategy, rather than focusing on individuals (Rodgers et al., 2023). These firm-level choices impact PSOs, with a tightly coupled co-evolution between professional governance and professional practice (Sako and Peo, 2024).

Overall, the organizational structures, distinct work strategies, and client focus of PSFs significantly shape their PSOs, influencing the relationship between customization and standardization, with implications for operational efficiency and productivity.

Professional service operations management within professional service firms

Given the nature of their PSOs as discussed above, what does PSOM look like within PSFs? A comparison with healthcare, the professional services setting that the operations management literature has explored most thoroughly (Harvey, 2016; Heineke, 1995; Huckman et al., 2024; Machuca et al., 2007; Senot et al., 2016; Thirumalai and Devaraj, 2024, 2024), may be instructive. Unlike hospitals, PSFs such as law firms rely less on capital investment and more on the knowledge and expertise of their professionals, shaping their approach to PSOM. An established taxonomy of knowledge-intensive firms highlights key distinctions between “Professional Campuses”, like hospitals, and “Classic PSFs”, like law firms (von Nordenflycht, 2010). The main difference lies in capital intensity: hospitals are more capital-intensive than law firms.

This difference has two important implications. First, it increases professionals’ bargaining power. Since their knowledge and expertise are more important, they are more mobile and face fewer barriers to establishing their own firms. This makes retaining professionals more challenging and especially difficult to manage through mandates. Before Covid-19, this was described as a situation where “the assets go down the elevator each night [...] and the firm can’t control whether they come back” (von Nordenflycht, 2010, p. 162). Today, referring to “remote log-ins” may form the basis for a more apt metaphor.

Second, lower capital intensity means PSFs do not need to raise as much capital as Professional Campuses and so do not need to organize in ways that protect outside investors. This gives them the flexibility to structure themselves to support professional autonomy and decentralize authority (Lee, 2024). As a result, PSOM in these firms can be particularly

challenging – sometimes likened to “cat-herding” (Løwendahl, 2005; von Nordenflycht, 2010). Unlike in Professional Campuses, where management is separated from professionals and operational processes can be more easily directed (Heineke, 1995), managers in PSFs tend to focus on influence rather than control. Professionals in these firms typically handle much of the PSOM themselves, managing tasks such as staffing, allocating work, reviewing outputs, and monitoring utilization, often with minimal external management intervention.

As their PSOs were considered to provide a distinct operations management context (Goodale et al., 2008; Lewis and Brown, 2012), and research findings were not expected to be theoretically significant, few operations management researchers studied PSOM within PSFs like law firms (Balthu and Clegg, 2021; Machuca et al., 2007). Those who did generally concurred that the knowledge-intensive and customized nature of PSF’s PSOs led to the conclusion that “standard operating procedures” and their associated practices were ill-suited for PSFs’ PSOM (Kellogg and Nie, 1995, p. 330). Instead, operations management in these firms evolved a distinctive approach, characterized by “subtle influences” and “guiding, nudging, and persuading” professionals toward outcomes like productivity and efficiency – that is, managing operations through “gentle nudges” – rather than mainstream OM practices (Goodale et al., 2008, p. 670; Harvey et al., 2016, p. 7; Malhotra et al., 2006, p. 175).

Yet, recent research challenges these positions, showing trends in PSFs towards greater capital intensity and reduced client interaction (Brandon-Jones et al., 2016; Kronblad, 2020), extensive standardization and limited customization (Lewis and Brown, 2012), as well as diminishing professional autonomy in quality and process assessments (Lewis and Brown, 2012; Spring, Faulconbridge, and Sarwar, 2022). In an editorial for a special edition on PSOM in the *Journal of Operations Management*, Harvey and colleagues (2016, p. 7) noted that the “gentle nudges” of PSOM theory “may be too convenient a response”. This research explores an alternative explanation. It examines digital technology and AI as potential occasions for

change (Barley, 1986; Smets et al., 2017; Spring et al., 2022), investigating how PSFs integrate these technologies into their PSOs, and the role of PSOM in this process. The next section outlines why rethinking “gentle nudges” in the context of digital technology and AI is important.

Digital technology and AI in professional services operations

The term “digital technology” refers to electronic devices and systems that use binary methods to process data, information, or knowledge (Ceruzzi, 2013). This concept is widely recognized in related management research (Ardolino et al., 2022; Kronblad and Pregmark, 2021; Sako et al., 2022). “AI”, while historically rich, presents a more complex conceptual scope due to its varied definitions and applications (McCarthy et al., 1955; Russell and Norvig, 2020; Wang, 2019), particularly in professional services (Brooks et al., 2020; Faulconbridge et al., 2023; Goto, 2023; Legg and Bell, 2020; Rodgers et al., 2023; Spring et al., 2022). Although expert systems and other instantiations of AI have a long history in operations management (e.g. Turban and Sepehri, 1986), this study focuses on AI such as machine learning (ML), large language models (LLMs), and similar emerging technologies.

The role of technology in organizational productivity and its evolving impact on individuals, organizations, and society has been central to management literature (Grodal et al., 2023). Technology is particularly integral to operations management due to its role in supply chains and value-adding processes (Angelopoulos et al., 2023). In a professional services context, for example, IT has been shown to improve operational performance by enabling a more efficient flow of work (Devaraj et al., 2013), although arguably it has yet to fulfil its transformative potential for service operations (Heineke and Davis, 2007). The recent advancement of digital technology and AI has suggested that this might be changing, further highlighting key operational challenges, such as technology adoption (Venkatesh et al., 2024) and business process redesign (Davenport et al., 2023). These trends have contributed to an

emerging discourse in the OM literature around digital technology and AI in the context of service operations generally and professional service operations specifically (e.g. Heim, Nair, and Bendoly 2021; Spring, Faulconbridge, and Sarwar 2022; Sampson and Pires dos Santos 2023; Amaya and Holweg 2024; Angelopoulos et al. 2023; Choi et al. 2022).

What is it about digital technology and AI that makes them a new consideration in terms of operations in professional services? Digital technology and AI are influencing PSFs' distinctive characteristics (Kronblad, 2020), professional work (Felten et al., 2024; Sako, 2024; Sako et al., 2022), and how operations are performed and managed within PSFs (Spring et al., 2022). First, they can automate professional expertise, removing or reducing the need for professional agency, judgment, and decision-making (Armour and Sako, 2020; Raisch and Krakowski, 2021; Sampson and Pires dos Santos, 2023; Spring et al., 2022). Second, digital technology and AI bring technological and industry-standardizing tendencies (Scott and Orlikowski, 2022; Zhang et al., 2023), challenging professionals' client customization. In knowledge work and professional services, integrating AI effectively involves practices such as identifying and controlling process variation and standardizing tasks (Amaya and Holweg, 2024; Davis et al., 2011). Third, digital technology and AI change how and by whom professional services work is done (Huckman et al., 2024), shifting agency in, and control and performance of, workflows (Angelopoulos et al., 2023), with professionals' autonomy challenged as they respond to or accommodate them (Armour et al., 2022; Faulconbridge et al., 2023; Kronblad and Jensen, 2023). Fourth, professionals increasingly deal with opacity when using digital technology and AI (Lebovitz et al., 2022; Pakarinen and Huising, 2023; Rostain and Huising, 2023), involving obscure processes and technical outputs that they may struggle to validate or interpret (Anthony, 2021). Fifth, digital technology and AI can be seen as part of an "ensemble mutually constituted with the professionals and processes with which it interacts" (Spring et al., 2022, p. 610), with practitioners purposefully integrating technology through

their working practices (Orlikowski, 2000). This means that novel theoretical and practical insights may come from investigating them in situ. Yet this is rare in the literature. As Spring and colleagues (2022, p. 598) note: “the use of IT of any kind in professional services has been researched very little in OM”.

Collectively, these factors call into question the adequacy and sufficiency of the traditional “gentle nudges” PSOM explanation. Can this traditional approach to PSOM be effective when integrating digital technology and AI involves identifying and controlling process variation and standardizing work? If so, how? If not, what needs to change, and how does that transition happen? In short, reexamining this approach to PSOM in light of these technologies may enhance both theoretical and practical understandings of how PSFs can integrate digital technology and AI into their workflows and effectively manage associated productivity and efficiency.

Puzzle and research question

The literature presents a puzzle. On one hand, researchers have traditionally viewed PSFs as resistant to changes that would standardize their autonomous professionals’ customized client services. On the other hand, recent studies and theory imply significant shifts in professional services driven by digital technology and AI, indicating a move towards standardizing professionals’ work and workflows. This contrast frames my research question: How do PSFs develop operations management practices to integrate digital technology and AI?

METHODS

This study uses qualitative methods to examine how PSFs develop OM practices to integrate digital technology and AI (Gioia et al., 2013). The research AI combines a well-established research topic – PSOM (Harvey et al., 2016; Ketokivi, 2016) – with an emerging phenomenon – digital technology and AI (O’Mahony and Cohen, 2022). This approach

supports phenomenon-based theorizing (Bendoly and Oliva, 2025; von Krogh, 2018), which is important for advancing OM research to match the pace of real-world changes (Ketokivi, 2016).

To investigate this phenomenon, I adopt a case study method that enables in-depth, context-rich analysis (Ketokivi and Choi, 2014; Lewis and Brown, 2012; Spring et al., 2022). A single-case design is particularly suited to this research, offering theoretical insights focused on analytical rather than statistical generalization and without requiring the large sample sizes typical of quantitative research (Yin, 2014). This approach allows for a detailed consideration of complex, dynamic processes, such as the development of OM practices to integrate digital technology and AI in PSFs.

The selected firm represents a “special” or “revelatory” case because of the sophistication of its legal operations function and its willingness as a firm-level to integrate digital technology and AI into its workflows (Siggelkow, 2007; Yin, 2014). As such, it provides a rare opportunity to examine conditions that, while uncommon, are increasingly relevant to knowledge-intensive organizations integrating digital technology and AI. The case was chosen not for its representativeness but for its potential to generate theoretical insights and inspire further research. The following sections provide additional methodological details.

Research setting

My research focused on the delivery of legal services by large UK-based law firms with international offices serving corporate clients. These firms, characterized by professionals’ engagement with management and business values – measured by metrics like billable hours and profits per equity partner (PEP) (Campbell and Charlesworth, 2012; Faulconbridge and Muzio, 2021) – can be classified as managed professional businesses (Brock, 2006, 2008; Cooper et al., 1996) or reconstructed professional firms (Ackroyd and Muzio, 2007). They led

the globalization of legal work, navigating regulatory challenges and enabling transnational lawyering (Faulconbridge et al., 2008).

A major regulatory shift in 2007 allowed UK law firms to organize as public companies and expand non-lawyer activities, aiming to increase competition and reduce legal service costs (Armour et al., 2022; Armour and Sako, 2023). Around the same time, US law firms and the Big Four intensified competition in the London market (Hunter, 2020), while the Great Recession drove client cost-cutting and reduced demand (Henderson, 2011; Lewis and Brown, 2012; Markovic, 2019). In response, corporate legal clients developed a “more-for-less” expectation, reducing spending and increasing pressure on firms to enhance efficiency and productivity (Susskind, 2013).

This period also saw rapid advances in digital technology applications within the legal industry (Rodgers et al., 2023; Whalen, 2022), a trend accelerated by the COVID-19 pandemic (Empson, 2021; Sako and Parnham, 2021). These developments reinforced a long-term trajectory of rising legal technology adoption (Wall and Johnstone, 1997). Today, UK-based law firms use digital technology and AI for a range of “use cases” – the application of technologies for specific operational purposes (Maghazei et al., 2022; Spring et al., 2022).

Legal operations (or “legal ops”) emerged in the 1980s alongside the rapid growth of in-house legal departments in large companies (Leicht and Fennell, 1997). Since then, it has grown significantly (CLOC, 2020; Hunter, 2020). Founded in 2010, the Corporate Legal Operations Consortium (CLOC) is the primary association representing the function. CLOC defines legal operations as “a set of business processes, activities, and the professionals who enable legal departments to serve their clients more effectively by applying business and technical practices to the delivery of legal services” (CLOC, 2020).

While legal operations practitioners initially worked within corporate legal departments, they are now increasingly present in law firms as well (Armour et al., 2022;

Hunter, 2020). Their expertise in business and technical processes suggests they may have the capacity to apply OM practices to the delivery of legal services. This study examines the extent to which legal operations practitioners in large UK-based law firms have developed OM practices to integrate digital technology and AI.

My research focused on a large UK-based law firm (the “Firm”) actively integrating digital technology into its legal service delivery. The Firm was selected from a theoretically-informed shortlist based on its willingness to participate and its ability to provide structured access to a diverse range of interviewees knowledgeable about operations management in this context. Its organizational structure reflects that typical of large UK-based law firms.

The Firm’s in-scope practice groups were Corporate and Capital Markets, both of which provide high-end legal services. The Firm made available a wide range of digital technology, including productivity applications (such as word-processing, email services, video-conferencing, and instant messaging), a document management system (DMS), a practice management system (PMS), a knowledge management system (KMS), document automation applications, AI-enabled contract review and e-discovery platforms, virtual data rooms (VDRs), and other transaction management and collaboration software.

During the study, generative AI, particularly LLMs, emerged as potentially applicable for legal services. Legal operations practitioners played a central role in trials and piloting use cases for LLM adoption. However, at the time of research, the Firm’s lawyers had not yet substantively engaged in integrating LLMs into their client work.

Data collection

I collected data between October 2022 and December 2023, using a case study approach based on in-depth, semi-structured interviews, supplemented by observation and document analysis. Participants were selected through theoretical sampling (O’Reilly et al., 2012; Patton, 2002), with the Firm nominating individuals who independently consented to participate.

Sampling continued until theoretical saturation was reached as the sample size expanded when data collection stopped providing novel material, with new data giving trivial or de minimis differences represented by repeated patterns in the data (Charmaz, 2006).

In total, I conducted 56 interviews at the Firm. Of these, 25 were with legal operations practitioners actively developing OM practices to integrate digital technology or AI. Their backgrounds varied: some were former lawyers, while others came from consulting, business, or IT. The other 31 interviews were with legal and business services professionals, including fee-earning lawyers and those in technology roles. Appendix 1 provides a table detailing interview participants by function, practice area, and background.

Interviews explored participants' experiences with legal service delivery and production workflows. I asked them to describe their background, role within the Firm, and how their work had change over time. To examine OM practices related to digital technology and AI, I specifically asked them to outline a typical workflow and where technology fit within it, who they worked with, and what they needed to know to perform their work. I posed clarification questions as needed and ended with a broad, open-ended question to account for role bias (Ketokivi, 2019). Interviews were recorded and transcribed, with transcripts running to about 310,000 words (around 540 pages).¹² This interview-led case study approach aligns with established methods for studying practice development (Langley et al., 2013; Nicolini, 2017).

To triangulate findings (Mathison, 1988), I supplemented interviews with observations, document analysis, and participant feedback. Observations included three meetings between legal operations practitioners and fee-earning lawyers, where I took detailed notes and expanded them with post-meeting reflections. I also observed screen-share sessions

¹² I had an audio problem with one interview, which did not record. Instead, I made an attendance note of this interview.

demonstrating the Firm's digital technology and AI applications. Document analysis included annual reports, published case studies, job descriptions, press releases, and organizational structure charts. Participant feedback included Firm members checking and validating my descriptions of its development of OM practices to integrate digital technology and AI, although they were not consulted about my interpretations. This corroborative approach aligns with prior research on OM practices in professional settings (Senot et al., 2016), and reflects the need for creative data collection strategies when studying highly paid professionals (Sampson and Pires dos Santos, 2023). Collectively, these methods provided robust visibility into the OM processes and practices underlying the Firm's integration of digital technology and AI (Bendoly and Oliva, 2024).

Data analysis

My data analysis followed an inductive approach to develop empirically grounded theory that directly responds to my research question (De Treville et al., 2023; Eisenhardt et al., 2016), applying established qualitative research methods (Gioia et al., 2013). The units of analysis were individuals and their OM practices. Given substantial similarities across the practice areas in scope, I pooled data within the Firm (Bechky and O'Mahony, 2015).

I coded interview transcripts in NVivo 12 following standard academic practices (Saldaña, 2016). Using open coding, I actively categorized empirical data (Grodal et al., 2021) and identified patterns (Corbin and Strauss, 1990), such as technology automating repetitive tasks and enabling lawyers to focus on legal advisory work. I assigned preliminary labels to emerging themes, applying *in vivo* codes where appropriate to reflect participants' language (Charmaz, 2006). Next, I performed axial coding to link categories with subcategories by specifying their properties and dimensions. Finally, I used selective coding to refine categories, add descriptive detail, and unify them around a core category (Corbin and Strauss, 1990).

The core category, representing the central phenomenon of this study, is the development of OM practices to integrate digital technology and AI. Figure 1 presents the data structure, mapping first-order concepts, second-order themes, and the aggregate dimensions.

Appendix 2 contains first-order concepts with representative data.

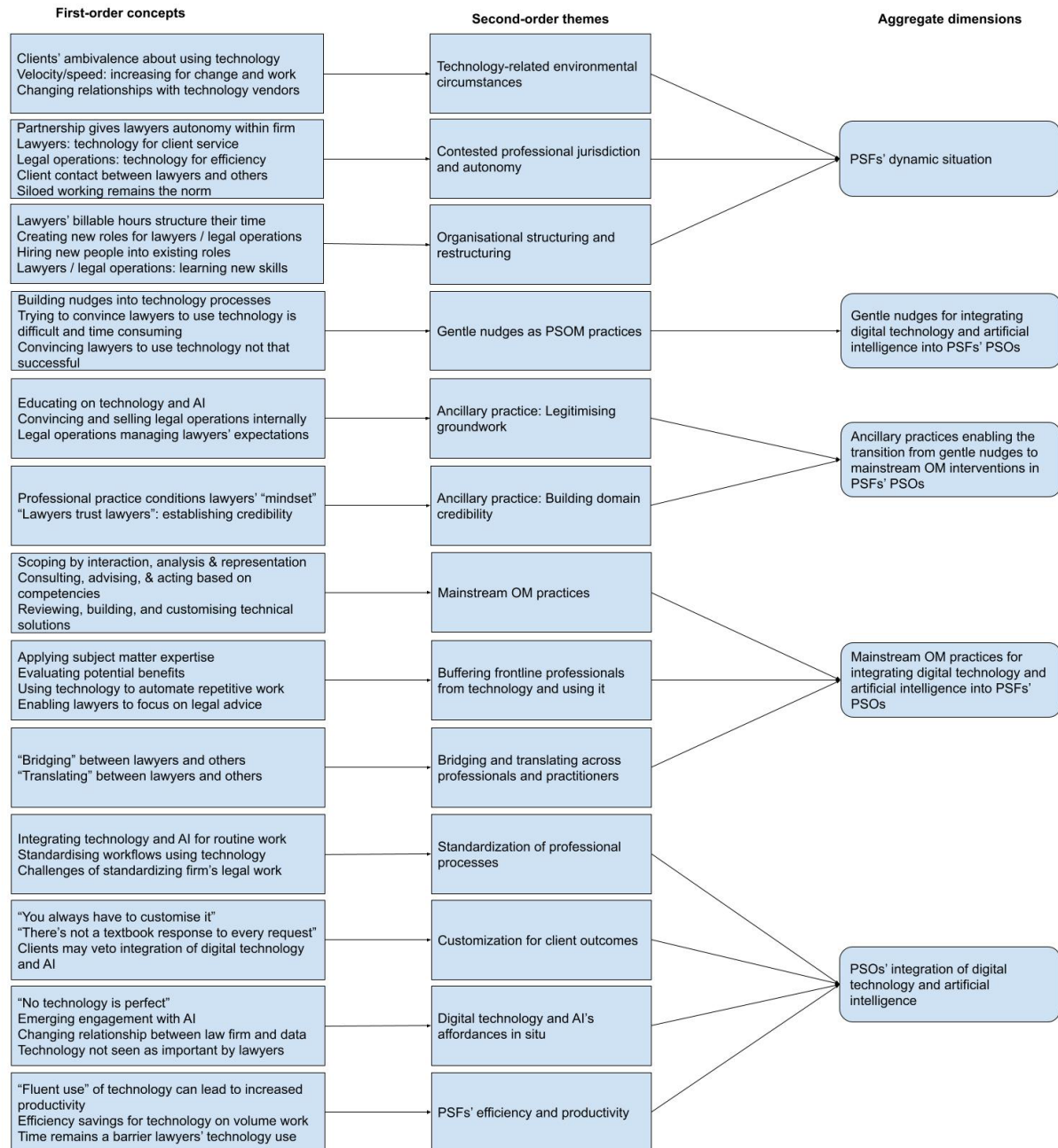


Figure 1 - Data Structure

FINDINGS

This study examines how the Firm's OM practices for integrating digital technology and AI developed and the implications of this for its productivity. Rather than providing an exhaustive account of OM practices or technology applications and use cases, I focus on concrete examples that directly address my research question: How do PSFs develop OM practices to integrate digital technology and AI? This focused approach allows for an in-depth examination of how and why these practices emerged and developed over time. The following sections present my findings, organized around the four aggregate dimensions outlined in Figure 1.

