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Collective professional role identity in the age of artificial intelligence

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ABSTRACT

The increasing use of digital technologies such as artificial intelligence (AI) may be harmful to professions and occupations. Professional role identity can be damaged as AI takes the place of people across a broad range of professional tasks. Past studies have focused on individual-level identity, yet collective-level professional role identity remains largely unstudied. In addition, identity studies have developed two separate explanations for identity shifts: one relying on professionals' interpretation of technology and one relying on institutional logics. It is thus unclear whether and how the interpretation of technology and institutional logics coexist in a shifting identity. To address these gaps, I studied how collective-level professional role identity is being affected by AI among audit professionals in Japan. My research consisted of a textual analysis of professional publications from 2009 to 2018 and 42 interviews with Japan's national professional association and the 'Big Four' firm auditors. My analysis shows that a new collective professional role identity was constructed with six identity themes reflecting six interpretations of technology. These identity themes enacted a new constellation of managerial and professional logics that framed the audit profession's future positively. This study expands our knowledge about professional role identity by showing the value of an in-depth analysis of the content of collective identity, the missing link between the interpretation of technology and institutional logics and the importance of collective identity as a guiding principle for professions. This research also helps advance hybridity literature, as well as the emerging scholarly conversation about AI and professions.

KEYWORDS: professional identity; artificial intelligence; qualitative research; professional service firms; audit

INTRODUCTION

Many have argued that the rise of digital technology may significantly impact service delivery, client relationships, and career prospects for professions and occupations (Smets et al. 2017). Artificial intelligence (AI), in particular, seems to be automating and replacing humans in a broad range of professional tasks (Armour and Sako 2020). When a new technology is adopted, professionals must often reconfigure their professional roles (Lifshitz-Assaf, 2018), which are the essential part of their identities. This professional role identity—'the way that professionals see themselves in terms of who they are and what they do' (Reay et al. 2017)—is important because it maintains a profession's integrity against external changes (Goodrick and Reay 2010). This is particularly relevant for situations in which a technology is speculated to replace what humans do (Nelson and Irwin 2014), as in the case of AI.

However, our knowledge about professional role identity and new technology is scarce in two important areas.

First, we have little understanding of professional role identity at the collective level. As Chreim, Williams and Hinings (2007) demonstrate, professional role identity construction is a multi-level process that professional associations often facilitate and provide templates for at the field level. These templates significantly affect the enactment of individual identity in a daily professional work context. Collective-level professional role identity can evolve through interactions among professionals and between professionals and other stakeholders, allowing professionals to better cope with field-level shifts (Reay et al. 2017). As argued by Ashraft (2013) and Reay et al. (2017), however, the literature on professional role identity has largely focussed on the individual level, often taking collective-level identity for granted as a background factor (Bevort and Suddaby 2016; Kyratsis et al. 2017; Breit, Fossestøl and Andreassen 2018; Hendrikx 2018). A detailed study of how professional role identity operates at the collective level is thus an important but understudied line of inquiry within the literature about this topic.

Secondly, there are two separate explanations for identity shifts. Past studies of the relationship between professional identity and technology have suggested that how professionals experience and interpret a new technology plays a central role in how they reconfigure their identity (Korica and Molloy 2010; Barrett, Oborn and Orlikowski 2012; Nelson and Irwin 2014). Meanwhile, most professional identity studies have explained identity shifts through the lens of institutional logics (Thornton and Ocasio 1999)—the norms and beliefs that regulate the behaviour of individuals and organizations—claiming that identity often shifts in accordance with changes in institutional logics (Chreim et al. 2007; Goodrick and Reay 2010; Kyratsis et al. 2017; Reay et al. 2017). Technology, however, does not represent specific institutional logics a priori but is instead constituted in situ. For example, AI is not necessarily being developed and promoted for the sake of a particular institutional logic. The separation of these two research streams—identity vis-à-vis technology and identity vis-à-vis institutional logics—thus makes it unclear whether and how these two perspectives can coexist in the constitution of professional role identity confronting new technology. Past studies imply that the content of identity reflects both of the two perspectives: studies focussing on technology have shown that professionals' interpretation of technology makes up the content of their identity (Nelson and Irwin 2014), while studies focussing on institutional logics have revealed that the constellation of institutional logics is reflected in the contents of professionals' identity (Goodrick and Reay 2010; Reay et al. 2017). However, earlier collective-identity studies have focussed on the process of identity change via just one of the two perspectives, leaving the details about the contents of professional role identity underexplored.

To address these gaps, this research asks the following general research question: What makes up the content of a new collective-level professional role identity when professionals face a new, potentially threatening technology such as AI? At a more specific level, this study explores whether, and with what roles, the interpretation of technology and institutional logics coexist and interact in the shifting identity. Following the approach of existing collective-level identity studies (Goodrick and Reay 2010; Nelson and Irwin 2014), I conducted a textual analysis of publications from 2009 to 2018 by the Japanese Institute of Certified Public Accountants (JICPA), which is the professional association of auditors in Japan. This profession has existed for decades in the country but has only recently had to come to terms with the rise of AI. JICPA has recognized that, given the rise of this new technology, the lack of perspective on auditors' future roles is a problem requiring clarification of these roles in order to maintain the profession's integrity. Textual data were supplemented by 42 interviews conducted between 2017 and 2018 with auditors from JICPA and the 'Big Four' who led their firms' initiatives to adopt AI.

The analysis revealed that a new collective professional role identity was constructed—with a set of six identity themes reflecting six dimensions of professionals' interpretation of technology. The themes were not sporadic or fragmented but rather contributed to a mutually reinforcing rhetoric ensuring the positive framing of the future of the profession. The study also found that the reconfiguration of identity enacted a new constellation of institutional logics for these professionals—one that promoted managerialism as well as professionalism. Specifically, in this new identity, productivity improvement—through enhanced

managerialism with AI automation (auditors reimagined as 'Productivity Maximiser' and 'Collaboration Facilitator')—could provide resources for auditors to focus on new AI-augmented expertise. This led to enhanced professionalism with AI-empowered higher service quality (auditors reimagined as 'Data-empowered Advisor' and 'Analytics User'). These productivity and quality improvements enabled professional legitimacy to be maintained (auditors reimagined as 'Continuous Self-disruptor' and 'Guardian of Capitalism as before') and service opportunities to continue.

This article expands the literature on professional role identity in three ways. First, it demonstrates the value of a deep understanding of the content of collective professional role identity by showing a rich picture of the factors contributing to identity interacting with each other to frame the future of the profession positively. Secondly, this study illuminates the under-researched link between the interpretation of technology and institutional logics in reconfiguring identity. Thirdly, it substantiates the important role of collective-level identity for a profession's guiding principle, suggesting that professionals can exercise agency against disruptive technology.

This study also makes theoretical contributions to other research streams in three ways. First, it shows that collective professional role identity can incorporate hybridity beyond the individual-level identity work of managing complexity (Bevort and Suddaby 2016; Ahuja, Nikolova and Clegg 2017; Hendrikx 2018). Secondly, it broadens our view by introducing a particular rhetorical approach to identity hybridization—segmenting tasks to mutually supplement professional and managerial roles. Finally, this study advances the emerging scholarly conversation about AI and professions (Hinings, Gegenhuber and Greenwood 2018; Armour and Sako 2020) by demonstrating the potential significance of professional role identity as an area in which drastic change can emerge.

