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The Dark Side of the Industrialisation of Accountancy: Innovation, Commoditization, Colonization and Competitiveness

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Abstract

Technological innovation continues to play a fundamental role in disrupting many industries, but the impacts of digital innovation on accountancy and its effect on firms and individuals remain somewhat overlooked. Nevertheless, technological innovation is transforming accountancy work and business models as firms react to competition and regulatory restrictions. The analysis of sixty semi-structured interviews with UK accounting firms reveals how the adoption of new technology and alterations in regulations impacts on accounting practices. In turn, this research raises questions about the nature of professional occupations, the deskilling of accountancy and colonization of new service areas, challenging the extant conceptualisation of knowledge-intensive services.

Keywords: Accounting, Audit, Regulation, Technology, Colonization, Professional Services, Deskilling

Introduction

Accountancy firms and their constituent actors occupy an important role within our economies and as sites of embodied expertise labour (Bryson and Rusten, 2005), safeguarding financial

institutions and securing economic stability. The most fundamental role fulfilled by accountancy professionals, the auditing of company accounts safeguarding the interests of employees, shareholders and government, provided them with social closure (Weber, (1922)1978) and transformed accountancy into an archetypal profession. As such, this profession and its constituent members have a number of other attributes that qualify accountancy as a professional occupation including: acquisition of a systematic body of knowledge, the commitment to an ethical code, a shared culture and authority over non-(accountancy) professionals (Greenwood, 1957). The satisfaction of these criteria provided the accountancy profession with security and economic rewards as a result of regulations enacted in the 1940s which excluded non-professionals from undertaking audit work (Hanlon, 1994; Power, 1997). However, accountancy is now experiencing new drivers of change which have presented, or continue to give rise to, interesting implications for accountancy professionals, and in turn the wider business ecosystem, and disrupt the roles traditionally enacted by accountants. This is part of an on-going process of disruption and adaptation in response to technological and regulatory innovations combined with alterations in client behaviour and in the nature of competition.

The paper draws upon face-to-face interviews with accountants to identify and explore two interrelated drivers of disruptive change being experienced by accountants: technological innovations and changes in regulations. The dynamic interrelationships between these two drivers presents an increasingly complex challenge for the accountancy industry and its professionals. While these factors are not novel, they are evolutionary, resulting in on-going firm and individual adaptations. Combined, these factors are part of a process of commoditization in which some accountancy services are increasingly selected on price rather than via reputation or third-party referrals. Innovation is altering the market structure of the accountancy industry as well as the everyday practices of accountancy. This paper's

contribution is to explore the impacts technological innovation and regulatory changes are having on a profession. This research seeks to understand current regulatory and technological drivers of change and the impacts of these innovations on accountancy firms and individuals, and to identify adaptation strategies and their impacts. Some of these impacts highlight that there is perhaps always a darker side to innovation; innovation simultaneously destroys and creates tasks/jobs. These impacts also include deskilling combined with a reorientation of large accountancy practices from audit to non-audit work, which reflects a process of deprofessionalisation as accountancy practices focus on the provision of high-value services rather than regulated and more price-sensitive audit contracts.

This paper proceeds as follows. First, the research background outlines the contemporary accountancy industry and recent regulatory initiatives, as well as the extant knowledge on (de)professionalisation and technology adoption in accounting. Second, the research design and linked methodology that was developed to explore the impacts of technological and regulatory change on accountancy is presented. Third, the paper analyses how the role of technology is affecting accounting practices and the performance of accounting. Fourth, this paper concludes by summarising the impacts of technological and regulatory innovations on the accounting profession, highlighting areas for future research.

