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'While division of labour in society at large, whether such division be brought about or not by exchange of commodities, is common to economic formations of society the most diverse, division of labour in the workshop, as practiced by manufacture, is a special creation of the capitalist mode of production alone.' (Marx, Vol.1, 339)

Introduction

We can begin this chapter by reflecting upon a simple distinction. The notion of profession may be used as either a noun and/or as an adjective. In the former case, specific occupations are referred to as professions by virtue of the control they exercise over the performance of particular tasks, including the designation of who may legally undertake such work. Such occupational control (Johnson, 1972) may either be direct as when states pass laws or grant charters permitting occupational associations to determine the rules and regulations for undertaking professional practice or when states directly employ professionals to undertake these decisions on their behalf (Macdonald, 1995). Different researchers have explored (and emphasized) different aspects of what control entails. That is, how much control over what types of resources are required for an occupation to be considered and classified as a profession?

For some, control preeminently involves an exclusive, socially recognized claim to serve a particular market (Larson, 1977; Macdonald, 1995; Wilensky, 1964). In other words, professionalization is a form of social closure (Weber, 1978, p. 341 and passim), through which strict control of a labour market is exercised. In this case, a profession is a license to practice while professionalization creates monopolies of

service provision. Thus, market closure constitutes a significant part of what Larson (1977) refers to as the 'professional project', that is, the seeking out of social recognition/legitimation as a profession.

A somewhat different twist to this account is staked out by Abbott (1989), who argues that it is the relationships between professions, both aspiring and confirmed rather than relations between a profession and a lay public that is all important. In Abbott's view professions and would-be professions struggle with one another for jurisdictional control over the right to perform certain work tasks or services. Any occupation may possess an internal system of licensing (real estate), a code of ethics (financial planning) and training facilities (beautician schools), but what each of the above lacks is a socially (i.e. politically) sanctioned right to exclusively regulate practice within its respective domain. How such rights are won (and occasionally ceded) to rival occupations is the main order of business. For Abbott it is all about control of work, that is, the right to perform certain tasks rather than control of the market for a service that is consequential. By control of work, Abbott is referring to jurisdictional control or the legal right to perform the work and this relates to how work is socially divided between occupations rather than to what is happening within the work of specific occupations.

For a third group of writers, professional control of work is lent a different emphasis again. As succinctly put by Freidson, it is the ability "to do their work as they see fit on the basis of their own sense of knowing how to do it" that defines the professional (Freidson, 1994, p.73). In other words, the true professional has the autonomy in her/his job to determine the goals associated with work effort, the means through

which they shall be obtained and the evaluation of the results. This represents a very different set of circumstances to those found in non-professional work, where goal setting, coordination and process control as well as evaluation and reward/punishment fall under the prerogative of external agents, i.e. a separate cadre of managers (Edwards, 1979, p.18).

Two important points follow on from this brief overview. First, although the literature emphasizes different aspects in the formation of the professions – market control, jurisdictional/political control and control over work performance – each has a common parentage in the knowledge and associated skills that are required to perform the tasks associated with the profession. Professions are founded upon knowledge claims that supposedly translate into 'superior expertise' (Larson, 1977) in the recognition of and treatment of complex problems. Thus for Larson, it is essential that a profession possesses a 'cognitive basis' or structure that produces 'diagnostic authority' (Johnson, 1972) for its members.

The role of an exclusive knowledge paradigm has a similar status in the work of Freidson, while Abbott references the importance of knowledge claims in providing both structure and legitimacy for a profession. Indeed, a good deal follows from the success of such claims, including the establishment of recognized and required educational qualifications, accreditation, licensing, and codes of ethical practice (Collins, 1979). While Wilensky (1964) refuses to distinguish between knowledge paradigms that are based upon science and those that are founded upon other belief systems, successful professional projects in the era of capitalist industrialization and its aftermath would seem to rest upon positive science and efficacious treatments.

Abstract theory, which purports to explain how something works, forms the basis for systems of classification through which the diagnosis of problems, whether related to the human body, a disabled computer or a complex legal dispute can be rendered. The professional infers from this general body of knowledge to the individual case that she is confronted with to prescribe a treatment for the problem at hand, perhaps a medical prescription, a legal strategy/remedy, a social policy, etc. If results tend to validate the treatment and the theory behind the treatment, the profession is likely to gain in stature. It will have a secure place in the occupational division of labour, which brings us to our second point.