LITERATURE REVIEW

Professional role identity

Social identity theory suggests that individuals construct social categorizations through their group membership as boundaries (Tajfel and Turner 1986). Membership boundaries provide a community for those inside the boundary, reinforcing their shared identity. As membership boundaries build on the distinctiveness between insiders and outsiders (Montgomery and Oliver 2007), positive intergroup distinctiveness plays a central role in social identity construction (Hogg and Terry 2000). Social categories typically include gender, ability, age, sexuality, class, race, nationality, or industry membership (Ashcraft 2013; Roulet 2020). 'Profession' is one of these social categories, and professional identity is a particular form of social identity in professional settings (Kyratsis et al. 2017). It is 'an individual's self-definition as a member of a profession and is associated with the enactment of a professional role' (Chreim et al. 2007: 1515). As the definition suggests, enacting a particular role is an essential part of one's professional identity. This role enactment also gives rise to role identity (Chreim et al. 2007; Goodrick and Reay 2010)—'the goals, values, beliefs, norms, interaction styles, and time horizons that are typically associated with a role' that provide a 'definition of self-in-role' (Ashforth 2001: 6). Therefore, professional identity is inherently centred around professional role identity. As Reay et al. (2017: 1045) point out, 'the connection between role and identity is particularly strong for professionals', such that they commonly explain themselves 'with statements about the work that they do'. A growing segment of literature on occupations/professions and identity has studied occupational/professional role identity extensively (Chreim et al. 2007; Goodrick and Reay 2010; Nelson and Irwin 2014)—which is 'a sense of self that is associated with the enactment of a professional role' at the individual level (Goodrick and Reay 2010: 58), and 'the way that professionals see themselves in terms of who they are and what they do' at the collective level (Reay et al. 2017: 1045).

Collective-level professional role identity is constructed by means of multi-level factors and provides a template of what is considered ideal. Professional associations often contribute to its construction (Chreim et al. 2007), which is continuously reinterpreted and re-enacted by professionals in their daily professional work and is affected by the dynamics of the organization to which they belong (Pratt, Rockmann and Kaufmann 2006). Recent studies on professional role identity have focussed on how

individual professionals manage the complexity surrounding their identity (Ahuja, Nikolova and Clegg 2017). For example, Kyratsis et al. (2017) reported on physicians' professional identity shifts under the transformation from the communist to the capitalist regimes in Europe. Their analysis showed that a drastic environmental change, along with a professional logic shift, gave rise to identity threats. These threats triggered identity work by individual professionals, leading them to adopt new professional identities. In the research on societal change and professional identity shifts, particular attention has been paid to the hybridity of managerialism and professionalism as the source of complexity (Bevort and Suddaby 2016; Ahuja et al. 2017; Breit et al. 2018; Hendrikx 2018). In this context, professionalism emphasizes professional authority and autonomy based on irreplaceable expertise, while managerialism emphasizes organized and monitored actions to provide a service with maximum productivity (Freidson 2001). Professionals often face conflicting demands because of the rise of managerialism and thus engage in identity work to re-script their individual-level identity (Bevort and Suddaby 2016). In aggregate, the study of professional role identity has revealed the significance of individual professionals' roles in adjusting their work and identity under conflicting social requirements.

These studies, however, have left collective-level identity as a given and fixed 'foil' (Ashforth, Rogers and Corley 2011) against which individual professionals enact their individual-level identity. Scholars have paid less attention to collective-level professional identity, leaving a significant gap in the literature (Reay et al. 2017), although its strong influence on professionals has frequently been pointed out (Ashforth et al. 2011). Despite the limited number of collective-level identity studies, the continuous changes and subtle nuances of collective-level identity are well known. An analysis of nursing textbooks by Goodrick and Reay (2010) highlighted that collective-level role identity changes continuously, rather than remaining fixed and unchanging. These changes are driven by rhetorical techniques used by professionals to maintain moral legitimacy while adjusting to the changes in wider societal expectations. The study emphasizes how professional discourses reflect shifting societal expectations, often mediated by professional associations. Reay et al. (2017) further advanced the discussion by showing that professionals' collective-level efforts revolve around reinterpreting institutional logics surrounding the profession. Their study of Canadian physicians working in healthcare reform showed that the collective-level professional role identity shifted in its interactions with the constellation of logics (professional, market, state, and corporate, in the subjective construction by physicians), from 'autonomous expert' (dominated by professional logic) to 'head of team' (hybridization of multiple logics). This suggests the important role of the interactions between the collective-level professional role identity and institutional logics enacted by the professionals. In this study, I build upon and expand on this literature on collective-level professional role identity within a context of drastic social change.

Technology and professional/occupational role identity change

Among the various drivers of social change, technology has long been considered an essential factor in professional settings (Noordegraaf 2011). It has recently become still more vital due to the increasing impact of digital technology on professions and occupations (Smets et al. 2017; Hinings et al. 2018). However, studies on professional and occupational role identity have rarely investigated the impact of technology. Most have highlighted regulatory or market environmental change using the institutional logics lens—framing the institutional logic shift associated with the environmental change as a trigger and describing the resulting identity shift (Chreim et al. 2007; Goodrick and Reay 2010; Kyratsis et al. 2017; Reay et al. 2017). Yet, in the case of technology change, it is problematic to analyse an identity shift as a result of a logic shift that is fixed along with the technology. This is because technology itself is not an institutional logic nor its representation, but one of the environmental conditions surrounding logics (Thornton, Ocasio and Lounsbury 2012). New technology does not enter an occupational field fully defined but is constituted within the context (Leonardi and Barley 2010). As such, technology has a way of influencing professional and occupational identity through a peculiar mechanism. Past studies

have highlighted three important aspects of this mechanism.

First, individual-/group-level studies have revealed that new technology itself can trigger professional and occupational identity reconfiguration (Zetka 2001) and give rise to a new identity through professionals' new practices and boundary negotiations with others (Barrett et al. 2012). For example, Korica and Molloy (2010: 1892) showed that surgeons constructed new roles and identity through 'many different insider/outsider dynamics created around new technology, both at the intra- and the inter-professional level'. As another illustration, Prasad and Prasad (1994) studied the adoption of an administrative database for Health maintenance organization (HMO) nurses and reported that nurses interpreted the technology as a new expertise to enhance their roles and identity, thus strengthening their undervalued position and expanding their occupational boundaries. These studies suggest that new technology can urge occupational members to reinterpret themselves, through the lens of how the new technology affects their professional/occupational work and boundaries (Prasad 1993; Gopal and Prasad 2000).

Secondly, advancing this line of inquiry, some scholars have addressed the collective-level identity shift. Nelson and Irwin (2014) studied librarians facing the rise of the Internet, a technology that could replace librarians' traditional role. They found that the librarians interpreted technology through their occupational identity, while their experience of the technology also shaped their occupational identity. The authors demonstrated the shift of the librarians' collective-level occupational identity from 'masters of search' to 'connectors of people and information'—suggesting that technology can encourage occupational members to refine their identity to become irreplaceable, even when the technology provides similar services as their own occupation. Their study highlights the interactive and co-evolving nature of identity and the interpretation of technology, including at the collective level.

Thirdly, some studies—particularly those in information systems (IS) research—have implied that the shifting constellation of institutional logics among professionals may have an important link with the shift of professional identity, even in the context of technology change. IS research has extensively examined the field of medical services, within which significant transformations incorporating IS adoption have aimed to promote cost-efficiency, performance, and accountability (Doolin 2004; Currie and Guah 2007). IS adoption has been reported to create tension among professionals, by disrupting work patterns (Boonstra and van Offenbeek 2010) and professional autonomy (Davidson and Chismar 2007; Abraham and Junglas 2011). As these outcomes deviate from the traditional professional logic, the literature has often assumed new technology to be a carrier of institutional logics (such as rising managerialism) that stimulates identity change as a result (Rajao and Hayes 2009; Bernardi and Exworthy 2020). However, as most of the literature has studied medical services—which are already being challenged by the non-technological institutional pressures of New Public Management reforms—and as the situations of technology adoption in the reform can be naturally compatible with its logic, it is unclear how exactly new technology and logics interact in professional identity change.

This study is based on—and intends to advance—these literatures, by supplementing our scarce understanding of collective-level identity and exploring the obscure yet important link between the interpretation of technology and institutional logics in shifting professional role identity.

METHODS

Research setting

I studied the collective-level professional role identity of auditors in Japan as a case of an established knowledge profession facing AI—a technology that was rumoured to potentially replace professional auditors. In Japan, the Certified Public Accountants (CPA) Act was introduced in 1948 to officialize the profession. After a major revision to the legislation in 1966, CPAs monopolized the statutory audit as registered members of the JICPA. As of December 2018, Japan had more than 31,000 CPAs and 220 audit firms. The 'Big Four' franchise firms (EY Shin Nihon, KPMG Azusa, Deloitte Tohmatsu, and PwC Arata and PwC Kyoto) held a large share of the external audit market, covering over 70% of all clients and over 90% of the market cap for listed companies,

which are the core auditing segment. The remaining clients were serviced by local firms and individual accountants.