Research Background

Accountancy is a business and professional service (BPS) with professionals employed by clients to provide advice and expertise. Some of this input is strategic and specialist and some relatively ubiquitous and generic but customised to meet the needs of a particular client. Some BPS sectors are professions whereby the ability to practice is based on the acquisition of systematic knowledge that is formally accredited by a professional body (Greenwood, 1957). There are other important characteristics of being a professional; professionals have more

control over the labour process, especially in terms of the rights and obligations expected for continued membership of their professional body (Freidson, 1973: 56). Some BPS activities have not developed into fully recognised professional activities, for example marketing, public relations and management consultancy. Professional bodies exist in these areas, but non-members are still able to practice without sanction. Some client service inputs that are delivered by BPS firms are mandatory, for example the requirement for companies to have their accounts audited, while others are discretionary, for example employing a marketing consultant or a trained industrial designer. The diversity in BPS highlights the role played by quasi professions (Hearn, 1982) and demonstrates the ambiguous boundary of professions in contemporary practice (Wilensky, 1964). This has also led to the classification of traditional and new professions, exemplified by accountancy and management consulting respectively (Faulconbridge, 2015).

The concept of competition is fundamental to neoliberal economic systems, but within professional services there are two contrasting views regarding the state of the field, particularly when considering the audit market. The last century saw a series of mergers and acquisitions between the largest accountancy firms, resulting in the emergence of several 'Big' practices. While there was a Big Six, PLCs arguably had a reasonable selection from which to choose when appointing an auditor; however, this choice was restricted with the merger of Price Waterhouse with Coopers and Lybrand in 1998 (ICAEW, 2019), and was further compromised with the collapse of Arthur Andersen in the wake of the Enron scandal in 2002.¹ This left four 'Big' companies: Deloitte, EY, KPMG and PwC. Although there are a plethora of other firms with audit licences, such as RSM or Grant Thornton, they do not operate on the same global scale as the so-called Big 4 (see e.g. Financial Reporting Council 2017: 45) and do not have a comparable depth of resources with which to provide services to multinational

¹ <http://news.bbc.co.uk/1/hi/business/2047122.stm>

clients. Thus, while in theory, there are more than four providers in the market for audit services, in reality, there are limited options for larger blue chip companies (Crump, 2013), some of whom are path dependent in their choice of service provider giving rise to decades-long audit firm appointments (see e.g. Wallace, 2015). It could therefore be argued that the audit market is not competitive at all, a view which is held by regulators.

Innovations including developments in computer programming over the past three decades have presented significant opportunities for accountancy practices. Whereas beforehand, the embodied expertise ascribed with knowledge intensive services and the professions was just that, the development of computer programmes and software packages has provided a new means for knowledge codification and dissemination. Thus, it increased the transferability of knowledge, by extracting knowledge (or know-how) from individuals (Abbott, 1988) and facilitating its application to new contexts by other individuals (Suddaby & Greenwood, 2001). Regulation is synonymous with professionalisation (Greenwood, 1957), determining that those who wish to practice accounting must acquire a systematic body of knowledge and attain the relevant qualifications. Despite various layers of governance and regulation, the accountancy industry, however, has regularly been criticised for unethical conduct. The most infamous case surrounds the activities of Arthur Andersen, auditors and consultants to the former failed energy giant, Enron, whose dual role as service provider evidently compromised the integrity of their audit opinion (Chicago Tribune, 2002). This marked a turning point, with regulators introducing the Sarbanes-Oxley act in the US. Similar regulations were developed and introduced in the UK intended to remove any conflict of interests between the provision of audit services compared with consulting services (ICAEW, 2019b). Nevertheless, accountancy firms reacted by innovating to circumnavigate regulatory constraints, which resulted in a fresh wave of concerns over accounting activities due to the continued questionable conduct by auditors, who were often simultaneously pursuing more lucrative non-audit contracts from their

audit clientele. Thus, 2014 saw the ratification of mandatory auditor rotation in the European Union, which was implemented in 2016, forcing those companies that must statutorily procure an external audit, such as Public Interest Entities (PIEs), to change provider at least every twenty years, with a requirement to put the work out to tender once per decade (ICAEW, 2019c). This strategy was designed to increase auditor independence, reduce auditor-client embeddedness and promote competition within the industry. New regulations also limited the amount of non-audit work that accountancy practices could conduct for an existing audit client, capping this revenue at 70% of the audit fee (Ibid.).

