



The Emerging Liquid IT Workforce: Theorizing Their Personal Competitive Advantage

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Abstract

In this paper we aim to contribute to a better understanding of an emerging phenomenon of ‘liquid workforce’, which according to industry press, is rapidly growing. Our specific focus is on the broad research questions: *How do liquid IT workers remain competitive? What are suitable strategies for their management and engagement?* Using the research insights from the interviews with independent liquid IT professionals working on the same mission-critical compliance program in a large financial institution, we propose a new conceptual model of their ‘personal competitive advantage’ (PCA). Drawing from the theories of human capital and social capital, we theorize PCA as a complex, mutually enhancing (a triple-helix-like) interplay of three highly-intertwined components of ‘*Doing*’, ‘*Relating*’ and ‘*Becoming*’. Based on the proposed model, we then articulate an initial set of strategies for management and engagement of the liquid workforce. In doing so, we expand and challenge the current IS research on IT workforce that remains focused on its retention and prevention of turnover. Instead, we propose to focus on specific management strategies for building and maintaining social capital within and beyond organizational boundaries.

Keywords Liquid IT workforce · Future of IT profession · IT skills · Management of IT professionals · Qualitative study · Personal Competitive Advantage

1 Introduction

In today’s highly dynamic global markets, the challenges of finding, employing and retaining suitable Information Technology (IT) workforce are greater than ever. At the same time, the nature of IT workforce is rapidly changing. For example, Randstad’s future workforce report predicts that by year 2025, 69 % of the workforce will consist of agile and non-traditional workers (Randstad, 2016). In a more recent survey of 800 executives world-wide, about 70 % expect the demand for individual, on-site freelancers, contractors and temporary workers to increase over the next two years,

compared to the pre-Covid 19 pandemic levels (Dua et al., 2020). This includes the demand for IT contractor talent with specialist competencies (McDonald, 2020).

On the supply side, a growing number of highly-skilled IT workers are choosing flexibility and new kinds of temporary work engagement over more stable and longer-term employment (PWC, 2011; Accenture, 2016; Deloitte, 2017). This trend is often attributed to job preferences of new generations of millennial workers (Wingard, 2019). Citing the USA today report, Wingard (2019) found that 70 % of millennials are interested in freelancing and 40 % plan to leave their permanent jobs in pursuit of freelancing over the next 5 years. A new generation of talent platforms, currently used by almost all 500 companies, now provides on-demand access to freelance workers with premium expertise (Fuller et al., 2020). Some industry reports go even further and predict that within a decade we could expect to see a new Global 2000 company without any full-time employees apart from senior executives (Daugherty et al., 2016). Consequently, new types of ‘on-demand by choice’ IT workforce are constantly emerging, including crowdsourced workers (Pedersen et al., 2013; Zhao & Zhu, 2014; Deng & Joshi, 2016; Taylor & Joshi, 2018), digital nomadic workers (Wang et al., 2020; Schlagwein & Jarrahi, 2020) and, as discussed here, liquid workers.

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Indeed, according to influential industry reports, the liquid workforce — temporary, on-demand and highly specialized knowledge workers (Liu, 2020a) — is expected to grow very rapidly (Gupta, 2018, 2019) to the extent that is becoming a new norm (Gallagher and Savoy, 2017). Accenture sees ‘liquid work’ as one of the key future trends, a much-needed solution to the global shortage of IT skills and a new source of competitive advantage (Daugherty, Carrel-Billiard and Bilitz, 2016). Recently, Liu (2020b) goes even further and declare liquid work to be the future of work.

In preparation, some companies such as Google and General Electric have already started innovating their HR processes to meet the requirements and preferences of the liquid workforce they aim to attract (Petac and Petac, 2016). More recently, companies are changing their policies and processes in recognition that independent, flexible, high-end workers’ skills are critical for their adaptation in the new post-pandemic normal (Strom et al., 2021). As Liu (2020b) warns, companies “must learn to engage liquid workforce, or risk getting left behind” (p.1.).

However, in spite of growing industry enthusiasm for, and predictions about liquid workforce, there is a very limited understanding of this phenomenon, both at the individual and organizational level (Gupta, 2018, 2021). Very little is known about their needs, preferences and the ways of working (Gupta et al., 2017). The scarce literature suggests that their managers are also struggling (Gupta et al., 2017; Gupta, 2018; Jha et al., 2018), because the traditional management methods are no longer sufficient to provide the necessary guidance. Therefore, more research on suitable management strategies is urgently needed.

At the same time and in the absence of any agreed definitions and with nascent empirical research, the term ‘liquid workforce’ has been used in a variety of ways. Consequently, it is possible to observe a conceptual confusion as ‘liquid workforce’ may appear to be just another term for agile workers, gig economy workers, crowdsourced workers, contractors and freelancers. While it does share some important characteristics with other forms of highly-flexible workers, researchers such as Jha et al. (2018), Gupta (2018, 2019, 2021), Ghosh et al. (2019), Chakraborty et al. (2019), and industry analysts such as Daugherty et al. (2016), Gallagher & Savoy (2017), JLL (2019) and Liu (2020a, b, c) all argue that liquid workforce is a distinct new phenomenon, needing our urgent attention. This in turn calls for its definition and theoretical conceptualization, as attempted by this research.

Recognizing the importance of this rapidly growing category of workers, Gupta et al. (2017) issued an urgent call for further research on the liquid workforce. Responding to this call, in this paper we aim to gain a better understanding of this emerging phenomenon, in particular liquid workers’ needs, preferences and strategies to remain competitive in highly

dynamic and competitive IT industry. This in turn opens a pathway for a better understanding of suitable strategies for their management and engagement. Thus, taking the perspective of individual workers, we focus on the following broad research questions: “*How do liquid IT workers remain competitive in highly dynamic IT industry?*” and consequently, “*What are the implications and strategies for their management and engagement?*”

To answer these research questions, we interviewed a group of independent liquid IT professionals working on a mission-critical project in a large financial institution. Consistent with our research questions, we took the perspective of individual workers rather than the organizational one. Our research findings show that these professionals remain competitive by engaging in deliberate practices of growing, what we conceptualize here as “Personal Competitive Advantage” (PCA). Consequently, they select their work assignments very strategically and value organizational contexts and management strategies that respect and enable long-term growth of their PCA.

Drawing from the theories of human capital (HC) and social capital (SC), we theorize PCA as a complex, mutually enhancing (a triple-helix-like) interplay of three highly-intertwined components that we recognize and name as skills of: *Doing*, *Relating* and *Becoming*. Thus, *Doing* emphasizes the act of doing that is applying IT skills and knowledge (HC) to create value. *Relating* describes building, using and maintaining social capital of relating to others, within and beyond the current work assignment. *Becoming* refers to a deliberate practice of engaging in the ongoing process of “developing a professional self” (Scanlon, 2011, p.14). This component includes deliberate application and refinement of higher-order non-cognitive skills, such as reflection, self-efficacy, and self-awareness. It also relies on, and brings to the surface personal characteristics, in particular character strengths, such as ‘social intelligence’ and persistence, as previously articulated by Peterson et al. (2010).

Each of these components was found to play very different role in growing one’s PCA. While the *Doing* component was perceived by the liquid IT workers as a *necessity*, *Relating* was linked to their on-the-job survival as well as the current and future job *opportunities*, and *Becoming* was linked to the *longevity* of their self-directed careers. Moreover, as liquid workers are engaged in project work, the *Relating* and *Becoming* (in particular their personal characteristics and values) components of their PCA were found to be the key enablers of successful collaboration and coordination in their temporary project assignments.

Based on the proposed theoretical model of PCA, we argue that in the case of liquid IT workforce it is necessary to shift the existing IT management strategies from retention of HC and prevention of IT turnover, towards the new ones that focus on long-term growth of social capital (SC), during as

well as between work assignments – both *with* and *among* IT liquid workforce. In doing so, we both challenge and expand the existing body of IS and management literatures, which is still predominantly focused on IT workforce retention and/or prevention of turnover.

Our research offers the following theoretical contributions:

- A conceptualization of ‘liquid workforce’ as a new type of contingent IT workforce, including its research-based definition.
- A theoretical model of Personal Competitive Advantage (PCA) of the liquid IT workforce, grounded in the theories of social and human capital.
- Articulation of an initial set of strategies for management of IT liquid workforce during and, importantly *between* work assignments, which are informed by the proposed theoretical model of PCA.