In recent years, some Oxford researchers have claimed that AI can replace the tasks of various occupations in their influential reports (Frey and Osborne 2017). Their reports suggested that accountancy is highly vulnerable to such replacement. This issue has generated a great deal of media attention around the potential loss of the role of human CPAs and their arguably pessimistic future. To offset any scepticism about the value of one's role, it is effective to have a counterproposal regarding the important roles that one will continue to play. Yet, auditors themselves were unsure as to the roles they would occupy once AI was sufficiently developed and diffused in the future. One reason for the unpreparedness was the lack of actual use cases of AI in practice from which a new role identity could emerge. The future impact of technology was likewise highly uncertain. The application of AI to auditing does not result in an immediate change. Instead, it involves task evaluation and solution development for hundreds of audit tasks (Abdolmohammadi 1999), all of which are linked with specific professional expertise and knowledge. As auditors did not know which specific tasks were replaceable by which technological solutions, they also lacked theories as to whether and how their professional expertise and knowledge could (or could not) be marginalized.

The JICPA observed that this lack of a solid understanding of their future professional role was destroying integrity and confidence within the profession. In 2015, its IT committee launched a team to research this issue. In March 2016, the committee published a report entitled '*The Outlook for IT-based auditing: Approaches to next generation audit*' (JICPA 2016)—which explained continuous auditing and data analytics, along with a visionary scenario of what future auditors' work would look like. Since that time, JICPA has published seminal articles on the topic of AI in professional magazines. In October 2018, JICPA published another draft report by its IT committee, '*The Outlook and issues of the next generation audit*' (JICPA 2018), in which it updated its vision for AI.

By November 2016, all the Big Four firms had launched task force teams at the firm level, aiming to study and develop AI audit solutions. These teams studied possible applications of AI to their auditing. They also promoted its adoption in 2016–8, via research collaboration with universities, patent acquisition, and new solution development with external vendors. Several firms announced their application of AI-assisted solutions to the core audit task (journal entry fraud detection) in 2018. Algorithmic solutions were experimentally explored in pilot audit projects for a wide range of audit tasks and were adopted firm-wide.

Research design

Prior literature suggests that to capture the discourse about changing occupational and professional identity at the collective level, materials published by and for those in the focal occupation or profession should be analysed (Goodrick and Reay 2010; Nelson and Irwin 2014). Past studies of the intersections between identity and technology have also shown that the ways in which occupational members construct the focal technology play a central role in their identity reconfiguration (Korica and Molloy 2010; Barrett et al. 2012). As a representative study of the intersection of these literatures, Nelson and Irwin's (2014: 895–904) study of librarians suggests the following steps to translate media data into the content of collective identity. First, the authors selected the two most representative professional journals, one for its affiliation with a professional association and the other for its large circulation volume. Secondly, they identified relevant articles in the journals by selecting keywords of interest related to the focal technology and excluding unrelated items such as advertisements and book reviews. Thirdly, they coded discursive responses to the new technology for each article—and traced the percentage of articles in a given year that reflected each response—to understand longitudinal change. Fourth, to capture the nuances of each article, they conducted multi-step coding for each article to develop the second-order themes and aggregate dimensions. Fifth, they matched the codes with the discursive responses to identify longitudinal change by phases. Their analysis effectively identified the key theme of the librarians' occupational role identity which shifted during those phases.

I followed Nelson and Irwin's analytical approach overall but customized it to the current study in three ways. First, measuring longitudinal change is out of the scope of this study, as the history of AI was still too brief to present such a shift. Therefore, I followed the first, second, and fourth steps of their analysis overall, but excluded the steps for understanding longitudinal change (the third and fifth steps). Secondly, while their analysis highlights only one consolidated theme of occupational role identity in each phase for analytical brevity, this study opts to further explore any nuances potentially omitted in such a simplification. I therefore conceptualized professional role identity as a set of multiple themes (Goodrick and Reay 2010). The format of multiple themes can richly describe diverse dimensions of the contents of identity, as Goodrick and Reay's study on nurses illustrates via concrete examples of key identity themes (e.g. 'Nursing as science', 'Nursing as caring', and 'Nursing as a good or service'). Thirdly, as AI adoption was still in its early phase, it was possible that archival data might miss some emerging professional discourses. To address this issue, I also collected interview data from JICPA and AI-adoption task force members in the Big Four firms, because professionals playing leading roles in change can strongly influence the way collective-level identity is reconfigured (Reay et al. 2017).

Data collection

Archival data

I first collected a broad range of local literature published from 2014 to 2018—using the keywords 'AI', 'analytics', and 'audit'—to understand trends. This included reports, brochures, websites, press releases, and magazine articles produced by JICPA, the Big Four firms, and medium-sized local firms, along with other business media articles on the topic. For in-depth textual analysis, I selected the two JICPA reports (2016–8) and their professional journal, '*Kaikei Kansa Journal*' (in English, *Accounting and Audit Journal*, JICPA's monthly official professional journal)', for their affiliation with JICPA and because they were widely referred to amongst professionals. All parts of the two JICPA reports were relevant to the current research focus as they describe the technology change and its potential influences on the profession throughout. Meanwhile, as *Kaikei Kansa Journal* contained a wider range of content, I extracted only those that were relevant by excluding advertisements, 'News Flashes', 'Academic Foresights', 'Book Reviews', and other miscellaneous pages (Nelson and Irwin 2014). I then reviewed the remaining 1,663 articles published over the previous 10 years (2009–8). As no reference to AI could be identified prior to January 2016, I focussed my analysis on publications from 2016 to 2018. Among the 627 articles shortlisted, I identified 23 that explicitly mentioned AI. These included opinion articles by CPAs, vision statements by JICPA directors, and symposium summaries.

Interview data

I conducted 42 semi-structured, face-to-face interviews (a total of 55 h with 63 interviewees) with members of the Big Four firms and JICPA, at their Tokyo headquarters in 2017–8. Most interviews ($n = 33$) were audio-recorded and transcribed, while detailed memos were taken for the remainder. Interviewees from the Big Four firms were distributed as follows: Firm A: 16; Firm B: 4; Firm C: 12; and Firm D: 9 (in the order of my access). Data pertaining to JICPA were collected from another interview with JICPA directors, supplemented by six of the firm interviews involving staffs who were temporarily transferred to JICPA. The firm interviewees were all internal task force members for AI adoption (including various levels from Associate to Partner), except for one interview with an external IT vendor from Firm C. Other auditors outside the task force teams lacked sufficient knowledge and opinions about AI auditing, since firm-wide AI-adoption preparation was being carried out confidentially.

Data analysis

I adopted a two-step coding approach—in-vivo and axial coding—to balance researcher creativity and analytical rigour (Glaser and Strauss 1967). For the first step, I identified paragraphs in the data that explicitly referred to the rise of AI and auditors' professional roles (145 paragraphs from the literature data and 247 paragraphs from interview scripts). The total of 392 paragraphs were coded in vivo in terms of their original meaning (Strauss and Corbin 1998).

Where the analysis suggested multiple meanings (in 46 paragraphs), I used two codes for the most relevant implications. For example, I labelled the following comment by an auditor in a panel discussion article in a professional journal as 'Need for IT and AI knowledge' and 'Need for statistics knowledge':

> Listening to today's discussion, I realised that we must actively incorporate new factors such as IT and statistics to change our audit work. CPAs will at least need to acquire skills to use, understand, and evaluate these expertise areas. For that, it is important to clarify what knowledge CPAs should have, which is where JICPA is expected to contribute (*Kaikei Kansa Journal*, January 2018: 37).

Although the paragraph included another theme about JICPA's role, I prioritized coding for professional roles ('who we are' and 'what we do'). As such, I obtained 438 codes (346 single-coded and 46 double-coded paragraphs).

