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UK's Human Cloud SMEs' Imbrication; Unravelling Sociomaterial New Routines

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Abstract

The human cloud is an emerging technological paradigm that provides a set of online digital marketplaces in which talent and those seeking to employ talent can find and engage one another in a work arrangement. Whereas cloud offerings, such as Google Apps and Microsoft Office 365 are rapidly gaining a large user base, enterprise software migration towards the human cloud is still in its infancy, despite a 42% rise in human cloud platform revenue in 2019. Organisations have the opportunity to exploit the human cloud by creating a series of interconnected virtual collaborative workspaces from employees' homes. This scenario is akin to sociomateriality theory, which explores how humans, spaces and technologies intertwine in business practice. The sociomateriality perspective has not sufficiently examined organisational routines in the materiality of work practices in a human cloud context. The significance of this paper is applying the sociomateriality perspective and organisational routines theory to understand how sociomateriality practices could potentially influence organisational change, when an organisation moves from an on premise IT system to a human cloud business model. We present initial findings of interpretive case studies from Small-Medium Enterprises (SMEs) operating in the UK, of the potential migration of on premise IT systems to a human cloud business model, such as Oracle Human Capital Management (HCM) systems. We collected empirical data from 101 SMEs. Focus groups and observations were conducted comprising business managers regarding their current methods of using on premise IT systems, how they apply them to their business processes and how these methods could change their organisational routines in the event of transitioning to a human cloud business model.

Keywords: Human Cloud, Sociomateriality, Gig Economy, Collaboration, Performance Efficiency

Introduction

Background

The uptake of the "Human Cloud" is likely to impact on the responsibilities and skill sets of workers, as well as IT support structures. The concern with the interrelationship between sociality and technology is hardly new, but recurrent in the field of information systems (IS) research (Leonardi, 2013; Cecez-Kecmanovic et al., 2014; Kim & Yang, 2020). In this paper, we use the sociomaterial perspective (Orlikowski, 2007) in combination with the organisational routines theory (Feldman & Pentland, 2003) to explore how sociomaterial practises affect managers' skill sets and organisational routines through the introduction of the human cloud. Materiality describes the way an artefact is composed, in which its physical and digital materials are arranged. Similarly, Leonardi describes sociomateriality as the enactment of specific activities that are connected to both materiality and socialness (Leonardi, 2012). Therefore, the sociomateriality view explores the various material characteristics associated with society and the resulting routines within the workplace (Pentland & Feldman, 2008). An organisational routine, according to Feldman and Pentland (2003, p.95), is a "repetitive, recognisable pattern of interdependent actions, involving multiple actors." The primary means by which organisations achieve their goals is by organisational routines. The sociomateriality viewpoint is useful for understanding how organisational and technological developments are intertwined in practice, as well as how social and material issues are intertwined (Orlikowski, 2007; Leonardi, 2011; Viktorelius et al., 2021). Changes in organisational routines have not been sufficiently examined and linked with changes in the materiality of work practises in the Human Cloud context by the sociomateriality perspective.

According to a report from the Staffing Industry Analysts (SIA), the human cloud is an emerging technological paradigm that provides a set of online digital marketplaces in which talent and those seeking to employ talent can find and engage one another in a work arrangement (SIA, 2017). Whereas cloud offerings, such as Google Apps and Microsoft Office 365 are rapidly gaining a large user base (Ali, 2019; Loukis et al., 2019; Ali, 2020), enterprise software migration towards the human cloud is still in its infancy, despite a 42% rise in human cloud platform revenue in 2019 (SIA, 2017). Organisations have the opportunity to exploit the human cloud by creating a series of interconnected virtual collaborative workspaces from employees' homes. More specifically, this paper

explores, using the sociomateriality perspective , how materiality inscribes aspects of social structures on internal workers, such as managers and on their organisational routines (Feldman & Pentland, 2003) when an organisation transitions from an on premise IT system (Leonardi, 2011) to a Human Cloud model. An on premise IT framework is a software service model in which consumers buy permanent licences to commercially available software and the programme and infrastructure associated with it are maintained by the organisation's IT staff (Elleithy et al., 2010). We present findings from interpretive case studies of the migration of on premise IT systems to a Human Cloud model from UK Small and Medium Enterprises (SMEs).