Accountancy is a highly regulated profession, but accountancy firms provide a range of professionalised or regulated and unregulated services to clients. This is an important point. Regulatory change, combined with innovation, encourages accountancy firms to alter the balance between the provision of regulated and unregulated services. This has been labelled as a process of “colonization” by Suddaby and Greenwood (2001) in which large accountancy firms migrate into adjacent professional jurisdictions, for example law, cybersecurity and technology, in response to enhanced competition and commodification. Nevertheless, it is worth noting that our research has identified that BPS colonization predominantly involves the provision of non-professionalised rather than professionalised services.

There are push and pull drivers behind this migration or colonization. On the one hand, client problems are often complex, requiring accountancy firms to develop new areas of expertise. This is an on-going process in which expertise providers must alter the balance of provided services. On the other hand, BPS firms are engaged in a continual process of innovation as they attempt to differentiate themselves from competitors. There are two drivers behind this innovation. First, BPS firms develop new services, but clients rapidly internalise these services reducing demand for external consultancy-related inputs, facilitated by technological offerings. Second, competitors develop their own versions of these new services. There is thus a continual

race to innovate. Innovation is restricted in the provision of heavily regulated professional expertise which is another driver behind colonization into unregulated practice areas.

Colonization can be conceptualised as a process by which accountancy firms deprofessionalise. This process of deprofessionalisation operates at two levels. First, colonization alters the balance within accountancy firms towards the provision of unregulated and unprofessionalised services. Second, the application of technology to the provision of audit and other regulated accountancy services has altered everyday accountancy practices. Automation has altered task content as part of a displacement effect in which capital substitutes for tasks previously performed by labour. For white-collar workers in accounting, sales, logistics, trading and some managerial occupations, some tasks have been replaced by specialist software and artificial intelligence (Acemoglu and Restrepo, 2019: 4).

The application of technology to audit by clients and accountancy firms is part of a process in which traditional auditing skills are experiencing a process of deskilling combined with reskilling (Braverman, 1974). This reflects the impacts of the application of technology to BPS firms and the emergence of *protech* or the professional services version of fintech or propotech. Deskilling and the degradation of work is not usually associated with professionalised labour, but it does occur (Suddaby and Muzio, 2015). The on-going application of technology, combined with commoditization, to audit and accountancy has shifted the balance in the delivery of accountancy services towards more routine, fragmented and deskilled tasks. The affected functions typically make use of knowledge management systems and databases, which enable firms to efficiently deal with providing solutions to standardized client problems (Faulconbridge, 2015). Part of this process involving the degradation of audit and accountancy work is reflected in the expectations placed on accountants that they must work longer hours. It is also reflected in the shift to provide non-audit services. The status of accountancy, audit and accountants is altering. At the same time, there has been a decline in professionally

qualified accounting academics being employed in the accounting academic community (Paisey and Paisey, 2017).

The process of regulatory and technological evolution is not finite; innovation continues to present new challenges for the industry which requires that social scientists continue to explore the impacts innovation is having on what is arguably one of the archetypal professions. Given this, it is important to understand how firms are responding and adapting to these types of innovations by exploring both firm level and actor adaptations.

Methodology

To explore and understand the impact and responses to regulatory and technological innovations, we adopted a comparative case study research design using a qualitative methodology that included sixty semi-structured intensive interviews with accounting professionals working in 16 firms. These informants were all working within the West Midlands (UK) and were chosen via purposeful sampling to represent different service lines and hierarchical levels, to ensure that the sample could provide a holistic insight into the changing nature of the profession and of accountancy practices. In this way, we selected an intentionally heterogeneous sample, to determine whether our findings would be applicable across contexts (Mason, 2002; Robinson, 2014). Despite difficulties in obtaining access, reflecting the time pressures experienced by accountants, the number of interviews overcomes concerns relating to selection bias.