In terms of practical contributions, our research insights urge managers of the liquid IT workers to shift their attention and organizational resources from the strategies focused on their retention and prevention of their turn-over. Instead it calls for the new kind of management strategies that focus on building social capital with, and among liquid workers, even beyond their current work assignments. Importantly, this kind of management extends beyond formal organizational boundaries and the time-span of the current job assignments. This is an important contribution, given that the managers are currently struggling to manage this rapidly emerging segment of their workforce (Gupta, 2018, 2019; Jha et al. 2018; Liu, 2020b).

We also offer some important insights for educators of the future IT workforce as our research emphasizes the skills of *Becoming* and *Relating*. Based on our research findings we argue that these skills go beyond narrowly defined ‘soft skills’ of communication and team work. This in turn, requires further, yet-to-be-investigated development of the existing curricula in Information Systems (IS), IT, business and management education as well as in other professions with emerging liquid workforce (e.g. engineering).

The paper is organized as follows: The next section provides a review of current literature on liquid workforce, thus clearly differentiating liquid workforce from other forms of flexible workers. It also reviews the literature on the changing nature of IT work, IT skills and management of IT workforce, in order to establish research gaps related to the liquid workforce, which motivate this research. Section 3 focuses on the theoretical foundations for our study. We use human capital theory and social capital theory as our combined theoretical lens. Section 4 gives a brief description of our research method – the research site and our research approach. Section 5 elaborates on our findings, organized around different phases of the liquid workers’ experience from finding work, working on temporary projects, leaving the current work assignment

and finding the next one. Based on our research findings we then propose a theoretical model of PCA in Section 6, thus answering the first research question. In Section 7 we use the proposed theoretical model of PCA to infer and articulate new management strategies for the liquid workforce as an alternative to those that focus on IT retention and prevention of turnover. In doing so we answer the second research question. In Section 8 we discuss the main contribution of our work by relating it to the wider IS and management literature. In Section 9 we wrap up the paper with the main conclusions, study limitations and some ideas for future work.

2 Related Work

2.1 What is Currently Known About the IT Liquid Workforce?

Our review of multidisciplinary literature from IS, IT, business and management studies, confirms Gupta et al.’s (2017) previous observation that very little is known about the liquid workforce. Recognizing the absence of any agreed definition as well as the presence of conceptual confusion because the liquid workforce appears to share a number of characteristics with other forms of flexible workforce, in this subsection we review both academic and practitioner literature in order to derive the main characteristics of the liquid workforce. We then use these characteristics to offer a definition of the liquid workforce as a distinct form of contract work.

Going back to the origins of the term liquid workforce, IBM described it as ‘IT workers of the future who are ‘hired on an “as-needed” and “just-in-time” basis for specific project activities, whether for days, weeks or months’ (Gupta, 2018, p.5). Building upon this definition, Accenture (2016) added more characteristics by describing liquid workforce as adaptable, contingent, with valuable external skillset, and organized around projects. More recently, liquid workforce was described as new type of highly-skilled workers that ‘can be “seasonally” attached and detached with ease as per the contingent strategic and operational needs’ (Gupta, 2018, p.5). Emphasising a win-win value proposition of employing liquid workers, another recent industry report described them as “a team of willing experts can be hired to swoop in and innovate, then swoop back out whenever they like” (JLL, 2019, p.1). Their specialised expertise was also emphasised by Liu (2020a, b, c), along with the project-based nature of their work.

Moreover, the liquid workforce typically comprises of knowledge workers (Gupta et al., 2017) working in the open talent economy, across organizational and geographical boundaries, while moving from role to role (Deloitte, 2017). Typically, they come from different knowledge and information-intensive professions (e.g. accountants, teachers,

lawyers, engineers, business consultants). However, the most prominent group includes IT professionals – the same group of liquid workers we focus on in this paper. Although they are agile by nature, Gupta et al. (2017) argues that liquid workforce is different from “agile workforce”. This is because “agile” is often used as a very generic description of today’s workforce and organizations (McKinsey, 2017; Jadoul et al., 2021). As Gupta et al. (2017) explains, the term “agility” is also used in two ways: as a personal characteristic of employees (e.g. having an “agile mind set”) or as a generic work requirement for today’s dynamic business environment.

At the first glance, a number of these characteristics do apply to other emerging categories of IT workforce such as crowdsourcing, gig workforce, nomadic work as well as contract work in general. However, when considered in combination, their synthesis starts to paint a clearer picture of a distinct new category of IT knowledge workers, as follows.

- Liquid workers are ‘high-end’ knowledge-workers (Jha et al., 2018) with highly specialized skills (Liu, 2020c) who are hard to find and employ on a permanent basis (Jha et al., 2018).
- They have the skills and experience that would take too long or would be too expensive for the company to develop (JLL, 2019; Wingard, 2019).
- They *choose* to work as freelance workers often in pursuit of flexibility, lifestyle or personal fulfillment (Ranstad, 2016, 2018a, b; Lui, 2020b). Contrary to the still-prevalent assumptions that freelancers are professionals who are unable to secure permanent employment, this is no longer the case with the new wave of agile talent (Wingard, 2019).
- They reject more traditional career paths and engage in liquid work not as a temporary solution, but as the means of strategically charting their own career pathways (Wingard, 2019; Liu, 2020a).
- They are doing *work of strategic importance* for the company, rather than administrative or lower-level operational tasks often associated with temporary workforce, such as those in the new gig economy (Wingard, 2019; Younger & Smallwood, 2018).
- They are engaged on specific, often mission critical projects (JLL, 2019; Liu, 2020b). The *project-nature* of their work (Liu, 2020a, b) makes them very different from contract workers doing crowdsourcing work, which is typically independent and task-oriented (Taylor & Joshi, 2018).
- They are employed “as needed” and “just in time” contingent workforce (Gupta, 2021), who are released “without any burdens to the corporation” once the project they are hired on is complete (Liu, 2020c).
- The just-in-time contingent nature of the projects they are engaged in also means that the whole project teams are also assembled “just-in-time” (Gupta, 2018). This in turn

adds another level of complexity to the liquid workforce’s work environment, compared to joining already established and stable project teams.

- The liquid workers are expected and able to quickly learn and adjust to various aspects of very dynamic and diverse organizational settings (including unfamiliar organizational culture, norms, rules, expectations, formal processes and company policies) in order to meet contingent strategic and operational needs (Gupta, 2018).
- Compared to other forms of digital workforce such as crowdworkers who are independent individuals (Ayaburi, Lee & Maasberg, 2020), liquid workers need to be integrated into company’s blended workforce (Liu, 2020b) because of the project-nature of their work. Therefore, they are expected to collaborate and coordinate their work with people with very diverse skill-sets (Gupta, 2018).

Based on our synthesis of the above characteristics, we offer the following definition:

The liquid workforce are high-end knowledge workers, who choose contract work in pursuit of flexibility, lifestyle, and/or personal fulfillment; They are employed on-demand and just-in-time by the companies lacking their specialized expertise, on the projects of strategic importance, which involve coordination and collaboration in highly dynamic and diverse teams comprising of permanent employees and/or contract workers, including other liquid workers.

In responding to Gupta et al.’s (2017) urgent call for more research, we observe the absence of any research on liquid IT workforce in Information Systems (IS). Yet, this topic is very relevant for the IS discipline, given its long history of research on IT workforce. In particular research on: (i) the changing nature of IT jobs, (ii) skills and competencies of IT workers and (iii) management of IT workforce, which we review in the following subsections.

2.2 The Changing Nature of IT Work

The IS discipline has had a very long history of research on IT workforce. In their historical review of IS research on this topic, Wiesche et al. (2019) observe three waves of related research. Even though their research curation was based on the articles published by a leading IS journal (MIS Quarterly), it is nevertheless reflective of the history of thinking about IT workforce by the leading IS scholars. Thus, the first wave, which was mainly conducted in the 80 s, coincided with the emergence of IT as the core business function. Consequently, the research in this wave focused on articulation of IT as a new

profession by investigating specific skills and competences of at-the-time emerging IT/IS jobs, such as system analyst (Green, 1989), the role of IT managers, and the roles of IT workforce in general. The second wave of IT workforce research (from early 90s to early 2000s) coincided with the recognition of IT as a strategic resource. Consequently it focused on the relationship between very dynamic IT jobs requirements and the fast-emerging new IT trends (Wiesche et al., 2019). This wave also emphasized IT managers becoming a critical organizational resource. The third wave (from early-mid 2000 to today) has shifted the focus to new forms of IT organizations, such as open-source communities and online labor platforms (Howison & Crowston, 2014; Stewart & Gosian, 2006). This wave, Wiesche et al. (2019) observe, aims to extend our collective understanding of the changing nature of IT workforce beyond the organizational boundaries and the traditional employment relationships to new forms of working and new types of organizations.