Analyses of the professions have prima facie been concerned with the occupational or social division of labour in society. How people are assigned to the varieties of work that require fulfillment, and how these positions come to be differentially rewarded – in the case of the professions in relatively privileged ways - are major preoccupations. As noted above, historically the main asset, which professionals have possessed, is knowledge, which some argue, constitutes a form of capital (Macdonald, 1995). Possession of knowledge that is perceived to be efficacious in identifying and resolving complex problems, allows the professional to control her work in ways that are not easily challenged. For this reason, most analysts, beginning with Weber (1978, p. 302 and passim) have seen professionals as positively advantaged, typically middle class groups in possession of educational credentials that can be converted into commercial assets through professionalization, (Collins, 1979). Based on 'superior expertise' and associated knowledge claims, the position of established professions is viewed as more or less beyond challenge by a lay public. Consequently, diagnostic authority trumps bureaucratic or managerial power even when the professions are

ensconced in large organizations (public or private) as salaried employees. For this reason, allusions to de-professionalization, let alone proletarianization (Oppenheimer, 1973) are considered by many analysts of the professions to be wide of the mark.[1] Instead, it has been suggested that while professionals have been busy subsuming managerial/administrative tasks under their own brief (Abbott, 1989, p.155; Freidson, 1994, p. 139), managers have been preoccupied with claiming a professional status of their own (Leicht and Fennel, 2001).

As noted at the beginning of this chapter, the concept of profession can also be used as an adjective to describe the nature of work. This significantly extends the ambit of the foregoing arguments. Thus, while not all emerging occupations will share all of the attributes of the older professions (e.g. control over entry into the training that is required to practice, licensing by the state, etc.), to the extent that they do entail working with information to diagnose and resolve problems, more and more employment is seen to take on the essential aspect of professional work. From this it is a relatively easy step to conclude, as does Freidson and a host of other post-industrial thinkers that "the post-industrial society will be the professional society" (Freidson, 1994, p. 74). Different authors have used a variety of appellations to signify this trend. – symbolic analysts (Reich, 1992), the knowledge class (Bell, 1976), the creative class (Florida, 2002) – but for all, the changing nature of work is transforming both workforces and class structures in a post-industrial landscape (Castells, 1996; Clement and Myles, 1994).

Yet for all of the conversation pertaining to the changing nature of work, apart from general assertions, it is precisely this topic, which the professionalism/post-industrial

literature ironically avoids. For, as already observed, the sociology of professions is mainly concerned with the social division of labour in society. The study of work in industrial or post-industrial contexts, on the other hand, requires a detailed analysis of the technical division of labour in actual workplaces before definitive conclusions concerning the changing nature of work can be arrived at. To put it another way, theories of post-industrial professionalism exhibit a circular form of reasoning that goes as follows. First, the defining feature of professional work is the autonomy that it is said to require. The identification of problems, their classification, diagnosis and treatment calls forth a large measure of self-direction for workers to get on with the job in the way they see fit, free from micro managerial overview. Next, there is the presumption that increasing swaths of work that entails the use of information and human service requires this sort of sovereignty. Informational service work is identified with greater levels of autonomy or self-management. This being the case, it is relatively easy to assert that there is a general trend towards professionalization across workforces. As we move from an industrial economy to an advanced service economy that is built upon circuits of knowledge and flows of information and data, the workers who staff such positions assume the roles and status of professionals. But does this automatically follow?

In the sections that follow we examine these claims more closely, first by inspecting an occupation – nursing which is now making use of information technology in the form of decision support software systems in the performance of medical triages. This is an example of an older profession that is experiencing rapid change in the ways that its work is done. Next, through a second case study, we examine the work of IT ‘experts’ and specifically those workers who provide help desk assistance for

corporate users of IT programs. Compared to nursing, this is a relatively new occupation, but like the nursing labour force, it confronts an uncertain future that belies an easy identification with professionalization.

The Case of Tele-health Nurses

Contemporary nursing exhibits many of the features associated with professionalism as discussed above including its own theoretical paradigm, which informs university level training, licensing and subsequent practice. In general, nurses believe that nursing is an art and there is an intuitive element to it backed up by training and experience. The preference of nurses is to reach out to the patients with a human experience of holistic care. According to Carvalho (2014) in the professionalization and professionalism of nurses, care is the key concept, 'the basic area in which professional jurisdiction is based' (p 8).