Our interpretive approach enabled us to explore the profession from the perspective of its constituent actors, but by making use of additional case material, we are able to attest to the validity of our findings. In addition, we took steps to ensure the trustworthiness of our data by speaking with multiple informants from each firm where possible, and by incorporating 16 firms in our sample, we avoid prioritizing novelty (Tokatli, 2015). We also avoided hindsight

bias by focusing our interviews on the current practices that existed in the firm and on the everyday practices experienced by each interviewee (Aguinis and Solarino, 2019).

Our interview guide was based on themes from extant academic and practitioner literature and was piloted on representatives from Recognised Supervisory Bodies. The interviews took place in 2014 and 2015 and were audio-recorded where permission was granted, before being transcribed. As the audit rotation policy had been announced in 2014, to be implemented in 2016 (European Commission, 2014), the interviews enabled us to gain insight into firm-level adaptations in preparation for this change. In all cases, detailed notes were taken during the interviews. Interview material was then analysed using Nvivo, with data coded based upon predetermined themes, but also in relation to emergent themes within the transcripts. We then undertook axial coding to identify linkages between the themes (Allen, 2017).

We uncovered new realities about the nature of accounting work as a result of the application of new technology and present two primary effects of technological and regulatory drivers of change; the rebalancing of firm activities between audit and non-audit work and an on-going process that centres on the deprofessionalisation of accountancy.

Analysis: Exploring Accountancy Adaptations and the Performance of Accounting

The interviews confirmed that the heavily regulated nature of audit and accountancy has led to somewhat standardized outputs. This challenges accountancy firms to innovate their value propositions in order to attract and retain clients in the non-statutory audit market, as well as to justify fees in the PIE arena to cost-conscious clients. One respondent noted that *'Your client will always try and push your fee down in audit'* (Medium Firm #2).

As part of this product innovation, firms are transforming what they physically deliver to the client and *'... typically the bigger the business, the bigger the report used to be. You would get volumes of the thing. You could use them as a weapon to hurt people; they were seriously*

humungous documents. We basically took things back to what are the absolutely key decision-making things that somebody needs to know' (Big 4 Firm #1). This reflects both a focus on strategic inputs, but also reduces the time and cost of providing service inputs to clients. Firms are also incorporating technical advances including analytics into their core offerings and one respondent noted that *'we deliver analytics as standard as part of the audit'* (Big 4 Firm #2). In this way, they are adding an advisory element to the audit work.

The incorporation of technology is not improving the quality of audit work; a sample of 325 Big 4 audits was reviewed by the Financial Reporting Council between 2013/14-2016/17, with 83 found to be requiring improvements (Table 1). Importantly, 'good' audits also include those requiring limited improvements; thus, this category still raises questions about audit quality as the balance between those requiring no and limited improvements is unreported. Moreover, process innovations are taking place as firms adopt technological innovations reconfiguring the ways that firm routines are operationalised. For example, *'the cloud has been really facilitative in allowing alternative delivery models'* (Big 4 Firm #2), however over time, some of these technological innovations, such as software packages, become available on the open market, enabling clients undertake tasks themselves in-house.

[Table 1 near here]

Accountancy firms have long sought to diversify their service offerings. Sometimes this occurs within traditional 'accountancy' boundaries, such as a Medium Firm #4 who positioned itself to advise on pension auto-enrolment by hiring a pension specialist. Firms were also diversifying into new industries including cybersecurity: *'Technology is used a lot in all our functions. There's a lot of particularly in the tech advisory space, so that's cyber security, big data, things like that... clients now have just got so much information that is electronic, that they need guidance around storage, analysing...'* (Big 4 Firm #3). The friction that this creates

within the profession is acknowledged, although previous regulatory iterations have not curtailed the conflicts that this colonization can create.