I used the two types of data to supplement each other in the following steps. First, I began my analysis with the text data to develop in vivo codes. Secondly, by repeatedly reading and classifying the codes, I obtained emerging first-order categories. Thirdly, I conducted in-vivo coding with the interview data to further explore identity discourses with fresh eyes, without referencing the in-vivo codes obtained from the text data. Fourthly, I matched the two sets of in-vivo codes to reconsider the first-order categories. I then found that the two sets of codes were actually highly similar and could be integrated into 17 first-order categories that were repeatedly observed.

The content and distribution of the coding results were generally consistent between the field level (text data) and the firm/individual level (interview data). Meanwhile, in some first-order categories with only a limited amount of text data evidence, the exploration of the interview data confirmed further supporting evidence. For instance, one of the first-order categories ('7. Improvement of audit task effectiveness') had only 5 pieces of text data evidence, which were supplemented by 36 pieces of evidence from the interview data. This suggests that the two data sources successfully complemented each other. Some of these emerging themes had not yet been sufficiently captured by professional publications, but the interviews found the professionals to have already perceived and actively discussed those new themes in their context. All 17 codes were also observed in each of the four firms, suggesting that no firm(s) strongly deviated from the observed identity themes.

For the second step, I analysed the relationships between the first-order concepts, focussing particularly on how these concepts correlated with the auditors' interpretations of the technology and of their professional role identity. Here I assumed that the professional role identity is constructed in interaction with the interpretation of technology (Nelson and Irwin 2014) and comprises multiple themes (Goodrick and Reay 2010). I developed the second-order themes which corresponded to the identity themes, by categorizing and summarizing related first-order concepts. I achieved this through an iterative process of reading and categorizing the concepts and original data. This 'axial coding' (Strauss and Corbin 1998) was adopted to allow the researcher's flexible sensemaking to explore hidden-order categories. Figure 1 summarizes the revealed 'data structure' (Gioia, Corley and Hamilton 2013), showing the link between the original data and the extracted themes. This demonstrates the six second-order themes of the auditors' collective-level professional role identity identified through analysis, which can be aggregated into three semantic dimensions.

FINDINGS

In this section, I present each of the six themes identified as part of the auditors' professional role identity. These themes were also intertwined with auditors' interpretation of the technology. At the end of this section, I propose a model that summarizes what constructed auditors' professional role identity alongside AI.

Identity theme (1): Auditor as productivity maximizer

In this thread of professional discourse, the auditors interpreted AI as a tool for productivity improvement, which 'rationalizes inefficient work that previously required long work hours' (Firm A, #9). Many interviewees showed their strong interest in AI as a

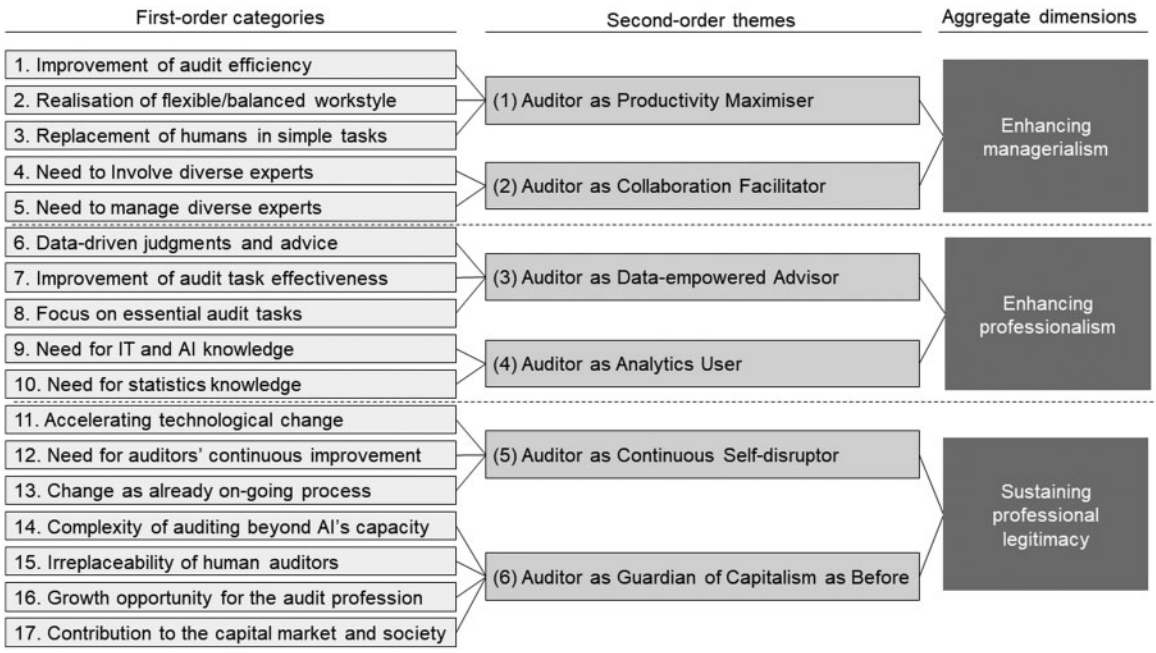

Figure 1. Data structure.

productivity booster. One Senior Associate's comment was representative of this interest: 'As a front-line staff, what I expect for AI most is definitely workload reduction' (Firm A, #5). The role of auditors in the age of AI was to maximize productivity. The JICPA report claimed that 'the advancement of digital technology [would] definitely realise more efficient auditing by replacing a large amount of human work processes and manual work' (*Kaikei Kansa Journal*, August 2016: 28). As a result, it was expected that auditors' 'work-life balance and working environment [would] be greatly improved' (JICPA 2018: 12). They perceived that 'designing which part of audit work should be delegated to AI' was essential in their new role, to leverage its potential (*Kaikei Kansa Journal*, May 2017: 17).

Improvement of audit efficiency

In this conversation thread, auditors perceived AI as a tool for improving productivity in two aspects. First, AI and algorithmic solutions would automate and reduce time-consuming simple and repetitive tasks, as the JICPA report stated:

> The advanced task automation will release auditors from simple and repetitive tasks such as a large amount of vouching, and enable efficient data collection, which form(s) the basis of auditors' judgements (JICPA 2018: 1).

Secondly, AI would contribute to the levelling of audit work and eliminate excessive year-end work via continuous auditing—an automatic method used to perform auditing activities on an ongoing basis. Auditors expected that it would 'identify audit issues timely through the year' (JICPA 2018: 29) to greatly simplify the year-end audit procedure. As the JICPA report posited:

> Auditors can expect to significantly reduce analytical verification procedures at the end of a fiscal year, which is now barely managed in the tight timeline before disclosure. As long as the auditing program does not notify errors, auditors basically can finish auditing without additional year-end procedures (*Kaikei Kansa Journal*, May 2016: 23).

Auditors' interest in efficiency reflected their perception that traditional auditors were susceptible to overwork. This formed a part of their old role identity, in which auditors willingly worked long hours doing manual audit work when necessary, as

a symbol of their dedication to the clients and profession. As a Senior Manager remarked, they 'spent so much time on tedious tasks which auditors do not have to do' (Firm A, #13). As a Partner pointed out, however, 'junior staff [were] becoming increasingly doubtful about the value of time-consuming manual work' (Firm D, # 35). They perceived the new technology as an opportunity for change in the direction of enhanced productivity. As a Senior Associate put it, 'the world is not like 'Yeah, let's work all night!' as before, anymore (Firm D, #39).

Realisation of a flexible/balanced workstyle

Such productivity improvement was associated with a more focussed and flexible workstyle, in three ways. First, 'auditors [would] have less need for working in clients' meeting rooms' and 'increasingly work at audit firm offices, or even at their home' (JICPA 2016: 32). Secondly, AI would improve auditors' work-life balance. As one JICPA Director commented: 'auditors will benefit economically and personally by having more of their own private time' (JICPA, #41). Thirdly, the technology would enable a 'shift to specialized task teams, organized only when audit machine programs identified some anomalies or errors' (JICPA 2016: 31), replacing the current fixed-team assignment model. Incorporating these changes, the JICPA report envisioned a flexible remote workday for an auditor in a story-telling format:

> On 7 July 2025, my workday kicks off by reviewing the automated dashboard on my home PC listing updates of my client firms, with a cup of coffee. As I can login (to) the firm desktop environment . . . I can check everything at my home. When there are no alert signs on the screen, I can decide my office hours flexibly (JICPA 2016: 33).