The third wave continues to expand, as the new type of IT workers are constantly emerging. More recent examples include crowdsourcing workforce (Thuan et al., 2016; Deng & Joshi, 2016; Taylor & Joshi, 2018; Zhao & Zhu, 2014; Pedersen et al., 2013), digital nomads (Wang et al., 2020; Schlagwein & Jarrahi, 2020), IT freelancing workers providing services through specialized online freelancing service platforms (Sultana, Im and Im, 2019) and a generic category of ‘gig’ economy workers in IT and other professions (Taylor & Joshi 2018).

We observe several important characteristics of the third wave that enable us to position our work on the liquid IT workforce within this body of IS literature. First, the new types of IT workforce shift the focus from organisations to the workers who are self-employed and choose their work. This in turn shifts the power relationship found in traditional organizations, in relation to employment engagement. The prime example of this emerging trend are digital nomads (Wang et al., 2020) who are not only self-employed, but challenge our traditional understanding of the context of work, which in their case spans different geographical and organizational boundaries. Second, with each new category of IT workforce emerging, pioneering IS researchers first focus on its conceptualization as a new phenomenon. For example, Zhao & Zhu (2014) and Pedersen et al. (2013) first conceptualized the phenomenon of crowdsourcing, thus paving the way for other IS researchers to explore its many aspects. Their collective efforts shaped what is now recognized as an important area of IS research. We observe a similar trend now emerging with conceptualization of digital nomadism (Wang et al., 2020; Schlagwein & Jarrahi, 2020). Third, we observe the absence of any prior IS research on the liquid workforce. Based on our previous discussion, we claim that the liquid workers represent the new category of work and as such expand the third wave of IS research on IT workforce.

Following the same approach taken by the IS researchers who previously investigated other (at the time) new types of IT workers, in this paper we focus on conceptualization of the liquid workforce.

2.3 IT Skills

Research on IT workforce skills represent an important stream in IT workforce (Goles et al., 2008; Kaarst-Brown et al., 2018). Throughout its long history, researchers have investigated skills and competencies of different IT jobs, initially within, and more recently beyond organizational boundaries. Although very diverse, these studies continue to emphasize that IT work is very unique compared to other professions. This is because IT skills become obsolete very quickly, thus requiring IT professionals to engage in continuous learning in order to master changing business needs and rapid technological shifts (Wiesche et al., 2019).

Researchers have long observed two broad categories of IT skills, which are often classified as technical and non-technical. For example, in their comprehensive literature review of research on IT skills Goles et al. (2008) discuss a variety of technical skills, which are specific to the IT field. They also include less-precise, non-technical skills, which include business skills, management and interpersonal skills, often referred to as ‘soft-skills’. More recently, both academic and industry literature emphasize the rising importance of ‘soft-skills’, especially communication and team skills.

Also relevant for our research are prior approaches used to investigate skills of IT professionals. For example, researchers often use various classifications of IT skills and proceed to map the skill set of different IT roles under investigation (e.g. Zweig et al., 2006). A different approach, which is particularly relevant for our work, focuses on skills that shape an IT professional’s career. For example, researchers have used different stages of IT career and the corresponding frameworks, such as the so-called career anchor model, to identify the most important career-defining skills (Ginsberg & Baroudi, 1988; Lash & Sein, 1995; Josefek & Kaufman, 2003). The same approach was deemed appropriate for our project, as it enabled us to focus on the most important skills that shape an IT liquid professional’s career, while remaining open towards the emergence of new skills not previously discussed in the literature on more traditional IT workforce. Also, when investigating the career-shaping skills of the liquid workforce, we focused on types of skills, rather than actual skill set included in, for example, project management or system analysis. The latter is the approach taken by researchers who use mapping against previous agreed classifications, see for example Zweig et al. (2006).

Thus, looking at different aspects of their professional career, in this research we focus on the types of skills that enable the IT liquid workers to find work and remain competitive.

That is regardless of the industry sector they are working in as IT professionals.

2.4 Management of IT Workforce

The topic of IT workforce management has continued to attract the attention of multidisciplinary research communities in organization studies, business, management, human resources and IS. Two overlapping streams research are particularly relevant for our research: IT workforce retention and prevention of turnover, reviewed next.

2.4.1 Retention of IT Workforce

Retaining IT talent has been challenging for many organisations since the introduction of computers (mid 1950s). Throughout the decades it has remained one of the most pressing management issues facing IT leaders and organizations (Kaarst-Brown et al., 2018; Wynen et al., 2018).

Consequently, for years both the academic literature and industry press have urged companies to focus on retention of their valuable IT workforce. Indeed, a recent industry report warns that in today's digital world and tight labor market, "war for IT talent is raging" and retaining IT workforce is more important than ever before (Randstad, 2018a, b). Following the same line of thinking, the academic literature offers numerous studies on IT turnover. For example, citing a large number of meta studies, Wynen et al. (2018) confirm that employee turnover has been a core theme in organisation and management studies for years. Importantly, there is a common assumption that turnover is negative (Wynen et al., 2018; Wang et al., 2017) and should be prevented. In addition to the loss of valuable knowledge and skills for the organisations (de Vasconcelos et al., 2016; Bairi et al., 2011) and a significant labour cost involved in finding and hiring suitable IT experts (Wang & Kaarst-Brown, 2014), there are also consequences for the remaining employees, such as increased workload and decreased moral (Wang & Kaarst-Brown, 2014).

In response, managers are offered research-based retention strategies and frameworks (Wynen et al., 2018; Pflugler et al., 2018; Allen et al., 2010). Moreover, as Pflugler et al. (2018) observe, the IT managers are even obliged to take the appropriate actions to retain an employee deemed valuable for the organization. Management efforts are combined with other initiatives. For example, organisations are now using HR analytics for employee retention. Boudreau (2014) offers a good illustration of what is already possible: "Imagine one of your managers walks into their subordinate's office and says: 'Our data analysis predicts that you will soon get restless and think of leaving us, so we want to make you an offer that our data shows has retained others like you'" (p.1).

The liquid workforce challenges the whole body of the retention literature, as these workers choose flexible work and do not want to be retained. Consequently, they require not only new management strategies (Gupta et al., 2017) but more fundamentally, a paradigm shift in management thinking about this growing segment of workforce. This in turn requires a much better understanding of the needs and preferences of the liquid workforce, which is the research gap (Gupta, 2018) tackled by our research.

2.4.2 Prevention of Turnover

Overlapping with research on retention is another large research stream on prevention of turnover of IT workforce, which also includes different management strategies. Here, there are numerous notable studies of turnover intention, in organizational behavior literature, business, management and IS, such as those conducted by Agarwal et al. (2006), Joseph et al. (2007), Ahuja, et al. (2007), Ang & Slaughter (2004), Ferratt et al. (2005), Armstrong et al. (2007) and Baroudi (1985). For example, various IS researchers have investigated the contributing factors to IT turnover, which included job-related and organizational factors as well as various personal attributes of IT workers (Ang & Slaughter, 2004; Ahuja et al., 2007; Joseph et al., 2007; Litecky et al., 2004). In their meta-analysis of IT turnover research in IS, Joseph et al. (2007) found that job satisfaction and organizational commitment directly affect turnover intentions among IT/IS professionals. Other IS researchers, such as Lacity et al. (2008) have extended this model by conceptualizing and testing various antecedents of job satisfaction and organizational commitment.

Another group of researchers, such Wang et al. (2017), investigated different models for turnover intention, including turnover risk evaluation models. This particular stream remains very prominent. For example, Lacity et al. (2008) reported finding thousands of turnover intention models in IS, organizational behavior and management literature.

However, despite numerous studies on IT turnover and recommendation to organisations how to retain their valuable IT employees, the turnover rate remains high (Lo, 2015; Kaarst-Brown et al., 2018). Based on a comprehensive literature review on voluntary turnover of IT employees, Lo (2015) offers the following important observation: "The need for further research on IT turnover has been called by many, but much of the literature continues to conduct similar studies using the same constructs, and these studies find similar results" (p.378). Consequently, Lo (2015) issues a call to IS and other researchers to focus our collective attention to new and less explored research directions. In answering Lo's (2015) call, we observe that the liquid workforce offer an opportunity for a much needed new direction in IT turnover research. At the same time, they also open an important research gap, as

their turnover is frequent, predictable and, by definition, unavoidable.