There is also the risk that mandatory audit rotation for large client firms will not ameliorate audit quality: *'if you change auditor every ten years, there is a danger that in the first couple of years of a new audit firm there will be a dip in quality, just because it takes you a long time to get your head round something'* (Big 4 Firm #2). To prepare for the revenue threats that would come with audit rotation policy, accountancy firms began to intensify their colonization of adjacent professional jurisdictions. Firms began to colonize new areas with one respondent noting that *'We're now a law firm as well. We can provide legal services, so we're definitely more multi-disciplined'* (Big 4 Firm #3). More often, however, they were redoubling their efforts in colonizing industries in which they already had a foothold, such as management consulting and other forms of advisory. This offensive strategy was being operationalised primarily through acquisitions; PwC acquired Booz & Co, KPMG acquired High Point Rendel, EY acquired Seren and Integrc, and Deloitte acquired Kaisen Consulting, all of which took place as part of the multitude of deals to acquire consultancy firms that were agreed by the Big 4 in 2014-15 (Table 2).

[Table 2 near here]

This flurry of colonization activity affects the balance of accountancy versus non-accounting, or audit versus non-audit work being carried out within firms. The latter is more profitable for firms, with prices for these service products determined by *'what the market can bear'* (Big 4 Firm #2). The shifting balance in fee income between these competing domains is evident in Tables 3 and 4.

[Table 3 near here]

The introduction of audit rotation regulation was intended to protect the sanctity of audit within firms and increase auditor independence. Nevertheless, the shift towards revenues generated from other jurisdictions highlights the decline in the importance of audit work for the Big 4 (Table 4). The Big 4 are transforming into suppliers of expertise that is not directly linked to the provision of accountancy services and is not linked to the provision of non-audit services to companies whose accounts they are auditing. The Big 4 are shifting away from being accountancy firms to providers of specialist non-audit services to clients.

[Table 4 near here]

The changing role of audit has, however, brought with it a need for new skills. The increased deployment of technology in the audit process has resulted in a shift in the types of technical skills required by accountancy firms. Algorithms and machine learning have been incorporated into accountancy by both clients and accountants. Accountancy is becoming more of a technical process based around the application of algorithms to increase operational efficiency rather than being predominantly based on the delivery of professional accountancy inputs. This has worrying consequences for the skill base of the profession. One respondent noted that:

‘. . . in some respects, it’ll be fantastic that we’ve got all these new whizzy tools and things that can happen. But, the flip-side of it is that our ability to train people to then operate effectively at a senior level, when they haven’t done any of the low-level auditing and really, really understood the nuts and bolts of what we do, because it has been done by computer, will then make it harder for them to then exercise judgement’ (Big 4 Firm #2).

The danger is that accountants will no longer have the training and practice required to understand audit processes and their related problems and challenges in any depth. The accountant’s expertise will be partly hidden within computer code and machine learning. This

exposes the accountant, clients and wider society to errors that are hidden within code and bias that emerge within machine learning based systems. The auditor's role is changing to become the face of the firm and the role is shifting towards that of being a client relationship manager tasked with securing non-audit revenue from audit clients or attempting to transfer audit clients into more lucrative non-audit clients, post-rotation of an audit contact. Thus, *'if we lose an audit client, it may actually benefit us to end that; they may still want to use us in an advisory capacity'* (Big 4 Firm #3). Deskilling of audit work is occurring, as is a reskilling of the accountant, to cope with new market conditions. This is also a more general phenomenon across accountancy firms, as more individuals working within colonized areas are being enveloped into practices, altering the core skills base of these firms with the balance between professional and non-professional activities shifting towards the latter.

The shift in the evolving identity of the accountant from doer to overseer and client manager is altering the expectations placed upon professional workers. Technological advances have enabled the traditional boundaries of work to be eroded, providing constant connectivity between managers and employees, and clients and professionals, elongating the working day. Technological innovation including smartphones, combined with the shift in emphasis to client relationship management, means that for many accountants the boundaries between work and everyday living become increasingly blurred. One accountant described a working day as follows *'I normally get home at 7pm [...] Once I've caught up on the day, eaten and whatever, I will then get my laptop out and do another couple of hours work'* (Big 4 Firm #2). This is exacerbated by the rotation policy, which increases workloads as firms must bid for existing and new contracts without increasing audit staffing levels. This in turn compromises the work-life balance of accountants and has implications for their health and wellbeing.