Replacement of humans in simple tasks

From the perspective of auditors, it was also assumed that 'it is highly probable that routine audit tasks will be substituted by AI' (JICPA 2018: 25). One Partner acknowledged its potentially significant impact: 'Human auditors could decrease by half. It is not an unrealistic scenario' (Firm C, # 29). Meanwhile, they perceived that the application of AI would be limited to certain task categories only, as a JICPA article noted:

> It is estimated that advancing digital technology will substitute us in tasks with the following features: tasks which require accuracy only, which are repetitive, and which involve calculations with a fixed logic (*Kaikei Kansa Journal*, August 2016: 28).

Auditors framed automation as an opportunity to capture improvement potential, aiming for 'the optimization of human judgements and AI in the audit workflow with innovative views' (*Kaikei Kansa Journal*, July 2017: 32). Thus, a central role of AI-age auditors would be their analysis and recommendations about which specific simple manual tasks should be substituted by AI and how. A central role of auditors would be 'to define audit tasks that AI can substitute and those that humans should do, to realise more efficient work' (JICPA 2018: 29). One JICPA Director noted that auditors' new role of designing productivity maximization strategies would be an important way for them to stay relevant: 'We may end up delegating much of our tasks to IS, but still we make decisions on what audit tasks are necessary, based on solid understanding of the client business through client discussions. This is exactly what the auditors will do' (JICPA, #41).

Identity theme (2): Auditor as collaboration facilitator

In this thread, AI was interpreted as the basis of collaboration for multiple experts. In leveraging AI, auditors anticipated that they would need to involve more non-auditor experts, due to knowledge requirements expanding beyond their capabilities. The JICPA report noted the need for specialized experts in new areas:

> Auditing inevitably needs advanced statistical knowledge and expertise in data analytics. When highly specialized analyses are deployed,

> experts of statistics or data analytics will be engaged (JICPA 2018: 34).

An audit team would become a mix of multiple experts, as a result, in which 'Data scientists and AI experts would be increased while CPAs would be decreased' (Firm C, #28). With increasingly diverse teams, auditors perceived that their new role would shift to the management of those various experts, as the JICPA report posed:

> As task areas of non-CPA experts expands, CPAs need to spend much time on evaluating the validity of those experts' work. The main task of CPAs has been to develop audit opinions based on audit evidence collected through their own audit procedures. Since the audit evidence collection will increasingly rely on other experts' work, it will become important for CPAs to control those experts to secure due audit evidence (JICPA 2018: 49).

Need to involve diverse experts

In these discussions, auditors perceived AI as the core engine of audit, but also as a new knowledge area lying beyond their current expertise. The JICPA report pointed out this gap as a serious potential problem:

> Auditors need to consider whether background process logics of AI are adequate in evaluating judgments of logic-based AI. However, there can be some cases in which CPAs alone cannot judge whether the logic has problems. One problem is that auditors might apply new audit technologies inappropriately because they cannot judge the validity of AI judgments. Another problem is that auditors might not be able to sufficiently scrutinise analytical methods using big data, because of their lack of specialised skills such as statistical knowledge (JICPA 2018: 48).

A natural resolution of this problem was to frame AI as a tool for collaboration with other experts. Many interviewees appreciated the value of such a collaboration. As one Senior Manager noted:

> AI is a programme, which requires human expert judgments of whether it appropriately runs as a programme. We CPAs are not so knowledgeable in this area. Thus, AI is something that changes audit work to involve those AI experts and make the new way of collaboration possible (Firm C, #31).

This change contrasted with the more traditional view that auditors are isolated specialists in a homogeneous culture that lacks diversity. As one Director commented, '[audit firms had only] an extremely narrow range of people, or one could call them very unilinear', as most auditors joined the firms straight from university, 'having experienced only the same CPA examination' (Firm A, #14).

Need to manage diverse experts

With increasing cross-expert collaboration, auditors perceived that the focus of their role would shift towards managing diverse professionals and collaboration processes, rather than conducting actual analyses. As stated in one JICPA article, they perceived that 'CPAs are expected to play the role of supervising and managing the team, as auditing [would] become a profession that combines diverse expert abilities, such as IT, data science, data cleansing, and RPA' (*Kaikei Kansa Journal*, July 2017: 32). Consequently, auditors were expected to be skilled in 'project management to manage task progresses of diverse non-CPA experts' and 'facilitation of communications between IT experts and CPAs without IT backgrounds' (JICPA 2018: 51). For example, the JICPA reports envisioned a future audit-firm Partner's typical day, focussed on managing a team of experts:

> I listed up IT and forensic experts who match the criteria of this case, using 'Accounting and audit assistance AI', and ordered to launch an investigation team. I also told my Manager to ask the data management team for their support, as we may need data processing of the client's raw data because their systems are not integrated (JICPA 2018: 57).

Identity theme (3): Auditor as data-empowered advisor

In this conversation thread, auditors interpreted AI as a capability enhancement. Auditors greatly appreciated AI's potential contribution to improve task quality—particularly in fraud detection—by 'reducing [human auditors'] overlooking anomalies' (Firm B, #23) or by applying truly effective journal data investigation criteria with data analytics, beyond what is offered by humans who 'can think of only simple conditions' (Firm D, #37). The data revealed auditors' aspirations to provide more advanced judgements and advice to their clients. The 2018 JICPA report clearly envisioned that future auditors would provide data-empowered judgements and advice, by effectively using AI:

> Auditors will be able to access audit evidence, which cannot be obtained with the current audit methodologies, by deploying new experts and audit methodologies to expand the range of audit procedures. As a result, the technology will enable deeper understanding of clients' business and clearer risk identification, then auditors may be able to choose and conduct audit procedures which better suit specific risks (JICPA 2018: 48).

Such a development was expected to improve the effectiveness of auditing as a whole by enabling auditors to 'respond to further advanced accounting standards—with more complicated accounting to accurately represent the reality of transactions—that the society demands' (JICPA 2018: 4). As the JICPA president emphasized in their professional journal, AI was perceived as a tool enabling them to focus on the essential expertise of the profession:

> There is a concern that auditing might be substituted by IT and AI. The reality is, however, there are numerous tasks which we rather want to delegate but we humans have to deal with. Leveraging IT and AI to significantly reduce simple tasks which human auditors are doing today, allowing machines to conduct certain judgments to focus on the verification of those judgments, and enhancing critical judgments that only humans can handle and communications . . . this is what our profession should be (*Kaikei Kansa Journal*, April 2017:13).

Data-driven judgements and advice

Auditors proposed their new role as that of data-empowered advisors, which contrasted with their past role in two ways. First, auditors problematized their past overestimation of the value of human intuition. As one Senior Manager stated, 'Partners rely on individual intuitions, so their audit quality varies' (Firm A, #13). Auditors suggested that they would fully leverage data analytics to improve audit quality and reduce human variance. Secondly, they highlighted the need for their role to evolve—beyond that of a mere accounting mistake checker, to that of a managerial advisor. As one Partner said, 'it is no longer sufficient to simply give audit reports according to a fixed procedure as in the past. Firms are looking for collaboration partners to enable their transformations' (Firm C, #29). One new role was that of prediction-based preventive advisor: 'Firms need practical advice to prevent future problems if there may be some abnormal signs. That's what we should achieve in our auditing' (Firm A, #7). Consequently, auditors assumed that 'the core of auditing would increasingly become client communications based on a deep understanding of their business' (Firm D, #22). As a representative story, the JICPA report described a future typical day of an audit firm Partner with such a new task focus and improved confidence:

> My team members sent me their analysis results [of anomalies automatically identified by AI in the morning]. The automatic alert in this morning was due to journal entry human errors, not accounting frauds. They suggest that it was potentially caused by the lack of accounting knowledge among the client subsidiary staff. I decided to contact the CEO, because an early intervention will prevent further problems. As firms make immediate managerial decisions based on real-time data, misinputs can directly lead to wrong decisions nowadays. I sent a message to my Manger to

summarise the log, causes and required actions for the problem, and finally had a morning coffee' (JICPA 2018: 57–58).