PSFs' dynamic operational environment

The Firm's dynamic operational environment shaped the development of its OM practices for integrating digital technology and AI. Three distinct themes emerged. First, advancements in digital technology and AI shifted the Firm's external environment. Second, these technologies contributed to tensions over professional jurisdiction and autonomy within the Firm. Third, digital technology and AI were both influenced by existing organizational structures and, in turn, drove organizational restructuring. The following sections explore these themes in detail.

Technology-related environmental context

The Firm's operational environment was shifting as digital technology and AI advanced. Clients showed mixed attitudes toward technology adoption in legal matters. Some actively encouraged the Firm to integrate technology, asking for quarterly reports on its use or specifying it be used on their matters. Others, however, prohibited certain types of digital technology, particularly AI, citing concerns over sensitive data. Yet, most clients prioritized outcomes such as cost or quality, treating technology as a "check box" consideration rather than a defining element of service delivery (INT 40).

Neither the Firm nor its clients had a clear benchmark for high-quality service when digital technology and AI were integrated into front-office operations. The Firm had extensive experience delivering high-end legal work, variously described as “Rolls Royce”, “white glove”, or “platinum” service (INTs 40 & 41). However, uncertainty persisted over how to maintain this type of service using technology. Clients, too, were unsure about what to expect from technology-enabled legal services. They sometimes held unrealistic expectations about technology’s capabilities or its impact on the Firm’s pricing. In short, both the Firm and its clients were navigating uncertainty around digital technology and AI’s role in premium legal services.

The rapid pace of technological evolution added to this uncertainty. Many within the Firm perceived that technology was advancing faster than ever before, creating operational challenges in managing existing applications while integrating new ones. Fee-earning lawyers were often unsure which technologies to use or how to integrate them into their workflows. One interviewee described this challenge: “It’s the not really being sure what it is that we need and how that can really fit into [...] what we’re doing” (INT 45).

The Firm’s relationships with technology vendors also shifted. Traditionally, these relationships were managed by the Firm’s technology function, but over time, legal operations practitioners and even fee-earning lawyers began interacting directly with vendors. Vendors often struggled to tailor their approach to different stakeholders. Their pricing, for example, could be prohibitive, or they might approach the Firm’s clients directly to influence the use of their application – an approach some within the Firm viewed as “aggressive” (INT 5). The constant influx of new digital technology and AI applications into the legal services market made it increasingly difficult for the Firm to keep pace with the latest developments too. As one interviewee reflected: “Literally every week there’s a tech coming up, right?” (INT 31).

Tensions over professional jurisdiction and autonomy

The availability and integration of digital technology and AI introduced or exacerbated tensions over professional jurisdiction and autonomy within the Firm. The partnership model afforded lawyers significant autonomy, allowing local partners to implement technology in their regions and delegate authority to junior lawyers. As one interviewee explained, “You are the lawyer in charge of this and you are basically calling the shots, obviously with partners’ supervision, but partners empower you to do so” (INT 35). However, this autonomy sometimes conflicted with the aims and objectives of technology managers or legal operations practitioners, who saw it as a source of unnecessary complexity and inefficiency.

These tensions reflected broader differences in priorities between lawyers and legal operations practitioners. Lawyers typically prioritized client service, focusing on delivering “high-quality, suitable service that’s useful to the client” (INT 41). If a technology failed to meet client needs, they were much less likely to use it. In contrast, legal operations practitioners tended to emphasize efficiency. For example, one interviewee noted that when thinking about integrating technology, they considered efficiency factors such as “who’s doing the work, does it need to be them, could it be given to someone else?” (INT 24). For instance, while a lawyer might offer clients flexibility in how they receive bills, a legal operations practitioner might streamline this process by standardizing billing options, telling clients, “You can choose option A, B, or C, but you’re not having D” (INT 52).

Digital technology and AI also altered patterns of client interaction. In the past, lawyers rarely invited others to client meetings. However, particularly with the emergence of AI and generative AI, some partners began bringing technology specialists into discussions to explore how these technologies could impact client workflows. While this practice was becoming more common, it remained the exception, as lawyers continued to control (or monopolize) client-

facing interactions. This was the case even in matters involving technology – sometimes to the frustration of legal operations practitioners.

Shifts were also evident in internal collaboration. Legal operations practitioners' initiatives often involved digital technology and AI, with progress having been made in recent years in collaborating with lawyers on process improvements. However, substantive collaboration remained limited, as many lawyers continued to work in siloed matter teams. One interviewee, who had been at the firm for years, captured this reality: "I don't think I've ever worked with our legal operations team or anyone else" (INT 37).

Organizational structuring and restructuring

Digital technology and AI were both connected to the Firm's existing organizational structures and contributed to its ongoing restructuring. A key factor influencing this process was the billable hour, which structured lawyers' time and shaped their relationship with technology. The billable hour was deeply ingrained in the Firm's business model. It was widely seen as a barrier to technology use as it did not incentivize faster, more efficient work. Lawyers were highly focused on maintaining high billable hours, knowing that senior colleagues regularly reviewed these metrics. This time-based billing created further challenges for technology integration, as lawyers often felt too busy to learn and adopt new applications. One interviewee captured this sentiment:

"Because lawyers are so busy and because there's so many technologies [...] for them to kind of, to get used to or familiar with all the different tools or technologies, it's not easy, right? Especially when you're like doing fourteen or fifteen hour days on a deal, last, they're like, "Last thing I wanna do is use another tech now"." (INT 31)

Digital technology and AI also drove ongoing organizational restructuring. The Firm created new roles for lawyers and legal operations practitioners to support the integration of these technologies into workflows. Some lawyers transitioned from fee-earning roles,

traditionally centered on billable hours and client work, to full-time technology and legal operations positions (e.g., INTs 14-17). Additionally, the Firm hired professionals with expertise in business analysis and mathematics to fill roles now requiring AI-related skills, sometimes replacing individuals without these capabilities (e.g., INTs 31 & 54).

Organizational restructuring also involved expanding technology training within existing roles. Some AI-enabled applications in particular proved difficult for lawyers to use, requiring additional support from legal operations practitioners. These practitioners provided training and practical guidance, complementing efforts by the Firm's technology function to establish a basic level of technical competence across the organization.

“Gentle nudges” as PSOM practices

“Gentle nudges” – managing operations through “subtle influences” by “guiding, nudging, and persuading” professionals (Goodale et al., 2008, p. 670; Harvey et al., 2016; Malhotra et al., 2006, p. 175) – remained a core feature of the Firm's PSOM approach. Much of the Firm's work was carried out by fee-earning lawyers working in “client-matter” teams (INT 55), typically consisting of a partner, senior and junior fee-earners, and trainees.

Often, the Firm's premise was that if these lawyers could be encouraged to adopt technology, it would become integrated into their workflows and client work. To facilitate this, the Firm used “gentle nudges” related to digital technology and AI. For instance, a partner might guide another lawyer by telling them that a client expected to see technology used on a matter. Behavioral nudges were also built into processes, such as only allowing partners to submit client expense receipts through a Firm-approved application. Persuasion was ongoing, for instance by informing lawyers that technology use would be part of their performance review. One interviewee explained what was needed for this approach to be successful: “You've got to be nice and you've got to keep being persistent, you know, reminding people that the reasons why it's good for them” (INT 40).

However, the Firm found that this “gentle nudges” approach could have particular limitations when it came to substantively integrating digital technology and AI into legal work. Convincing lawyers to use these technologies was often difficult and time-consuming, with limited success. Even when they adopted technology, the lawyers did not necessarily meaningfully integrate it into their workflows. This had led the Firm to reassess the continuing viability of this traditional approach in these circumstances. As one interviewee explained, the Firm’s strategy had been to have legal operations practitioners or technology managers “scout” for applicable technologies and then try to convince lawyers to use them, but it had found – typically the hard way – that “that usually doesn’t fly” (INT 8).

Transitioning practices: From “gentle nudges” to mainstream OM practices

Recognizing the limitations of “gentle nudges” for integrating digital technology and AI, the Firm began implementing an alternative approach. This involved developing and performing activities incorporating mainstream OM interventions (that is, “mainstream OM practices”) to supplement or replace “gentle nudges”. However, performing these mainstream OM practices generally required the lawyers’ approval (or at least their passive acceptance), for them to lessen or give up control of certain work altogether or stop performing it.

To facilitate this shift, legal operations practitioners within the Firm developed *transitioning practices* to ease moves from “gentle nudges” to mainstream OM practices. These practices sought to get lawyers’ “buy in” (INTs 6, 14, 35) with others – particularly legal operations practitioners – being involved in or taking over aspects of their work relating to digital technology and AI. The following sections detail two transitioning practices.

Transitioning practice: Legitimizing groundwork

One transitioning practice involved performing legitimizing groundwork, which included educating, convincing, and managing expectations to help lawyers become

comfortable with others being involved in or taking over aspects of their work relating to digital technology and AI.

Educating lawyers about digital technology and AI was central to this effort. This was done through technology training sessions, demos, showcases, and making materials available on the Firm's intranet. When this was effective, it raised awareness among lawyers about the various digital technology and AI applications available and encouraged them to seek further information from legal operations practitioners.

Beyond education, legal operations practitioners worked to gain legitimacy for their inclusion in client work and workflows by convincing them of their usefulness, effectively acting as "sales people" for the benefits of legal operations (INT 8). To do this, they collected successful "use cases". They then showed these to lawyers to show that the digital technology and AI applications worked and made them more efficient or effective (INT 8).

Legal operations practitioners also worked to manage lawyers' expectations as part of their legitimizing groundwork. Many lawyers, often perfectionists, had unrealistic assumptions about digital technology and AI capabilities. This issue was particularly evident with AI-enabled contract review applications, where lawyers underestimated the time and effort required to train AI models. As one interviewee explained:

"Expectation management is a key part of any training we do, yeah, not, not just the AI stuff, although that's probably the area where there's the biggest gap between what people want it to do or think it can do, and what it can actually do." (INT 25)

Transitioning practice: Building domain credibility

A second transitioning practice involved building legal operations practitioners' domain credibility among lawyers. When they were trying to get lawyers' approval to their involvement or for them to give up control of their work it was important that they had credibility, so that the lawyers saw them as the right people to involve or take on the work.

Legal practice within the Firm was shaped by what interviewees referred to as lawyers' "mindset" (INTs 14, 36, and 50). This mindset influenced how they approached their work, often focusing on transactions and getting deals done. Lawyers were typically risk-averse and resistant to change that got in the way of this – including technological change. One interviewee's short anecdote illustrates: "I remember we abolished desk phones a few years ago to great uproar and opposition" (INT 46).

To establish credibility in this context, legal operations practitioners often relied on the idea that "lawyers trust lawyers" (INT 14). Gaining trust required them to "speak the right language" (INT 9) and demonstrate an understanding of lawyers' challenges. By emphasizing shared experiences, they could show that they "get it" (INT 14). As one interviewee put it:

"Obviously you've got to be credible. You know if I didn't think that [*legal operations practitioner*] knew what she was talking about, I wouldn't listen to her, but she does.

And knowing that from four years of working with her." (INT 40)

Mainstream OM practices for integrating digital technology and artificial intelligence

Mainstream OM practices contributed to the integration of digital technology and AI into the Firm's PSOs. Three key themes emerged. First, there were a range of mainstream OM practices being used within the Firm to integrate digital technology and AI. Second, as legal operations practitioners engaged in these mainstream OM practices in the Firm's context, a key concern was buffering frontline professionals from technology and, using it, from routine low-value work. Third, another key function legal operations practitioners performed was bridging and translating across professionals and practitioners in relation to digital technology and AI. These themes are outlined below.

Mainstream OM practices

Mainstream OM practices played a key role in integrating digital technology and AI into the Firm's PSOs, following two main steps. The first involved scoping, understanding the

content of operations, specifically the Firm's work and workflows. Legal operations practitioners approached this through two methods: interaction and analysis. Interaction involved working directly with lawyers in meetings to understand what they did and why. Analysis, on the other hand, was desk-based, focusing on reviewing data and understanding matters. These methods typically involved representing the work and workflows through process mapping, where a graphical view of the current ("as-is") and proposed ("to-be") workflows was produced (INT 23). Legal operations practitioners reviewed these process maps with lawyers, doing this carefully as lawyers were often busy and did not always value the outputs. However, understanding the end-to-end process was important for legal operations practitioners determining where technology could potentially be integrated into the Firm's operations to enhance their effectiveness.

The second stage involved legal operations practitioners acting as "in-house consultants" (INT 28), proposing interventions to re-engineer workflows or improve efficiency. These interventions were often linked to "profitability" (INTs 31 & 50). They included reengineering a specific part of a process or delegating certain types of work to junior lawyers, legal operations practitioners, or technology (that is, by automating it). Legal operations practitioners designed these reengineering interventions based on work modeling, for instance running simulations on a spreadsheet to find the most efficient and effective (usually measured by profit metrics) way to do the work on a matter (e.g., What was the impact on profitability if they staffed a stage with paralegals rather than lawyers, and had a senior lawyer quality check the output? Or what if they outsourced a stage – such as due diligence – to an alternative legal services provider?) They then typically managed these interventions using project management principles tailored to the Firm's highly technical work. Once the interventions were implemented, they evaluated their performance, monitoring the impact of changes and establishing a baseline to assess improvements.

Legal operations practitioners were also involved in technology operations and management when off-the-shelf applications were deemed unsuitable. In such cases, they reviewed, built, and customized technical solutions. For example, they collaborated with the technology function to test, pilot, or develop proof-of-concept solutions, sometimes collaborating with technology vendors to build their own applications. This latter approach, for instance, led to the Firm's development of an end-to-end technology-enabled solution for corporate due diligence that included substantial document automation technology.

Buffering frontline professionals from technology and using it

As legal operations practitioners engaged in mainstream OM practices, a key concern was buffering fee-earning lawyers from technology and, by using it, shielding them from routine, low-value work. One way they achieved this was by applying their domain-specific subject matter expertise. Several non-practicing lawyers at the Firm worked as legal operations practitioners, playing a central role in preventing fee-earners from unnecessary engagement with digital technology and AI. By leveraging their experience and expertise, they minimized the need for fee-earners to be involved unless necessary, such as to gain their "buy-in" (INTs 6, 14, 35). These practitioners were often seen as "subject matter experts" (INT 30), able to use their professional judgment to evaluate the benefits of integrating digital technology and AI into client legal work, ensuring that interventions aligned with what fee-earners cared about. As one interviewee explained:

"So you know, for the lawyer it's, "How is it going to make your life better? You know. Are you going to get home earlier? Is it taking out part of the dumbness of some of the work that you do?" You know, all of that stuff." (INT 50)

In addition to helping integrate digital technology and AI without burdening fee-earners, legal operations practitioners used technology to buffer lawyers from routine, low-value work. One approach was to do this by automating documents. For instance, most of the

Firm's transaction documents were now automated, meaning lawyers no longer had to produce a "first draft" (INT 15) or "write something completely from scratch" (INT 35). Instead, they could rely on an application that generated consistent, up-to-date transaction documents (which legal operations practitioners were responsible for ensuring). This allowed lawyers to focus on providing legal advice and applying their expertise to higher-value work. This aligned with the Firm's business strategy. As one interviewee recalled a partner saying: "We want technology that supports what our goal is. We are a law firm, not a technology firm" (INT 6).

Bridging and translating across professionals and practitioners

A key function legal operations practitioners performed was bridging and translating in relation to digital technology and AI. At the center of the Firm were fee-earning lawyers, and legal operations practitioners acted as intermediaries between them and technologists, innovation specialists, and others. As one interviewee noted, "Now we've got the luxury of this amazing bridge—someone who's a superstar lawyer but is also working on innovation stuff" (INT 41). An important aspect of this bridging role was connecting "the typical software developer and our typical lawyer" (INT 21), as both groups often assumed the other had more knowledge than they did, leading to incomplete or mis-communication. Legal operations practitioners facilitated better communication by understanding both sides and helping to close these gaps.

A related function was translating regarding digital technology and AI. While bridging focused on filling knowledge gaps, translating involved "speaking the right language [...] both ways" (INT 9). For example, the Firm developed a role that combined legal transactional experience with the ability to communicate effectively with technology vendors and developers, facilitating clear two-way communication. Legal operations practitioners often interpreted technical terms for lawyers and, conversely, used technical language when

instructing technologists and innovation specialists. Their role was to “translate practice needs into [...] technology or services” (INT 8).

With that said, translation was not always required, especially when lawyers and technologists could “speak the right language” to each other directly. As one interviewee remarked, “Those are the gold dust lawyers, and the gold dust tech guys are the ones who can speak to the lawyers without a translation service” (INT 2).

PSOs’ integration of digital technology and artificial intelligence

The Firm integrated digital technology and AI into its PSOs, with four key themes emerging. First, the integration of digital technology and AI was associated with further standardization of professional processes. Second, this integration did not significantly disrupt the Firm’s ability to customize client outcomes. Third, the integration was closely tied to both the actual capabilities of the technology and what people believed it could do. Fourth, OM practices that resulted in the integration of technology and AI typically enabled more productive work within the Firm, with efficiency gains particularly evident in volume work. These themes are outlined below.

Standardization of professional processes

The integration of digital technology and AI into the Firm’s PSOs was closely tied to further standardizing professional processes. This was mainly done for routine or “commoditized” work, typically involving high-volume workflows with a high degree of similarity (INT 48). In most cases, these workflows had already been somewhat standardized, with technology then applied to enhance that standardization.