2.5 Summary

Drawing from the previously described streams of research, we identify the need to investigate the liquid IT workforce that, according to the leading industry reports, is rapidly emerging. In particular we focus on their skills and personal attributes that make them very competitive on the highly dynamic IT job market. We approach our investigation by focusing on career-shaping types of skills across the key phases of their work. In parallel we investigate the appropriate management strategies for the liquid workforce, as the traditional management strategies of retention and prevention of turnover are no longer working. In doing so we extend the third way of research on IT workforce in IS. We now turn our attention to the theoretical lens used in our study.

3 Theoretical Lens of Human and Social Capital

Human Capital (HC) refers to a combination of knowledge and skills possessed by individuals and the collective workforce of a firm. It encompasses professional knowledge, skills and technical ability; personal traits such as intelligence, energy, attitude, reliability, commitment; ability to learn, including aptitude, imagination and creativity; desire to share information, participate in a team and focus on the goals of the organization (Fitzenz, 2000).

Employees' HC is considered to be as a key factor for firm competitiveness (Hall, 1992). This is because, knowledge "embedded" in human capital is considered to be highly valuable and very difficult to replicate (Crook et al., 2011). Consequently, turnover is seen not only as depletion of the accumulated human capital, but also as a further opportunity for the competitors to acquire knowledge and gain competitive advantage (Peteraf, 1993). Also, draining human capital needs to be replaced, and as such comes with an often-higher cost of acquiring and training new workforce to get them up to speed (Shaw et al., 2013).

Hence, when focused on human capital as a source of competitive advantage, organizations are under pressure to understand its nature and win the talent war (Gardner, 2005), typically by retaining their workforce (Randstad, 2018a, b). This is especially the case in the IT industry. Indeed "in today's tight labor market, retaining quality employees is more important than ever" (Randstad, 2018a, p.1).

As these trends are expected to intensify, there are new challenges and incentives for employers to treat human capital of their workforce like any other capital (McKinsey, 2017). Indeed, many researchers, such as Ahuja et al. (2013), argue

that it is necessary to retain employees in a firm as a productive resource and encourage their willingness to create, share and protect firm's human capital.

However, in today's knowledge economy, it is becoming clear that the internal HC is no longer sufficient. Companies also depend on external HC of other companies (Marti, 2004). This external HC can be obtained by networks, norms and social trust developed by the organization and can facilitate cooperation and coordination for mutual benefit. This in turn calls for the so-called social capital (Putman, 1995). In simple words, social capital is the stock of accumulated resources that one can access based on the relationships that can be leveraged to achieve a particular purpose (Tymon & Stumpf, 2003).

For individual employees, social capital can, among other things, influence professional success and create human capital (Beuno et al., 2004). The assumption behind the concept of social capital is that *investment in social relations is made with expected returns*. Therefore, when individuals engage in interactions and relationship building they also produce 'capital' (Lin, 2001).

While the concepts of human capital envisage 'capital' as a resource invested and vested in individuals, social capital assumes that 'capital' is captured through social relations. As such it is seen as a social asset by virtue of individuals' connections and access to resources in the network or group of which they are members.

Social capital can fundamentally be distinguished into three dimensions based on the 'network view' (Woolcock & Narayan, 2000): *bonding, bridging, and linking*. Bonding social capital refers to intragroup connections and is the relationships amongst members of a network who are similar in some form i.e., homogenous group. It can be interpreted as the horizontal association between people and relations within and among other members of the network with a 'homophilous' interaction among actors who are similar) and have strong connections.

Bridging social capital refers to relationships amongst people who are dissimilar in a demonstrable way, such as age, socio-economic status, race/ethnicity and education (Szreter & Woolcock, 2004). This relationship can also be viewed as horizontal association and has 'heterophilous' interaction that is generated from a weaker connection among diverse actors. Related research shows that bridging social capital has a positive effect on growth, whereas bonding social capital has a negative effect on the degree of sociability outside the closed social circle (Beugelsdijk & Smulders, 2003).

Linking social capital is the extent to which individuals build relationships with institutions and individuals who have relative power over them (e.g. to provide access to services, jobs or resources). This can be considered as the vertical dimension of social capital, where capacity to leverage resources, ideas and information from formal relationships can

be developed from alliances created with individuals in position of power. Linking social capital is an outcome of the weakest relationship but it is considered as the most valuable outcome, as linking provides access and connection to power structures. It (linking social capital) is good for accessing support from formal institutions. It is different from bonding and bridging in that it is concerned with relations between people who are not on an equal footing and can be used to leverage resources for ‘getting things done’.

Both bridging and linking SC are required to give individuals and organizations a sense of identity and common purpose. Nevertheless, bonding ties are equally important as they bring together those who already have some affinity. Bridging social capital brings people together who might not otherwise associate; linking social capital enables groups to leverage resources, ideas and information from formal institutions beyond the community (Woolcock, 2001).

The theories of human and social capital are well established in the IS literature. They have been used individually or in combination to study organizational workforce, including IT professionals. In this paper, we use them in combination as a suitable theoretical lens through which we observe the emerging phenomenon of IT liquid workforce. More precisely, the theory of human capital provides a theoretical lens to investigate what happens when the human capital of the liquid workforce cannot be preserved and owned by organisations. The theory of social capital, on the other hand, enables us to investigate temporary work assignments of the liquid workers that require highly dynamic teamwork in a particular work context. In combination, these two theories enable us to observe how social and human capital of liquid IT workforce, are shaping and are shaped throughout different phases of their career.

4 Research Method

Based on the exploratory nature of this research focused on an emerging, yet-to-be understood phenomenon (the liquid workforce), this study adopted a qualitative research method and an interpretive approach (Walsham, 1995; Klein & Myers, 1999; Myers, 2013). This is the most appropriate research method because the research topic is novel and the relevant literature is very limited (Myers, 2013). Different from positivist researchers ‘[i]nterpretive researchers do not predefine dependent and independent variables, but focus instead on the complexity of human sense-making...they attempt to understand phenomena through the meanings people assign to them’ (Myers (2013, p.39).

Consistent with the adopted perspective, we used semi-structured interviews with liquid professionals as the most suitable data collection method. Our objective was to understand liquid work from the perspective of the liquid workers,

rather than the organisations they are temporarily working for. We note that the interviews have also been used in other studies of IT workforce from the perspective of individual workers, see for example (Lacity et al., 2008; Schlagwein & Jarrahi, 2020). Using the constructivist approach (Warren, 2001), we aimed to understand and make sense of the experiences and constructs our interviewees gave about the nature of their work, the organization they were currently working for on a shared project, and the issues they experienced as liquid IT professionals. The interviewees were viewed as meaning makers, not passive conduits for retrieving information from their answers. Our purpose was to draw interpretations, not facts from their talks (Warren, 2001).

Recognizing the *project nature* of their liquid work, which requires collaboration and coordination with others in a particular organizational context (JLL, 2019; Liu, 2020a, b; Gupta, 2018), we decided to interview liquid professionals working on the same large-scale company-wide ICT program within a large financial organization. The mission-critical program, described in the next section, consisted of a number of inter-dependent projects all employing liquid IT professionals. The chosen program therefore provided an opportunity to gain additional insights across individual interviews, as interviewees were all referring to the shared context.

We conducted 15 interviews (from the total of 80 project members who were working at the time) comprising of executives and non-executives. Although employed in the financial sector, all of them were contracted as IT professionals. We also aimed to interview IT liquid workers in different roles, which included the program manager, program release manager, project managers, change manager, senior and junior test analysts, senior project coordinator, solutions architect, senior and junior business analysts and business lead.

The interview comprised of questions aimed to capture information about the organization, program and project specific information, the respondent’s role in the project, individual experiences within the project, experience of working with, and where appropriate managing other individuals (in particular, liquid IT workers) and so on. The interviews took up to one hour each. The interviews were recorded and later transcribed.

To make sense of ‘the how’ and ‘the why’ of each stage at a more granular level, the researchers used open and axial coding (Charmaz, 2014), followed by the thematic analysis (Fereday & Muir-Cochrane, 2006). Thematic analysis also involved drawing from disciplinary contexts (Tracy, 2019), which were the contexts of IT workforce and future of work. The emerging themes were then observed through the combined theoretical lens of social and human capital theories, leading to new findings about the career-shaping skills that make liquid workers competitive, as well as the proposed strategies for their management and engagement. The next section presents the main research findings.

5 Research Context: a Mission-critical ICT Compliance Program at BNQ

BNQ (pseudonym) is a major Australian financial institution, specializing in financial advising, superannuation and insurance products. Due to two major reforms of the Australian financial sector, which were mandated by the Australian Government and the Australian Taxation Office, BNQ was forced to implement a major company-wide ICT Compliance Program in order to remain compliant. This mission-critical program had to be completed within 2 years.