Improvement of audit task effectiveness

As the basis of this new role, auditors perceived that 'AI is a tool to make audit work more effective' (JICPA 2018: 29). AI was expected to contribute in two ways. First, thorough data collection and analysis with AI solutions would identify risks that human auditors 'may have missed in the current sampling method' or 'changes only computers could identify' (Firm A, #4). As another Senior Manager explained:

> Current audit approach is to focus on pinpointed areas to find anomaly, as it's difficult to set all the possible scenarios. But it will become possible to check a much broader range of data, and what will emerge will give us an 'aha' moment (Firm C, #27).

Secondly, analytical solutions would enable a sophisticated quantitative verification of audit clients' estimations in their financial results. For example, one Partner suggested the value of such data-driven evaluation, which was difficult without new technology:

> We will analyse our clients' profitable and non-profitable operations in the past, run a machine learning using related data, then find the formula of profitability. Then we can apply it to the on-going projects and identify those with a high risk of making a loss (Firm B, #11).

These features were expected to improve audit quality by 'overcoming human biases with AI' (Firm A, #4) and 'reducing the variance by auditors' (Firm B, #23).

Focus on essential audit tasks

Auditors observed that AI-based improvements could be framed as a means of enabling them to focus on the essential part of audit tasks—the elements that are complex but add value. One article in the professional journal exemplified such a shift of focus:

> The audit industry as a whole should recognise the change and leverage AI to streamline operations, so that auditors will focus on the tasks that only auditors can deliver (*Kaikei Kansa Journal*, July 2018: 20).

In other words, auditors would 'use the spare time gained from using new technology on other tasks that had not been sufficiently addressed' (Firm D, #38). Specifically, auditors assumed advanced risk consideration and client advice as areas for this new focus, as one Senior Manager noted:

> We want to spend much more time on tasks that require deep thinking or client communications, but the reality is that we're overwhelmed by the huge amount of testing and documentation tasks ... In that sense, we think efficiency leads to improved effectiveness as a result (Firm A, #4).

Identity theme (4): Auditor as analytics user

In this discourse thread, auditors interpreted AI as a new area of expertise to be acquired. As a Manager commented, the rise of new technology had historically been associated with a need for auditors to acquire new types of expertise: 'Many technologies continue to emerge, and CPAs continue to learn how to utilize them as a new required CPA skill' (Firm D, #38). Having a basic knowledge of IT and AI, as well as of statistics, was perceived to be a new 'must-have'. The JICPA report noted the new skill requirements as a serious issue:

> Required skills for CPAs to lead clients have become highly sophisticated. Beyond the minimum requirement of a good business sense to understand clients' activities and related risks, CPAs need to acquire IT skills to evaluate the financial data generation process, and statistical knowledge to utilize data analytics methodologies and their results (JICPA 2018: 58).

This study's interviewees unanimously agreed with this new professional requirement. As one interviewee noted: 'when clients adopt those advanced technologies, auditors have to understand them' (Firm C, #33). Statistical knowledge was discussed as the basis of professional judgements, because 'without statistical knowledge, auditors are unable to judge whether it is an outlier to be investigated or not, when data analysis results are slightly outside the expected range' (JICPA 2016: 29). With these new capabilities, auditors would become the tactical users of advanced analytics.

Need for IT and AI knowledge

In this line of professional conversations, AI was a new learning task for auditors. One Manager, for example, stated: 'to complete auditing decently, IT knowledge will become indispensable to control or handle the process. We cannot totally leave it to other experts' (Firm B, #16). Auditors have had to repeatedly adjust to new technology advances in the past, as one Partner suggested via the example of enterprise resource planning (ERP):

> Twenty years ago, if an audit manager went to a client meeting and asked them, 'By the way, what is this thing called ERP'? Then he never got a call again from the client. Yes, we always have to continue catching up with the technology advancement (Firm A, #15).

These discussions about technology expertise reflected the perception of auditors as technology laggards. As one journal article pointed out, it was perceived that 'generally, the audit profession [had] been conservative and inactive to incorporate new technologies' (*Kaikei Kansa Journal*, 2016: 30). Senior auditors used to build their expertise and professional trust 'based on their professional intuition, which they developed through the tedious manual work in the past' (Firm A, #13). AI adoption was framed as an opportunity for auditors to depart from this obsolete tradition, transforming themselves into the leaders of the technology age.

Need for statistics knowledge

Auditors predicted that two tasks would become critical in their audit work: planning machine analytics and interpreting results. Because many of their analytic processes can be automated using algorithms authorized by auditors themselves, 'the most important work of auditors may be to set the audit algorithms properly before the beginning of the fiscal year' (JICPA 2016: 30). Because 'analysis results of AI cannot be 100% accurate' (Firm C, #30), auditors would also develop detailed analytical tests, such as to 'check correlations among data, confirm its reliability based on correlation coefficients, and set thresholds of KPI outliers' (*Kaikei Kansa Journal*, May 2016: 22). Thus, statistical knowledge would become the key requirement for such tasks, as the JICPA report pointed out:

> Auditing by statistical methods such as correlation coefficients and hypothesis testing means that our current way of audit opinion formation, based on vouching and other approaches, is shifting to a new statistical approach. For example, if the data analysis result is slightly higher or lower than the expected level assumed by the audited company and the auditor, you cannot judge whether it is abnormal or normal without statistical knowledge (JICPA 2016: 30).

Identity theme (5): Auditor as continuous self-disrupter

In this thread, auditors interpreted AI as an ever-developing technology. Throughout the discourse, auditors repeatedly emphasized the race against recently accelerating technology advancement. The head of JICPA's IT committee alerted auditors in a journal article, for example:

> In these days, the advancement of new technologies such as AI, IoT [Internet of things] and Blockchain is bringing about drastic changes in the society. How we should deal with those technological innovations in auditing is becoming a critical agenda for us

auditors (*Kaikei Kansa Journal*, December 2018:72).

Auditors highlighted their continuous adjustment to technological change as an essential feature of their profession. As the 2016 JICPA report noted, they shared a timeless ideal that 'auditors have their responsibilities to keep pursuing new analytical approaches at any time' (JICPA 2016: 37). The continuing evolution of auditing was still more vital in the AI age, because 'the digital transformation is an endless disruption that can renew paradigms' (*Kaikei Kansa Journal*, August 2016: 29). JICPA thus idealized those auditors who 'keep training themselves, adjusting to the needs of the times, never being content with past experiences' (*Kaikei Kansa Journal*, August 2016: 30).

Accelerating technological change

AI and other new technologies were highlighted as ever-developing tools; auditors would need to make continuous efforts to catch up. As one journal article warned: 'The information processing technology and science, represented by the IoT, IoE [Internet of everything] and AI, is advancing dramatically at a speed beyond our imagination' (*Kaikei Kansa Journal*, January 2017: 2). This concern was also shared at the individual level. For example, one Partner showed his bewilderment: 'AI, blockchain, these emerging technologies, and in the future, we'll have more . . . I think it's moving faster right now' (Firm D, #36).

Need for auditors' continuous improvement

Amidst such relentless technology growth, auditors perceived continual learning and adjustment to the latest technology as part of their professional work. As one Partner commented, 'as technology advances, then the more Big Data we have; then we have next research agenda items. It is the cycle of progress . . . we need to always keep up with changes in society' (Firm B, #11). Individual auditors were expected to 'continue acquiring further advanced knowledge and skills to evaluate whether financial results correctly reflect the reality of businesses' (JICPA, 2018: 58).

Auditors reflected on how they had previously perceived auditing as a mature profession that was complete in its form—which was no longer true. There was a shared sense of anxiety: 'the difference is that it's happening more quickly. I doubt, how quickly can we really change and create the new professional model?' (Firm D, #36). In their professional journal, the JICPA president claimed that there was a critical need for auditors' continuous improvement:

> We audit professionals are required to adapt successfully to the rising disruptive technologies and globalisation in this increasingly connected world, in order to stay relevant . . . We must continue asking ourselves, 'are we creating the future, or are we becoming a useless passive bystander?' (*Kaikei Kansa Journal*, February 2017: 9).