One example was due diligence. The Firm integrated an AI-enabled contract review application into this workflow because due diligence was a regular requirement in transactional matters and involved “pretty standardized” provisions (INT 38). Legal operations practitioners, such as paralegals working with legal technologists, used the AI to carry out instructions, with

lawyers reviewing the output for quality, similar to what would happen in an outsourcing scenario. The process was relatively consistent and standardized, with the AI trained to extract relevant clauses, managed by a dedicated “AI Adviser” (INTs 7, 25), and the output delivered relatively consistently to fee-earning lawyers. This was typically part of a broader workflow management initiative, with legal operations practitioners looking for other opportunities to use technology on matters where they already had their foot in the door. One interviewee explained that they might explain to the lawyers:

“If you, you know, use the AI technology over here, we can extract the data from here, and we could push it through to our document generation platform, and at the end you can sort of have a, have a contract that spits it out the other side.” (INT 23)

Legal operations practitioners also actively standardized workflows that integrated technology. For instance, with “repeat work” using the same data and outputting the same report, the workflow was developed with “very limited scope for variation” (INT 25). This reflected the practitioners’ experience in integrating technology into the Firm’s processes. As one interviewee summarized:

“To make the most out of technology, you have to have a consistent standardised process, repeatable process [...] if everyone does it differently, everyone’s gonna want that technology to do something slightly different, and it’s never quite right.” (INT 23)

Customization for client outcomes

While the integration of digital technology and AI into the Firm’s PSOs contributed to the further standardization of professional processes, it did not significantly disrupt customization for client outcomes. For example, when lawyers used the Firm’s document automation application, they still had to customize documents based on deal structures. Similarly, when partners used the Firm’s customer relationship management (CRM) application for business development, they could not provide “textbook responses” to client

requests but instead had to tailor responses to each client (INT 27). In some cases, digital technology, such as extranets, was integrated in ways that enabled more, not less, client customization. One interviewee explained:

“One of our private equity clients who has bought a number of huge loan portfolios over the years, we have our [extranet] platform established for them. There’s a paralegal who spends a lot of her time uploading documents onto the platform at their request, or adapting the documents at their request.” (INT 48)

The Firm also considered edge cases where standardized processes with integrated technology were not suitable for specific clients. Rather than drop the client, the Firm would drop the standardized process or technology. Although rare, some clients did not consent to or want a technology being used on a matter. In such situations, the Firm customized the process and outcome for the client, reverting to previous working practices that were in place before the technology became available. One interviewee recalled that they worked on a deal where “the partner really pushes to use a piece of tech and the client just ignored it [...] obviously they never logged in” (INT 40).

Technological capabilities and perceptions

The integration of digital technology and AI into the Firm’s PSOs was shaped by both the actual capabilities of the technology and the expectations surrounding it. There was a general acknowledgment that “no technology is perfect” (INT 25), with some recognizing the “technical limitations” of certain applications (INT 11) and the iterative nature of integration. However, there was a sense that the Firm preferred to “wait until the technology is absolutely perfect” before rolling it out (INT 41). This was particularly true for AI, where applications were often viewed as not quite ready, with generative AI at the time still seen on the legal practice side as a “gimmick” (INT 34). As one interviewee explained: “If the technology is perfect for the use case, then it’s easy to implement, but if there are doubts, it tends to get shut

down quickly” (INT 32). In an environment where no technology was perfect, this often led to predictable results.

Despite these challenges, the Firm was extensively engaging with AI, including both extractive and generative applications. At the time of the research, only extractive AI applications, such as the Firm’s AI-enabled contract review application, had been integrated into its operations. Generative AI was still in the exploratory phase, with legal operations practitioners performing testing and leading pilots. From this engagement, the Firm gained insights into what AI could and could not do and how to manage its integration into legal work. As one interviewee explained:

“Artificial intelligence isn’t self-explanatory; it isn’t something where you can just give a bunch of lawyers access and then they will work it out and run with it. It’s something where you need to have people on the ground to, yeah, help our lawyers and set up technologies in the right way for the specific matters [*and*] manage technologies.” (INT 21)

Alongside AI, the Firm’s relationship with data was also evolving. For example, the AI-enabled contract review application needed to be trained using existing contract data. Efforts were made to ensure this data was accessible and curated, including manually maintaining a database of past transactions and implementing machine learning for document classification in its knowledge management system. This focus on data extended beyond AI, driven by a managing partner who viewed “data as very much a central point into how to run the business” (INT 20). One interviewee described other uses of data:

“There’s analytics around things like matter profitability that can then feed back into estimating which business you go after. And there’s things around lawyer busyness [...] So there’s other stuff you can do with data, rather than just the ML side of it.” (INT 12)

However, there was a sense among the Firm’s junior lawyers that emerging technology was not yet that important to their day-to-day client work. Some were surprised that digital technology and AI had not been as transformative as they had expected before joining the Firm. While they acknowledged that technology could make processes “faster, more efficient” (INT 47), they felt it was often more of a nice-to-have rather than essential to their workflows. As one interviewee summarized: “I have never seen another law firm use technology where I have thought, “That's a competitive advantage. We need that.”” (INT 37).

Technology’s outcomes for PSF’s efficiency and productivity

There was a clear appreciation that the “fluent use” of technology could enhance productivity within the Firm (INT 24), helping people complete their work more quickly and consistently. Efficiency gains were particularly evident when technology and AI were integrated into volume work. However, for more one-off tasks, it remained difficult to standardize processes enough to make integrating technology and AI worthwhile.

One issue was the presence of informal standards among the Firm’s fee-earning lawyers, with different groups consistently performing their work in distinct ways. As one interviewee explained, “If I get onto a new deal, I will just do it the same way I’ve done it before which will just be like the standard way that I’ve been taught” (INT 33). This lack of uniformity made it difficult to agree on a single standard process into which to integrate technology and AI. Time remained a significant barrier to fee-earning lawyers’ technology use too, limiting both their training and adoption.

The nature of the Firm’s work also posed challenges. Integrating digital technology and AI into somewhat standardized processes became difficult when the Firm prioritized high-value, one-off transactions over routine work. As one interviewee noted about a lot of the Firm’s matters, “We can’t standardize our process and just churn them out” (INT 23). This surfaced particularly in opposition to process mapping. One interviewee reflected:

“People don’t want to think the work they do is commoditised, if we have work that’s so standard to the point it can be mapped in that way, it’s probably not the kind of thing we should be working on, because we don’t do commoditising, what we do is highly bespoke, right?” (INT 11).

DISCUSSION AND CONCLUSIONS

Digital technology and AI can shape operational dynamics but only successfully if organizations go beyond mere adoption and accompany them with transformational ongoing processes (Angelopoulos et al., 2023), integrating them into their everyday work and workflows. In professional services, the integration of digital technology holds particular interest due to its potential to transform operations and its implications for technology and operations management. This is especially true as AI-based technologies increasingly take on core professional work (Spring et al., 2022). While the operations management literature has begun to address this, there is a lack of primary empirical research on how OM practices develop to integrate digital technology and AI in professional services.

This study demonstrates that OM practices are developing within PSFs alongside the integration of digital technology and AI, supported by transitioning practices that facilitate a shift from “gentle nudges” to mainstream OM practices. The findings reveal how PSFs bring together legal operations practitioners, fee-earning lawyers, and others in business services to work with digital technology and AI, aiming to enhance productivity, efficiency, and service delivery. These insights contribute to the understanding of technology and operations management in the underexplored context of digital technology and AI in professional services. Additionally, this study shifts the focus from frontline professionals, such as fee-earning lawyers, to include operations-oriented actors like legal operations practitioners. It emphasizes the operational work practices of these practitioners and their collaboration and cooperation

with professionals and technologies, offering a more nuanced understanding of the OM practices developing within PSFs in the context of digital technology and AI integration.

In the following sections, I present a process model theorizing the development of OM practices for integrating technology and AI in PSFs, followed by a discussion of the findings and theory across the phases of the model: PSFs' organizational context, PSOM and transitioning practices, and PSOs integrating technology and AI.

Process model: PSFs' development of OM practices to integrate technology and AI

A process model derives from the second-order themes and aggregate dimensions, structured into three phases. Phase one addresses the organizational context of PSFs. Here, factors such as technology-related environmental context, contested professional jurisdiction and autonomy, and organizational structuring and restructuring shape the evolving context in which OM practices for integrating digital technology and AI develop. These elements create a dynamic operational environment that influences firms' efforts to integrate technology and AI into their PSOs.

Phase two covers the active development of PSOM practices and transitioning practices for integrating digital technology and AI. PSFs' default PSOM approach involves practices constituting "gentle nudges", which focus on persuading professionals to adopt and use digital technology and AI in their workflows. However, this approach has limitations, including slow adoption and limited effectiveness. To overcome these, PSFs' operations managers and practitioners develop and perform mainstream OM practices. These practices enable integration in two ways: first, by translating and bridging across professionals, technologists, and operations practitioners to fill knowledge gaps and facilitate communication between them; and second, by buffering frontline professionals from routine, low-value work by operations practitioners taking on work such as implementing and using technology themselves. For mainstream OM practices to succeed, operations practitioners must gain

professionals' approval (or at least acceptance) and encourage them to give up control over certain aspects of their work. To achieve this, they engage in transitioning practices, such as legitimizing groundwork (educating, convincing, and managing expectations) and building domain credibility (demonstrating understanding of professional workflows and preferences).

Phase three focuses on the integration of digital technology and AI into PSOs within the situated context of PSFs and their PSOM and transitioning practices. Technology is primarily integrated into workflows that are on the path to standardization, further enhancing the efficiency of these processes. At the same time, the integration of technology is performed so that it does not disrupt the customization required for client outcomes. However, the outcomes are shaped by the affordances of digital technology and AI, with technical or cognitive limitations creating particular challenges. These factors influence productivity, with gains seen when standardization, customization, and technological affordances align, but with less certainty otherwise. The outcomes of this integration process then feed back into the development process iteratively, shaping future activities.

The specific operational mechanisms – how PSFs move from “gentle nudges” to more mainstream OM practices – is not well covered in the literature. Research often addresses the outcome of technology adoption (e.g., increased efficiency, changes in professional work) (Mukherjee and Sinha, 2020; Sampson and Pires dos Santos, 2023; Spring et al., 2022), but not necessarily the step-by-step processes and practices of integration at an operational level (Amaya and Holweg, 2024). This process model makes such a contribution, inductively derived and theorizing how PSFs develop OM practices to integrate digital technology and AI into their PSOs.

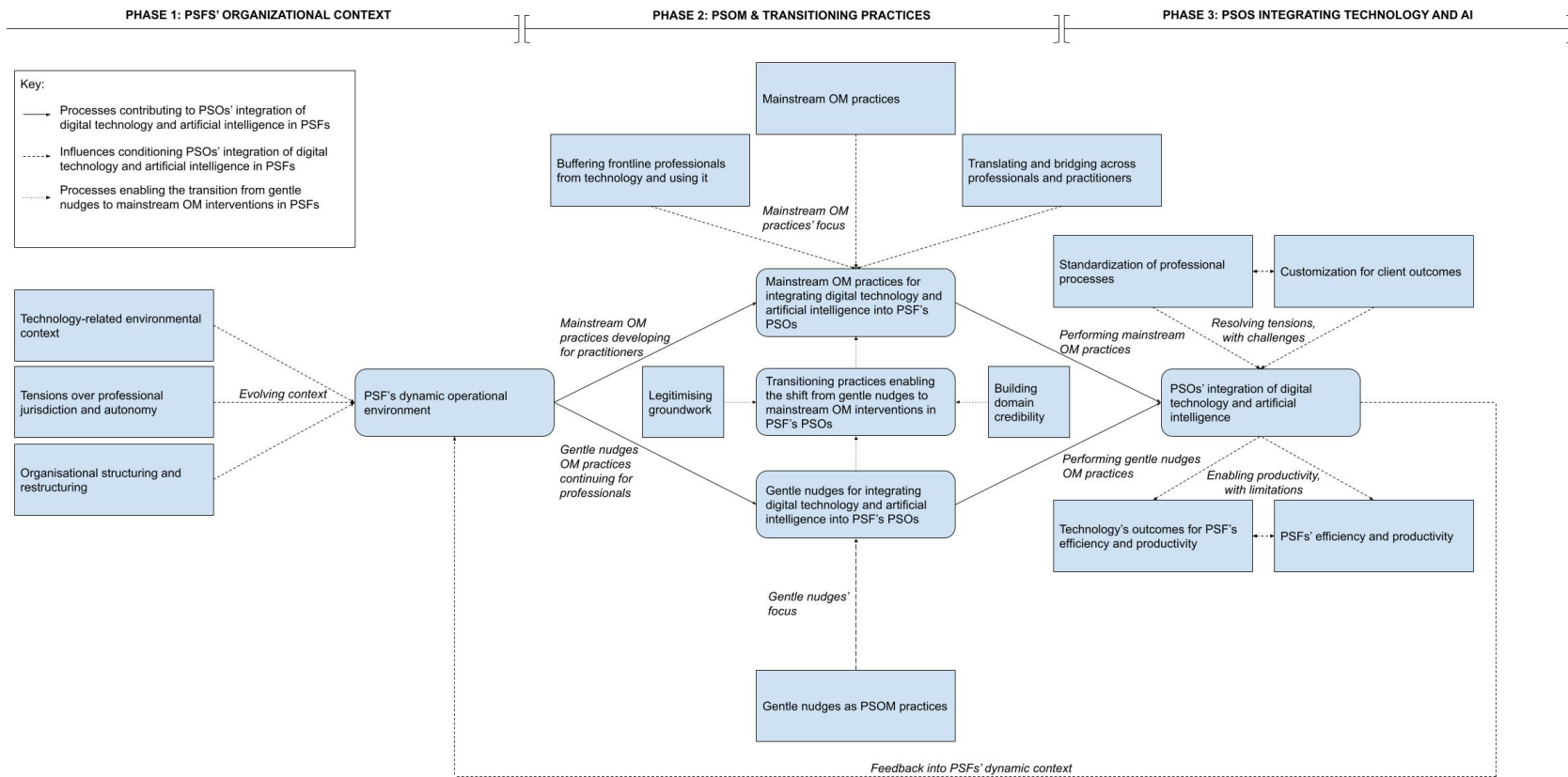


Figure 2 - Process model: PSFs' development of OM practices to integrate technology and AI

PSFs' organizational context

Managing uncertainty in the environment and a firm's technology is a core challenge in operations management (Thompson, 1967). My findings reflect participants' views on the increasing environmental uncertainty and the role of digital technology and AI. For example, service organizations must consider both client needs and the tangible benefits of technology to justify its implementation (Haynes and Thies, 1991), with clients' distinct needs posing difficulties for service providers (Rosenzweig et al., 2024), and the rate of technology advancement limiting workforce knowledge (Gaimon et al., 2011). In my study, managing environmental and technological uncertainty was ever-present. The Firm might struggle to address client needs effectively, as clients often sent mixed signals: some encouraged the use of technology for efficiency and effectiveness, while others expressed concerns about its impact. The Firm also faced challenges in realizing the tangible benefits of digital technology and AI, lacking clarity on what constituted good client service when these technologies were integrated into its operations. For example, clients were sometimes asked to provide more data, use new platforms, or receive legal advice in new formats, which they did not always appreciate or value. This made uncertainty in its environment and technology a real challenge for the Firm.

Despite this uncertainty, the Firm's core legal service delivery remained relatively undisrupted. This suggests that the development of OM practices helped buffer the production core from environmental and technological uncertainty (Thompson, 1967). This highlights an important consideration when intervening in existing professional services operations: the need to develop OM practices that mitigate the risk of introducing uncertainty into core operations. While offloading tasks can lower costs without compromising quality (Sampson and Pires dos Santos, 2023), this approach may not fully address the broader uncertainties faced by PSFs without OM practices to buffer the production core. This aligns with Birkinshaw and

Lancefield's (2023) findings that PSFs are adopting a dual strategy: building alternative service capacities while reinforcing their traditional strengths in addressing client challenges.

Angelopoulos and colleagues (2023) emphasize that successful organizations complement technology adoption with transformational changes, including restructuring operations processes, collaborative operational improvements, and business model innovation. While the findings show evidence of restructuring operations processes and collaborative operational improvements, there is little indication of substantive business model innovation beyond new service delivery (Menor et al., 2002; Spring et al., 2022). This aligns with trends in PSFs, where traditional advisory business models may persist, as outlined by Armour and Sako (2020), alongside emerging models organized around operations and technology. The findings suggest that PSFs such as large UK-based law firms continue to adhere predominantly to the traditional advisory model, which provides significant human capital benefits (Armour et al., 2022). Many interviewees highlighted challenges posed by time-based incentive structures (e.g., billable hours, utilization rates), reinforcing the continued importance of the partnership model in professional service operations (Lewis and Brown, 2012).

However, the findings also suggest significant flux within the partnership model. New roles are emerging in operations and business services, while existing roles are evolving to accommodate digital technology and AI, with professionals shaping and adapting to these changes (Armour et al., 2022; Faulconbridge et al., 2023; Kronblad and Jensen, 2023). These shifts represent efforts by PSFs, including their operations practitioners and managers, to promote the integration of technology and AI by restructuring processes and facilitating collaborative improvements within the constraints of their existing business model.

PSOM and transitioning practices

Harvey and colleagues (2016, p. 4) conclude that "Much has been said about the 'gentle nudges' that typically constitute PSOM, but [...] this may be too convenient a response". This

study's findings align with this view. While “gentle nudges” may be necessary for explaining PSOM in PSFs, they are not sufficient. “Gentle nudges” are light-touch efforts to introduce change without confronting autonomous professionals too directly (Goodale et al., 2008; Malhotra et al., 2006; von Nordenflycht, 2010). These traditional PSOM practices focus on easing professionals into integrating digital technology and AI by emphasizing benefits like saving them time or improving their efficiency. The flaw is that effectively integrating digital technology and AI involves challenging the core of professional work: automating expertise, standardising activities, and shifting control and performance of workflows, often in ways opaque to practicing professionals (Amaya and Holweg, 2024; Angelopoulos et al., 2023; Sampson and Pires dos Santos, 2023; Spring et al., 2022). This means that in the face of traditional “gentle nudges”, most professionals will not bother to change, comfortable with their current methods, and those who do may do so slowly, incrementally, and sometimes ineffectively.

When “gentle nudges” do not get PSFs their desired results in terms of integrating digital technology and AI into their operations, developing and performing more mainstream OM practices is a logical next step. My findings show legal operations practitioners engaging in structured, formalized activities familiar to any operations manager, such as process-mapping and work modelling (Browning, 2010, 2020; Huising, 2019), project management (Bendoly and Swink, 2007; Pal et al., 2024), and performance evaluation (Koufteros et al., 2014). These practices allow operations practitioners to advise professionals and provide OM interventions to solve to their operational problems, recognizing that integrating digital technology and AI may require systemic changes in how work is performed, organized, and measured. In solving these problems on this basis, operations practitioners integrate digital technology and AI to automate tasks, outsource work to remote professionals, and delegate low-value tasks to semi-professionals (Sampson and Pires dos Santos, 2023). They also act as

buffers, shielding professionals from the minutiae of technology and tedium of routine work (Spring et al., 2022), while serving as bridges or translators to facilitate enhanced communication and action (Pemer, 2021). These developments were not achieved by the strategic introduction of simple rules but instead by practitioners assessing “the forces at work at the various interfaces [...] [*and*] leverage points where the right pressure, adroitly applied at the right time and place, could bring about desired change” (Harvey et al., 2016, p. 7). The desired change is integrating digital technology and AI into professional work and workflows to improve speed, cost, quality, and efficiency, and so to enhance productivity; recognizable, possible, and desirable OM outcomes (Holweg et al., 2018; Lawrence et al., 2016; Schmenner, 2004).