The company-wide program of such a large scope required highly skilled IT professionals. Though BNQ had its own internal (permanent) IT workforce, they needed to find and hire a very large number (over 200) of experienced IT professionals (who ought to be skilled in specific IT areas of the project and also did not affect BAU) at the very short notice. These IT professionals included software developers, testers, systems and business analysts, and IT project managers. They were all employed on “as-needed” and “just-in-time” basis over the period of 2 years. Figure 1 depicts the size and complexity of the Compliance Program. It also illustrates BNQ’s reliance on IT liquid workforce.

As depicted, the whole Compliance Program was implemented at three different levels called: Portfolio level, Program level, and Project level. The Portfolio level was enterprise-wide and as such included the business division and all technology verticals. The Portfolio level comprised of senior stakeholders who had authority to make financial decisions. They also handled governance around the program life cycle and standards.

In order to operationalize the Compliance Program, the so-called Program Management Office (PMO) was set up under the Portfolio level. The PMO team consisted of senior stakeholders responsible for Program. They included: Program Manager IT, Program Manager Business, Change Authority, Quality Assurance, Change and Communication Managers, Testing Practice Manager and Head of Technologies.

Multiple streams of 9 projects and the corresponding project teams were initiated under the PMO portfolio. Each of the nine project teams comprised of Project Manager Business, Project Manager IT, Subject Matter Experts (multiple financial product lines), Technology Lead, Business Analysts, Test Manager and specialist testers. External vendors were engaged to provide advice and additional software and hardware-related services.

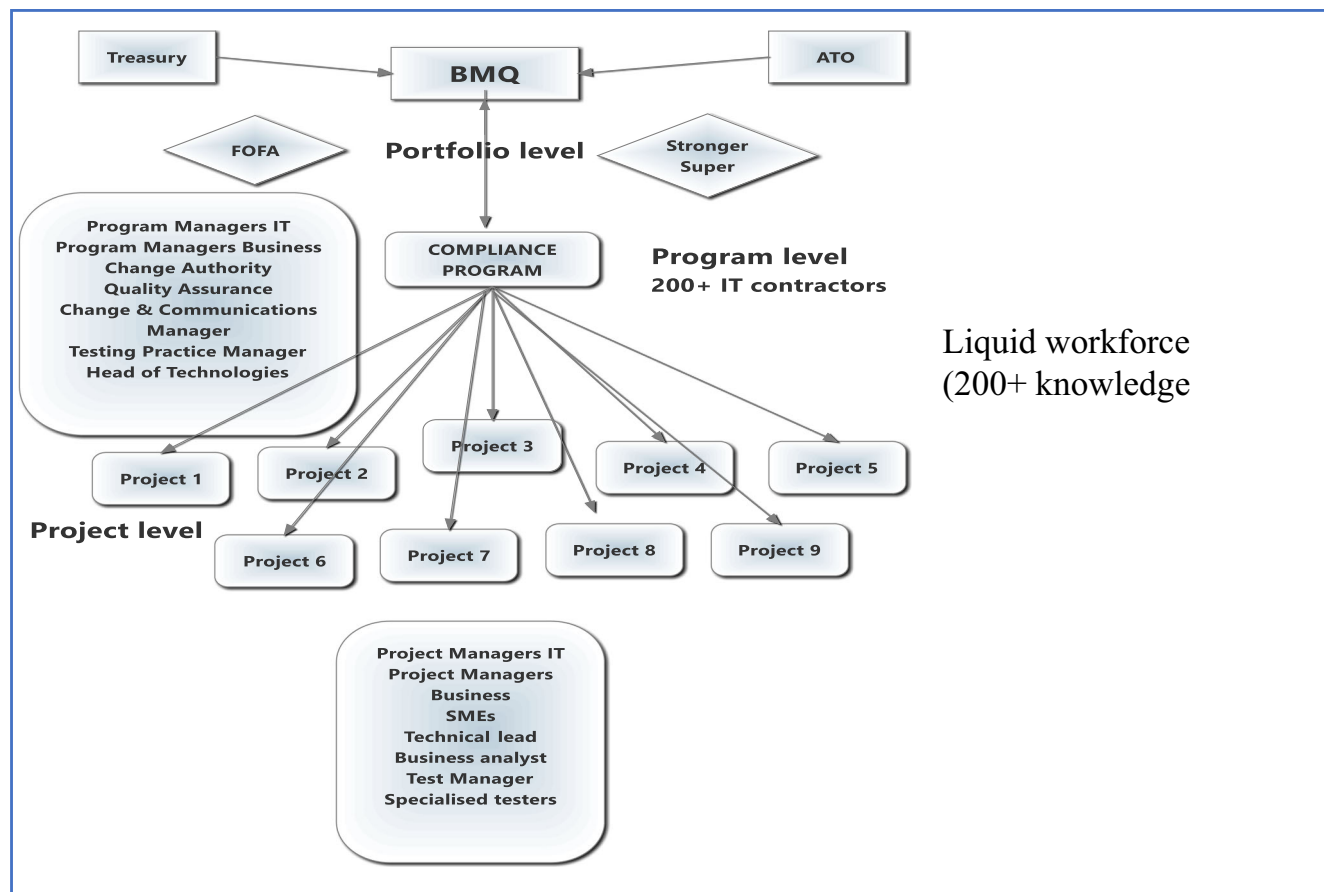


Fig. 1 The scope and complexity of BNQ’s compliance program and its reliance of the IT liquid workforce

The challenge of delivering 9 projects and coordinating work of such a large group of liquid IT professionals relied on clear communications channels across the projects, programs, technology initiative and industry standards as well as regulatory guidance and reforms. Furthermore, multiple streams of sub-projects had to be delivered at different stages, as required by the regulatory and legislation deadlines. Consequently, various aspects of the program had to be dynamically tailored, constantly monitored and executed often in a different way than originally planned. The whole gamut of work had to be outlined in a business case that had to list the potential risks if the organization missed to deliver the specific key dates.

The Compliance Program was successfully completed on time and as per very strict compliance requirements of the Government regulators. Upon completion, the program was handed over to BAU (Business as usual) team by the end of second year.

The project nature of this mission-critical program, which involved a very large number of highly skilled on-demand workforce, made it a suitable context for our research project. BNQ's temporary IT professionals also shared the characteristics of the liquid workforce, as articulated earlier in the paper. Therefore, they were suitable participants for our study.

6 The Lifecycle of the Liquid Work

To describe research findings related to the experience of the liquid workers, we used a conceptual frame of a lifecycle, which covers their experience from being hired, working on the temporary project, and being let go upon the project completion. We also asked the study participants to describe their experiences 'between jobs' in order to understand how they built and maintained their competitive advantage in a highly dynamic and competitive IT market.

6.1 How were Liquid IT Professionals Found and Recruited for the BNQ Project?

Instead of looking for work, the interviewed liquid professionals were 'headhunted' through two main channels: by the project managers as well as by the follow liquid workers. For example, the Program Manager, who was also a liquid employee, was given the responsibility to find just-in-time resources (IT professionals) with prior experience in the finance industry and specific "ready-to-be-deployed" expertise, as required by different project streams. She used her social ties to bring trusted and experienced team members from her previous work assignments. She explained it as follows:

"...through networks we bring each other in - only to the extent that those people, a) you can trust, b) who are

credible, and thirdly, that's got the skill-set." (IT Project Manager)

Also, team members themselves found and brought in other team members, leveraging their own previous connections. Describing their experience of joining the project, a liquid IT worker (Solution Architect) offered the following insight:

"I was actually headhunted. Somebody that knew what I was doing, previously worked with me ...so they contacted me to check my availability and I started that way." (Solutions Architect).

When looking for new team members, many interviewees emphasised the importance of candidates' personal attributes, in particular their trustworthiness. In the words of IT Project Manager:

"We do bring people along. And we do start scouting around to see who's available and who's not. Reason being that CVs can be very beautifully written. Some people interview very well, others don't. But there's nothing like knowing who you've worked with." (IT Project Manager).

It is important to note that in spite of being recommended and invited to apply, all liquid IT workers went through the rigorous hiring process, in accordance with the Australian employment laws and regulations. The Program Manager explained the rigorous nature of the process as follows:

"I don't go with friend-of-friend... I know a lot of people. And I work with a lot of people. So, I have enough knowledge - but at the same time, I also follow the organisational processes of course... So when I say I actually brought people in, I took their CVs and then after practice-screening, the proper interview process happened. And I didn't interview those people myself, because I knew those people and wanted to work with them. I let other people do the interviews...So, we follow the process, but again it is everybody's advantage to bring the good high-talented people to the organisation...And sometimes you can get a really good candidate through a normal application process." (Program Manager).