Change as an already on-going process

Although auditors admitted the potential threat of technology, they also framed their professional transformation as a manageable on-going process. As JICPA commented in a symposium article in their professional journal, 'the question of "whether the current audit procedures are effective" is nothing new; it has always been problematized' (*Kaikei Kansa Journal*, January 2018: 35). A statement by the JICPA president exemplified this bridging of the past and present:

> Some people misunderstand that the current audit is not leveraging IT. That is absolutely incorrect. Audit firms all over the world have long been adopting IT, including the latest data analytics technology. We are already utilizing IT, and now is the time to further advance our research (*Kaikei Kansa Journal*, April 2017: 13).

Identity theme (6): Auditor as guardian of capitalism, as before

Overall, auditors viewed AI as a supplemental tool, rather than one replacing them. One Partner aptly commented: 'It is sure that AI in audit cannot be something more than an assisting tool for human

auditors, for the time being. This is our consensus. That is, auditors will never be replaced by AI' (Firm C, #27). Auditors' professional identity discourse has frequently revolved around the idea of novelty. Yet, believing that AI would be merely a supplemental tool, they considered their strong and consistent identification with their traditional role—as the guardians of capitalism, who ensured trust in the market—to still be meaningful in the AI age. Such a 'Back to basics' discourse comprised the following justifications.

Complexity of auditing beyond AI's capacity/ irreplaceability of human auditors

Auditors perceived that AI could not completely substitute human auditors, for two reasons. First, they assumed that the complexity involved in auditing would be beyond AI's capacity, as the 2018 JICPA report illustrated:

> Audit work is not only analysing past financial figures, but also estimating the invisible data and future prospects, which requires atypical and highly nuanced guessing. It also needs communication skills, particularly with the top management. In short, auditing is a highly judgmental work incorporating the soft side of organisational and individual contexts. Today, AI has not sufficiently evolved to take such roles (JICPA 2018: 25).

Secondly, they observed that machines could not take on auditing responsibilities. As one Director of the JICPA IT committee commented, 'Just as the case of fatal accidents in automated vehicles, some humans have to bear the responsibility of audit final judgments. Therefore, the judgment without background transparent processes is useless' (JICPA, #41). For these reasons, auditors perceived that 'AI can never replace CPAs in particular task areas' (*Kaikei Kansa Journal*, January 2018: 35). This understanding was linked to the perceived irreplaceability of human auditors: 'As long as what auditors face is the financial statements which involve clients' judgements, AI is not replacing human auditors, but is playing a role as a tool to support advanced human auditing' (JICPA, 2018: 30).

Growth Opportunity for the Audit Profession/ Contribution to the Capital Market and Society

Because AI's diffusion could lead to challenges in its adoption for client firms as well, auditors framed it as a potential growth opportunity. As suggested by a JICPA journal article, 'CPAs with advanced digital technology expertise would find new service areas, such as the assurance of big data, as societal needs for securing the reliability of big data would rapidly rise' (*Kaikei Kansa Journal*, August 2016: 30). The Big Four firms perceived various service growth opportunities, such as 'advising how best to utilize accounting and internal control' or 'evaluating the quality of AI' for clients (Firm A, #6).

This positive framing, substantiated by a belief that human auditors were irreplaceable in auditing, was associated with auditors' belief in their never-changing professional mission: contributing to capital markets and society via assurance. By providing assurance—particularly for financial statements, but sometimes in new ways as well—'CPAs have continued to play a central role in the corporate disclosure system' (*Kaikei Kansa Journal*, August 2018: 21). As one Partner commented, AI was an enabler of this long-lasting ideal:

> We are not meeting the expectation of the society. Nobody wants accounting frauds, and everybody wants to prevent them, but we cannot achieve it at this moment. Then what can we do? . . . This is the motivation we share as the guardian of the market. Such an aspiration leads us to the technology adoption to defeat the dead-end situation (Firm C, #29).

A model of what constructed auditors' professional role identity in the AI context

The analysis revealed that six themes, based on auditors' six interpretations of AI, were involved in the reconfiguration of the new collective-level professional role identity. These exemplified the multifaceted, complex nature of the content of the collective-level professional role identity. Based on the findings, I propose a model of what constructed auditors' professional role identity in the context of AI (Fig. 2).

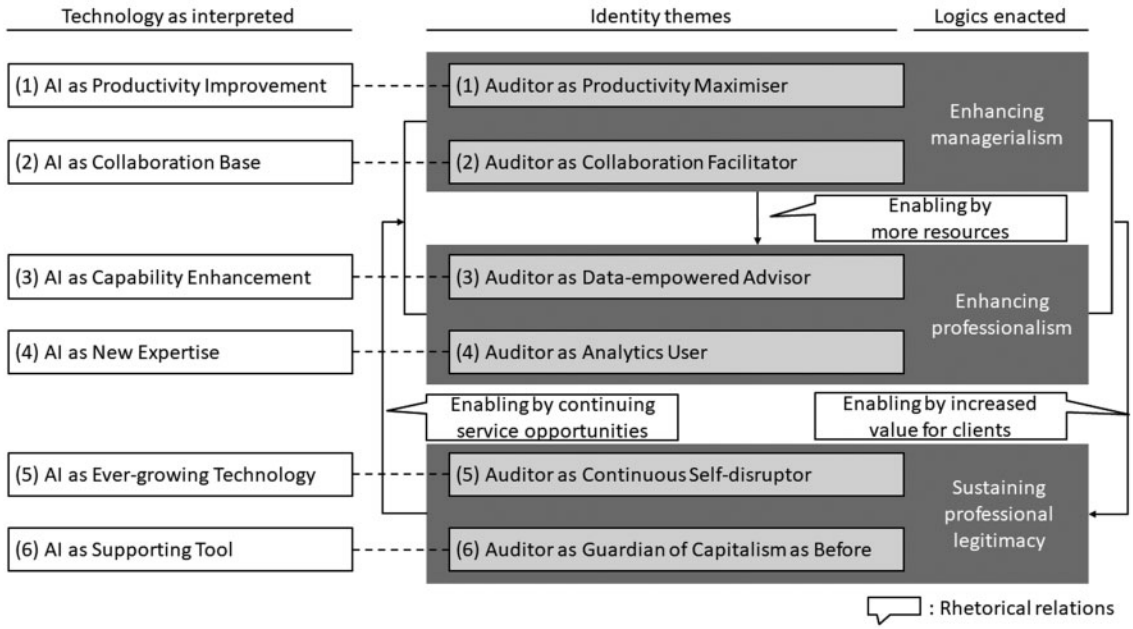

Figure 2.A model of what constructed auditors' collective professional role identity in the AI context.

The model highlights the following structure. First, technology—as interpreted by audit professionals—forms an integral part of their multidimensional identity themes. Secondly, these identity themes can enact and represent certain logics. In this case, these are centred around issues associated with the future of professionalism. The first two themes stressed managerialism (focussing on productivity and managing diverse experts), while the rest highlighted professionalism (focussing on higher service quality and continuing services). Thirdly, those identity themes with enacted logics can have rhetorical relations with each other, thus supporting a positive theorization of the profession as a whole. Specifically, enhanced managerialism (improved productivity) would provide more resources, enabling enhanced professionalism (improved service quality). Improved productivity and quality would, in turn, satisfy clients and sustain professional service opportunities—and these could continue as a cycle. Finally, when such a collective-level identity is reconstructed in response to the rise of AI, hybridity (in this case, managerialism and professionalism) can be a result.