The evolution of the profession, and the changing role of the accountant, could also explain the turnover of staff within firms; sixteen of the interviewees had left their firms to work in-house

in the private sector since data collection. While some of this turnover could be attributed to natural attrition or chance factors, the interviews signalled low morale and stress within the industry. One respondent stated that *'I don't sleep massively well, I probably get five hours a night on weekdays which is not the most healthy and I understand that it's because I don't switch off'* (Big 4 Firm #3). This inability, or discouragement from 'switching off' indicates that work life balance concerns could be a key factor behind career moves. The challenge is that the accountant has limited free time and thus *'if an email comes in Saturday and it's something urgent, I'd rather know about it and deal with it than ignore it until Monday and have someone be annoyed at you'* (Big 4 Firm #3).

Discussion: Colonization Combined with Deskilling

Our analysis has identified that there are two processes at work within the Big 4 accountancy firms. On the one side, there are alternations in the balance between the delivery of professional services and other types of non-audit services. On the other side, there are alterations in the delivery of accountancy services including deskilling linked to the application of software solutions by clients and accountancy firms. These two processes reflect a reworking of the everyday practices involved in the delivery of professionalised and other types of expertise to clients.

Any meaningful definition of professionalism within BPS must reflect the realities of everyday practices including the mismatch between professional codes and practice. To Hoyle and Wallace (2007) this reflects the 'irony of presentation' in which the image of a profession 'is not wholly congruent with the reality of its daily practices' (2007: 19). This has led Evans (2008) to distinguish between three different states of professionalism. First, *demande*d or *requeste*d professionalism reflecting specific professional service level demands. Second, *prescribe*d professionalism reflected in recommended professional service levels, and, third,

professionalism that is *enacted*. To Evans (2008: 13) it is this third state of professionalism that reflects the reality of everyday practice. This conceptual framework has been developed from an analysis of professionalism in the provision of educational services. Nevertheless, this approach provides an important conceptual framework that can be applied to exploring accountancy and other BPS industries. The Big 4 accountancy firms' everyday practices are changing in response to alterations in regulations and innovations, but these changes are in advance of any attempt to regulate new practices. A linked ecology (Abbott, 2005) has developed in which the Big 4 accountancy firms are adapting to alterations in regulations combined with innovations and these adaptations are challenging the jurisdictional boundaries of accountancy firms and the accountancy profession itself. One difficulty is that *enacted* professionalism is always one step ahead of *demande*d or *prescribed* professionalism. This lag explains difficulties that emerge with the quality of professional inputs as enacted professionalism challenges existing professional conventions.

This paper has explored the impact of regulatory and technological innovations on the accountancy industry focusing on understanding the implications of these drivers of change on organisations and professionals. In doing this, it has uncovered how regulatory and technological innovations are resulting in three levels of innovation within organisations. First, it has identified process innovations, enabled through the application of new technologies to enhance existing routines within firms. These include altering the balance between audit and non-audit work in response to rotation regulations; regulation restricts non-audit fee income from audit clients, and then accountancy firms prioritise growing other service lines over audit. Secondly, it has identified product innovations, whereby technological innovations are utilised to differentiate existing outputs, for example by combining analytics with the core audit offering. Thirdly, it has identified business model innovations as accountancy firms expanded their 'professional' boundaries by colonizing adjacent service areas to diversify their portfolio

of services provided and perhaps, more importantly, to alter the balance between audit and non-audit service delivery.

One of the paper's key contributions is to identify that accountancy firms' colonization is into non-professionalised rather than professionalised service lines. Social closure (Weber, (1922)1978: 638) is one of the defining characteristics of a profession by which one group closes off opportunities to another group of outsiders (Murphy, 1988). Social closure enabled providers of professional services to control and restrict entry, but it also inhibits innovation and differentiation by product and process; professional bodies restrict and regulate innovation. Further research is required into the relationship between professionalisation and the regulation of process and product innovation and the ways in which the everyday enactment of professional practices occurs in advance of demanded or prescribed professionalism.