Never the less, given the waged status of most nurses, many of whom are employed in the public or not-for-profit sectors, the occupation has been beset by ongoing change emanating from fiscal pressures and associated technological and managerial innovations (Ackroyd and Bolton, 1999: Adams et al, 2000; Bolton, 20004; Brannon, 1996; Lloyd and Seifert, 1995). One such change is the introduction of tele-health as one component of an e-health agenda. Tele-health allows for over the phone consultations, including the provision of health care information and the conduct of medical triages between nurses and the public. It is made possible by a combination of two technical innovations – the adoption of call centre functionality as a medium for exchanging, processing, producing and distributing information to large numbers of people and the utilization of decision support software in the production of individual case dispositions. The former permits long distance consultations to take

place. Members of the public may communicate with a health contact centre through a single, common telephone number. Incoming queries are allotted to waiting nurses via an automated call distribution system, which also generates 'production' statistics for the operation as well as for individual nurse agents. In other words, one aspect of tele-health involves the placement of nurses in call centres.[2]

The second feature which, has made tele-health possible, is the incorporation of decision support software into the process of remote health consultation. This technology may assume different forms, including referential guidelines that are used in an open fashion to direct conversations/consultations between nurses and callers (Mayo et al, 2002; Anderson-Bach, 2008), and, more stringent medical algorithms, which are used to perform medical triages (Russell, 2012; Smith et al, 2008; Collin-Jacques and Smith, 2005). In the latter, more common instance, the nurse, in consultation with the caller, will enter a symptom into the IT system. This action triggers a series of questions that the nurse poses to the caller. Each response that is provided generates further questions all the while eliminating certain scenarios, until, at the end of the session, a recommendation is made. The goal is to arrive at an appropriate level of treatment for the caller. As the nurse proceeds through the algorithm certain conditions, beginning with the most serious, are ruled out, until a final disposition is made. The process involves moving through a series of screens, each containing a question to which the nurse enters the caller's response. To a certain extent, then, the screens read like scripts. The nurse uses her judgment/discretion over which algorithm to initially enter, although often this involves little more than asking the caller for their principle symptom. Use of the algorithms, on the other hand, is

mandatory in health care systems such as the NHS in the UK, which have purchased such software as part of their investment in tele-health.

Given this background, we can now explore the relationship between this new domain of health care and the profession of nursing. In this section of the paper, we examine the work of tele-health nurses at an Australian Health Contact Centre (HCC), which is a state driven initiative and includes a tele-triage system. The research discussed here draws on findings from two rich qualitative studies, one, that collected and analyzed a wide range of data entailing extensive interviews with the nurses at various levels including RNs, Clinical Nurses (i.e. team leaders) and Nurse Unit Managers (NUM) as well as both participant observation in training sessions and passive observations at the HCC. This is supplemented by the findings of a doctoral research study that engaged in extensive in-depth interviews with the Director (GM) of the Health Contact Centre (De, 2011).

To begin with, a little bit of history may prove helpful. E-health does not come cheaply, so we might ask why states around the world (Kumar and Snooks, 2011) are making such investments at this time. As outlined in the business strategy document that formed the foundation for the eventual establishment of the HCC, "The initiative may free up current health resources which could be redirected within the health service. … a health contact centre has potential to address immediate health system problems such as the number of primary care type presentations at Emergency Departments …" (HCC, 2004). Translated – the hospital system is under ever increasing pressure, in the first instance, from direct presentations at Accident and Emergency Departments; tele-health has the potential to relieve some of this demand,

especially if it can be used as the gateway into the health care system. Re-routing all calls from A&E departments (presumably to request ambulance service) to a tele-health centre would "Contribute to the appropriate use of ED [Emergency Department] services" (HCC Policy Document, n.d.). Also noted in the background briefings are several overseas studies (UK and US) that show considerable cost savings "as a result of nurse triage services that are provided outside usual business hours" (HCC, 2004).

Several points follow from this thumbnail sketch. First, it is instructive that '*a business case*' was required to be put forward prior to the adoption of tele-health. More than that, however, was the fact that this business case constituted the main foundational document and blueprint for the future operation. Given these terms of reference, it is not in the least bit surprising that an economizing logic should take hold and constitute the main rationale behind tele-health. Finally, in keeping with this overall orientation tele-health would be subject to 'professional' management, which would oversee implementation of the business strategy and as part of its remit would benchmark future operations against providers in other countries. As a result, a non-nurse manager, to whom the Director of Nursing reports, is in charge of the overall operation at HCC.

Importantly, no where in this narrative do nurses, their professional association or their union seem to have had any influence what so ever. Rather, nurses were hired into the system after the key decisions were taken as to what form tele-health would assume. This included settling such important issues as to whether the system would be based upon decentralized regional centres or one large centralized call centre, the

operant division of labour within the setup and the nature of the software tools that would be developed or purchased. Each of these matters involves the execution of choices that can produce significant variation in overall outcomes (Russell et al, 2013); the important point here being that nurses were not part of the decision making process around any of these items. Arguably and in general terms, this exclusion would have consequences for the enactment of a professional project.