However, while mainstream OM practices – automating expertise, standardising activities, reengineering control and performance of workflows, and managing opacity, using repeatable, scalable processes, and so on (Amaya and Holweg, 2024; Sampson and Pires dos Santos, 2023; Spring et al., 2022) – are typically more effective than “gentle nudges” for effectively integrating digital technology and AI into professional work, they need professional buy-in to design, perform, and avoid resistance (Malhotra et al., 2021) because these more standardized processes often go against professionals’ control over their work and preferences for client customization (Empson et al., 2015; Løwendahl, 2005; von Nordenflycht, 2010). To navigate the transition from “gentle nudges” to mainstream OM practices, PSFs’ operations practitioners are developing and performing transitioning practices. In particular, operations practitioners need legitimacy and domain credibility. In my study, for example, lawyers tended to interact more effectively with those with recognized domain expertise, so legal operations practitioners had to build credibility through activities like educating lawyers about emerging technologies, managing expectations, and aligning technology with their needs. Legal operations practitioners acted as “sales people” (INT 11), advocating for legal operations

practices, whether with lawyers, PSFs' managers, or others in business services. These activities, influential to overcome challenges, align with emerging findings elsewhere on intraprofessional segmentation (Koljonen and Chan, 2024; Scarbrough et al., 2024) and how team learning can support technology implementation in professional services (Stevens and van Schaik, 2020).

So, applying this logic beyond large UK-based law firms, “gentle nudges” in PSFs should not be seen as adequate replacements for mainstream OM practices when it comes to integrating digital technology and AI. While “gentle nudges” remain a core feature of PSFs' general PSOM approach, they have limitations – particularly regarding speed and effectiveness – when it comes to integrating digital technology and AI. Instead, mainstream OM practices play an important role in facilitating this integration into firms' PSOs. This implies that the theoretical and practical focus of OM in professional services should not be solely on the adoption of digital technology and AI, but also on how OM and transitioning practices develop and their titration to integrate these technologies into PSFs' work and workflows.

PSOs integrating technology and AI

The core process of delivering professional services can be conceptualized using Abbott's (1988) sequential model, which includes diagnosis, inference, and treatment stages (Harvey et al., 2016; Spring et al., 2022). My findings suggest that subject matter expertise remains a key differentiator for successful professionals effectively performing this process, as highlighted in the traditional PSF literature (Løwendahl, 2005; Maister, 1993; Maister et al., 2000). Professionals' knowledge, expertise, client contacts, and judgment remain critical to their status and rewards, reflecting their ability to navigate the diagnosis, inference, and treatment processes for their clients.

The integration of digital technology and AI directly and indirectly affects the core process of delivering professional services in PSFs, influencing both the scope and nature of

the services they offer (Sako, 2024; Spring et al., 2022). My findings highlight legal operations practitioners and technology managers playing integral roles in technology integration, but they typically lack the subject matter expertise of fee-earning lawyers, except for those with a recent legal background. These practitioners and managers approach technology with their own expertise and values, often focusing on efficiency (e.g., speed and cost). This can be problematic, as managers who prefer efficiency are more likely to exercise an autocratic management style, ignoring preferences of their team members (Kocher et al., 2013), which clashes with autonomous professionals. They also do not always share this efficiency focus or methods for achieving it with fee-earning lawyers, whether for hierarchy (Senot et al., 2016) or other reasons. As one participant noted: “that’s our job, you know, just to have that lean side of things and we deliver it to them; they don’t necessarily need to know about the methodology” (INT 33). This reflects a divide in knowledge between lawyers, who focus on normative, client work, and operations practitioners and managers, whose expertise may be technical or syncretic (Spring et al., 2022).

This divide also raises the question of why fee-earning lawyers do not engage with methodologies like lean, which have been shown to enhance performance in knowledge work (Staats et al., 2011). There is a long-standing stream of research literature, including in operations management research (Harvey, 1992), dealing with how practicing professionals may have different values (Schön, 1983), make different judgements (Dawes et al., 1989), be competent in different ways (Sandberg and Pinnington, 2009), or have different logics (Sandberg and Tsoukas, 2011) from others, including semi-professionals (Fang et al., 2023) or managers (Andersson and Liff, 2018). My findings fit with theory in this tradition. Legal operations practitioners often faced the challenge of reconciling fee-earning lawyers’ focus on customizing legal advice to individual clients – strengthening relationships by tailoring services to client needs – with desires for standardization. To manage these competing

priorities, legal operations practitioners developed routines and practices that addressed conundrums (Spee et al., 2016) and paradoxes (Smith and Lewis, 2011), particularly those arising from digital technology (Gilbert and Finch, 1985) and AI (Raisch and Krakowski, 2021). By doing so, they could enable PSFs to achieve a more consistent and efficient workflow, enhancing productivity (Schmenner, 2004).

Implications for PSF managers

For PSF managers, this research shows that mainstream OM practices – such as process mapping, work modeling, project management, and performance evaluation – can be successfully implemented in high-end professional services. However, for these practices to succeed, operations practitioners must perform legitimizing groundwork and build credibility. Managers who overlook the importance of these foundational efforts are unlikely to achieve success in developing such OM practices. Credibility, particularly with professionals, is a critical concern for operations practitioners. PSF managers should consider this across personnel management processes, from hiring and training to promotion. For instance, PSF managers could focus on recruiting operations practitioners with both technical and professional expertise, offering targeted training in both technology and professional workflows and terminology, and ensuring that operations practitioners are visibly involved in the appropriate client interactions. Additionally, the expected returns on standard OM objectives, such as quality, speed, cost, and efficiency, must be tailored to the specific context in which digital technology and AI are integrated, and can be very difficult to measure in a complex professional environment. PSF managers would do well, therefore, to deepen their understanding of their firms' specific work context and its potential implications for their firms' efficient and effective delivery of professional services when integrating digital technology and AI into their operations.

Firm leadership, particularly partners, should also encourage direct (i.e. by professionals) or indirect (i.e. by operations practitioners) technology adoption – of the type they desire – by setting clear expectations, adjusting incentive structures (e.g., billable hours), and integrating operations professionals into decision-making processes. Visible leadership support for operational changes will also be important for navigating technology integration and ensuring its long-term success.

Limitations and further research directions

There are, of course, limitations to this study and its findings. My research setting was a large law firm in the UK, so I expect the findings to be most applicable to similar organizations, such as what von Nordenflycht (2010) called “Classic PSFs”, including accounting, architecture, and law firms, which share distinctive characteristic, most notably high human capital (or low capital intensity), and have similar organizational responses. My findings and theory are potentially applicable to other types of PSFs as well, on a spectrum depending on their nature and levels of professional autonomy, customization of client services, and knowledge-intensive work, which contribute to the dynamic development of OM practices for integrating digital technology and AI that I theorize. However, given the methods and case study approach used, which has strong internal validity but can be limited in external validity (Eisenhardt, 1989), I cannot definitively say whether the development of OM practices for integrating digital technology and AI is generally applicable beyond my focal firm. Although I mitigated this limitation for large UK-based law firms by socializing my emerging findings with others throughout the research process, theory suggests that emerging technologies are likely to have heterogeneous impacts on different professions and, by extension, their client services and organizations (Sampson, 2018). Despite these limitations, I believe the study is robust and adheres to common practices for ensuring academic validity.

Future research could examine the development of OM practices to integrate digital technology and AI in other categories of PSFs, including what von Nordenflycht (2010) calls “Neo-PSFs”, such as management consultancies. Research could also develop a typology or taxonomy of OM and transitioning practices for integrating digital technology and AI into professional services, outlining their various implications for technology and operations management. This study’s findings also show that technological affordances are consequential for developing operations management practices and PSO’s integration of digital technology and AI. However, we do not yet understand how these might change with emerging technologies such as LLMs, with generative AI already shown to be impactful in adjacent operational scenarios such as additive manufacturing (Bendoly et al., 2024). This research also only represents a step towards identifying specific developing operations management practices in PSFs to integrate digital technology and AI but it does not extensively explore their impact for firms’ operational performance, an adjacent central concern of operations management (Bromiley and Rau, 2016). Future studies could examine how these operations management practices moderate digital technology and AI’s return on investment. This might build on previous research findings that technology which becomes a part of the professional services production process is associated with productivity improvements, while that which merely documents or collects information is not (Boone and Ganeshan, 2001), that indicate that enhanced knowledge management processes in adjacent operations processes lead to improved operational and organizational performance (Fugate et al., 2009), and that professional involvement in PSF’s operations management can increase wage bills (Abdulsalam et al., 2018). Yet, this should be approached with caution, as this study shows that OM practices do more than integrate digital technology and AI – they also manage broader technology-related environmental uncertainty in delivering core professional services. Accordingly, future research could focus on developing more suitable measures to assess the

impact of OM practices for integrating digital technology and AI on firms' operational performance.

Conclusion

This study shows how OM practices facilitate technology integration within PSFs, reframing PSOM as a blend of “gentle nudges” and mainstream OM practices and explaining the transitioning practices involved in moving from the traditional mode to an emerging one. The research advances theory by demonstrating the developing role of OM practices in integrating technology and AI within PSFs, enabling them to enhance their productivity and efficiency by standardizing operational processes for a more swift, even flow. In addition to its theoretical contributions, it also highlights practical implications for PSF managers, showing how mainstream OM practices – such as process mapping, work modeling, project management, and performance evaluation – can be effectively implemented in professional services to facilitate technology integration.

APPENDIX 1 – INTERVIEWS

Interviewee Identifier	Function Area	Practice Area	Participant Background	Format	Interview Date	Length (Mins)
INT1	Legal Operations	N/A	Other professional (consulting)	In-person	06/10/2022	15
INT2	Practice (<i>Other</i>)	N/A	Legal (lawyer)	In-person	06/10/2022	36
INT3	Technology	N/A	IT professional	In-person	06/10/2022	45
INT4	Technology	N/A	IT professional	In-person	07/10/2022	36
INT5	Legal Operations	N/A	IT professional	In-person	07/10/2022	47
INT6*	Legal Operations	N/A	Legal professional (non-lawyer)	In-person	07/10/2022	49
INT7*	Legal Operations	N/A	Legal professional (non-lawyer)	In-person	07/10/2022	(jointly with INT6)
INT8	Legal Operations	N/A	Business professional	MS Teams (on-site)	12/10/2022	24
INT9	Legal Operations	N/A	Legal professional (lawyer)	In-person	12/10/2022	27
INT10**	Technology	N/A	IT professional	MS Teams (on-site)	12/10/2022 & 19/06/2023	30 & 28
INT11	Legal Operations	N/A	Legal professional (non-lawyer)	In-person	12/10/2022	47
INT12	Technology	N/A	IT professional	MS Teams (on-site)	13/10/2022	32
INT13	Technology	N/A	Legal professional (lawyer)	In-person	20/10/2022	20
INT14	Legal Operations	<i>Other</i>	Legal professional (lawyer)	MS Teams (on-site)	20/10/2022	22
INT15	Legal Operations	Corporate	Legal professional (lawyer)	In-person	20/10/2022	28
INT16	Legal Operations	Capital Markets	Legal professional (lawyer)	MS Teams (on-site)	20/10/2022	41
INT17	Legal Operations	N/A	Legal professional (non-lawyer)	MS Teams	22/11/2022	23
INT18	Legal Operations	N/A	Legal professional (non-lawyer)	MS Teams	22/11/2022	25
INT19	Legal Operations	N/A	Legal professional (non-lawyer)	MS Teams	22/11/2022	27
INT20	Legal Operations	N/A	Business professional	MS Teams	22/11/2022	30
INT21	Legal Operations	N/A	Business professional	MS Teams	24/11/2022	24
INT22	Legal Operations	N/A	IT professional	MS Teams	24/11/2022	30
INT23	Legal Operations	N/A	Legal professional (non-lawyer)	MS Teams	24/11/2022	32
INT24	Practice	Capital Markets	Legal professional (lawyer)	MS Teams	06/12/2022	44
INT25	Legal Operations	N/A	Legal professional (non-lawyer)	MS Teams	06/12/2022	42
INT26	Legal Operations	N/A	Legal professional (lawyer)	MS Teams	06/12/2022	43

INT27	Legal Operations	N/A	Other professional (marketing)	MS Teams	08/12/2022	27
INT28	Legal Operations	N/A	Other professional (consulting)	MS Teams	08/12/2022	44
INT29	Technology	N/A	IT professional	MS Teams	14/12/2022	28
INT30	Technology	N/A	Other professional (consulting)	MS Teams	14/02/2023	37
INT31	Legal Operations	N/A	Other professional (consulting)	MS Teams	14/02/2023	38
INT32	Legal Operations	N/A	Business professional	MS Teams	22/02/2023	42
INT33	Practice	Corporate	Legal professional (lawyer)	MS Teams	10/03/2023	39
INT34	Practice	Corporate	Legal professional (lawyer)	In-person	20/03/2023	56
INT35	Practice	Corporate	Legal professional (lawyer)	MS Teams (on-site)	20/03/2023	43
INT36	Practice	Corporate	Legal professional (lawyer)	In-person	20/03/2023	43
INT37	Practice	Corporate	Legal professional (lawyer)	MS Teams	21/03/2023	44
INT38	Practice	Corporate	Legal professional (lawyer)	MS Teams	22/03/2023	46
INT39	Legal Operations	Corporate	Legal professional (lawyer)	MS Teams	27/03/2023	28
INT40	Practice	Capital Markets	Legal professional (lawyer)	MS Teams	05/04/2023	33
INT41	Practice	Capital Markets	Legal professional (lawyer)	MS Teams	11/04/2023	53
INT42	Practice	Capital Markets	Legal professional (lawyer)	MS Teams	11/04/2023	41
INT43	Practice	Corporate	Legal professional (lawyer)	MS Teams	11/04/2023	40
INT44	Practice	Capital Markets	Legal professional (lawyer)	MS Teams	11/04/2023	41
INT45	Practice	Capital Markets	Legal professional (lawyer)	MS Teams	12/04/2023	36
INT46	Practice	Capital Markets	Legal professional (lawyer)	MS Teams	12/04/2023	43
INT47	Practice	Capital Markets	Legal professional (lawyer)	MS Teams	13/04/2023	44
INT48	Practice	Capital Markets	Legal professional (lawyer)	MS Teams	13/04/2023	44
INT49	Practice	Corporate	Legal professional (lawyer)	MS Teams	18/04/2023	43
INT50	Legal Operations	N/A	Legal professional (non-lawyer)	MS Teams	22/02/2023	43
INT51	Practice	Capital Markets	Legal professional (lawyer)	MS Teams	24/04/2023	45
INT52	Practice	Corporate	Legal professional (lawyer)	MS Teams	25/04/2023	42
INT53	Practice (<i>Other</i>)	N/A	Legal professional (lawyer)	MS Teams	12/06/2023	23
INT54	Technology	N/A	IT professional	MS Teams	28/11/2023	54
INT55	Technology	N/A	IT professional	MS Teams	28/11/2023	55
INT56	Technology	N/A	IT professional	MS Teams	05/12/2023	55

* Interviewee 6 and Interviewee 7 were interviewed jointly. / ** Interviewee 10 was interviewed twice.

APPENDIX 2 – FIRST-ORDER CONCEPTS AND REPRESENTATIVE DATA

First-order concept	Representative data coded to it
Clients' ambivalence about using technology	"... it really comes down to the client's preference about which direction they want the work to be done. I think sometimes clients don't trust tech or don't trust like LPOs." (INT 7)
Velocity/speed: increasing for technology evolution	"I think tech is develop, is developing at a faster pace than ever before than I've seen it. So I'm fifty-six now, I've been working since I was eighteen and I've never seen an increment in, in the way tech is moving and being developed (INT 4)
Changing relationships with technology vendors	"I have directly worked with vendors who have approached us because one of our platinum clients has come to us and gone, "You need to speak to them 'cause they've come and showed us this tool and shown us as an in-house counsel what it can save us, we're not gonna work with you until you've, start using that tool."" (INT 5)
Partnership gives lawyers autonomy within firm	"I think, giving associates as much autonomy or at least as much, you know, empowerment to think, oh, you are, you are a lawyer but you are the lawyer in charge of this and you are basically calling the shots, obviously with partners' supervision, but partners empower you to do so." (INT 35)
Lawyers: technology for client service	"...if it doesn't work for the partner or it doesn't work for the bottom line, it doesn't work for the client, you're just not going to do it. So you have all the intention, all the good intentions in the world, but you know, if the client says no, the partner says no, then that's that." (INT 40)
Legal operations: technology for efficiency	"So, you know, the people is another big angle of what we look at, who's doing the work, does it need to be them, could it be given to someone else. Does it make that more efficient, does it give them learning opportunities, does it drive down the cost? You know, what's the, what's the benefit we're seeing there?" (INT 24)
Client contact between lawyers and others	"Or you know, AI and generative AI, to be able to talk them through what we think the impact will be on what they do. And clients often rely on the fact that we're seeing lots of other clients and what they're doing and able to give them a bit of a steer on that. So that's where I think putting the real experts in front of our clients, rather than us as lawyers mangling it in the middle, is a really good thing to do." (INT 48)
Siloed working remains	"I don't think I've ever... I don't think I've ever worked with our, yeah, I don't think I've ever worked with our legal operations team or anyone else." (INT 37)
Lawyers' billable hours structure their time	"I think that the sort of billable hour model for a law firm, like obviously doesn't incentivise like speeding things up..." (INT 49)
Creating new roles for lawyers / legal operations	"...it's a role that is not a surprising role. But back when we started, we didn't know that this is something you could have someone just focusing on that full time." (INT 41)
Hiring new people into existing roles	"On paper it's the same role. But you know, the person who left was somebody who had been working on essentially a data and quality assurance team who, you know, because of other changes in the organisation, ended up the like advisor, they worked their way up

First-order concept	Representative data coded to it
	slightly, basically. When he left, brought in somebody externally, it was a chance to get someone with a bit more technical experience. Someone not with a specific AI background [...] but what we do have is someone with a business analysis background and a maths background.” (INT 11)
Lawyers / legal operations: learning new skills	“I think that some of this new technology is a bit harder to use and that's why we have people like [name], you know, to show us how to use it and give them tips and tricks ...” (INT 40)
Scoping by interaction, analysis & representation	“‘Cause you know, here, here, I’m scoping, I’m saying the gearing’s not great but we map, when we understand the process, there’s clearly stuff that we should be doing to push work down, right. To improve gearing. So at the, when I’m doing this data analysis I’m kind of forming a bit of a scope I suppose.” (INT 31)
Consulting, advising & acting based on competencies	“I think you can say that it’s basically in-house consulting, in a way, obviously depending on the different role within legal operations. But more or less, I would say it’s, it’s an advisory role for sure, yeah.” (INT 28)
Reviewing, building, and customising technical solutions	“So we have licensed parts of it and then we started looking into it and writing customisation for what we needed the tool to do, and working then close with the company to customise it for our needs.” (INT 26)
Applying subject matter expertise	“I see the [Technology] lawyers as the subject matter experts because the [Technology] lawyers in our teams, they’re not like brand new lawyers, they’ve practised in the practice, whatever practice group that we’re trying to do this project for, they’re usually the [Technology] lawyers for that practice group so they’re SMEs.” (INT 30)
Evaluating potential benefits	“So you know, for the lawyer it’s, “How is it going to make your life better? You know. Are you going to get home earlier? Is it taking out part of the dumbness of some of the work that you do?” You know, all of that stuff.” (INT 50)
Using technology to automate repetitive work	“Document automation, yeah, so we’ve got our knowledge lawyers will sort of work with that. And yes, for most of our transaction documents are automated now.” (INT 34)
Enabling lawyers to focus on legal advice	“...what makes a partner special is their knowledge and expertise and who they know. And I, personally I’m not sure, has that really changed over the years because that, that’s what makes them the partner, right.” (INT 5)
“Bridging” between lawyers and others	“But now we’ve got the luxury of this, you know, amazing bridge, which is like someone who’s a superstar lawyer, but is also working on innovation stuff. And we’re still, you know, kind of finding the best way to integrate all of these different teams, because it’s all new for all of us.” (INT 41)
“Translating” between lawyers and others	“So I think in reality you always need, I believe you... the most efficient way is to have someone in between, so to translate between both worlds.” (INT 21)
Building nudges into technology processes	“one of the key changes we made on that front is for people to submit their expenses claim, they have to have filed in [the CRM