6.2 Working on the Temporary Project Assignment

When starting a new work assignment in a completely new and unfamiliar organisational context, the interviewed liquid

workers immediately employed the same strategy – that is on-the-job building and leveraging of their social capital with other employees within their own, and across different project teams. In this way they were able to acquire the necessary contextual knowledge and additional skills required for the given project. This strategy was very important in the absence of any formal training or job induction provided by BNQ. A liquid worker described their experience of starting on a new project:

“Because as a contractor, they expect us to start from day 1 actually...My manager or someone will tell me this is the document, this is the share drive where you can see all the documents and requirements. So even if I don’t know certain things, I’ll straight away ask people. Because they introduce us to people.” (Senior Test Analyst).

Furthermore, BNQ established another support mechanism whereby all new contract employees were assigned to a senior practitioner, who often worked on a different program. This mechanism served a dual purpose of building a liquid worker’s skills related to the current job assignment as well as helping them to establish more relationships with others for the purposes of knowledge sharing and mutual support. For example, when the liquid workers experienced any work-related issues, or were having trouble understanding where to get information from, they could contact their allocated senior practitioner, who would help them to contact someone from a different team. The allocated senior practitioner describes this process as follows:

“So every senior practitioner has a group of people assigned to them within their own practice. I think there are about 12 or 13 people under me now... So, in a way, I am their HR manager, line manager - when they come on board, when they have a problem. They don’t work for me, they don’t work within my programs, and they work on some other projects, some other programs - but if they have a problem, if they want to discuss something, if they ask us how to do something or how to approach someone, how to manoeuvre through the maze... If they need discuss anything, I am there for them, I support them as well. So I have the responsibility, when they come on board and if that person is linked to me, then I have the accountability, the responsibility as well to follow up how the person is going, if the adaptation to the organisation is working alright, if he/she has any problem.” (Program Manager).

While on the work assignment, the liquid workers continued to build their professional reputation in order to secure

future work assignments. Describing this long-term strategy, a liquid worker explained why knowing and being known and trusted is so important:

“So as the people move organisations and they start up new projects or programs, they try to bring in the people they know and trust.” (Program Release Manager)

Liquid workers were also willing to move to different teams, work very long hours and help others. They used every opportunity to establish and maintain their reputation of being trustworthy, highly-skilled, hard-working and helpful.

Even though they were employed as individuals working in the highly-competitive IT industry, while working on their temporary job assignments, they did not compete against each other. Moreover, they did not even perceive other liquid IT professionals as their competitors. Instead, we found very strong evidence of their ongoing and long-term mutual interdependence and support, while working together, as well as between projects. This in turn, helped them not only to complete the current assignment, but also to extend their professional networks, which they could then leverage in the future. In the words of a Testing Manager:

“For me, it all depends on the network that you have built as the years go and how widespread you can spread the word that ‘hey I’m looking for work.’” (Testing Manager).

6.3 On-the-job Expectations and Preferences of Liquid Workers

In spite of joining new project and new organisational context, the interviewed liquid workers knew what to expect from their job assignment. For example, they did not expect any on-the-job training, including formal induction training.

“So as far as training, it’s not expected by the contractors to get any training, as such – or formal training, not at all”. (Solutions Architect)

Instead, they emphasised their own responsibility for ongoing professional development and acquisition of sought-after skills. As a Senior Business Analyst pointed out: “because you are a contractor, you look after your own training”.

While each assignment enabled them to acquire new skills, they also committed time and personal resources to training. They were even taking time off from paid employment in order to pursue valuable opportunities for learning and improving their IT skills.

They also had very strong preferences about the ways they wanted to be managed while on a work assignment. For example, a number of interviewees pointed out that they did not want to be performance-managed. In fact, this was one of the key reasons why some of them decided to leave their previous permanent employment.

“I don’t like line management, I don’t like to do performance appraisals, I don’t like to do reviews... it becomes a very emotional thing, which I don’t really enjoy.” (IT Project Manager).

To succeed in such a dynamic environment, these employees emphasised the need to “know yourself” and their own preferred “work style”. For example, the interviewed liquid workers all demonstrated a very strong and highly developed sense of ‘self’, including their own strengths and values. In the words of the interviewed senior test analyst:

“I’m a risk-taker. It all depends on the individual. Not everyone can do contracting. It’s not just for money. You need to know yourself, whether you can move with different teams or you are flexible.” (Senior Test Analyst).

They were self-directed, quick learners, highly-motivated professional people with strong personalities and ability to multitask:

“So, visiting multiple places and different people, managing, handling. So that’s really helpful for me. You’ve got to be self-driven.” (Junior Test analyst).

Finally, they attributed their ability to adapt very quickly in any new environment to a combination of their personal and professional characteristics, as well as connecting in order to learn from other people. Talking about their adaptability, a Testing Manager offered the following insight:

“...it all depends on our individual character, on how adaptable to the environment, how quickly you pick up the knowledge from other people.” (Testing Manager).

6.4 Completion of Temporary Project Assignments and Experience Between Jobs

When the required work was completed, BNQ allowed the liquid professionals to leave, without trying to retain them as a longer-term contract or permanent employees. Equally, the liquid professionals did not want to stay.

Even though their work assignments were temporary, the liquid workers at BNQ adopted a collective practice of leaving something useful behind for future groups of liquid workers. Examples included a more detailed project documentation and helpful hints about the organizational context and work environment.

Between job assignments liquid workers adopted a deliberate long-term strategy of maintaining social capital with former fellow liquid workers and former managers. Their professional reputation and social capital acquired in the previous assignments, enabled them to secure future work. Reflecting on the ‘long-term’ approach to finding work, Program Release Manager used the following example:

“... within a year and half, I got calls again asking me if I want to come to a different place. Behind all this is the people you know as well. So as the people move organisations and they start up new projects or programs, they try to bring in the people they know.” (Program Release Manager).

The liquid workers also took a proactive and long-term approach to building and maintaining their skills and knowledge from one work assignment to another. In addition to professional development courses, they also proactively looked for, and considered work assignments that enabled them to broaden their skills and progress their career. As a Senior Project Coordinator explained:

“If I can free up some time to do something different, it means my skill-set’s getting broader. And it’s the only way as a contractor I feel that I can actually progress my career.” (Senior Project Coordinator).

Finally, individual IT liquid workforce were investing time, energy and money into building their own “company-of-one”. This process was driven by their long-term career goals. They were not only aware of these goals, but were also actively pursuing them. Consequently, they did not perceive themselves to be working for a current employer. For them it was the other way around. This is because they choose companies and work assignments to meet their own long-term career goals.

7 How Do Liquid IT Workers Remain Competitive?

In answering the first research question: *How do liquid IT workers remain competitive in highly dynamic IT industry?* we theorize that they remain competitive by growing what we

term here “*personal competitive advantage*” (PCA). They grow it over time and through deliberate long-term strategies, as they chart their own careers across temporary job assignments. Based on our research findings, we conceptualize their PCA as an *ongoing and mutually enhancing* interplay of three *highly-intertwined* components, we term *Doing*, *Relating* and *Becoming*. Observed through the combined theoretical lens of human and social capital, they are described as follows:

- The *Doing* component of PCA corresponds to their highly specialized IT skills and knowledge – their human capital (HC). We name this component *Doing* to emphasize the act of doing that is applying their skills and knowledge (i.e. their HC) to complete a particular work assignment in a given context in order to create value. This component also assumes maintenance and growth of HC through ongoing learning and professional development, which liquid workers see to be their own responsibility.
- The *Relating* component corresponds to their social capital acquired on their current work assignment and accumulated from the previous ones. This social capital includes ‘bonding’ capital with the current and past members of the same project team, ‘bridging’ across different projects and work assignments and ‘linking’ with their current and past managers. We name this component *Relating* to emphasize the nature of this component that is intra-personal and relational.
- The *Becoming* component emphasizes “the evolutionary, processual nature of developing a professional self” (Scanlon, 2011, p.14), in this case as a liquid IT professional. In the professional learning literature, the notion of ‘becoming’ is considered to be different from ‘being’ a professional. As Scanlon (2011) explains: “‘being’ a professional denotes the notion of arriving at a static point of expertise. It is a concept frequently encountered in typologies of professional practice” (p.14). We observe the same practice in IS research on IT professionals, in both the first and second waves of this research, as described by Wiesche et al. (2019). On the other hand, as Scanlon (2011) argues, becoming is “an iterative concept that eschews notion of arrival and end-point achievement of expertise. It is for that reason that ‘becoming’ is contiguous with notion of lifelong learning” (p.14). Our research findings also confirm that the ongoing process of becoming a liquid IT professional is a deliberate practice, rather than determined by various job assignments as they become available. As such, this deliberate practice includes the ongoing application and refinement of higher-order non-cognitive skills, such as reflection, self-efficacy, and self-awareness. *Becoming* also includes personal characteristics, in particular character strengths, such as ‘social intelligence’ and persistence, as previously articulated by Peterson, et al. (2010).