Research Context

Traditional work models, methods and infrastructures continue to be disrupted, enhanced, and transformed by a phenomenon known as the "gig economy". The gig economy is one of many names for different types of "gig" work or sometimes referred to as "collaborative consumption," and "sharing economy". The definitions of the gig economy differ greatly in the current literature (SIA, 2017; Lehdonvirta, 2018; Gandini, 2019). The narrower concept of the gig economy often refers to work organised as small projects with a relatively short length, usually enabled by an internet portal or app (Lehdonvirta, 2018; Gandini, 2019) (i.e. freelancing as intermediated by vendors working in the so-called "human cloud"). While the definition given by the SIA is wider, encompassing all fixed-term contingent jobs, such as temporary employees (sourced directly or through a staffing agency) and independent contractors. Therefore, the idea of a "gig" is not just limited to online transactions rather it is synonymous with contingent jobs, and staff being sourced and handled across a variety of segments within the workforce solutions ecosystem. Online platforms like Airbnb and Zipcar are also considered part of the gig economy by some observers. Because these services are not labour-related, SIA considers them part of the shared economy rather than the gig economy (SIA, 2017).

The Human Cloud, the fastest-growing segment of today's technology-fuelled gig economy, is gaining traction as companies around the world use, explore, and reconfigure contingent work across marketplaces (Watfa et al., 2014; Patnaik et al., 2016; Lehdonvirta, 2018; Gandini, 2019). The human cloud is an evolving collection of online/digital labour marketplaces where talent and those looking to recruit talent can

interact and work together. Human cloud sales rose by approximately 65% in 2017, with total human cloud spend reaching an estimated $82 billion globally (SIA, 2017). Although business-to-consumer (B2C) human cloud companies provided the vast majority of that spend, the business-to-business (B2B) segment of the human cloud is continually growing (SIA, 2019). The SIA keeps a close eye on the improvements and rapid advances in how work is facilitated and talent is engaged. The ongoing research into the human cloud shines a bright light on an ever-changing environment. SIA's 2017 report provides a detailed framework around the relevant market offerings and functionality of human cloud platforms, as well as detailed market insights and data for over 350 companies operating in the sphere, with a focus on the B2B segment (SIA, 2017). The Human Cloud is therefore a new collection of work intermediation models that enable the creation, management and completion of different types of work arrangements (including the payment of workers) via a digital/online platform.

Based on the potential benefits of a Human Cloud business model, companies, as a result, could implement such a model. However, these advantages can have consequences for staff and for organisational routines (Leonard & Higson, 2014). These consequences could include: shifting positions and skills requirements of IT staff, widespread layoffs of IT hardware workers and IT departments losing control of IT servers and concentrating more on data protection and vendor management as IT systems support shifts to cloud service providers. As a result, the transformation of on premise IT systems to the Human Cloud business model has proved useful in understanding how technological transition affects improvements in the operational routines of IS work practices (Orlikowski, 2007). In order to monitor the variety of different types of Human Cloud systems, cases were chosen because of on premise systems that had migrated to similar Human Cloud systems across SMEs in the UK.

Research Purpose

The theoretical contributions on the effects of the Human Cloud business model for organisational routines and related human resource management, as well as related improvements in organisational routines and changes in the materiality of IS work practices is low (Orlikowski, 2007). This paper aims to contribute to sociomateriality literature by drawing on the theory of organisational routines (Feldman & Pentland, 2003; Pentland & Feldman, 2008) and the sociomateriality perspective (Leonardi, 2013), by

exploring how Human Cloud adoption can cause variations in performance behaviour in the organisational routines of IT support staff. These differences in performance behaviour can be institutionalised, resulting in improvements in organisational routines. This ongoing research expands earlier work on the consequences of objects for organisational routines and illustrates the performance-to-ostensive transition that accounts for effects such as the development, maintenance or alteration of organisational routines. In addition, using the sociomateriality lens, this study explores the linkages between human and material agencies in the on premise IT system and in the human cloud climate (Leonardi & Barley, 2008).

Through our goal of researching how technological shifts from the on premise IT system to the Human Cloud business model are taking place, the inclusion of social frameworks in the roles and skills requirements of staff and the organisational routines of support for IT systems, we address the following research question:

How can the shift from an on premise IT system to the Human Cloud entangled in sociomateriality practice influence their organisational routines?

The paper is structured as follows: First, we include a theoretical analysis of the theory of sociomateriality and organisational routines. Subsequently, we will discuss the research methodology and findings. The paper ends with a summary of the contributions and shortcomings of our paper and possible directions for future studies.

Theoretical Review

We review the theoretical lenses, such as the sociomateriality perspective and organisational routines theory.