For professional service lines, differentiation has conventionally been based on third party referrals and reputations. On-going colonization of non-professionalised services increases the ability of accountancy firms to compete on product and process innovations, as these non-professionalised services are market-driven and can avoid or resist commoditization through continual innovation. The new audit rotation regulation has had a perverse consequence. It was intended to increase auditor independence and enhance the quality of client audit, but it has also encouraged accountancy firms to focus their attention on the provision of non-audit income lines. This is consistent with the assertion of Hansnata (2016), that competition within the accountancy industry is undermining the independence of audit.

The responses to audit rotation and fee limits on non-audit work have resulted in a variety of organisational adaptations. This is a new enacted professionalism – a new iteration of the accounting profession - as routines are adapted to service audit clients but also to ensure, maintain and enhance profitability. This includes the envelopment of non-professional

activities into the audit function, such as analytics and commercial/sales capabilities. Nevertheless, the dynamics of these inputs, and the resultant effects on the professional service product of the audit, are not yet regulated. In this way, the Big firms, which colonize new areas of expertise by incorporating them into their professional jurisdictions, are outrunning their professional regulators. Thus, there is a time lag between enacted professionalism and the types of professionalism prescribed to firms (Evans, 2008: 12). This is evidenced by the time it takes regulators to respond with initiatives intended to combat audit quality concerns.

KPMG was singled out by the Financial Reporting Council in 2018 for a significant deterioration in the quality of its audit work, supported by its role as auditor to the now-bankrupt Carillion (Davies, 2018). In response, it ceased offering non-audit services to its audit clients in November 2018 (Crisp, 2018); a rather altruistic move given potential revenues such services generate, but perhaps one that was necessary to salvage or protect this firm's reputation. In January 2019, KPMG announced that it had decided not to re-bid for the audit contract with Aston Martin when the work goes out to tender later in the year, despite holding a strong position as the current incumbent provider (Skoulding, 2019). Having provided this firm with audit services for over a decade, KPMG may benefit more from providing non-audit inputs to Aston Martin. This leads to the question of whether innovations in regulation are turning providers away from the audit market completely and whether the recent actions of KPMG will ripple throughout the industry. If so, this strategy will have important impacts on the market for audit services. More recently, in July 2019, PwC (2019), traditionally the market-leader in the PIE audit market, announced plans to invest £30 million annually in its audit arm. While this could be seen as a genuine exercise in improving audit quality, it is important to note that of the 26 of this firm's audits which were reviewed by the Financial Reporting Council (2019) during the past year, six were classed as requiring improvement. Moreover, it is important to understand the dynamics of PwC's proposed investment; while

some of this funding will be channelled into its external audit function, it will also fund the creation of a new digital audit team intended to focus on the provision of internal audits, cyber security and risk reviews (Marriage, 2019). This represents a shift in the types of audit services provided by this firm and is partly another form of colonization.

The different facets of innovation outlined in this research each have implications for individual workers, firms and the profession. Traditionally, employees within large accounting firms would have completed their Chartered qualifications, with those remaining with the firm post-qualification employed in the traditional accounting divisions of audit or taxation, or perhaps consulting. With the service diversification that such firms have pursued, however, audit and related accountancy services are becoming an increasingly peripheral element of their business models. As such, it is necessary to question the professional status these firms are afforded by society, when an increasing number of their employees neither holding nor practicing professional occupations (Greenwood, 1957). This is further complicated by the fact that technology has evolved to replace many of the manual tasks that used to be undertaken by accountants; the assistive role of software is well established and the application of knowledge databases to BPS is acknowledged as a threat to embodied expertise (Faulconbridge, 2015).

As firms seek to lower their cost-base, technology poses a threat to knowledge workers through the possibilities afforded by artificial intelligence. From a firm perspective, the productivity this would achieve is attractive, but it places professional workers in a precarious position: it is usually low-skilled, manual jobs that are considered to be at risk from automation, not middle-class, professional occupations (Autor, 2015; Bryson, 2018; Acemoglu and Restrepo, 2019). If, or perhaps when, automation is further deployed within the accounting industry, the effect on the labour market will be interesting. One impact will be a further reduction in the quality of audit processes as critical thought in audit processes may be lost and replaced by automated processes. This is contrary to extant literature (Hansnata, 2016) which asserts that

automation improves audit quality. Technological innovation displaces control over expert knowledge away from professionals (Suddaby and Muzio, 2015). In the short term, the deteriorating working conditions within the industry due to enhanced workload and client demands have important negative consequences for professional employees. The erosion of the boundary between home and workplaces is diminishing the possibility for an appropriate work-life balance, affecting the wellbeing of professionals as well as reducing the attractiveness of the profession to new entrants.