First-order concept	Representative data coded to it
	<i>application</i>] the details of the lunch, coffee, whatever that they had and who they had it with.” (INT 48)
Trying to convince lawyers to use technology difficult and time consuming	“...there’s plenty of other sort of use cases where we can show that tools work and make you more efficient. But still it’s very difficult and time consuming to convince teams, practices, partners, matter managers, to, to trial tools.” (INT 8)
Others convincing lawyers to use technology not that successful	“We’ve tried it differently with sort of technologies, scouting, and sort of... kind of scouting. Scouting was out there, but then you have to convince afterwards, the practice, that’s a good thing, and that, that usually doesn’t fly.” (INT 8)
Educating on technology and AI	“So, I mean, we try and do as much education as we can before they actually reach out to us, you know. We have training sessions, we have demos and showcases, we make material available on our firm’s intranet. So, we want people to be broadly aware of the sorts of tools that we have, and then come to us for specifics.” (INT 25)
Convincing and selling legal operations internally	“The [<i>Technology</i>] lawyers in a way are sales people for legal ops more generally. So you know, I in corporate used to get called in on not every matter, but some big matters that the partner knew me, he trusted me.” (INT 9)
Legal operations managing lawyers’ expectations	“Well, the, the biggest, yeah, the, the biggest challenge is that the, the customers, in this case the lawyers, they don’t want iterative delivery, they want, they want nothing until it’s perfect.” (INT 10)
Professional practice conditions lawyers’ “mindset”	“So, it is, it is tough, but again, it’s trying to get into a lawyer’s mindset, that something doesn’t have to be a hundred percent right, if you can get some benefits out of something being eighty percent of the way there, and then you have to do the last twenty percent yourself, I mean, there’s, there’s still some good gains to be had from that.” (INT 23)
“Lawyers trust lawyers”: establishing credibility	“I think unfortunately that does make a difference. And it’s something I’ve always been uncomfortable with in law firms is that, you know, lawyers trust lawyers. And so I do think there is a credibility aspect to that, that when they talk about this process, for example in conversation I have undertaken that horrible process myself and I do get it.” (INT 14)
Integrating technology and AI for routine work	“...we have this thing called [<i>AI-enabled contract review application</i>] which sort of looks through documents, and, and helps you in document review. So I think it’s useful for things like change of control clauses which are like pretty standardised or assignment provisions, exclusivity provisions, things like that.” (INT 38)
Standardising workflows using technology	“I think, you know, to make the most out of technology, you have to have a consistent standardised process, repeatable process, I mean, and that’s where, I mean, and that’s where process mapping sort of came from - (...) Lean, Six Sigma, you know, the engineering, sort of mechanical sort of side, so they could build cars, the same car every time with the least effort, without having to throw away as many components. And sort of improving that quality. And that’s what you need first of all to make the most out of technology. ‘Cause if everyone does it differently, everyone’s gonna want that

First-order concept	Representative data coded to it
	technology to do something slightly different, and it's never quite right." (INT 23)
Challenges of standardizing firm's legal work	"People don't want to think the work they do is commoditised, if we have work that's so standard to the point it can be mapped in that way, it's probably not the kind of thing we should be working on, because we don't do commoditising, what we do is highly bespoke, right." (INT 11)
"you always have to customise it"	"So we have like a [...] generator, we have like [...] generators, we have a [...] generator, like a [...] agreement, so we have a bunch of those. We have a [...] generator, a [...] generator, so those are like, you put in stuff but you always have to customise it based on the deal structure." (INT 38)
"there's not a textbook response to every request"	"...a lot of it is efficiency in processes as well, how, you know, where do our stories sit, where do the data sit, how do we bring that to life. How do we connect... it's a lot of dot connecting across the business, I would say is one of the biggest skills. And essentially not being a textbook, I would say. You know, there's not a textbook response to every request, and that's part of my education to everyone, and awareness, is, "This is different for each client. And we need to understand why and how to tailor it, and be consistent with that approach as well." (INT 27)
Clients may veto integration of digital technology and AI	"...we have like workbenches that we use for different matters at different stages. So many times I use my discretion, but sometimes for a client, a client will not consent to a tool being used." (INT 39)
"No technology is perfect"	"At this point, it gets a bit trickier. Ideally, what will then happen is, our quality control stage, because as you can imagine this technology is new, and no technology is perfect. So, it might pull out incorrect information, you know, false positives, it might miss things, it might miscategorise things." (INT 25)
Emerging engagement with AI	"Because something like artificial intelligence isn't self-explanatory; it isn't something where you can just give a bunch of lawyers access and then they will work it out and run with it. It's something where you need to have people on the ground to, yeah, help our lawyers and set up technologies in the right way for the specific matters, manage technologies and, since we are just starting in relation to Europe, we don't have that resource pool across all of our offices."
Changing relationship between law firm and data	"I think that law firms have massive opportunities to create their own machine learning models, but they need to hire people who are data governance specialists, but who also have a knowledge of the subject matter in order to do that. Because you can be a data specialist, but you can't go look at a claim form and advise on all the data points [...]." (INT 39)
Technology not seen as important by lawyers	"I have never seen another law firm use technology where I have thought, "That's a competitive advantage. We need that."" (INT 37)
"Fluent use" of technology can	"With fluent use of technology, there is a expectation that you will be more productive. I mean, you know, if we are only communicating on BlackBerry and emails, I imagine we're less

First-order concept	Representative data coded to it
lead to increased productivity	productive than if we have Teams, you know, interactive platform for changing documents, instantaneous updates, co-, co-authoring of the same document. So if you can all work in the same document, rather than through all lining up, there is increased productivity, I think, as a result of technology.” (INT 24)
Efficiency savings for technology on volume work	“... we’ve tended to automate those bigger documents like a consortium agreement as well, the larger precedents that are used frequently. But what we’ve also done is automated some of, a couple of the smaller precedents, like the board resolutions and shareholder resolutions precedents, they’re now automated. And although those are shorter documents, they’re high volume use documents, so there’s quite an efficiency saving with those.” (INT 36)
Time remains a barrier lawyers’ technology use	“It’s really difficult, because you know that what you are training will help to improve their productivity, and their experience of the technology. But it’s a, it’s a, you know, it’s a problem between the time and so, you’ve got to invest time to then make time, and it’s really difficult in the priority of things, all the things they’ve got to make time for, technology training is not one of them...” (INT 56)

REFERENCES

- Abbott, A. (1988). *The system of professions: An essay on the division of expert labor*, Chicago: University of Chicago Press.
- Abdulsalam, Y., Gopalakrishnan, M., Maltz, A., and Schneller, E. (2018). 'The impact of physician-hospital integration on hospital supply management'. *Journal of Operations Management*, **57**, 11–22.
- Ackroyd, S. and Muzio, D. (2007). 'The Reconstructed Professional Firm: Explaining Change in English Legal Practices'. *Organization Studies*, **28**, 729–747.
- Amaya, J. and Holweg, M. (2024). 'Using algorithms to improve knowledge work'. *Journal of Operations Management*, **70**, 482–513.
- Andersson, T. and Liff, R. (2018). 'Co-optation as a response to competing institutional logics: Professionals and managers in healthcare'. *Journal of Professions and Organization*, **5**, 71–87.
- Angelopoulos, S., Bendoly, E., Fransoo, J., Hoberg, K., Ou, C., and Tenhiälä, A. (2023). 'Digital transformation in operations management: Fundamental change through agency reversal'. *Journal of Operations Management*, **69**, 876–889.
- Anteby, M., Chan, C. K., and DiBenigno, J. (2016). 'Three Lenses on Occupations and Professions in Organizations: Becoming, Doing, and Relating'. *Academy of Management Annals*, **10**, 183–244.
- Anthony, C. (2021). 'When Knowledge Work and Analytical Technologies Collide: The Practices and Consequences of Black Boxing Algorithmic Technologies'. *Administrative Science Quarterly*, **66**, 1173–1212.
- Ardolino, M., Bacchetti, A., Dolgui, A., Franchini, G., Ivanov, D., and Nair, A. (2022). 'The impacts of digital technologies on coping with the COVID-19 pandemic in the manufacturing industry: a systematic literature review'. *International Journal of Production Research*, **62**, 1953–1976.
- Armour, J., Parnham, R., and Sako, M. (2022). 'Augmented Lawyering'. *University of Illinois Law Review*, **1**, 71–138.
- Armour, J. and Sako, M. (2020). 'AI-enabled business models in legal services: from traditional law firms to next-generation law companies?'. *Journal of Professions and Organization*, **7**, 27–46.
- Armour, J. and Sako, M. (2023). 'Lawtech: Levelling the Playing Field in Legal Services?'. In D. Engstrom (Ed.), *Legal Tech and the Future of Civil Justice*, Cambridge: Cambridge University Press.
- Balthu, K. C. and Clegg, B. (2021). 'Improving professional service operations: action research in a law firm'. *International Journal of Operations & Production Management*, **41**, 805–829.
- Barley, S. R. (1986). 'Technology as an Occasion for Structuring: Evidence from Observations of CT Scanners and the Social Order of Radiology Departments'. *Administrative Science Quarterly*, **31**, 78–108.
- Barrett, M. and Hinings, B. (2015). 'Service Innovation in Professional Service Firms'. In L. Empson, D. Muzio, J. Broschak, and B. Hinings (Eds.), *The Oxford handbook of professional service firms*, Oxford: Oxford University Press, Vol. 1, 238–54.
- Bechky, B. A. and O'Mahony, S. (2015). 'Leveraging Comparative Field Data for Theory Generation'. In K. D. Elsbach and R. M. Kramer (Eds.), *Handbook of qualitative organizational research: Innovative pathways and methods*, New York: Routledge.
- Bendoly, E., Chandrasekaran, A., Lima, M. D. R. F., Handfield, R., Khajavi, S. H., and Roscoe, S. (2024). 'The role of generative design and additive manufacturing capabilities in developing human–AI symbiosis: Evidence from multiple case studies'. *Decision Sciences*, **55**, 325–345.

- Bendoly, E. and Oliva, R. (2024). 'Holding North: Recognizing identity and advancing contribution in operations management'. *Journal of Operations Management*, **70**, 518–522.
- Bendoly, E. and Oliva, R. (2025). 'Meaningful Theoretical Pathways for Research Contributions'. *Journal of Operations Management*, **71**, 4–10.
- Bendoly, E. and Swink, M. (2007). 'Moderating effects of information access on project management behavior, performance and perceptions'. *Journal of Operations Management*, **25**, 604–622.
- Birkinshaw, J. and Lancefield, D. (2023). 'How Professional Services Firms Dodged Disruption'. *MIT Sloan Management Review*, **64**, 34–39.
- Boone, T. and Ganeshan, R. (2001). 'The effect of information technology on learning in professional service organizations'. *Journal of Operations Management*, **19**, 485–495.
- Brandon-Jones, A., Lewis, M., Verma, R., and Walsman, M. C. (2016). 'Examining the characteristics and managerial challenges of professional services: An empirical study of management consultancy in the travel, tourism, and hospitality sector'. *Journal of Operations Management*, Special Issue on Professional Service Operations Management (PSOM), **42–43**, 9–24.
- Brock, D. M. (2006). 'The changing professional organization: A review of competing archetypes'. *International Journal of Management Reviews*, **8**, 157–174.
- Brock, D. M. (2008). 'The Reconstructed Professional Firm: A Reappraisal of Ackroyd and Muzio (2007)'. *Organization Studies*, **29**, 145–149.
- Bromiley, P. and Rau, D. (2016). 'Operations management and the resource based view: Another view'. *Journal of Operations Management*, **41**, 95–106.
- Brooks, C., Gherhes, C., and Vorley, T. (2020). 'Artificial intelligence in the legal sector: pressures and challenges of transformation'. *Cambridge Journal of Regions, Economy and Society*, **13**, 135–152.
- Browning, T. R. (2010). 'On the alignment of the purposes and views of process models in project management'. *Journal of Operations Management*, **28**, 316–332.
- Browning, T. R. (2020). 'Operations management writ large'. *Journal of Operations Management*, **66**, 494–500.
- Brunsson, N., Rasche, A., and Seidl, D. (2012). 'The Dynamics of Standardization: Three Perspectives on Standards in Organization Studies'. *Organization Studies*, **33**, 613–632.
- Campbell, I. and Charlesworth, S. (2012). 'Salaried lawyers and billable hours: a new perspective from the sociology of work'. *International Journal of the Legal Profession*, **19**, 89–122.
- Ceruzzi, P. (2013). 'The Historical Context'. *The SAGE Handbook of Digital Technology Research*, London: SAGE Publications Ltd.
- Charmaz, K. (2006). *Constructing grounded theory*, London: SAGE.
- Choi, T., Kumar, S., Yue, X., and Chan, H. (2022). 'Disruptive Technologies and Operations Management in the Industry 4.0 Era and Beyond'. *Production and Operations Management*, **31**, 9–31.
- CLOC. (2020). *What is Legal Operations?* https://cloc.org/wp-content/uploads/2024/11/What-is-Legal-Operations_August2020.pdf
- Cooper, D. J., Hinings, B., Greenwood, R., and Brown, J. L. (1996). 'Sedimentation and Transformation in Organizational Change: The Case of Canadian Law Firms'. *Organization Studies*, **17**, 623–647.
- Corbin, J. M. and Strauss, A. (1990). 'Grounded theory research: Procedures, canons, and evaluative criteria'. *Qualitative sociology*, **13**, 3–21.

- Damali, U., Miller, J. L., Fredendall, L. D., Moore, D., and Dye, C. J. (2016). 'Co-creating value using customer training and education in a healthcare service design'. *Journal of Operations Management*, **47–48**, 80–97.
- Davenport, T. H., Holweg, M., and Jeavons, D. (2023). 'How AI Is Helping Companies Redesign Processes'. *Harvard Business Review*. <https://hbr.org/2023/03/how-ai-is-helping-companies-redesign-processes>.
- Davis, M. M., Spohrer, J. C., and Maglio, P. P. (2011). 'Guest editorial: How technology is changing the design and delivery of services'. *Operations Management Research*, **4**, 1–5.
- Dawes, R. M., Faust, D., and Meehl, P. E. (1989). 'Clinical Versus Actuarial Judgment'. *Science*, **243**, 1668–1674.
- De Treville, S., Browning, T. R., and Oliva, R. (2023). 'Empirically grounding analytics (EGA) research in the *Journal of Operations Management*'. *Journal of Operations Management*, **69**, 337–348.
- Devaraj, S., Ow, T. T., and Kohli, R. (2013). 'Examining the impact of information technology and patient flow on healthcare performance: A Theory of Swift and Even Flow (TSEF) perspective'. *Journal of Operations Management*, **31**, 181–192.
- Eisenhardt, K. M. (1989). 'Building Theories from Case Study Research'. *Academy of Management Review*, **14**, 532–550.
- Eisenhardt, K. M., Graebner, M. E., and Sonenshein, S. (2016). 'Grand Challenges and Inductive Methods: Rigor without Rigor Mortis'. *Academy of Management Journal*, **59**, 1113–1123.
- Empson, L. (2017). *Leading Professionals: Power, Politics, and Prima Donnas*, Oxford: Oxford University Press.
- Empson, L. (2021). 'Researching the Post-Pandemic Professional Service Firm: Challenging our Assumptions'. *Journal of Management Studies*, **58**, 1383–1388.
- Empson, L., Cleaver, I., and Allen, J. (2013). 'Managing partners and management professionals: Institutional work dyads in professional partnerships'. *Journal of Management Studies*, **50**, 808–844.
- Empson, L., Muzio, D., Broschak, J., and Hinings, B. (2015). *The Oxford Handbook of Professional Service Firms*, Oxford: Oxford University Press.
- Fang, C., Wilkenfeld, J. N., Navick, N., and Gibbs, J. L. (2023). "AI Am Here to Represent You": Understanding How Institutional Logics Shape Attitudes Toward Intelligent Technologies in Legal Work'. *Management Communication Quarterly*, **37**, 941–970.
- Faraj, S. and Xiao, Y. (2006). 'Coordination in fast-response organizations'. *Management Science*, **52**, 1155–1169.
- Faulconbridge, J., Beaverstock, J., Muzio, D., and Taylor, P. (2008). 'Global Law Firms: Globalization and Organizational Spaces of Cross-Border Legal Work'. *Northwestern Journal of International Law and Business*, **28**, 455–488.
- Faulconbridge, J. and Muzio, D. (2021). 'Valuation devices and the dynamic legitimacy-performativity nexus: The case of PEP in the English legal profession'. *Accounting, Organizations and Society*, **91**, 101224.
- Faulconbridge, J., Sarwar, A., and Spring, M. (2023). 'How Professionals Adapt to Artificial Intelligence: The Role of Intertwined Boundary Work'. *Journal of Management Studies*. <https://doi.org/10.1111/joms.12936>.
- Felten, E., Raj, M., and Seamans, R. (2024). 'Generative AI Requires Broad Labor Policy Considerations'. *Communications of the ACM*, **67**, 29–32.
- Frei, F. X. (2006). 'Breaking the trade-off between efficiency and service'. *Harvard Business Review*, **84**, 92–101.

- Fugate, B. S., Stank, T. P., and Mentzer, J. T. (2009). 'Linking improved knowledge management to operational and organizational performance'. *Journal of Operations Management*, **27**, 247–264.
- Gaimon, C., Özkan, G. F., and Napoleon, K. (2011). 'Dynamic Resource Capabilities: Managing Workforce Knowledge with a Technology Upgrade'. *Organization Science*, **22**, 1560–1578.
- Gilbert, J. P. and Finch, B. J. (1985). 'Maintenance management: Keeping up with production's changing trends and technologies'. *Journal of Operations Management*, **6**, 1–12.
- Gioia, D. A., Corley, K. G., and Hamilton, A. L. (2013). 'Seeking Qualitative Rigor in Inductive Research'. *Organizational Research Methods*, **16**, 15–31.
- Goodale, J. C., Kuratko, D. F., and Hornsby, J. S. (2008). 'Influence factors for operational control and compensation in professional service firms'. *Journal of Operations Management*, **26**, 669–688.
- Goto, M. (2023). 'Anticipatory innovation of professional services: The case of auditing and artificial intelligence'. *Research Policy*, **52**, 104828.
- Greenwood, R. and Empson, L. (2003). 'The professional partnership: Relic or exemplary form of governance?'. *Organization Studies*, **24**, 909–933.
- Greenwood, R., Hinings, C. R., and Brown, J. (1990). 'P2-Form' Strategic Management: Corporate Practices in Professional Partnerships'. *Academy of Management Journal*, **33**, 725–755.
- Grillo, F., Wiegmann, P. M., de Vries, H. J., Bekkers, R., Tasselli, S., Yousefi, A., et al. (2024). 'Standardization: Research Trends, Current Debates, and Interdisciplinarity'. *Academy of Management Annals*, **18**, 788–830.
- Grodal, S., Anteby, M., and Holm, A. L. (2021). 'Achieving Rigor in Qualitative Analysis: The Role of Active Categorization in Theory Building'. *Academy of Management Review*, **46**, 591–612.
- Grodal, S., Krabbe, A. D., and Chang-Zunino, M. (2023). 'The Evolution of Technology'. *Academy of Management Annals*, **17**, 141–180.
- Hansen, M. T., Nohria, N., and Tierney, T. (1999). 'What's Your Strategy for Managing Knowledge?'. *Harvard Business Review*, **77**, 106–116.
- Harvey, J. (1992). 'The operations management challenge in the delivery of complex human services'. *International Journal of Operations & Production Management*, **12**, 100–107.
- Harvey, J. (2016). 'Professional service supply chains'. *Journal of Operations Management*, Special Issue on Professional Service Operations Management (PSOM), **42–43**, 52–61.
- Harvey, J., Heineke, J., and Lewis, M. (2016). 'Editorial for Journal of Operations Management special issue on “Professional Service Operations Management (PSOM)”'. *Journal of Operations Management*, Special Issue on Professional Service Operations Management (PSOM), **42–43**, 4–8.
- Haynes, R. M. and Thies, E. A. (1991). 'Management of technology in service firms'. *Journal of Operations Management*, **10**, 388–397.
- Heim, G. R., Nair, A., and Bendoly, E. (2021). 'Aims and criteria for advancing technology management research at the Journal of Operations Management'. *Journal of Operations Management*, **67**, 920–925.
- Heineke, J. (1995). 'Strategic operations management decisions and professional performance in US HMOs'. *Journal of Operations Management*, **13**, 255–272.
- Heineke, J. and Davis, M. M. (2007). 'The emergence of service operations management as an academic discipline'. *Journal of Operations Management*, **25**, 364–374.