Sociomateriality Perspective

When faced with the messy realities of work in the real world, the concept of technology is very difficult to grasp. This issue is commonly dealt with in studying the relationship between material and human existence, or technology and social interactions. Sociomateriality is a term, which describes the entanglement of the material and social in practice (Orlikowski, 2007; Leonardi, 2012).

The relationship between social systems thinking and sociotechnical practises (Mumford, 2006) is rooted in theories such as, actor network theory (Law, 1992) and practise theory (Cecez-Kecmanovic et al., 2014). Sociomateriality thinking is assisted by two ontological stances: relational ontology (Orlikowski et al., 2008) and substantiality ontology (Leonardi, 2012). One could argue that the relational ontology of sociomateriality claims material and social are the same. It is a provocative theory that departs from the separation of concepts of human or machine from social existence. Relational ontology also departs from the traditional understanding of people and technologies as separate entities having distinct properties and boundaries, which interact and influence one another in practical settings (Cecez-Kecmanovic et al., 2014). In contrast, substantiality challenges of the notion of "substances of various kinds (things, beings, essences)" as preformed self-subsistent entities that participate in dynamic relations (Emirbayer, 1997, p.282). Many philosophers argue that the concept of "materiality" exists even in technology whether it is used or not in any given context. According to Leonardi, once technology is created, its materiality is set unless it undergoes any subsequent redesign (Leonardi, 2012). When technology is incorporated in an organisation, the materiality of that technology becomes essential because users react to the materiality of technology, which they view as bound and safe as it is transferred from the domain of the artifactual to the realm of society (Leonardi, 2013).

This paper adopts the substantiality ontological view to comprehend the intertwining of human and material agencies, as well as how this influences organisational routines. In the view of Leonardi, "routines and technologies are the infrastructure that the imbrication of human and material agencies produce" (Leonardi, 2011, p.149). In this context, "imbrication" refers to the ways human and material agencies fuse together to establish or change routines, or modify technologies. This paper posits that imbrication is useful because of two reasons. First, the term suggests that human and material agencies can effectively produce outcomes, which in this case is routines or technologies, only in the event that they are amalgamated, and the specificity and distinct characteristics of such outcomes are not altered by their interdependences (Leonardi, 2012). In other words, both people and technologies have agency, but ultimately, they will respond to a technology in way they see fit. Secondly, imbrication is akin to the interaction between human and material agencies that generate organisational residue like technologies or routines and such figurations continue to be inattentive of their creators (Leonardi, 2013).

Here, we observe that additional theory stems from the imbrication of the sociomateriality perspective, which is akin to organisational routines theory.

Organisational Routines Theory

Organisational routines are an essential part of organised work, but they can also be a source of inertia, inflexibility, and mindlessness (Feldman & Pentland, 2003). Organisational rules and routines have also been viewed as a means of transparency, political security, and stagnation. Routines help bureaucracies coordinate their expertise and exert control more efficiently. For example, the IT department has created an organisational routine to help IT users, and the IT systems support user support. Any IT user can submit a job to the IT helpdesk for any IT-related problem. IT technicians at the helpdesk (known as first tier IT support level), systems engineers and IT-experts at the second tier, which can be elevated to the third and fourth tier IT support tiers, perform the jobs in a hierarchical manner (Gao et al., 2010).
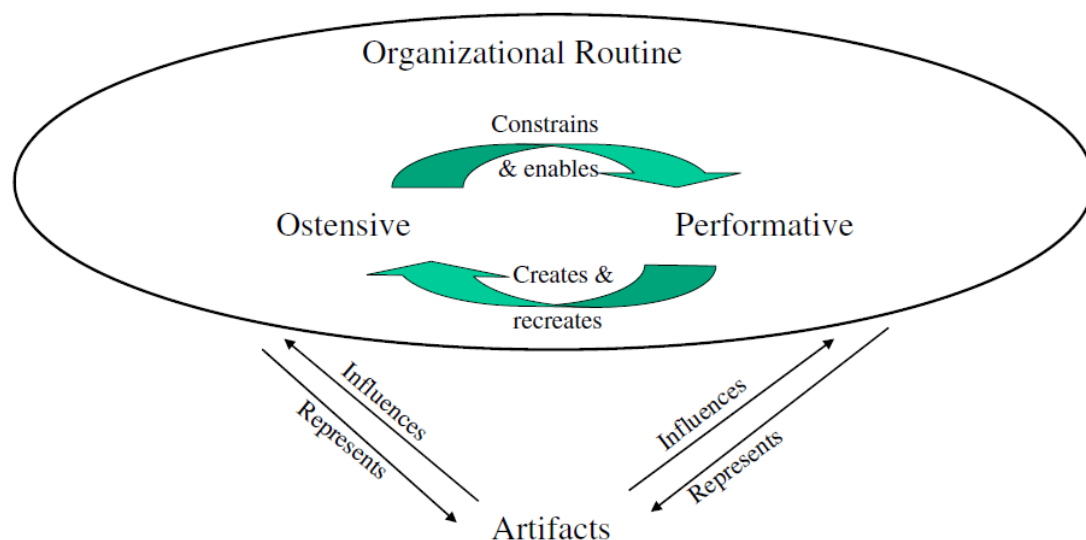
Figure 1: Organisational Routines Theory through the lens of Generative Systems (Pentland & Feldman, 2008, p.240)