Conclusion

This paper has identified and explored two interrelated drivers of change being experienced by accountancy firms and their professional employees: technological innovation and regulation. A central theme of this paper and this special issue is to explore the darker sides of innovation. Innovation emerges in response to disruption including alterations in the regulatory environment. Disruption displaces existing markets, regulations, technologies and industries. Disruption is simultaneously destructive and creative. It is creative as firms, industries and individuals adapt and innovate and it is destructive as existing tasks, occupations, firms and industries are displaced and altered.

In the regulatory sphere, this research has identified some of the issues presented by the introduction of mandatory auditor rotation. Recently, there have been calls for new regulations to separate audit and consulting activities (Competition and Markets Authority, 2018), seemingly recognising that the legalisation introduced in 2016 has failed to improve audit quality and ensure auditor independence. Yet, due to deeply enmeshed networks between actors in regulatory bodies and the larger accounting firms, it remains unlikely that truly effective regulation will be enacted to safeguard the sanctity of the audit profession, when such policies would be damaging to the Big 4.

This research has highlighted how despite perceived positive technological and regulatory innovations in the UK accounting industry, a closer analysis reveals a darker side to these innovations. Technological advances with their revolutionary possibilities have resulted in the redesign of jobs including the deskilling of previously expertise-laden embodied professional expertise. Embodied professional expertise is being substituted by algorithms and machine learning or a process of translation is occurring in which embodied expertise is being translated into computer code through an on-going process of digitization. The on-going application of artificial intelligence and machine learning will require new regulatory supervision. The lag time between the enactment of innovations in accountancy and service practices and their capture and incorporation into requested and prescribed professional standards is a major problem. The speed at which enactment occurs makes it difficult for regulators to adjust, exposing clients and national economies to potential threats including failures in the quality of service delivery.

While this research presents a novel account of technological and regulatory innovations in the accounting industry, it is necessary to extend this analysis to other industries. This includes applying the conceptual distinction between *enacted*, *demande*d or *prescribed* professionalism to exploring the tensions between innovation, regulation and service quality in other BPS sectors and occupations. In this analysis, it is important to explore the adaptation strategies and the impacts on firms, employees, including work-life balance, as well as on clients and service quality. The commodification of knowledge is occurring in other BPS industries, such as management consulting and software design, whereby somewhat standardized solutions can be developed that can be slightly customised to clients' individual requirements. Colonization may also be occurring. Nevertheless, the colonization of new professional jurisdictions is in some ways distinct in accountancy. Accountancy is a professional service rather than just a

business service and this professionalism is intended to play an important safeguarding role in the wider economy.

The legal profession, which operates a similar role, is similarly fragmented into high value and low value areas of work whereby innovations in both areas are changing the dynamics of practice; this could provide an interesting setting in which to explore the impact of digital innovation on other professional firms and orientations. Nevertheless, the interpretive, deductive design adopted in this study of accountancy does not allow us to attest to the generalisability of our findings to other industries, and we seek to avoid decontextualized, abstract claims (Robinson, 2014). Future research should seek to understand how the drivers of change within the accountancy industry which we have investigated are impacting upon adjacent professional fields, to lead to the generation of testable hypotheses. What is certain, however, is that technological and regulatory innovations have the potential to enable product and process innovations in all industries. Nevertheless, the primary challenge is that the positive and negative consequences, including the darker sides to innovation, of technological adoptions and firm/employee adaptations must be explored before implementation. It is important that regulation, including the self-regulation of a profession, must keep pace with alterations in enacted professionalism.

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