- Henderson, W. D. (2011). 'Three Generations of U.S. Lawyers: Generalists, Specialists, Project Managers'. *Maryland Law Review*, **70**, 373–389.
- Holweg, M., Davies, J., de Meyer, A., Lawson, B., and Schmenner, R. W. (2018). *Process Theory: The Principles of Operations Management*, Oxford: Oxford University Press.
- Huckman, R. S., Lee, V. S., and Staats, B. R. (2024). 'Retailers and Health Systems Can Improve Care Together'. *Harvard Business Review*, **102**, 120–127.
- Hui, A., Schatzki, T. R., and Shove, E. (2016). *The Nexus of Practices: Connections, constellations, practitioners*, London: Taylor & Francis.
- Huising, R. (2019). 'Moving off the Map: How Knowledge of Organizational Operations Empowers and Alienates'. *Organization Science*, **30**, 1054–1075.
- Huising, R. (2023). 'Professional Authority'. In G. Eyal and T. Medvetz (Eds.), *The Oxford Handbook of Expertise and Democratic Politics*, Oxford: Oxford University Press, 453–469.
- Hunter, D. (2020). 'The death of the legal profession and the future of law'. *University of New South Wales Law Journal*, **43**, 1199–1225.
- Jarzabkowski, P., Kaplan, S., Seidl, D., and Whittington, R. (2016). 'If you aren't talking about practices, don't call it a practice-based view: Rejoinder to Bromiley and Rau in Strategic Organization'. *Strategic Organization*, **14**, 270–274.
- Kellogg, D. L. and Nie, W. (1995). 'A framework for strategic service management'. *Journal of Operations Management*, **13**, 323–337.
- Ketokivi, M. (2016). 'On the importance of revisiting what we (thought we) already knew'. *Journal of Operations Management*, **41**, 62–62.
- Ketokivi, M. (2019). 'Avoiding bias and fallacy in survey research: A behavioral multilevel approach'. *Journal of Operations Management*, **65**, 380–402.
- Ketokivi, M. and Choi, T. (2014). 'Renaissance of case research as a scientific method'. *Journal of Operations Management*, **32**, 232–240.
- Kocher, M. G., Pogrebna, G., and Sutter, M. (2013). 'Other-regarding preferences and management styles'. *Journal of Economic Behavior & Organization*, **88**, 109–132.
- Koljonen, T. and Chan, C. K. (2024). 'Balancing professional autonomy and managerial goals amid broad technology adoption pressures: Intraprofessional segmentation at a Finnish School'. *Academy of Management Journal*, **67**, 798–828.
- Koufteros, X., Vergheze, A. (John), and Lucianetti, L. (2014). 'The effect of performance measurement systems on firm performance: A cross-sectional and a longitudinal study'. *Journal of Operations Management*, **32**, 313–336.
- Krajewski, L. (1980). 'The inauguration of a journal'. *Journal of Operations Management*, **1**, v–vi.
- von Krogh, G. (2018). 'Artificial Intelligence in Organizations: New Opportunities for Phenomenon-Based Theorizing'. *Academy of Management Discoveries*, **4**, 404–409.
- Kronblad, C. (2020). 'How Digitalization Changes our Understanding of Professional Service Firms'. *Academy of Management Discoveries*, **6**, 436–454.
- Kronblad, C. and Jensen, S. H. (2023). '“Being a professional is not the same as acting professionally”—How digital technologies have empowered the creation and enactment of a new professional identity in law'. *Journal of Professions and Organization*, **10**, 99–119.
- Kronblad, C. and Pregmark, J. E. (2021). 'How COVID-19 Has Changed the Digital Trajectory for Professional Advisory Firms'. (J. Lee and S. H. Han, Eds.) *The Future of Service Post-COVID-19 Pandemic, Volume 1: Rapid Adoption of Digital Service Technology*, 101–121.

- Langley, A., Smallman, C., Tsoukas, H., and Van de Ven, A. H. (2013). 'Process Studies of Change in Organization and Management: Unveiling Temporality, Activity, and Flow'. *Academy of Management Journal*, **56**, 1–13.
- Lawrence, B., Zhang, J. J., and Heineke, J. (2016). 'A life-cycle perspective of professionalism in services'. *Journal of Operations Management*, Special Issue on Professional Service Operations Management (PSOM), **42–43**, 25–38.
- Lebovitz, S., Lifshitz-Assaf, H., and Levina, N. (2022). 'To Engage or Not to Engage with AI for Critical Judgments: How Professionals Deal with Opacity When Using AI for Medical Diagnosis'. *Organization Science*, **33**, 126–148.
- Lee, M. Y. (2024). 'Enacting Decentralized Authority: The Practices and Limits of Moving Beyond Hierarchy'. *Administrative Science Quarterly*, **69**, 791–833.
- Legg, M. and Bell, F. (2020). *Artificial intelligence and the legal profession*, Oxford: Hart Publishing.
- Leicht, K. T. and Fennell, M. L. (1997). 'The Changing Organizational Context of Professional Work'. *Annual Review of Sociology*, **23**, 215–231.
- Lewis, M. A. and Brown, A. D. (2012). 'How different is professional service operations management?'. *Journal of Operations Management*, **30**, 1–11.
- Løwendahl, B. (2005). *Strategic Management of Professional Service Firms*, Frederiksberg, Denmark: Copenhagen Business School Press.
- Machuca, J. A. D., González-Zamora, M. del M., and Aguilar-Escobar, V. G. (2007). 'Service Operations Management research'. *Journal of Operations Management*, **25**, 585–603.
- Maghazei, O., Lewis, M. A., and Netland, T. H. (2022). 'Emerging technologies and the use case: A multi-year study of drone adoption'. *Journal of Operations Management*, **68**, 560–591.
- Maister, D. H. (1993). *Managing The Professional Service Firm*, London: Simon & Schuster UK.
- Maister, D. H., Galford, R., and Green, C. (2000). *The Trusted Advisor*, New York: Free Press, 20th Anniversary Edition.
- Malhotra, N., Morris, T., and Hinings, C. R. (2006). 'Variation in Organizational Form among Professional Service Organizations'. In R. Greenwood and R. Suddaby (Eds.), *Professional Service Firms*, Research in the Sociology of Organizations, Emerald Group Publishing Limited, Vol. 24, 171–202.
- Malhotra, N., Zietsma, C., Morris, T., and Smets, M. (2021). 'Handling Resistance to Change When Societal and Workplace Logics Conflict'. *Administrative Science Quarterly*, **66**, 475–520.
- Markovic, M. (2019). 'Rise of the Robot Lawyers'. *Arizona Law Review*, **61**, 325–350.
- Mathison, S. (1988). 'Why Triangulate?'. *Educational Researcher*, **17**, 13–17.
- McCarthy, J., Minsky, Marvin, Rochester, Nathaniel, and Shannon, C. (1955). 'A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence, August 31, 1955'. *AI Magazine*, **27**, 12–14.
- Menor, L. J., Tatikonda, M. V., and Sampson, S. E. (2002). 'New service development: areas for exploitation and exploration'. *Journal of Operations Management*, **20**, 135–157.
- Mills, P. K., Hall, J. L., Leidecker, J. K., and Margulies, N. (1983). 'Flexiform: A Model for Professional Service Organizations'. *Academy of Management Review*, **8**, 118–131.
- Mukherjee, U. K. and Sinha, K. K. (2020). 'Robot-assisted surgical care delivery at a hospital: Policies for maximizing clinical outcome benefits and minimizing costs'. *Journal of Operations Management*, **66**, 227–256.
- Nicolini, D. (2017). 'Practice Theory as a Package of Theory, Method and Vocabulary: Affordances and Limitations'. In M. Jonas, B. Littig, and A. Wroblewski (Eds.),

- Methodological Reflections on Practice Oriented Theories*, Cham: Springer International Publishing, 19–34.
- von Nordenflycht, A. (2010). 'What Is a Professional Service Firm? Toward a Theory and Taxonomy of Knowledge-Intensive Firms'. *Academy of Management Review*, **35**, 155–174.
- O'Mahony, S. and Cohen, S. (2022). 'Navigating the promises and perils of researching emerging phenomena in strategy and organizations'. *Strategic Organization*, **20**, 872–885.
- O'Reilly, K., Paper, D., and Marx, S. (2012). 'Demystifying Grounded Theory for Business Research'. *Organizational Research Methods*, **15**, 247–262.
- Orlikowski, W. J. (2000). 'Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations'. *Organization Science*, **11**, 404–428.
- Pakarinen, P. and Huising, R. (2023). 'Relational Expertise: What Machines Can't Know'. *Journal of Management Studies*. <https://doi.org/10.1111/joms.12915>.
- Pal, S., Nair, A., and Zuo, Z. (2024). 'Collaborative dynamics in open source software development: Unveiling the influence of team interaction and the role of project manager'. *Journal of Operations Management*, **70**, 1076–1099.
- Patton, M. Q. (2002). *Qualitative Research & Evaluation Methods*, London: SAGE Publications.
- Pemer, F. (2021). 'Enacting Professional Service Work in Times of Digitalization and Potential Disruption'. *Journal of Service Research*, **24**, 249–268.
- Raisch, S. and Krakowski, S. (2021). 'Artificial Intelligence and Management: The Automation Augmentation Paradox'. *Academy of Management Review*, **46**, 192–210.
- Rodgers, I., Armour, J., and Sako, M. (2023). 'How Technology Is (or Is Not) Transforming Law Firms'. *Annual Review of Law and Social Science*, **19**, 299–317.
- Rosenzweig, E. D., Kelley, K., and Bendoly, E. (2024). 'Diversity in Frontline Employee Perceptions: Policies and Procedures, Training, and Leadership as Drivers of Service Equality'. *Production and Operations Management*, **34**, 412–42.
- Rostain, M. and Huising, R. (2023). 'Vicarious Coding: Breaching Computational Opacity in the Digital Era'. *Academy of Management Journal*, **67**, 359–381.
- Russell, S. and Norvig, P. (2020). *Artificial Intelligence: A Modern Approach*, New York: Pearson.
- Sako, M. (2024). 'How Generative AI Fits into Knowledge Work'. *Communications of the ACM*, **67**, 20–22.
- Sako, M. and Parnham, R. (2021). *Technology and Innovation in Legal Services: Final Report for the Solicitors Regulation Authority*.
- Sako, M. and Peo, J. (2024). 'Leveraging or Overcoming Distance? Global Strategy and Structure of Professional Services Firms'. *The Journal of Applied Behavioral Science*.
- Sako, M., Qian, M., and Attolini, J. (2022). 'Future of professional work: evidence from legal jobs in Britain and the United States'. *Journal of Professions and Organization*, **9**, 143–169.
- Saldaña, J. (2016). *The coding manual for qualitative researchers*, Los Angeles: SAGE, 3rd edition.
- Sampson, S. E. (2018). 'Professional Service Jobs: Highly Paid but Subject to Disruption?'. *Service Science*, **10**, 457–475.
- Sampson, S. E. and Chase, R. B. (2022). 'Optimizing Customer Involvement: How Close Should You Be to Your Customers?'. *California Management Review*, **65**, 119–146.
- Sampson, S. E. and Froehle, C. M. (2006). 'Foundations and Implications of a Proposed Unified Services Theory'. *Production and Operations Management*, **15**, 329–343.

- Sampson, S. E. and Pires dos Santos, R. (2023). 'Reengineering professional services through automation, remote outsourcing, and task delegation'. *Journal of Operations Management*, **69**, 911–940.
- Sandberg, J. and Pinnington, A. H. (2009). 'Professional Competence as Ways of Being: An Existential Ontological Perspective'. *Journal of Management Studies*, **46**, 1138–1170.
- Sandberg, J. and Tsoukas, H. (2011). 'Grasping the Logic of Practice: Theorizing Through Practical Rationality'. *Academy of Management Review*, **36**, 338–360.
- Scarborough, H., Chen, Y., and Patriotta, G. (2024). 'The AI of the Beholder: Intra-Professional Sensemaking of an Epistemic Technology'. *Journal of Management Studies*. <https://onlinelibrary.wiley.com/doi/10.1111/joms.13065>.
- Schmenner, R. W. (1986). 'How Can Service Businesses Survive and Prosper?'. *Sloan Management Review*, **27**, 21–32.
- Schmenner, R. W. (2004). 'Service Businesses and Productivity'. *Decision Sciences*, **35**, 333–347.
- Schmenner, R. W. and Swink, M. L. (1998). 'On theory in operations management'. *Journal of Operations Management*, **17**, 97–113.
- Schön, D. A. (1983). *The Reflective Practitioner: How Professionals Think in Action*, Taylor & Francis.
- Scott, S. and Orlikowski, W. J. (2022). 'The Digital Undertow: How the Corollary Effects of Digital Transformation Affect Industry Standards'. *Information Systems Research*, **33**, 311–336.
- Senot, C., Chandrasekaran, A., and Ward, P. T. (2016). 'Collaboration between service professionals during the delivery of health care: Evidence from a multiple-case study in U.S. hospitals'. *Journal of Operations Management*, **42–43**, 62–79.
- Shove, E., Pantzar, M., and Watson, M. (2012). *The dynamics of social practice: Everyday life and how it changes*, London: SAGE Publications Ltd.
- Siggelkow, N. (2007). 'Persuasion with Case Studies'. *The Academy of Management Journal*, **50**, 20–24.
- Silvestro, R., Fitzgerald, L., Johnston, R., and Voss, C. (1992). 'Towards a Classification of Service Processes'. *International Journal of Service Industry Management*, **3**, 62–75.
- Smets, M., Morris, T., and Greenwood, R. (2012). 'From Practice to Field: A Multilevel Model of Practice-Driven Institutional Change'. *Academy of Management Journal*, **55**, 877–904.
- Smets, M., Morris, T., von Nordenflycht, A., and Brock, D. M. (2017). '25 years since 'P2': Taking stock and charting the future of professional firms'. *Journal of Professions and Organization*, **4**, 91–111.
- Smets, M., Rodgers, I., and Peo, J. (2023). 'Innovation in Professional Service Firms'. *Elgar Encyclopedia of Services*, Cheltenham, UK: Edward Elgar Publishing Limited.
- Smith, W. K. and Lewis, M. W. (2011). 'Toward a Theory of Paradox: A Dynamic equilibrium Model of Organizing'. *Academy of Management Review*, **36**, 381–403.
- Spee, P., Jarzabkowski, P., and Smets, M. (2016). 'The influence of routine interdependence and skillful accomplishment on the coordination of standardizing and customizing'. *Organization Science*, **27**, 759–781.
- Spring, M., Faulconbridge, J., and Sarwar, A. (2022). 'How information technology automates and augments processes: Insights from Artificial-Intelligence-based systems in professional service operations'. *Journal of Operations Management*, **68**, 592–618.
- Staats, B. R., Brunner, D. J., and Upton, D. M. (2011). 'Lean principles, learning, and knowledge work: Evidence from a software services provider'. *Journal of Operations Management*, **29**, 376–390.

- Stevens, M. and van Schaik, J. (2020). 'Implementing new technologies for complex care: The role of embeddedness factors in team learning'. *Journal of Operations Management*, **66**, 112–134.
- Sundbo, J. (2002). 'The Service Economy: Standardisation or Customisation?'. *The Service Industries Journal*, **22**, 93–116.
- Susskind, R. (2008). *The End of Lawyers?: Rethinking the Nature of Legal Services*, Oxford: Oxford University Press.
- Susskind, R. (2013). *Tomorrow's lawyers: An introduction to your future*, Oxford: Oxford University Press.
- Susskind, R. (2017). *Tomorrow's lawyers: An introduction to your future*, Oxford: Oxford University Press, Second Edition.
- Susskind, R. and Susskind, D. (2022). *The future of the professions: How technology will transform the work of human experts*, Oxford: Oxford University Press, Updated Edition.
- Taylor, F. W., (1911). *The principles of scientific management*, New York: Harper.
- Thirumalai, S. and Devaraj, S. (2024). 'Mitigating the curse of complexity: The role of focus and the implications for costs of care'. *Journal of Operations Management*, **70**, 157–179.
- Thirumalai, S. and Sinha, K. K. (2011). 'Customization of the online purchase process in electronic retailing and customer satisfaction: An online field study'. *Journal of Operations Management*, **29**, 477–487.
- Thompson, J. D. (1967). *Organizations in action: social science bases of administrative theory*, New Brunswick: Transaction.
- Tsoukas, H., Hadjimichael, D., Nair, A. K., Pyrko, I., and Woolley, S. (2024). 'Judgment in Business and Management Research: Shedding New Light on a Familiar Concept'. *Academy of Management Annals*, **18**, 626–669.
- Turban, E. and Sepehri, M. (1986). 'Applications of decision support and expert systems in flexible manufacturing systems'. *Journal of Operations Management*, **6**, 433–448.
- Venkatesh, V., Raman, R., and Cruz-Jesus, F. (2024). 'AI and emerging technology adoption: a research agenda for operations management'. *International Journal of Production Research*, **62**, 5367–5377.
- Wall, D. S. and Johnstone, J. (1997). 'The industrialization of legal practice and the rise of the new electric lawyer: The impact of information technology upon legal practice in the UK'. *International Journal of the Sociology of Law*, **25**, 95–116.
- Wang, P. (2019). 'On Defining Artificial Intelligence'. *Journal of Artificial General Intelligence*, **10**, 1–37.
- Whalen, R. (2022). 'Defining legal technology and its implications'. *International Journal of Law and Information Technology*, **30**, 47–67.
- Yin, R. K. (2014). *Case study research: design and methods*, Thousand Oaks: Sage, 5th ed.
- Zhang, J., Li, X., and Tong, T. (2023). 'A Tale of Two Types of Standard Setting: Evidence From Artificial Intelligence in China'. *Journal of Management*, **50**, 1393–1423.

CONCLUSIONS AND IMPLICATIONS

This section integrates the findings from this thesis's three papers, draws conclusions from them, and outlines their broader implications. It begins with an overview of the research that synthesises the papers' findings and theoretical contributions, identifying three emerging themes. Next, it articulates the broader implications of the thesis for researchers, practitioners, and other stakeholders. Finally, it identifies future research directions for subsequent study before adding some concluding reflections.

Research synthesis

This research set out to study the relationships between technology and organised professional work. It has focused on digital technology, including AI, and the professional work that goes on in PSFs. It has paid attention not just to the technology itself but also to situated work practices – that is, the bundles of activities that comprise professional work associated with digital technology in an organisational setting. This has enabled it to highlight the importance of considering technology not just as a tool for getting tasks done or a medium for communicating but in the context of a relational system of professional work (Anthony et al., 2023; Bailey et al., 2022). In doing so, it has moved towards addressing an area in the literature that we know relatively little about by enhancing understanding of the situated work practices that emerge, develop, and change when digital technology meets organised professional work.