The performative and ostensive elements of the organisational routine are intertwined (see Figure 1). The performative (or agency) aspect refers to the regular actions taken by specific people at specific times and in specific locations. The ability to remember the past, imagine the future, and react to current circumstances is a performative aspect that brings subjectivity and power into organisational routines (Pentland & Feldman, 2008).

Routines include adjusting to situations that require idiosyncratic or ongoing changes, as well as reflecting on the nature of behaviour in light of potential realities.

An organisational routine's abstract idea or structure is described as ostensive. It refers to abstract standards and regularities that allow participants to direct, account for, and respond to specific routine performances (Feldman & Pentland, 2003). The actors' embodied understandings and cognition make up the ostensive elements, which are not written rules or procedures. Variations in performative aspects can be attributed to artefacts associated with organisational routines. Written rules, protocols, and IT structures are examples of artefacts. Artefacts are used in operational routines to ensure the replication of specific action patterns (Pentland & Feldman, 2008). For example, an IT department has established a web-based IT system support to assist in the accurate, reliable, and accountable resolution of IT users' problems. This technology, on the other hand, can be viewed as both a facilitating and constraining intervention. As a result, the ostensive and performative aspects are generated and replicated by actor behaviour, which are restricted and allowed by structure. Consequently, these elements of organisational routines are seen as recursively related, with the ostensive aspect constraining and facilitating performances. The interaction between the ostensive and performative aspects of organisational routines creates an ongoing potential for variation, selection, and retention of new behaviours and patterns of action within routines, allowing routines to produce a wider variety of outcomes, from apparent consistency to significant change (Goh & Pentland, 2019).

In the context of this paper, our theoretical contribution derives from extending earlier work on sociomateriality and organisational routines theory by exploring how sociomateriality practices impact changes to the organisational routines, when an organisation transitions from an on premise IT system to a Human Cloud model.

Methodology

We conducted a multi-site, interpretive case study (Myers & Avison, 1997) of 101 UK SMEs to explore how Human Cloud changed managerial roles and their skill set requirements and functions of organisational routines during the adoption of the solution. The SMEs were chosen from a sample of 561,000 registered SMEs in the North West region of the UK based on a 2020 business statistics report by the House of Commons

(Ward, 2021). We collected empirical data through observations and focus groups with managers of their experiences when migrating on premise IT systems to the Human Cloud, further supported by documentation of the case companies. Both primary and secondary sources of empirical evidence were collected (Hox & Beoije, 2005). Primary sources comprised of field notes taken from both the observation and focus groups methods where we utilised both field notes and audio-recording to document the participants' accounts and code the data patterns. The complex data set was reduced to specific themes through our thematic analysis approach by applying the audio-coding feature in the data analysis software NVIVO. From another perspective, secondary sources included the official SME documentation (Gill et al., 2008). The secondary data, commonly described as archival records (Yin, 2014), proved useful in complementing the empirical data to enable further 'triangulation' of evidence.

Observations involved giving the SMEs a dedicated time slot of 30 minutes to give a short presentation on their experiences of transitioning from an on-premise IT solution to a Human Cloud business solution, where 10 SMEs performed each day (11 on the final day) over a two-week period (see Table 1). The presentations took place at the main theatre of the business cluster situated in North-West England between January and February 2020, where various students, academics, industry experts, charities and investors attended. The presentation groups were made up of industry leaders and managers of their respected SMEs. After the presentations were over, a post Q&A about the presentation was held where the audience asked a series of questions to the presenters. Furthermore, post-presentation focus groups were held at the business cluster to discuss the audiences and presenters' thoughts and ideas about the presentation (see Table 2). The focus groups took place in several quiet offices in the business cluster.