Here, we will examine the professional consequences of two of these decisions: the adoption of medical algorithms as the main support tool for delivering tele-health and the divisions between professional and non-professional labour at the HCC. As outlined above, medical algorithms are used as the main tool to provide tele-health at HCC. For each call received the nurse activates the Clinical Decision Support Software (CDSS) that is accessed at each workstation. CDSS was developed by doctors working in the field of medical informatics in the United States. It represents a codification of a medical paradigm wherein callers are asked for their primary symptom and one by one, following each further query, different possibilities are ruled out until a final recommendation is provided. Although the nurses understand that the algorithm provides direction and a framework to assist rather than a script to be strictly adhered to, this premise remains saddled with ambiguity. Thus, in training sessions RNs were simultaneously implored at the beginning of a call to “Get into your algorithm because that’s your protection” (from legal liability) while simultaneously drawing upon clinical expertise when using the software. Consequently, while going beyond the algorithm and supplementing it with questions drawn from their own expertise is also promoted, this must *complement* rather than contradict the directionality of the algorithm. Ultimately then, professionalism is

practiced at the margins. This is brought out most clearly when there is a disagreement between the professional and the machine.

In principle nurses can over-ride the recommendation of the software. CDSS recommendations can be upgraded by RNs placing a higher level of urgency upon a disposition, or downgraded. The latter action, however, requires immediate approval from a team leader (Clinical Nurse). In practice, alteration of the computer generated dispositions is rare if they involve a lower level of attention than that recommended by the algorithm.

> *To downgrade we need to get a team leader's okay, and if you are really busy, it's just not worth downgrading …* (1,7,09-4)

> *It's rare to downgrade I find, but it's not unusual to recommend doing an upgrade and it's also as a result of being aware, as you can often hear what's going on in the background and the implications of their physical status as to where they are and their need. The computer can't hear … so it's being perceptive to not only what the caller is saying but what is also happening in the background* (1,7,09-5)

> *Yeah, I don't downgrade very often. I could probably count on one hand the number of times I have done that since I've started* (26,3,09).

> *I've never done that [downgrade a CDSS recommendation]. A lot of the times I've thought to myself, if someone rings you with a seven day old injury that they can easily see the doctor about it the next day, you sometimes think to*

> *yourself, do you really need to go to the emergency department … But unfortunately the algorithms and assessment tool doesn't take into consideration the timeframe that the person's done it. … The tool doesn't allow for anything like that at all*. (24,3,09)

The final quotation also alludes to perceived shortcomings of the programmed algorithms, a theme which was further expanded upon by our subjects. Use of the algorithms depends upon nominating a single symptom to be investigated. But sometimes things are not so simple as the following example illustrates.

> *The other thing that we are asked to say is that what if they give you four things, like my child has a fever, they've got a cough, vomiting and they have diarrhea. 'Okay what's the thing that is bothering you the most?' Then there's a lot of times they will say 'well everything' and you will ask them five different ways …* (23,6,09).

The point here is that focusing on one symptom may exclude important inter-relations and elements of context. As a number of nurses poignantly called attention to, the use of 'expert' software systems has important consequences for nursing practice and for professional identity;

> *It's like a medical model is dominating rather than as nurses we have our own intuitive practice. Nursing is an art. It's not normally based upon the medical model. Somehow we are being shifted into following the medical model* (1,7,09).

> *… they are not served by that algorithm system because it's taking their symptom out of the context of their life …* (4,6,09)

What these nurses are registering is the way in which the use of medical algorithms challenges the paradigm that nurses bring to health care delivery. Professions other than nursing (medicine + IT) have been responsible for the development of medical/tele-triage algorithms and they reflect a different knowledge paradigm and approach to doing the work. The use of systems such as CDSS has changed the job of nursing. Now, the primary imperative is to triage in order to avoid risks that the system itself creates. Other aspects of what nurses define as important elements of their profession, including patient education/empowerment, have been hived off and re-assigned to in-take call handlers. Consequently, the model of tele-health that has been developed at HCC includes a greater technical division of labour with some aspects of nursing being reallocated to non-professional support staff (i.e. call handlers). Could other aspects of nurse's job also be handed off to non-professional staff in the future through the mechanisms of tele-health and the use of expert machine systems? Recent developments in England's NHS-Direct (Russell et al, 2013) suggest that this is more than a hypothetical possibility.