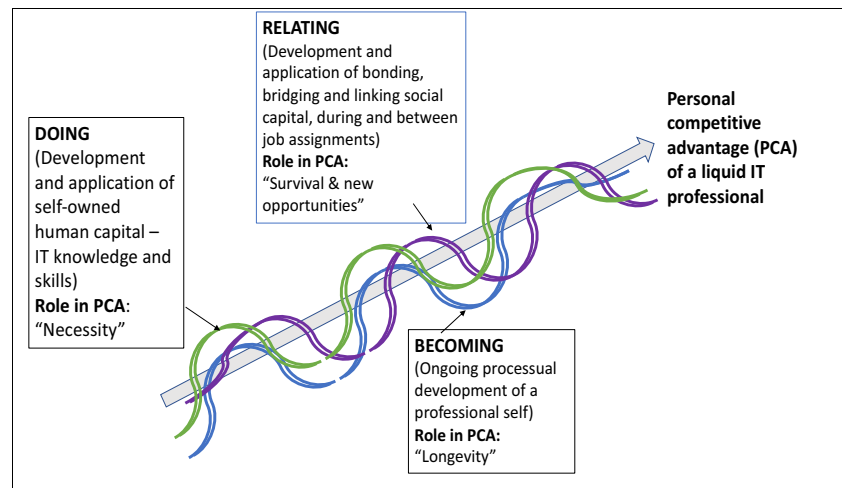
By depicting PCA as a triple-helix (Fig. 2) we aim to communicate the message that its three components are highly intertwined and, most importantly, mutually enhancing. Therefore, by considering one in isolation of the other two, it is not possible to gain a comprehensive understanding of the phenomenon that is personal competitive advantage.

Our research findings indicate that the *Doing*, *Relating* and *Becoming* components play very different roles in an ongoing process of growing one’s PCA. We name these roles respectively as ‘*Necessity*’, ‘*Survival*’ and next ‘*Opportunity*’ and ‘*Longevity*’ for the following reasons:

- The doing component of PCA is perceived as “necessity”
The liquid workers perceive their IT knowledge and skills (i.e. the *Doing* component) as *necessary* but not sufficient for long-term survival in the highly dynamic and competitive IT market. As they continue to work in different organizational settings, they are also constantly aware that they own their HC (not the organizations they work for). Consequently, they take full responsibility for their ongoing professional development thus always growing their HC.
- Our research findings reveal an important consequence of the personal ownership of HC by liquid workers. They do not expect or even value any skill-based training provided by their temporary employers. In the words of a BNQ’s liquid worker : “*You cannot expect the company to train you. ...So, you go to market and buy ready-made*” (Program Release Manager).
- The relating component of PCA enables “survival” and creates the next “opportunity”
The ongoing deliberate practice of building and maintaining social capital while on a particular work assignment and beyond, which we named the *Relating* component of PCA, was perceived to be the most important “survival mechanism”. For example, in any new work environments where they are expected to “fit in” immediately and start performing, their on-the-job *survival* depends on their ability to *relate* to others. By deliberately building *bonding* social capital with their co-workers, *linking* with their managers and *bridging* across different teams enables them to successfully “navigate the maze” and complete their project work, in the absence of training and with very little support from the organization.
- The becoming component of PCA provides “longevity” of their chosen career

As the liquid workers move from one temporary job assignment to another, it is the *Becoming* component of their PCA that continues to provide solid foundations for the other two components. For example, the interviewed liquid workers at BNQ all demonstrated a very strong and highly developed sense of ‘self’, including their own strengths and values. As they continue to chart their own careers, they made career choices based on their values

Fig. 2 A theoretical model of Personal Competitive Advantage (PCA) of the Liquid IT workforce



and a long-term vision for their self-directed career. They considered *trustworthiness*, *credibility*, *willingness to help others*, *readiness to go an extra-mile* to be the most important personal characteristics, developed and used in the process of becoming a liquid IT worker. Consequently, they used deliberate strategies to build and maintain their own reputation as trustworthy, willing to help, collaborative and credible professionals in each temporary work assignment as well as between jobs.

While working, they build social capital by helping others within their own teams and beyond. In doing so they also enhance their own HC. However, our research findings show that building social capital (*Relating*) is based on trust and professional respect (*Becoming*), which is earned through intra-dependency while working on same projects (*Doing*) in an environment with very little support.

The *Doing*, *Becoming* and *Relating* components also reveal what liquid workers value most in a workplace. For example, more than any other type of support, BNQ’s liquid workers valued opportunities to build their social capital (the *Relating* component of their PCA) – both among themselves and with the management and other employees.

This particular finding is significant because it challenges several recent findings about what liquid workforce value in a workplace. For example, focusing on support for liquid workers, Gupta (2019) offers a hypothesis that perceived career development support for liquid workers is positively related to their work performance. Similarly, Jha and colleagues posit that perceived investment in liquid workers’ development is positively related their engagement (Jha et al. 2018). Also focusing on different types of workplace support (including for example, mentoring or resource support) for liquid workforce, Ghosh and colleagues (2019) posit that such support prevents (i.e. “negatively influences”) their turnover

intention. Contrary to these insights from the literature, the liquid workforce we interviewed did not receive, nor expected any career support including on-the-job training. There was no investment in their development by the organisation they worked in. Interestingly, even if offered, they would not even value such support. Yet, contrary to the previous research findings, they kept looking for every possible opportunity to contribute and show their commitment and demonstrate high performance. We could explain it by the *Becoming* component of their PCA, in particular their ongoing commitment to building and maintaining their professional reputation. Being liquid workers, at the end of each work assignment they left without any intention to stay, contrary to the previous research findings by Ghosh et al. (2019).

8 Management Strategies

In answering our second research question about suitable management strategies for the liquid workforce, we articulate two contrasting approaches. The first one is based on the current literature on management of IT workforce, as reviewed previously in this paper. The second approach is based on our research findings and builds upon our conceptualization of PCA.

The first approach, which we term the traditional approach to managing IT workforce, perceives the liquid IT workers through the lens of Human Capital (HC). Consequently, they are treated as valuable organizational resources which need to be retained, in order to retain their HC. IT turnover, is therefore seen as negative as it leads to loss of knowledge and skills (HC) perceived to be owned by the company.

The proposed alternative approach perceives IT liquid workforce through the lens of Social (SC) capital. Although their knowledge and skills are still perceived as valuable to the

company, the main focus shifts from the ownership of HC to building SC through relationships. Consequently, rather than trying to prevent it, IT turnover is embraced by the company as a future opportunity to enhance the existing skill set on a continuous basis. This is because when established with the liquid workers, *social* capital could be used to “pull back” skills and knowledge of previously-engaged liquid IT workforce. Every time these workers return, they bring back more and more valuable skills and knowledge (HC) accumulated throughout their other job assignments. Our interviews reveal that managers of BNQ’s liquid workers were aware of this important feature of human capital and were happy to let the highly-skilled IT professionals go after each project, without any attempt to retain them. Contrary to the recommendations found in the management literature – see for example a literature review conducted by Wynen et al. (2018) – BNQ’s managers were embracing IT turnover as an opportunity to attract this workforce back. By maintaining the social capital with former employees, and beyond the immediate work assignments, these managers created future long-term opportunities to bring these employees back, when needed. While human capital is confined within the boundaries of formal organizations, social capital transcends organizational boundaries. This in turn is expected to change the nature of management strategies beyond organizational boundaries and even beyond the current employment of liquid workers.

We also found that the current employees were also using their own social capital to find and recommend the required liquid workforce to be interviewed, and if successful, to be selected for the temporary positions. This has an important implication for managers who need to create opportunities for the existing workforce to enhance their social capital while on the job assignment. Being aware of such a practice, at BNQ, managers introduced all new employees to the key liquid workers whose HC (knowledge and skills) might be helpful. The allocation of a senior partner from another team as a designated go-to person, was also a very important strategy for building (linking) social capital and discovering the needed HC within the organization. The just-in time engagement of liquid workers also requires rethinking of company’s existing human resources (HR) processes that might be too slow for this purpose.