Each paper in this thesis has explored a puzzle associated with the central research question: “How does digital technology relate to professional work practices within PSFs?” The first paper focused on an emerging technology – generative AI – and associated practical expertise – prompt engineering. Its underlying puzzle was: Why do professionals, responding to the same generative AI application, end up learning and performing prompt engineering in such diverse ways – and how does this link between learning pathways for practical expertise and boundary work develop in a PSF context?

This puzzle emerged as two surprising patterns were discovered related to the practical expertise that professionals relied on to use generative AI effectively. First, while “prompt engineering” was widely portrayed as a technical task involving, for example, configuring large language model (LLM) prompts via one-shot or chain-of-thought sequences (Acar, 2023; Boussioux et al., 2024; Liu et al., 2023; McAfee et al., 2023), our findings were that it involved a broader, four-step process: (1) diagnosing and framing a professional problem, (2) translating that problem into prompts aligned with generative AI’s capabilities, (3) iteratively assessing and validating outputs using domain-specific criteria, and (4) combining those outputs with professional judgment to deliver client services. This process reflected the distinct prompt engineering expertise needed to use generative AI effectively in professional practice, as opposed to the more specialized, technical knowledge that might be expected to be connected with technologists or other “AI experts”. Seen this way, prompt engineering was different from adjacent expertise like data science for which there are longstanding reference points (such as precision and recall) or well-established roles (such as data scientists). Moreover, it was less technically complex than typical IT or other types of AI, enabling professionals to (often, but not always) learn it themselves without technical training in computer or data science, for example.

Second, rather than delegating generative AI use to a few “prompt engineers” or “knowledge managers”, we found three distinct “learning pathways” and “boundary work” practices among professionals: those *engaging* with generative AI developed *human-to-machine relational expertise*, affording *reinforcing* boundary work; those *connecting* with other professionals developed *human-to-human relational expertise*, affording *relating* boundary work; and those *avoiding* generative AI did not develop relational expertise for prompt engineering, constraining them to *resisting* boundary work. In addition, senior professionals – often presumed to be less technologically adept – often seemed to be more

effective than their juniors at prompting, appearing to make use of their deeper substantive professional expertise and reflecting this in their human-to-machine relational expertise. Conversely, junior professionals sometimes struggled to articulate themselves in their prompts, which could lead to them avoiding learning prompt engineering and to resist generative AI's use in their work.

These two patterns were striking. Prior research on professional skill acquisition had largely focused on how novices master established techniques under expert supervision (Bailey and Barley, 2011; Nicolini et al., 2022; Van Maanen, 1975) – yet here, we saw professionals developing practical expertise through mostly solo experimentation or working together with adjacent professionals. It was also surprising that senior professionals – rather than ‘digital-native’ juniors – seemed to excel at prompt engineering (Beane and Anthony, 2023; Kellogg et al., 2025; Leonardi, 2007). We might have anticipated a more junior cohort would adapt more readily, but the reality flipped: many senior professionals displayed greater confidence in their prompts and reported greater utility from them, often drawing on their professional experience in the process of prompt engineering.

In exploring this puzzle, this paper theorises how emerging technology (such as generative AI) relates to professional boundaries, reshaping them in patterned ways according to professionals’ learning pathways for practical expertise (such as prompt engineering) on a use-case-by-use-case basis, rather than in a uniform way determined only by the technology and its features or by the nature of the tasks involved in their professional work.

The second paper moved beyond considering a single instance of emerging technology (generative AI) to consider digitalisation in organised professional work more broadly. It explored another puzzle that emerged from the literature review: Why does digitalization in PSFs often fail to produce the disruptive transformations that theory might expect or predict? One strand of research theorised about digital technology “disrupting” and “transforming”

organised professional work (Christensen et al., 2013; Susskind and Susskind, 2022). Another strand found PSFs displaying a surprising persistence of traditional forms of work and organization while “enacting”, “accommodating”, or “responding” to digitalization (e.g., Perner 2021; Faulconbridge, Sarwar, and Spring 2024; Marti, Lawrence, and Steele 2024). For instance, conceptual approaches predicted more extensive and rapid changes (Felten et al., 2021; Katz, 2013; Susskind, 2013), yet reviews of the empirical research on the impact of technology on law firms have repeatedly found more limited use cases in practice (Faulconbridge, 2025; Ogunde, 2024; Rodgers et al., 2023).

This puzzle framed the paper’s research question: How does digital technology, including AI, maintain, change, or recreate professional work – and with what implications for organizational digitalization? Investigating this research problem, the findings identified a process of “getting comfortable” with digital technology. This process involved professionals performing four connected work practices: *assessing* the technology for potential relevance and usefulness for their work; *evaluating* its compatibility with their professional identity and expertise; *validating* its appropriateness for their live client work through testing or other trial use; and *reflecting* iteratively on the technology’s continuing appropriateness for their work. Professionals “getting comfortable” with digital technology was associated with three distinct responses: *maintaining* work practices by excluding or minimizing technology; *reconstituting* work practices by integrating technology while preserving professional identity and expertise; and *reconfiguring* work practices by integrating technology while adjusting professional identity or expertise. These findings formed the basis for building theory about how professionals “getting comfortable” with digital technology variably shapes PSFs’ digitalization, theorizing that digital technology, mediated through professionals’ work practices, can lead to variable outcomes. Rather than a unidirectional process (e.g., Kronblad, 2020; Susskind & Susskind, 2022), digitalization may involve maintaining, increasing, or

decreasing a PSF's knowledge intensity, depending on how professionals navigate, engage with, and integrate digital technology into their work. In short, by exploring this puzzle, this paper builds theory about the dynamics of digital technology in organised professional work within knowledge-intensive settings, addressing gaps in understanding about how and why digitalization unfolds as it does within PSFs.

Rather than focus on a specific digital technology or how professionals learn or get comfortable with these applications, the third paper examined the operations involved in getting professional work done in a PSF. It considered the tension between customization in professional services (and the high level of professional autonomy associated with it) and the standardization often associated with effective use of digital technology. While recent research acknowledges that digital technology and AI might benefit from more standardised operational processes within PSFs (Amaya and Holweg, 2024; Spring et al., 2022), little empirical evidence exists on how these firms can practically manage this transition, given their historical resistance to standardization and limited managerial authority (Harvey et al., 2016; Kellogg and Nie, 1995). This highlights a problem: How do PSFs balance customized client work and professional autonomy with the need for standardised processes that support digital technology, from basic IT to emerging technology such as AI?

As such, this paper investigated the research question: How do professional service firms develop operations management practices to integrate digital technology and AI? It found work practices such as process mapping, work modelling, project management, and performance evaluation involved with integrating digital technology and AI into professional service operations within a PSF. These helped to both *bridge* professionals to ancillary resources (such as potentially relevant technology applications or adjacent expertise) and to *buffer* them from low value or routine work (such as by automating repetitive aspects of their workflows or preventing them from having to deal with basic technology issues). Operations

practitioners also developed *transitioning* work practices that legitimized operations managements' role and built their credibility, enabling a shift from customised traditional methods to a more standardised technology-inclusive mode of production for professional services. This paper contributes to an emerging discourse on operations and technology management in the context of firms generally and PSF specifically integrating digital technology and AI into their knowledge work and workflows (e.g. Heim, Nair, and Bendoly 2021; Spring, Faulconbridge, and Sarwar 2022; Sampson and Pires dos Santos 2023; Amaya and Holweg 2024; Angelopoulos et al. 2023; Choi et al. 2022). In particular, it addresses an under-theorised area of the literature relating to how PSFs can move their operations up the diagonal of the service matrix from professional service towards service factory for a more swift, even flow that enhances productivity (Schmenner, 1986, 2004; Schmenner and Swink, 1998).

Taking the papers together, three distinct themes emerge. First, digital technology is related to professional expertise and boundaries. Expertise has been historically concentrated in the professions (Abbott, 1988), but it could be distributed elsewhere such as into technology or organisations (Abbott, 1991). Developments associated with digital technology – including emerging technology such as generative AI, evolving existing IT such as cloud computing, and changing attitudes to technology more generally – are problematising existing settlements. For instance, professions who previously could rely on socialisation in communities of practice to develop expertise are having to find new ways to learn skills associated with digital technology (e.g., Bailey and Barley, 2011; Nicolini et al., 2022; Van Maanen, 1975). This includes seniors learning from junior professionals, one group of professionals learning from another, or professionals simply learning by themselves on the job (e.g., Beane and Anthony, 2023; Kellogg et al., 2025; Leonardi, 2007). This affects professional boundaries by challenging existing relationships and sometimes redistributing them within the broader system of work:

whether it be juniors and seniors, professionals and adjacent professionals, or professionals and technology. Instances of this can be found across all three papers: from learning pathways for practical expertise involving emerging technology, through professionals “getting comfortable” with digital technology, to the work practices of operations managers to integrate technology into PSFs’ workflows.

A second theme that emerges is that of digital technology’s relationship with professional autonomy. Organised professional work – i.e. that done in PSFs – has historically provided professionals with a wide discretion to act in ways they see fit: whether in terms of outcomes or the processes to achieve those outcomes (von Nordenflycht, 2010). This is linked to managerial authority, that is, the ability for a manager to put forward a course of action and have it followed (Huising, 2023). While in PSFs this has traditionally been balanced in a state of high professional autonomy and low managerial authority, digital technology can challenge this settlement. Again, this is found in all three papers. For instance, in the study involving prompt engineering, neither PSF involved as a research setting *mandated* that its professionals use generative AI in their work, and no individual professional interviewed reported that they had told another professional within their firm to use it either (although they might strongly suggest this, as when a partner recommends it to an associate). Similarly, in the study of organisational digitalisation, it emerged that professionals’ process of “getting comfortable” with digital technology helped explain the various modes of integrating it into their work practices. When managerial mandates were used, they were typically ignored or symbolically conformed with – something which other studies have alluded to before (e.g., Edmondson, Bohmer, and Pisano 2001; Pachidi et al. 2021). However, the study involving developing operations management practices in PSFs suggested that, while digital technology may challenge professional autonomy – likely because it is more effective when paired with higher (or, at least, different) managerial authority to, for instance, redesign customisation and

enhance standardisation – this was a contested domain rather than a foregone conclusion. When professional autonomy was ‘given up’ in practice, it was often to other professionals who had developed the credibility and legitimacy to take it on (often in the guise of ex-professionals turned operations practitioners), rather than to conventional managers. This enabled the PSF in my study to transition elements of its mode of production from customised and manual-based to more standardised and technology-inclusive, while redesigning workflows to reflect more a Toyota assembly line than a traditional craft workshop.

A third theme that emerged was around the variety of digital technology adoption and integration. The papers show professionals sometimes avoiding a technology, maintaining their existing work practices, or continuing to produce their professional work through traditional methods; at other times engaging with a technology, reconfiguring their work practices to accommodate technology, or transitioning away from a customised to a much more standardised mode of technology-inclusive production. Between these two ideal-type poles, the papers show a range of middle-grounds: some professionals connecting with other professionals, some reconfiguring their work practices to superficially incorporate technology, and others following a dual-track mode of production, essentially producing professional services in ways that resemble both craft and assembly-line methods simultaneously.

These integrated themes contribute to and extend existing theory. They highlight the particularly complex, complicated, and dynamic relations between digital technology and professional expertise, boundaries, and organisation. Prior research shows that professional work involves processes of diagnosis, inference, and treatment, performed within a jurisdiction reflecting a division of expertise (Abbott, 1988). This work is often performed within distinct organisations, PSFs, which provide professionals with a high degree of autonomy (von Nordenflycht, 2010). Professional service workflows typically have slow throughput and are highly variable, impacting their productivity (Schmenner, 2004). The integrated themes build

on this, showing how and why digital technology relates to changes in professional expertise, PSFs' organisation for autonomy, and professional service workflows. In doing so, it extends theory by moving towards a technology-sensitive system of professional work (for instance, building on but not simply following Abbott's (1988) conception of a "system of professionals" and not merely viewing technology as a tool for doing tasks or a medium for communicating), building on ideas of professional autonomy in PSFs to show how this relates to managerial authority in the context of digital technology, and theorising how professional service operations can move to faster throughput and lower variability in combination with *transitioning* work practices that enable a shift in PSFs' mode of production to make it more technology-inclusive.

The integrated themes also contribute to theory on how digital technology is part of a system of professional work – rather than just an external factor that impacts it (e.g., Anthony et al., 2023; Bailey et al., 2022). It shows how paying attention to work practices, the bundles of activities that involve getting organised professional work done, can help with theorising this relational, systemic approach. Prior research shows that technology can occasion changes in organised professional work by altering roles and patterns of interaction between professionals and other occupations (Barley, 1986), that digital technology can affect PSFs by enabling professional services to be delivered at lower levels of knowledge intensity (Kronblad, 2020) and through new business models (Armour and Sako, 2020), and that AI can enable the automation and augmentation of professional work (Spring et al., 2022), often accompanied by workflow changes for it to be effective (Amaya and Holweg, 2024). The integrated themes contribute to this literature, for example, by showing how certain work practices enable PSFs to deliver services with different levels of knowledge intensity, or how they can help redistribute professional autonomy and managerial authority, practically

facilitating workflow changes associated with effective use of digital technology for professional work.

Finally, this thesis provides three durable theoretical contributions that extend beyond any single technology. First, it explains why and how learning pathways for practical expertise shape the integration of emerging technology into organised professional work. Paper 1 provides a typology of practical expertise for technology-inclusive professional work and a model that links modes of expertise acquisition to patterned boundary work responses. These contribute to the literature by showing that whether and how an emerging technology becomes integrated into professional work depends on the mode through which practitioners learn the practical expertise to use it. This builds on previous research that has focused on the distinctive pathways for learning practical expertise, particularly that relating to emerging technology, adding to it by showing that learning such practical expertise cannot be explained by senior-junior or insider-outsider relations alone but instead involves developing both substantive and relational expertise; with the mode through which professionals learn this practical expertise being an important consideration in theories of emerging technology adoption in PSFs (e.g., Bailey and Barley, 2011; Barley, 1986, 1996; Beane, 2019; Beane and Anthony, 2024; Faulconbridge et al., 2023, 2024; Kellogg et al., 2025; Koljonen and Chan, 2024; Leonardi, 2007; Pakarinen and Huising, 2023; Perner and Werr, 2023; Sandefur, 2015).

Second, the thesis contributes to explanations of why professionals in PSFs adapt and respond as they do to digital technology. Paper 2 provides a typology of a series of work practices that professionals use to get comfortable with digital technology and a model theorising how these assessment, evaluation, validation, and reflection practices enable professionals to navigate and engage with such technology under distinctive governance arrangements within PSFs. This mechanism accounts for outcomes ranging from maintenance to reconstitution to reconfiguration, explaining why the integration of digital technology into

professional work leads to varieties of digitalization within PSFs. This extends research on professional adaptation and responses to technological changes and challenges to their work, adding to it by showing how and why their distinctive expertise and identity leads to otherwise unexpected practices and outcomes (e.g., Amaya and Holweg, 2024; Faulconbridge et al., 2023, 2024; Goto, 2023; Koljonen and Chan, 2024; Marti et al., 2024; Perner, 2021; Perner and Werr, 2023; Scarbrough et al., 2024).

Third, the thesis explains how and why operations practitioners within PSFs integrate digital technology and AI into their operations. Paper 3 outlines ways that operations practitioners develop transitioning work practices that legitimize their role and build credibility, facilitating a shift from traditional methods to a standardised mode of production for professional services to integrate digital technology and AI. This advances an emerging understanding of operations and technology management in the context of firms integrating digital technology and AI into their knowledge work and professional service workflows, extending it by explaining how and why PSFs' distinctive "gentle nudges" operations management practices become accompanied by – and sometimes transitioned to – more standard practices as firms integrate digital technology (e.g., Amaya and Holweg, 2024; Angelopoulos et al., 2023; Choi et al., 2022; Goodale et al., 2008; Harvey et al., 2016; Heim et al., 2021; Malhotra et al., 2006; Sampson and Pires dos Santos, 2023; Schmenner, 1986, 2004; Spring et al., 2022).

Taken together, these contributions specify and reveal distinctive characteristics of technology adoption in PSFs. PSFs are knowledge-intensive settings that involve distinct learning pathways to develop practical expertise for emerging technology's integration into professional work; PSFs' organization and governance give a professional workforce substantive autonomy to adapt and respond to technological changes and challenges to their work, which they exercise through a series of work practices that enable them to negotiate

digital technology in the context of their system of professional work; and PSFs' operations management takes place in a distinctive setting in which operations are more customized than standardized and in which operations practitioners must establish their credibility and legitimacy to be involved in professional work rather than rely on mandates or managerial authority. These contributions extend enduring debates on learning and technology adoption, professional adaptation and responses to changes and challenges to their work, and operations management in professional services.

At the outset, this study had three objectives. (1) To explore how professionals' work within PSFs involves (or does not involve) digital technology. (2) To examine why professional work in PSF changes (or does not change) when new digital technology becomes available. (3) To analyse the work of professionals and others to navigate the introduction of emerging digital technology like generative AI within their firms. Its central research question for investigation was: "How does digital technology relate to professional work practices within PSFs?" The integrated findings extend and contribute to theory in this area, highlighting how situated work practices emerge, develop, and change when digital technology meets organised professional work.

Research implications

In addition to its theoretical contributions, this thesis has broader implications for researchers, practitioners, and other potentially interested parties. For researchers, it implies that there is much more to learn about management and organisational theory relating to digital technology and AI by investigating situated professional work practices. These are detailed throughout the literature review and papers and will not be repeated here. However, one item that has not been mentioned but which is implied by my methodological experiences is that researchers may need to develop their research methods to better and further explore situated, organised, professional work practices. When a lot of work is done using technology, often

remotely, and there is an acute awareness of confidential or sensitive material, it can be difficult to get comprehensive access to a research site. In my situation, for example, each paper may have benefited from more observation material, but this was very difficult to obtain. While my research used workarounds such as directly using technology applications to interpret interview responses, future approaches could potentially be enhanced by methodological innovation that further balances organisational and professional requirements with those of researchers studying situated practices in a system of work.

For practitioners, there are implications of this thesis too. First, it challenges claims that emerging technology such as AI will transform organised professional work by necessarily replacing professionals or, to repeat the trope, that ‘professionals who don’t use technology will be replaced by those who do’. Instead, it implies that professionals themselves retain a lot of control over the process and purpose of incorporating technology into their work. Second, it shows the variety of responses open to professionals when it comes to digital technology. They can continue to work without it, integrate it into their work, or do any number of things in between. This suggests that managers taking a case-by-case approach to emerging technology, fitting their methods with professionals’ preferences, might be more effective at achieving their preferred outcomes than those that try to take a one-size-fits-all approach. Third, it shows some practical approaches that can help managers and organisations to encourage professionals to use technology applications, should this be their requirement. For instance, it highlights the importance of prompt engineering expertise for professionals’ effective use of generative AI. Similarly, it implies that professionals who “get comfortable” with digital technology are more likely to use it substantively in their work, rather than superficially or not at all. It also emphasises the importance of changing operational processes for the effective use of digital technology in professional work and shows how operations practitioners building credibility and legitimacy can help to transition one mode of production

to another. In short, this thesis guides practitioners – professionals and managers alike – on the importance of appreciating the practical, everyday approaches used and challenges encountered as digital technology is integrated into organised professional work.