The Case of IT Service Support Workers

The tension between work that has been routinized and work that is dependent upon specialist human capabilities and agency is particularly evident when considering the everyday experiences of IT service support workers. These workers typically work under intense time pressures imposed upon them through management surveillance techniques that include ongoing measurements against service level agreements (SLA's), electronic scoreboards reporting in real time worker productivity, and other performance reports. They also typically have their work regulated and structured by technology, specifically by workflow management systems. However the work might

also be characterized by the highly specialized knowledge and skills that workers develop through the experiential application (and refining) of theory as they investigate and resolve highly contextualized and complex service incidents.

IT service management (ITSM), as a practice that has become increasingly homogenized through 'best practice' techniques such as ITIL, is in the tradition of Taylorist scientific management thinking (Taylor, 1911). Therefore, at face value, work within such organisational environments might be reasoned to be at odds with Abbott's (1991) assertion that professional work is resistant to rationality. Central to Taylorism is an evangelism of measurement for maintaining and improving efficiency and service quality (van Bon *et al*, 2008). The creeds of ITSM include '*You can't manage what you don't measure*' (Arraj, 2010), '*What you measure gets done'* (Smith, 2008) and '*If you cannot measure something you cannot improve it*' (Computer Economics Report, 2009). This hunger amongst managers for numerical data inevitably reduces human workers to resources for measurement. For example, as illustrated in this extract from the ITIL manuals, IT service managers are encouraged to dehumanize and objectify workers as resource assets to be measured, configured and controlled in much the same way as technological resource assets:

> *All assets can fail to perform at the required level. Assets engineered and maintained for higher performance tend to have higher MTBF [Mean Time Between Failure] under the same operating conditions... The concept of MTBF applies to people and processes even if the actual metrics may be difficult or meaningless. The idea is the same. (Taylor, Iqbal and Nieves, 2007, pp. 174-175)*

This is in line with Fiske's (2009, p. 33) definition of a '*form of dehumanization which might be termed objectification, [that] views people as automatons (tools, robots, machines)'*. Under such 'best practice', IT service support workers are defined by the processes and routines they are called to follow. However, IT service support work entails working with complex IT systems that can fail in a very broad variety of ways. As Orr (1996, p. 2) observed about a similar technological work environment: '*control is fragile… work in such circumstances is resistant to rationalisation, since the expertise vital to such contingent and extemporaneous practice cannot be easily codified.'* Thus the benefits of rationalisation have their limits, and different sets of workers implicitly have different levels of autonomy depending upon the extent to which their defined role requires the application of individualized stocks of contextualized technical knowledge and skills to investigate and resolve complex service incidents.

The findings from this research into IT service support workers are based upon ethnographic research that was carried out in five IT service management organizations, two of which were in the public sector, while the remainder were private sector entities (Trusson, 2013). Observational fieldwork and semi-structured interviews were conducted across ten work teams in the five organizations. The research suggests that this workforce might be classified according to three practice-based criteria, namely: the design of their job within the organisational structure; the balance between theoretical and contextual knowledge which they fuse and apply in their everyday practice, and the individual relative orientations/identities displayed in their practice, which can be typified as 'cosmopolitan' IT professionals, 'local' organisational employees (Gouldner, 1957), and 'servants' of customers/IT users.

From the research data, four such classifications are identifiable. As listed in Table 1, these are: Resigned Robot, Constrained Careerist, Aspiring Artisan, and Establishment Expert. In the following paragraphs, we describe each of these stylizations in greater detail before considering their overall implications.

Classification	Likely Job Design Type	Likely Orientation Bias	Likely Knowledge Bias
Resigned Robot	First-line	Servant	Contextual (or balanced)
Constrained Careerist	First-line	Cosmopolitan	Contextual (preference for theoretical)
Establishment Expert	Second-line or Single-line	Local	Contextual (or balanced)
Aspiring Artisan	Second-line or Single-line	Cosmopolitan	Theoretical

Table 1: Identifiable IT Service Support Worker Classifications

i) Resigned Robot (RR)