DISCUSSION

This study has explored what constructed the content of professionals' new collective-level role identity amidst the rise of a new and potentially substituting technology, as evidenced by the case of auditors and AI. The findings and model expand the literature of technology and professional identity in the following areas. As the baseline, the analysis vividly shows the characteristics of collective-level professional role identity in the context of new technology, which can be constructed by a variety of technology interpretations, associated multiple identity themes, logics enacted by those themes and their interrelations. Past collective-level studies have left such rich content understudied, leaving the content of identity in relatively aggregated forms (Nelson and Irwin 2014; Reay et al. 2017). The in-depth exploration in this study shows a much richer picture; multiple identity themes enacting multiple logics can yield a mutually reinforcing rhetoric in such a way that the future of the profession can be positively framed. This demonstrates the value of a deep understanding of the content of identity.

Also, importantly, by providing such a rich understanding, this study clarifies the missing link between

the interpretation of technology (Prasad 1993; Prasad and Prasad 1994; Gopal and Prasad 2000; Korica and Molloy 2010; Nelson and Irwin 2014) and institutional logics (Chreim et al. 2007; Goodrick and Reay 2010; Kyratsis et al. 2017; Reay et al. 2017) in identity studies. It reveals how a new technology can indirectly affect professionals' constellation of logics. The data suggests that technology triggers professionals' identity reconfiguration through their interpretation of the technology, and that the new identity can enact particular logics. This insight reconciles the sometimes obscure relationship between technology and institutional logics in past studies—in that technology is not itself representing particular logics a priori, but that actors' interpretations of technology can result in the enactment of logics in situ through identity reconfiguration.

This study also broadens our view on the understudied but important role of collective-level identity as a profession's guiding vision. Past studies have often highlighted collective-level identity as an aggregated accumulation of individual identity reconfiguration (Chreim et al. 2007), in a longitudinal cumulative change process observed over decades (Goodrick and Reay 2010; Reay et al. 2017). Yet the analysis here shows that even in the early stages of disruptive technology diffusion, auditors' collective-level professional identity has explicitly incorporated the technology. This suggests that collective-level identity is not necessarily a passive reflection of the 'as is' state but could be a proactive 'to be' aspiration. This has been observed in instances of collective identity change for better occupational positioning, such as massage therapists redefining themselves as healthcare providers (Oerton 2004) and airline pilots as technology experts (Ashcraft 2007). Collective-level professional identity could incorporate such manoeuvres to frame disruptive technology as controllable, positioning professionals as indispensable for society. If we focus on the leading professionals of identity work—such as those in professional associations or in dominant firms that play key roles in identity shifts within a highly professionalized field (Reay et al. 2017)—a new visionary identity template can be discussed and claimed quickly, even before the technology is established as part of the professionals' daily work. This extends the debate about professionals' strategic agency against the threat of technology substitution (Hinings et al. 2018) by highlighting that collective-level professional role identity can be one tool to enhance professionals' collective efforts to protect their profession.

This study has further implications for the literature of professional identity and hybridity. First, it broadens our view of the possible hybridization of collective-level professional role identity. Past studies have stressed how managerialism and professionalism can be intertwined in the daily practices of individual professionals (Blomgren and Waks 2015; Postma, Oldenhof and Putters 2015). However, the analysis reveals that a rise of disruptive technology can increase hybridity at the collective level, in that the two logics become explicitly harmonized within the collective-level professional role identity. This study demonstrates that hybridity can also be managed at the collective level, potentially as a way for professionals to strategically adopt managerial thinking and techniques (Waring and Currie 2009). These findings provide important empirical evidence for a theoretical proposition made in the hybridity literature—shifting focus to 'how professionals may be actively embracing ideas about management and leadership, and seeking new ways to become more organized to ensure legitimacy and sustainability' (Kirkpatrick and Noordegraaf 2015: 103)—highlighting that it applies not just to individual-level tactics but also to the collective-level shift. This study implies that the shifting nature of collective-level professional identity should be carefully considered in interpreting individual-level identity, as the former provides changing assumptions for individual professionals—including how, and to what extent, such hybridity should be taken for granted at a certain point in time. For example, an auditor's professional role identity today can be significantly different from what it was ten years ago. This is due not just to individual and organizational factors, but also to changes in what the profession as the collective embraces and represents.

Secondly, and relatedly, this study expands our knowledge about identity hybridization by illustrating a particular rhetorical approach: segmenting professional tasks to mutually supplement professional and managerial roles. This rhetoric changes past

studies' assumptions about unresolvable conflicts between professionalism and managerialism (Raelin 1986; Freidson 2001) by envisioning the two as contributing to and enabling each other. In other words, this study corroborates the fact that change undertaken by professions is not simply about efficiency and commerce displacing traditional ethics (Muzio, Brock and Suddaby 2013). Rather, it is a move towards the co-evolution of the two logics (Kirkpatrick and Noordegraaf 2015). The analysis implies that 'organizing professionalism', or 'organizational dimensions of and in professional work' (Noordegraaf 2015: 188) can be effectively represented with the observed rhetoric. This view also resonates with what Postma et al. (2015) introduced as 'articulation work'—'"organizational" tasks, such as coordinating and planning' as 'an intrinsic part of professionalism' (p. 62)—and suggests that explicitly acknowledging and appreciating articulation work may be one form of identity hybridization at the collective level.

Finally, this study contributes to the emerging scholarly conversation about the influence of AI on organizing (Kellogg, Valentine and Christin 2020; Raisch and Krakowski 2021, forthcoming), particularly concerning professions and occupations (Hinings et al. 2018; Armour and Sako 2020). It demonstrates that the rise of AI can transform collective-level professional role identity, in addition to the already reported shifts such as those in business models (Armour and Sako 2020). Although this study investigates only one profession, other professions and occupations may follow the reformation of collective-level identity to declare their continuing relevance, as they face similar pressures of technology substitution (Susskind and Susskind 2015). Meanwhile, as Armour and Sako (2020) predict, AI can create a divergence among professionals in the degree of change they embrace. Since the traditional model can also survive (at least for the time being), some professionals may transform, and while others may not. This proposition can also apply to the case of identity change, as individual professionals enact their identities in diverse ways—often diverging from the collective-level template (Pratt et al. 2006; Ahuja et al. 2017). That is, individual professionals can show significant variance in their acceptance of the new AI-age collective identity, even when the new template is carefully designed. This is particularly relevant when economic disparities within a profession are considered. Big Four firm auditors may welcome their new identity, for example, as it can strengthen their firms' competitiveness. Yet independent or small-firm auditors may resist the change, as they lack sufficient resources to provide AI-driven auditing. In fact, JICPA was aware of this issue and noted the need to educate, engage, and empower smaller firms (JICPA 2018: 52–53). Some Big Four auditors who were outside the AI initiatives—unlike the interviewees of this study, who were 'insiders' of those initiatives—may also learn about and perceive the new technology and identity in various ways. Thus, one logical consequence of the collective identity reformation for professional survival against AI is, ironically, to expand individual-level identity diversification within the profession.

As with any exploratory study of a rarely observed ongoing phenomenon, this study has several limitations. First, as this is a study of a single profession, the particularity of the case needs to be considered when interpreting its implications. The profession was highly knowledge-intensive, with an oligopolistic structure dominated by just four extremely large firms. Thus, professionals in the mainstream had relatively easy access to sufficient resources to leverage new technology, along with controlling stakes. They could therefore develop a collective-level consensus relatively easily. It will be fruitful for future studies to systematically compare diverse professions and occupations in terms of their identity shifts for a broader view of the effects of digitalization (Pemer 2021, forthcoming). Secondly, the study focussed on collective-level identity to highlight its significance, but did not address individual-level diversity. As past professional identity studies have reported intensively, individuals can enact their professional role identity very differently from the collective-level template (Suddaby, Gendron and Lam 2009; Bevort and Suddaby 2016). This diversity—particularly in terms of firm-size segments, as well as intra-firm roles—will be a fruitful area for future study. Thirdly, this study covers only the early phase of technology adoption. As role identity continues to change through interactions with technology (Nelson and Irwin 2014), a long-term perspective in understanding technology and identities (Leonardi and Barley

2010) should be applied to the context of AI and professions. Although auditors' collective-level identity is currently integrated as a single model, it could evolve into multiple models segmented by new and specialized professional work domains, for instance. Continuous observations of the changing relationships between evolving digital technology and professions will be of great importance for management research, in this age of exponential digitalization.

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