For other potentially interested parties, such as professional associations, this thesis highlights that digital technology, including AI, may provide benefits – such as increased efficiency and productivity of professional services. However, these opportunities take place in a wider system of work that involves professionals navigating a range of priorities, including ensuring a high level of quality and standard of client care. This research suggests that such interested parties could benefit from taking a systems approach to digital technology and appreciating how it is integrated into professional work practices, rather than simply focusing on the potential benefits or features of a single technology type (e.g., generative AI’s capacity to create plausible legal text or its potential to increase affordability, access, or quality at a given price point). This research shows how digital technology relates to organised professional work in complex, complicated, and often surprising ways. As such, it suggests that interested parties should consider not just the immediate first-order effects (e.g., how a technology might be used to automate or augment a task) but the potentially related effects too (e.g., how will a technology affect professional expertise, boundaries, or work more generally).

Future research directions

This thesis provides an exploratory study towards understanding the situated work practices that emerge, develop, and change when digital technology meets organised professional work. However, there is still much that could be done. One avenue for future research might involve a more in-depth observation of digital technology in use in an organised professional work setting. This could help researchers to build further theory by providing thick data from which to theorise the relationship between digital technology and work practices. For instance, how do professionals ‘unlearn’ expertise relating to one technology vintage and

replace it with expertise relating to another? This comes to mind after hearing in interviews about professionals continuing to try to use generative AI as if it were a Google-style search engine (i.e., using key words) rather than pivoting to a more appropriate approach incorporating prompt engineering.

Another avenue might involve taking other units of analysis for study. In this thesis, units of analysis included those like individual professionals (i.e. lawyers, knowledge managers, technologists, or operations managers) or use cases (i.e. their context of using a technology application). While this approach enabled substantive theory-generation, there were other units that could shed light on phenomena of interest. For instance, professional services work is often performed in teams, which can impact learning, responses to new technology, and boundaries (Edmondson, 1999, 2003; Edmondson et al., 2001). By taking teams as a unit of analysis, for instance, future research may build on this thesis's findings and theorizing by discovering dynamics such as those involving leadership or psychological safety. We also know that junior-senior relationships are important for professionals learning new technologies (Anthony, 2018, 2021; Beane and Anthony, 2023). Future research could enrich theorizing by exploring the impact of seniority or other status differentials on professional work.

In addition, both digital technology and organised professional work are continually changing. For instance, since this research was conducted, generative AI has seen the emergence of “reasoning models” that use extra computation to plan responses step-by-step before generating them (Schwarcz et al., 2025), and autonomous artificially intelligent communication technologies (Endacott and Leonardi, 2022) – i.e. AI agents – have emerged more feasibly as a possibility. Future research could build theory by studying these varieties of emerging technology. Similarly, professions and occupations relating to digital technology are

proliferating and adapting, such as data scientists, prompt-engineers, and so on. Future research could further examine their role in technology-inclusive professional work practices.

Indeed, research on AI and PSFs has advanced rapidly since I completed (and published) my literature review in late 2023. My updated version included in this thesis addressed these developments for law firms, while recognising that no review can cover every new study. For example, it considered how professionals' efforts to accommodate AI leads PSFs to reorganise work and differentiate roles (Faulconbridge et al., 2024), influencing client-facing advice and opening alternative career paths within and across the profession. I also assessed whether newer studies, including those considering generative AI, undermine my core conclusion – that technology has not ended law firms but is transforming them in evolutionary, not revolutionary, ways, with distinctive recent features (Faulconbridge, 2025; Faulconbridge et al., 2024; Ogunde, 2024). They do not. This conclusion carries a caveat: research on emerging technologies often lags practice because data take time to accumulate and be analysed. As a result, both the literature review and my papers – based on historical data – are likely biased towards a conservative assessment of technology more generally.

With that said, my literature review focused on law firms to allow depth, though each paper engages, where relevant, with broader literatures on professions, knowledge work, and AI. A different approach might have foregrounded those emerging research streams more prominently. For example, recent work moves beyond prediction to show how generative AI supports creativity and problem-solving – central activities in professional work (e.g., Boussioux et al., 2024; Doshi, Bell, Mirzayev, & Vanneste, 2025; Jia, Luo, Fang, & Liao, 2024). Attention has also shifted from technology “adoption” to human–AI agency and collaboration, with emphasis on role division, control, and accountability (e.g., Amaya & Holweg, 2024; Angelopoulos et al., 2023; Gehman, Glaser, & Merritt, 2024; Koljonen & Chan, 2024; Raisch & Fomina, 2025; Vanneste & Puranam, 2024). Recent studies also analyse

professional response mechanisms at the learning, workflow, organisational, and institutional levels, explaining why outcomes range from accommodation to resistance (e.g., Beane & Anthony, 2024; Faulconbridge et al., 2024; Kellogg et al., 2025; Kim, Rezazade Mehrizi, & Bailey, 2025; Marti et al., 2024; Scarbrough, Chen, & Patriotta, 2024). This emerging research could inform my future work as the papers in this thesis are prepared for publication. For example, Paper 1 may focus more on how professionals learn practical expertise for new technologies while avoiding learning failures; Paper 2 may refine the mechanisms of “getting comfortable” to consider agentic AI and its implications for professional autonomy; and Paper 3 may link operations management practices to changes in role division, control, or accountability more explicitly. For researchers more generally, next steps might include studying how and why generative AI supports creativity and problem-solving or the unfolding of human–AI agency and collaboration in organised professional work given the distinctive characteristics of technology adoption in PSFs highlighted by this thesis, as well as further identifying, contextualising, and explaining the various response mechanisms set out in the literature and extended here.

Concluding reflections

I set out to look closely at how professionals actually use digital technology in their work and hoping to explain how and why related changes happen – or don’t – in law firms specifically and PSFs more generally. This was based on a sense – both from my time in industry and reviewing the academic literature – that the messy practicalities of integrating technology like AI into day-to-day professional work were mostly missing from the conversation. This was a blind spot worth further investigation because it seemed important to shed light on what was happening in practice in order to generate more robust theory.

This thesis represents a step in that direction. It builds on and contributes to a growing awareness among management and organisation theory researchers that studying technology

relationally within a system of work can provide a platform for building novel and compelling theory. While there is still much to be done, the three papers in this integrated thesis present findings and contribute to theory in important areas. As researchers, we now know more about how learning pathways affect professional boundary work, how professionals “get comfortable” with digital technology and why this contributes to varied work practices and patterns of organisational digitalisation, and how operations management practices develop to integrate digital technology including AI into professional work in PSFs. I hope these contributions can provide a platform for future research to build on.

REFERENCES

- Abbott, A. (1988). *The system of professions: An essay on the division of expert labor*, Chicago: University of Chicago Press.
- Abbott, A. (1991). 'The future of professions: Occupation and expertise in the age of organization'. *Research in the Sociology of Organizations*, **8**, 17–42.
- Acar, O. A. (2023). 'AI Prompt Engineering Isn't the Future'. *Harvard Business Review*. <https://hbr.org/2023/06/ai-promptengineering-isnt-the-future>.
- Amaya, J. and Holweg, M. (2024). 'Using algorithms to improve knowledge work'. *Journal of Operations Management*, **70**, 482–513.
- Angelopoulos, S., Bendoly, E., Fransoo, J., Hoberg, K., Ou, C., and Tenhiälä, A. (2023). 'Digital transformation in operations management: Fundamental change through agency reversal'. *Journal of Operations Management*, **69**, 876–889.
- Anthony, C. (2018). 'To Question or Accept? How Status Differences Influence Responses to New Epistemic Technologies in Knowledge Work'. *Academy of Management Review*, **43**, 661–679.
- Anthony, C. (2021). 'When Knowledge Work and Analytical Technologies Collide: The Practices and Consequences of Black Boxing Algorithmic Technologies'. *Administrative Science Quarterly*, **66**, 1173–1212.
- Anthony, C., Bechky, B. A., and Fayard, A.-L. (2023). "“Collaborating” with AI: Taking a System View to Explore the Future of Work". *Organization Science*, **34**, 1672–1694.
- Armour, J. and Sako, M. (2020). 'AI-enabled business models in legal services: from traditional law firms to next-generation law companies?'. *Journal of Professions and Organization*, **7**, 27–46.
- Bailey, D. E. and Barley, S. R. (2011). 'Teaching-Learning Ecologies: Mapping the Environment to Structure Through Action'. *Organization Science*, **22**, 262–285.
- Bailey, D. E., Faraj, S., Hinds, P. J., Leonardi, P. M., and von Krogh, G. (2022). 'We Are All Theorists of Technology Now: A Relational Perspective on Emerging Technology and Organizing'. *Organization Science*, **33**, 1–18.
- Barley, S. R. (1986). 'Technology as an Occasion for Structuring: Evidence from Observations of CT Scanners and the Social Order of Radiology Departments'. *Administrative Science Quarterly*, **31**, 78–108.
- Barley, S. R. (1996). 'Technicians in the Workplace: Ethnographic Evidence for Bringing Work into Organizational Studies'. *Administrative Science Quarterly*, **41**, 404–441.
- Beane, M. and Anthony, C. (2024). 'Inverted Apprenticeship: How Senior Occupational Members Develop Practical Expertise and Preserve Their Position When New Technologies Arrive'. *Organization Science*, **35**, 405–431.
- Boussieux, L., Lane, J. N., Zhang, M., Jacimovic, V., and Lakhani, K. R. (2024). 'The Crowdless Future? Generative AI and Creative Problem-Solving'. *Organization Science*, **35**, 1589–1607.
- Choi, T., Kumar, S., Yue, X., and Chan, H. (2022). 'Disruptive Technologies and Operations Management in the Industry 4.0 Era and Beyond'. *Production and Operations Management*, **31**, 9–31.
- Christensen, C. M., Wang, D., and van Bever, D. (2013). 'Consulting on the Cusp of Disruption'. *Harvard Business Review*, **91**, 106–114.
- Doshi, A. R., Bell, J. J., Mirzayev, E., and Vanneste, B. S. (2025). 'Generative artificial intelligence and evaluating strategic decisions'. *Strategic Management Journal*, **46**, 583–610.
- Edmondson, A. C. (1999). 'Psychological Safety and Learning Behavior in Work Teams'. *Administrative Science Quarterly*, **44**, 350–383.

- Edmondson, A. C. (2003). 'Speaking Up in the Operating Room: How Team Leaders Promote Learning in Interdisciplinary Action Teams'. *Journal of Management Studies*, **40**, 1419–1452.
- Edmondson, A. C., Bohmer, R. M., and Pisano, G. P. (2001). 'Disrupted Routines: Team Learning and New Technology Implementation in Hospitals'. *Administrative Science Quarterly*, **46**, 685–716.
- Endacott, C. G. and Leonardi, P. M. (2022). 'Artificial Intelligence and Impression Management: Consequences of Autonomous Conversational Agents Communicating on One's Behalf'. *Human Communication Research*, **48**, 462–490.
- Faulconbridge, J. (2025). 'Trajectories of legal work in the context of machine learning AI: conceptualising mediated evolution'. *International Journal of the Legal Profession*, **32**, 97–120.
- Faulconbridge, J., Sarwar, A., and Spring, M. (2023). 'How Professionals Adapt to Artificial Intelligence: The Role of Intertwined Boundary Work'. *Journal of Management Studies*. <https://doi.org/10.1111/joms.12936>.
- Faulconbridge, J., Sarwar, A., and Spring, M. (2024). 'Accommodating Machine Learning Algorithms in Professional Service Firms'. *Organization Studies*, **45**, 1009–1037.
- Felten, E., Raj, M., and Seamans, R. (2021). 'Occupational, industry, and geographic exposure to artificial intelligence: A novel dataset and its potential uses'. *Strategic Management Journal*, **42**, 2195–2217.
- Gehman, J., Glaser, V. L., and Merritt, P. (2025). 'An Assemblage Perspective on Hybrid Agency: A Commentary on Raisch and Fomina's "Combining Human and Artificial Intelligence"'. *Academy of Management Review*, **50**, 477–479.
- Goodale, J. C., Kuratko, D. F., and Hornsby, J. S. (2008). 'Influence factors for operational control and compensation in professional service firms'. *Journal of Operations Management*, **26**, 669–688.
- Goto, M. (2023). 'Anticipatory innovation of professional services: The case of auditing and artificial intelligence'. *Research Policy*, **52**, 104828.
- Harvey, J., Heineke, J., and Lewis, M. (2016). 'Editorial for Journal of Operations Management special issue on "Professional Service Operations Management (PSOM)"'. *Journal of Operations Management*, Special Issue on Professional Service Operations Management (PSOM), **42–43**, 4–8.
- Heim, G. R., Nair, A., and Bendoly, E. (2021). 'Aims and criteria for advancing technology management research at the Journal of Operations Management'. *Journal of Operations Management*, **67**, 920–925.
- Huising, R. (2023). 'Professional Authority'. In G. Eyal and T. Medvetz (Eds.), *The Oxford Handbook of Expertise and Democratic Politics*, Oxford: Oxford University Press, 453–469.
- Jia, N., Luo, X., Fang, Z., and Liao, C. (2024). 'When and How Artificial Intelligence Augments Employee Creativity'. *Academy of Management Journal*, **67**, 5–32.
- Katz, D. M. (2013). 'Quantitative Legal Prediction, or How I Learned to Stop Worrying and Start Preparing for the Data Driven Future of the Legal Services Industry'. *Emory law journal*, **62**, 909–966.
- Kaynak, E. (2024). 'Leveraging Learning Collectives: How Novice Outsiders Break into an Occupation'. *Organization Science*, **35**, 948–973.
- Kellogg, D. L. and Nie, W. (1995). 'A framework for strategic service management'. *Journal of Operations Management*, **13**, 323–337.
- Kellogg, K. C., Lifshitz, H., Randazzo, S., Mollick, E., Dell'Acqua, F., McFowland, E., et al. (2025). 'Novice risk work: How juniors coaching seniors on emerging technologies

- such as generative AI can lead to learning failures'. *Information and Organization*, **35**, 100559.
- Kim, B., Rezazade Mehrizi, M. H., and Bailey, D. E. (2025). 'Interlacing Situated and Algorithmic Modes of Knowledge Work: A Workplace Jurisdiction Perspective'. *Academy of Management Journal*. <https://doi.org/10.5465/amj.2023.1286>.
- Koljonen, T. and Chan, C. K. (2024). 'Balancing professional autonomy and managerial goals amid broad technology adoption pressures: Intraprofessional segmentation at a Finnish School'. *Academy of Management Journal*, **67**, 798–828.
- Kronblad, C. (2020). 'How Digitalization Changes our Understanding of Professional Service Firms'. *Academy of Management Discoveries*, **6**, 436–454.
- Langley, A., Lindberg, K., Mørk, B. E., Nicolini, D., Raviola, E., and Walter, L. (2019). 'Boundary Work among Groups, Occupations, and Organizations: From Cartography to Process'. *Academy of Management Annals*, **13**, 704–736.
- Leonardi, P. M. (2007). 'Activating the Informational Capabilities of Information Technology for Organizational Change'. *Organization Science*, **18**, 813–831.
- Liu, P., Yuan, W., Fu, J., Jiang, Z., Hayashi, H., and Neubig, G. (2023). 'Pre-train, Prompt, and Predict: A Systematic Survey of Prompting Methods in Natural Language Processing'. *ACM Computing Surveys*, **55**, 1–35.
- Malhotra, N., Morris, T., and Hinings, C. R. (2006). 'Variation in Organizational Form among Professional Service Organizations'. In R. Greenwood and R. Suddaby (Eds.), *Professional Service Firms*, Research in the Sociology of Organizations, Emerald Group Publishing Limited, Vol. 24, 171–202.
- Marti, E., Lawrence, T. B., and Steele, C. W. J. (2024). 'Constructing Envelopes: How Institutional Custodians Can Tame Disruptive Algorithms'. *Academy of Management Journal*, **67**, 1273–1301.
- McAfee, A., Rock, D., and Brynjolfsson, E. (2023). 'How to capitalize on generative AI'. *Harvard Business Review*, **101**, 42–48.
- Nicolini, D., Pyrko, I., Omidvar, O., and Spanellis, A. (2022). 'Understanding Communities of Practice: Taking Stock and Moving Forward'. *Academy of Management Annals*, **16**, 680–718.
- von Nordenflycht, A. (2010). 'What Is a Professional Service Firm? Toward a Theory and Taxonomy of Knowledge-Intensive Firms'. *Academy of Management Review*, **35**, 155–174.
- Ogunde, F. (2024). 'Navigating the legal landscape: large language models and the hesitancy of legal professionals'. *International Journal of the Legal Profession*, **31**, 311–322.
- Pachidi, S., Berends, H., Faraj, S., and Huysman, M. (2021). 'Make way for the algorithms: Symbolic actions and change in a regime of knowing'. *Organization Science*, **32**, 18–41.
- Pemer, F. (2021). 'Enacting Professional Service Work in Times of Digitalization and Potential Disruption'. *Journal of Service Research*, **24**, 249–268.
- Pemer, F. and Werr, A. (2023). 'Defusing Digital Disruption Through Creative Accumulation: Technology-Induced Innovation in Professional Service Firms'. *Journal of Management Studies*. <https://onlinelibrary.wiley.com/doi/abs/10.1111/joms.12972>.
- Raisch, S. and Fomina, K. (2025). 'Combining Human and Artificial Intelligence: Hybrid Problem-Solving in Organizations'. *Academy of Management Review*, **50**, 441–464.
- Rodgers, I., Armour, J., and Sako, M. (2023). 'How Technology Is (or Is Not) Transforming Law Firms'. *Annual Review of Law and Social Science*, **19**, 299–317.
- Rostain, M. and Huising, R. (2023). 'Vicarious Coding: Breaching Computational Opacity in the Digital Era'. *Academy of Management Journal*, **67**, 359–381.

- Sampson, S. E. and Pires dos Santos, R. (2023). 'Reengineering professional services through automation, remote outsourcing, and task delegation'. *Journal of Operations Management*, **69**, 911–940.
- Sandefur, R. L. (2015). 'Elements of Professional Expertise: Understanding Relational and Substantive Expertise through Lawyers' Impact'. *American Sociological Review*, **80**, 909–933.
- Scarbrough, H., Chen, Y., and Patriotta, G. (2024). 'The AI of the Beholder: Intra-Professional Sensemaking of an Epistemic Technology'. *Journal of Management Studies*. <https://doi.org/10.1111/joms.13065>.
- Schmenner, R. W. (1986). 'How Can Service Businesses Survive and Prosper?'. *Sloan Management Review*, **27**, 21–32.
- Schmenner, R. W. (2004). 'Service Businesses and Productivity'. *Decision Sciences*, **35**, 333–347.
- Schwarcz, D., Manning, S., Barry, P. J., Cleveland, D. R., Prescott, J. J., and Rich, B. (2025). 'AI-Powered Lawyering: AI Reasoning Models, Retrieval Augmented Generation, and the Future of Legal Practice'. <https://www.ssrn.com/abstract=5162111>.
- Spring, M., Faulconbridge, J., and Sarwar, A. (2022). 'How information technology automates and augments processes: Insights from Artificial-Intelligence-based systems in professional service operations'. *Journal of Operations Management*, **68**, 592–618.
- Susskind, R. (2013). *Tomorrow's lawyers: An introduction to your future*, Oxford: Oxford University Press.
- Susskind, R. and Susskind, D. (2022). *The future of the professions: How technology will transform the work of human experts*, Oxford: Oxford University Press, Updated Edition.
- Van Maanen, J. (1975). 'Police socialization: A longitudinal examination of job attitudes in an urban police department'. *Administrative Science Quarterly*, **20**, 207–228.
- Vanneste, B. S. and Puranam, P. (2024). 'Artificial Intelligence, Trust, and Perceptions of Agency'. *Academy of Management Review*. <https://doi.org/10.5465/amr.2022.0041>.