Evoking the routinisation of work discussed in Ritzer's (1996) MacDonaldization thesis, these workers are those who typically sit on a service desk dealing with the constant demands of customers with only a limited opportunity to develop their theoretical skills and knowledge. The work of the RR is predictable within defined organisational processes and offers little scope for development, such that workers often become resigned to their roles being low status and lacking variety and challenge. The status of this first-line work, where deeper problem solving is escalated to a second-line, is evident across the interviews with workers. A service

desk supervisor, for example, commented that the service desk was '*a bit of a dumping ground*' and that '*people… just think: 'yeah, helpdesk, they'll deal with all that crap''* (18,06,10); whilst another worker revealed his perception of his personal status rather sardonically when asked what his job title was, responding '*Service Desk Assistant – very glamorous!'* (20,05,10) *In* these workflows autonomy is restricted and staff are compelled to spend their working hours engaged in prescribed activity. For these workers the work becomes increasingly dull and meaningless (Marx, 1844; Malone et al, 2011) to such a point that one first-line service desk analyst interpreted a question concerning the level of autonomy that he had in his work such that he provided this as an answer:

> *If I was to get a call I would definitely take full ownership of it and obviously give my details… to the users…, escalating it if need be, always making sure I've got updates… and keeping the user informed.* (28,06,10)

It is as though for this worker, Asghar, it was not conceivable to relate 'autonomy' to personal freedom to make choices over time. Instead he revealed that he was in the grip of the Incident Management process as prescribed for him.

ii) Constrained Careerist (CC)

The CCs are typically those first-line workers who have a theoretical knowledge base acquired through education but have had little opportunity to use or develop it in their day-to-day work. These workers might be associated with the concept of 'stuckness', which Kanter (1989, p. 511) defined as being '*a cap on the chance for skill growth – for... structural reasons beyond limitations of individual ability'*. In this context the most clearly identifiable CCs are those who, having previously studied IT with an

ambition to forge a career as an IT 'professional' with significant autonomy to develop through practice, now felt constrained because managerialist practice had brought about routinisation and strict demarcation of their work. One senior service desk analyst tellingly reported his frustration at the restrictions placed upon his autonomy:

> *In my head I've got a lot of technical knowledge and a lot of ability to do stuff but just not having the tools and rights and access to do them … it's very frustrating because… the job satisfaction… goes down.* (17,06,10-1)

Similarly a colleague intimated a similar frustration with '*being controlled… not being able to just go up and do things… you have to go through this hierarchy to get permission*'. (17,06,10-2)

iii) Aspiring Artisan (AA)

In contrast to the RRs and CCs, those IT service support workers who extensively use mostly theoretical/technical knowledge that might easily transfer from one organization to another are - with a nod to Sennett's (2009) treatise 'The Craftsman – classified as AAs. Typically, AAs either work as second-line support or on single-line service desks with no escalation pathway. These workers fully engage their minds and bodies in an 'absolutist' rather than 'practitioner' approach to fully understand the issue before them from a technological/theoretical perspective and through this attitude necessarily learn, demonstrating their professional knowledge whilst at the same time deepening it.

A desire to understand the technology at a deep level was a common theme expressed by AAs. One IT desktop analyst, for example, explained that he got pleasure from '*getting to the bottom of [an issue]… actually finding out, learning something new, that's what gives me the buzz.'* (10,03,10) Similarly, a support engineer reported that he enjoyed working hard on *'a difficult issue [that's] been an interesting one to burrow down to resolve.'* (15,07,10) In these workflows, individual expertise is achieved through autonomous work activity, problem-finding as much as problem solving (Sennett, 2009). Through experience, such workers become ever more self-reliant, increasingly able to handle greater complexity, and they develop an ability to be increasingly innovative. Thus the research data reveals a body of AA workers who develop expertise by asserting personal control whilst, in contrast, other sets of RR and CC workers develop their competence only to a point of management-controlled 'arrested development' (Ericsson, 2008).

The AAs share a common 'cosmopolitan' outlook with the CCs whereby they implicitly owe a stronger allegiance to the nebulous community of IT 'professionals' than they do to more identifiable communities who collectively are responsible for the success of an employing organization or a customer entity. This outlook is fundamentally individualistic in line with those trends that respond to the undermining of established notions of employment permanency and job security (Baruch, 2001; Standing, 2011). Such individualism is evident in workers taking pride in their personal expertise. In this study, a systems support engineer spoke of himself as being an expert in an IT specialism, whilst a support engineer, after explaining how people regularly sought out his expert advice, indicated that this gave him status: '*That is nice – that you are looked up to a bit'*. (17,06,10-3)

Given that the IT occupational sphere is particularly sensitive to skills redundancy (e.g. Sennett, 2006), such individualism is a reasoned worker response, but it also reflects the practice of autonomously investigating complex and unique incidents. As a support engineer reported:

> *Every day is different… every day is a bit of a challenge because you don't know what you are going to be faced with … something to almost look forward to coming in for. It's not routine.* (15,07,10)