The rationale for conducing the observations and focus groups were to assist in unravelling understandings of the experiences of managers involved in migrating on premise IT systems to Human Cloud (Patnaik et al., 2016; SIA, 2017), as well as obtain feedback of the presentations from open discourse between the audience and the presenters. Documentation served to provide supplementary background information about the SME cases.

Table 1: Summary of Observation Sessions (SME Cases)

Date/Venue ID	Group IDs	SME Sector	Presentation Theme	Average Members/Duration
Day 1: BCA	SMEA1, SMEA2, SMEA3, SMEA1-4, SMEA5, SMEA6, SMEA7, SMEA8, SMEA9, SMEA10	Communications	Human cloud for small telecommunications businesses	6 members 30 minutes
Day 2: BCB	SMEB1, SMEB2, SMEB3, SMEB4, SMEB5, SMEB6, SMEB7, SMEB8, SMEB9, SMEB10	Catering	Human cloud for small businesses operating in catering and food industry	5 members 30 minutes
Day 3: BCC	SMEC1, SMEC2, SMEC3, SMEC4, SMEC5, SMEC6, SMEC7, SMEC8, SMEC9, SMEC10	Services	Human cloud for small service businesses (e.g. delivery, online tech support)	7 members 30 minutes
Day 4: BCD	SMED1, SMED2, SMED3, SMED4, SMED5, SMED6, SMED7, SMED8, SMED9, SMED10	Energy	Human cloud for small energy providers	5 members 30 minutes
Day 5: BCE	SMEE1, SMEE2, SMEE3, SMEE4, SMEE5, SMEE6, SMEE7, SMEE8, SMEE9, SMEE10	Education	Human cloud for small tutoring businesses	5 members 30 minutes
Day 6: BCF	SMEF1, SMEF2, SMEF3, SMEF4, SMEF5, SMEF6, SMEF7, SMEF8, SMEF9, SMEF10	Transportation	Human cloud for small transportation businesses	6 members 30 minutes

Day 7: BCG	SMEG1, SMG2, SMG3, SMG4, SMEG5, SMEG6, SMEG7, SMEG8, SMEG9, SMEG10	Books, Magazines & Newspapers	Human cloud for small information and news providers	7 members 30 minutes
Day 8: BCH	SMEH1, SMEH2, SMEH3, SMEH4, SMEH5, SMEH6, SMEH7, SMEH8, SMEH9, SMEH10	Accounting/Finance	Human cloud for small financial service providers	5 members 30 minutes
Day 9: BCI	SMEI1, SMEI2, SMEI3, SMEI4, SMEI5, SMEI6, SMEI7, SMEI8, SMEI9, SMEI10	Health/Medicine	Human cloud for small healthcare providers	6 members 30 minutes
Day 10: BCJ	SMEJ1, SMEJ2, SMEJ3, SMEJ4, SMEJ5, SMEJ6, SMEJ7, SMEJ8, SMEJ9, SMEJ10, SMEJ11	Non-profit/Charity	Human cloud for small charities	5 members 30 minutes

Legend: **BC** - Business Cluster; **SME** - Small Medium Enterprise
Average participant is total number divided by number of firms (e.g. 60 / 10 = 6)

Table 2: Summary of Focus Group Sessions based on Observations

Venue ID	Group	Average Participants	Duration
BCA	SMEA1-10	6	45 minutes
BCB	SMEB1-10	5	40 minutes
BCC	SMEC1-10	7	37 minutes
BCD	SMED1-10	5	35 minutes
BCE	SMEE1-10	5	41 minutes
BCF	SMEF1-10	6	43 minutes
BCG	SMEG1-10	7	37 minutes
BCH	SMEH1-10	5	45 minutes
BCI	SMEI1-10	6	44 minutes
BCJ	SMEJ1-10	5	39 minutes

Data coding were used for data analysis within the cases (Myers, 2019), to identify situations where the role of human and materiality entanglements in the human cloud had a significant impact on maintaining IT systems. Categorisation of managers' views on these human and material entanglements were structured into themes that fitted into the concepts describing the sociomateriality of the human cloud. These themes reflect five notions of sociomateriality (Jones, 2014): 'materiality', 'inseparability', 'rationality', 'performativity' and 'practice'. The analysis process first discusses the imbrication of human and material agencies, and then moves to how changes of managers' roles and skill set requirements, as well as performative and ostensive aspects of organisational routines influence technological artefacts entangled in sociomateriality practices.