Knowing that liquid IT workers value on-the-job opportunities to build social capital enables their managers to offer better support to these workers. However, this support should not come in the form of skill-based training that liquid IT workers do not value or even expect. More suitable strategies may include allocation of boundary-spanning senior managers (as it was done in BNQ) and better on-the-job opportunities for knowledge-sharing across different teams.

Individual IT liquid workers are investing time, energy and money into building their own “company-of-one”. Working with “companies-of-one”, rather than managing employees,

requires a shift in thinking and consequently new management strategies. For example, liquid workers do not want to be performance managed. Just as the companies evaluate their work, they also evaluate workplaces by choosing where to work. We are yet to understand the emerging competitive forces on the IT job market as liquid IT workers with their extensive professional networks start to influence each other’s choices of companies and work assignments. Given future predictions about the rapidly growing number of liquid IT workers, these competitive forces are likely to intensify.

By recognizing the intra-dependence rather than independence of liquid workers, organizations can create more supportive environments for IT liquid workforce. For example, using a collaborative software environment to support project work within and across teams is likely to enable more effective collaboration as well as provide them with a visible opportunity to ‘leave something behind’ for future liquid IT workers (as they aspire to do).

Table 1 offers a summary of two alternative approaches to managing the liquid workforce. The first one was drawn from the current literature which sees IT employees through the lens of HC. The second one we propose based on our findings in this research study.

9 Conclusions, Limitations and Future Work

The research presented in this paper is inspired by the emergent phenomenon of IT liquid force and motivated by the apparent lack of scientific research in this area, both in IS and a broader literature. As Kaarst-Brown et al. (2018) observe ‘Whereas in the past we debated definitions, skills, and composition of the IT workforce, we now must consider a future inhabited by a diversely skilled, global, temporary and often-virtual workforce’ (p. ix). We follow this recommendation by investigating the new and rapidly emerging category of the liquid IT workforce.

Using a combined theoretical lens of social and human capital, we draw insights from the interviews of liquid IT professionals all working on the same temporary, mission-critical program. We posit that they remain competitive through what we term and conceptualize as Personal Competitive Advantage (PCA), which we theorize as an ongoing and mutually-enhancing (triple-helix like) interplay of its three highly-intertwined components we term *Doing*, *Relating* and *Becoming*. Our research findings indicate that the liquid IT workers considered the *Doing* component (IT skills and knowledge) of their PCA to be necessary but not sufficient for a successful career. While the *Relating* component (their social capital) enabled them to survive in the current job and find the next temporary job assignment, the *Becoming* component was found to contribute to longevity of

Table. 1 Two alternative approaches to managing the liquid workforce

Management of IT liquid workforce	Traditional approach	The proposed approach
Main focus	Employees' HC seen as company's HC	Managers' and liquid workers' widening network of relationships within and beyond current organization (<i>bonding, linking and bridging SC</i>)
Liquid Employees seen as:	Temporary Resources	Partners (existing and former employees) (<i>linking becoming bonding social capital</i>)
Key Assumption	IT Turnover is negative	IT turnover as an opportunity to enhance and augment the existing HC in the company by using SC built with former employers to bring them back, each time with better skills and knowledge acquired in the meantime while working on other projects
Managerial actions focused on:	Retention of HC	Building, maintaining and growing SC with the existing and former employees (<i>linking social capital</i>) and Creating opportunities for the current workforce to build and enhance social capital among themselves (<i>bonding social capital</i>)

their career and shaping of their career choices. Therefore, contrary to prior research on the importance of skills for the recruitment of candidates (Humburg & Van der Velden, 2015), our research indicate that even advanced IT skills and knowledge of liquid IT workers are no longer sufficient for a successful long-term career.

Based on our research findings about preferences of liquid IT workers, in particular what they value in an organizational setting, we then articulated two alternative approaches to managing IT liquid workforce. While human capital is something that can be lost when employees walk away, social capital stays and could be leveraged to bring back “as-needed” and “just-in-time” human capital in the future.

The main theoretical contributions of our research include:

- (i) A conceptualization, including a definition, of the liquid workforce as a new category of IT workforce, distinct from other forms of contract work. In doing so, we expand the third wave of the IS research on IT workforce, as defined by Wiesche et al. (2019).
- (ii) A theoretical model of Personal Competitive Advantage of the liquid IT workforce, grounded in the theories of social and human capital. The proposed model contributes to the current body of IS research on IT skills and IT workforce.
- (iii) Articulation of an initial set of strategies for management of IT liquid workforce during and importantly *between* work assignments, which are informed by the theoretical model of PCA. In doing so, we challenge the long-established body of literature, both in IS and management that focuses on the retention and prevention of turnover of the IT workforce.

These theoretical contributions also answer an earlier call for more research on the liquid workforce by Gupta et al. (2017), that according to industry practitioners is rapidly emerging.

The main practical contribution of our research is in the proposed alternative approach to managing liquid workforce, including an initial set of management strategies. In doing so,

we direct managers' attention towards building social capital rather than investing organizational resources into retaining and preventing turnover of IT liquid workforce. We also provide important insights into what these workers value in the temporary work assignments and how to manage them in order to help them build their personal competitive advantage.

Following the principles and practice of qualitative interpretivist research (Klein & Myers, 1999; Myers, 2013; Tsoukas, 2018), our findings from a limited number of interviews should not be generalized to all liquid IT workers and IT industry in general. Instead, our study aims to provide rich contextual data, which when observed through theoretical lens, enable the researchers to build new theories (Tsoukas, 2018; Myers, 2013). Therefore, in this qualitative interpretivist research (Klein & Myers, 1999; Myers, 2013), we focused on theory building and proposed a theoretical model of PCA, which could be tested and refined through future studies in other contexts.

In doing so we also recognize that each liquid worker is, to use their words a “company of one” and therefore very unique. Even though we investigated their work in a shared context in order to gain richer insights (i.e. a common program of projects implemented by a single organization), we acknowledge the interviewees as independent professionals rather than employees of the company. Consequently, our study should not be misinterpreted as a research case study of the chosen company. Instead, we adopted the individual perspective, thus focusing on individual liquid workers as our unit of analysis.

Our research is limited as the current academic literature on liquid workforce is scarce and lagging behind industry trends. We addressed this limitation to some extent, by considering multidisciplinary literature and learning from the ways other (at-the-time new) concepts were first introduced to the IS community, such as crowdsourcing and digital nomadism. Our future research includes education of the liquid workforce and well as transformation of various organizational processes

to better accommodate them, while on temporary work assignments. Another limitation is a limited number of interviews with the liquid IT workers. Given their highly-dynamic work context as well as their status of highly-sought after professionals, securing interviews with this group professionals was and will always be a challenge. We also aimed to select and interview liquid IT workers in different roles, which further impacted on the number of interviews we conducted. Our future work will include more interviews of liquid IT professionals across different industry contexts.

Our research findings also open some important questions and directions for future education of IT workforce and their managers. Our experience as educators across both business and IT schools confirms that across both contexts, too much emphasis has been placed on IT skills and knowledge (i.e. the *Doing* component). Consequently, we call for more attention to *Relating* and *Becoming* in education of the future IT workforce and their managers. We also note that social capital continues to be perceived as “soft-skills” or even more limited “networking skills”. We argue that such a limited perception is misleading and even damaging. Skills involved in building and maintaining social capital in very dynamic environments involve much more than communication skills and teamwork. With more and more highly-skilled IT professionals choosing to work as liquid workforce, these skills will become critical for professional survival. Our research also opens new questions about possible inclusion/exclusion issues in the employment practices of liquid workforce. For example, with liquid workers recommending other liquid workers, there is a potential for favoritism (Ponzo & Scoppa, 2011) as well as potential bias related to gender, race and ethnicity (McGee, 2018). We are *not* implying that the hiring practices reported by the liquid workers in our study were biased or included favoritism. Indeed, in spite of being recommended, all interviewed liquid workers were hired through rigorous recruitment and interview processes. However, a limited pool of liquid workers who need to be found and hired very quickly may limit future opportunities for those who are entering the market of the liquid workers for the first time. This in turn opens interesting research questions related to equity and diversity, prevention of bias and favouritism in hiring practices of liquid IT workforce as well as their impact on the overall IT labour market.

Finally, our post-pandemic future of work will require “a reimagination of the relationship between independent workers, business and society at large” (Strom et al., 2021, p.67). This paper is our research-based contribution in this direction. It is also a call to action for all educators of future-ready IT workforce and their managers.

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