It is by being individualistic that these IT service support workers seek to retain their own sense of being 'professional', practicing using their expertise whilst being alert to the perishability of their personal skills and knowledge. This particularly explains the frustration felt by those workers identified and classified in the research as CCs.

iv) Establishment Expert (EE)

The fourth classification identifiable from the data is that of the EE. Here the worker's 'local' (i.e. organisational) career orientation is accentuated along with the depth of their contextualized knowledge that they use in fulfilling everyday problem-solving tasks, often of some complexity. As William H Whyte Jr. (1956, p. 3) wrote of 'The Organization Man', these workers in a very real sense not only work for 'The Organization' but 'belong to it as well'. Whether by accident or design, but implicitly by choice (Beck, 1986), EEs have developed over time an individual 'stock of knowledge' (Schutz and Luckmann, 1974), that is so heavily contextualized that within the organization their knowledge/skills are vital but cut adrift from it they have only a limited offering in the labour marketplace. Thus their 'professional' identity is

dependent upon their continuing employment by the organization in which they practice. They may have considerable IT expertise but nonetheless their 'local' outlook makes that 'professional' identity precarious.

In sum, it is important to recognize that these ideal typifications are not disconnected silos. In the real world these dichotomous typifications are helpful only to illustrate the extremes of what can be conceived as a theoretical continuum induced from the research data, along which a worker might sit at any given point in time. For example, we might readily classify a specific support analyst as a typical AA but also recognize that he was very conscious that the autonomy he had was dependent upon both management and customers. If they explicitly intervened he was likely to act according to their agendas. And if they did not explicitly intervene he might act with greater discretion whilst being aware there were implicit management and customer expectations as to his level of performance. Early in the interview with him, he said that:

> *I would probably say 95% of the time I'm making my own decision of what I'm doing at any one time… What I decide, and how important something is, is up to me unless there really is something urgent that comes up.* (10,03,10)

However, later in the interview a different picture emerged of the extent to which management and customer power restricted his autonomy:

> *I would love to… do my own to-do list… but… it's more of a fire-fighting exercise of who's shouting the loudest … The boss is likely to be being chased by someone but it's more likely that the user will ring up to chase something … If you get someone who pops into the office… that is going to change*

> *your priority. Or if somebody who is categorized as a VIP rings up then you've got to respond to that.* (10,03,10)

Similarly a support and installation engineer highlighted how management-defined processes and customer requirements impinged upon his autonomy:

> *We have to do whatever… comes through on the phones so we don't get to choose what we do… but in terms of fixing that… we've got a pretty free rein on what we can do.* (21,06,10)

Discussion

This chapter has examined two different occupations, one old and one comparatively recent, both of which can lay claim to engagement with professional work activity. Information and communication technologies are essential in both practices, with tele-nurses making use of medical algorithms to provide a portal into the health care system and IT service support staff using such technologies to do further repair work upon them for third party users. In both instances, the work is conducted through and delivered via call centre facilities. That this is service work that takes place remotely, without face-to-face human interaction, only adds another level of complexity to the situation. In both cases, workers are engaged in the act of trying to make sense of situations that they are being presented with. Such interpretive labour entails making use of existing knowledge paradigms to arrive at a classification of the problem at hand from which further recommended actions (treatments) ensue. There is also, ideally, a reflective moment to such work in which aberrant cases are encountered and theoretical templates are revised. All of this conforms with standard sociological understandings of profession.

In terms of formal qualifications, employment as a tele-nurse requires both tertiary educational qualification in the field of nursing studies and possession of a license to practice in the relevant political jurisdictions. Further to that, at the case study site that informs this research, a not insignificant minimum of four to five years of clinical experience is required for tele-nurse positions and eight or more years for team leader roles. Data from the study also points to IT service support work becoming increasingly professionalized in terms of the credence given to reputable objective qualifications, although these qualifications are fragmented to reflect the many specialisms within the work sphere. The interviewed and observed IT service support workers might be crudely categorized into those who had engaged with formal IT vocational qualifications and those who had arrived in their IT role without IT qualifications and had learnt to be capable at the job by doing it over time, a route which is not open to nurses or tele-nurses. Considering the data relating to the recruitment of front-line service desk workers, it seems that for entry into these roles having objective IT qualifications had now become important. Given that IT service desk work is regarded as a first rung on the IT career ladder (SFIA, 2011), the implication is that new recruits to the industry bring with them a body of IT knowledge from formal education in a way that previous generations of new recruits did not. If IT service support work is representative of IT work generally, it would seem that in order to progress an IT career, individuals, including first-line workers, must engage with formal IT qualifications as a method of acquiring recognizable proof of their theoretical competence, and thereby, competitiveness within the IT labour market place in a way that previously might have been unnecessary. These qualifications include both proprietary ones such as those offered by Microsoft and Novell, and more generic ones such as those offered by universities and reputable

examination boards who oversee practitioner qualifications. Given the connection that Abbott (1991) makes between personally retaining theoretical knowledge, and professional status, it might be reasoned that those IT service support workers who have the superior mix of quantity and quality of these IT theoretical qualifications can lay greater claim to being IT 'professionals'.

However, to leave matters here would be to gloss over important aspects of the work of these front-line occupations. Although the journey to become a registered nurse is considerable, the same cannot be said with respect to tele-nursing qualifications. In fact, training in tele-health at the HCC consisted of a relatively short, ten-day on-the-job stint, followed by a 12 week period of preceptorship during which new tele-health nurses are actively mentored by clinical nursing staff. The initial training period consists almost entirely of familiarization with the index of algorithms through role playing and buddying with tele-nurses on the floor of the HCC. The significant point here is that tele-health has not been defined as a specialized profession in its own right (Russell et al, 2013). A short period of mechanistic on-the-job instruction is not conducive to the launching or extension of a new 'professional project'.

Instead, both of our case studies exhibit an uneasy mix of managerial initiatives that contextualize professionalization within broader processes of rationalization. As succinctly put by the Director of the HCC

> *We are taking a health care industry into a contact centre and the two do not naturally meet. It does not come naturally to the nurses and advisors — principles of call control, the principles behind rostering, adhering to schedule, it is an alien concept.* (De, 2014)

In both instances of tele-nursing and IT service support, required expertise is increasingly subordinated to standardized processes. For the nurses this is enforced through restrictions on the scope of their work – this is why they are specifically referred to as triage nurses – and through the requirement to use the medical algorithms with each new presentation. Meanwhile, deviation from computer-generated recommendations in terms of the reclassification of cases to a less serious status than the software disposition must be justified by reference to superiors. The IT experts in our study, meanwhile, are required to defer to both their managers and their customers in the daily exercise of their knowledge.

This is not to say that there are not notable differences in the ways in which these occupations are developing. In IT, as suggested by the preceding, there is considerable intra-occupational stratification between cadres of 'resigned robots', 'constrained careerists', and 'establishment experts' on the one hand, and a small elite of 'aspiring artisans' on the other. This feature, combined with the relative newness of the occupation and its dynamic growth, has held out the possibility of individual career mobility for at least some. Nursing, on the other hand, is, occupationally, comparatively flat. Certainly, the HCC exhibited practically no stratification beyond the registered nurses and their nursing team leaders. With few prospects of mobility within their careers, nurses have turned to collective organization and in some cases to comparatively militant trade union organization to lend them the voice in the workplace that their professional designation denies (Russell, 2012; De, 2011, p.224-5, 236).

If by professionalism we understand the exercise of an autonomy that is anchored in deep stocks of theoretical knowledge for the purpose of arriving at decisions relating to how best to accomplish a goal that the individual is committed to, we may term this 'professionalism from below'. We are led to conclude that for the subjects of this study professionalism from below is, to a considerable degree, compromised. That is to say workers are unable to take decisions outside of tightly defined processes in their work. Increasingly, professionalism as sociologically understood, is practiced at the margins of working experience in these fields. Instead, what seems to be emerging is a 'professionalism from above', or a 'managed professionalism', where workers carry out prescribed protocols that they have had little hand in developing in the course of their work. To suggest as some do, (Germov, 2005) that workers "can assume managerialism as part of their professional project" and that in doing so they "secure a continuous professionalism" (Carvahlo, 2014, p.13) is naïve. Such claims alter, one might even say subvert, the notion of profession in its traditional sense. Working in a professional manner comes to mean enacting the rationalized processes in order to achieve as little variation in prescribed outcomes as possible. This shift in what it means to be a professional appears to render new professional projects of the classic variety increasingly unlikely in these fields.

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[1] As the author of one of the later pieces in the sociology of the professions literature summarizes, "In no case that I know of has genuine 'proletarization' or literal deskilling of professionals been documented", (Freidson p.42). Also see Larson, 1977, p.198 , 231, 235 and passim and Macdonald, 1995, p. 63 and for one of the few voices of dissent, Oppenheimer, 1973.

[2] For a general discussion of work in call centres see Russell, 2008 as well as Taylor and Bain, 1998.

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