Results & Discussion

Role of Imbrication in Human/Material Agencies

Matter exists in three basic forms, according to chemistry principles: solid, liquid, and gas, and thus humans can imbricate with the material artefact primarily in these forms. As a result, human and material agencies become intertwined: physically, virtually, and spiritually. A car driver, for example, imbricates with a car at least physically, whereas a non-driver, such as a car enthusiast, imbricates with cars virtually, and a car designer imbricates with cars at the spirit level (the essence of the car to meet the users' requirements, affordances, and look and feel), as well as physically and virtually. In a similar vein, this paper claims that human and material agencies are intertwined at three different elementary levels of sociomateriality: materiality, virtually, and/or at the spirit

(essence) level. Our findings consistently show how organisational leaders interact with technology in different ways at the material, virtual, and spirit levels.

Technological Materiality (Material Level)

Materiality is not only intrinsic to technology, regardless of how it is used or in what sense, but it is also a point of imbrication between human and material agents. In other words, materiality offers the affordances and constraints that allow for the imbrication of human and material agencies to occur. The existence of "materiality" as a term distinct from "sociomateriality" means that certain materials are not social at the same time. Our research shows that managerial staff perform well within the materiality of IT, that is, the hardware and software side of an IT system that plays a significant role is re-shaping an organisation's routine practices.

Our observations and focus groups found that managers use technology to help their companies be more efficient, which necessitates prior knowledge as well as expertise skills and abilities. The materiality of technology remains unchanged over time and space. For example:

Managers' reported that when they transitioned to a human cloud business model, the hardware relocates to data centres ("cloud"), and software is accessed through a web-based virtualized abstraction layer. This helped to streamline processes through providing efficient data management and human resource services, which in turn made the transition to purely a digital business a seamless process. [SMEA1; SMEB1]

When human/material institutions imbricate at the level of materiality, they remain separate entities:

Managers reported that the human cloud has become a necessity given the impact is has had on creativity since it eliminates the traditional financial obstacles to innovation and digital transformation by eliminating the need for physical infrastructure and the associated operating and labour costs. The managers further reported that the human cloud business model enables their business that would otherwise be unable to afford the upfront investment needed for on premise deployments to gain access to new technology, thereby making them inseparable. [SMEA3; SMEB6; SMEE2; SMEB5]

At the materiality level, there is also a strong distinction between human and material agencies. In their imbrication in particular activities, human and material agencies arise:

Managers reported that the rationality of the human cloud refers to social interactions that could be triggered by human agency or a business led IT service within the human cloud that calls for managerial involvement. [SMEC2; SMED5; SMEF1]

Similarly, human and material agencies are capable of achieving social outcomes. Physically, digitally, and non-physically, activities are interpreted:

A human agency might start or install a software application. The programme runs in order to achieve the desired results. [SMEE2; SMEF5; SMEG1; SMEH4]

On-premise and Human Cloud systems were also found to have different capabilities for initiating human/material activities:

Managers seemed to have different abilities when it came to communicating with and controlling human cloud systems. To avoid direct assistance on human cloud, managers changed organisational routines to regulate between managerial control of certain processes and others to be managed by the human cloud. [SMEA4; SMEB7; SMEE3; SMEB6]

Virtual Systems (Virtual Level)

The virtual realm of technology is concerned with technological features that are malleable and change according to system usage. Although this level is more technical as opposed to business related level, it is still important to explore the technicalities of this human cloud to demonstrate how it supports organisation practices. Virtual features, unlike material features, are inherent in technology but are dependent on context and use. For example, unlike on premise IT systems built on a client-server architecture, the human cloud business model has utility features like configurability, multitenancy, elasticity, scalability, and ubiquitous. However, the richness, malleability, and ease of integrations of on premise IT systems with other IT-system solutions like the human cloud via application programming interfaces (APIs) has created a different abstraction layer of technology, requiring different skills to maintain and support. Our research consistently demonstrates how organisational leaders interact in the virtual realm of technology in different ways.

The materiality of technology is seen as malleable when human and material agencies imbricate at a virtual stage. At this stage, managers must consider "why" the system behaves the way it does, which necessitates the use of more advanced IT skills, such as

coding. Imbrication at this stage is more common in the human cloud than in on premise IT systems, according to our findings:

Managers mentioned that they sometimes failed to troubleshoot human cloud systems and escalates the problem to a systems engineer, demonstrating that most IT personnel are unable to work in the virtual world of IT. [SMEB5; SMEC8; SMEF4; SMED6]

Human/material organisations remain distinct and autonomous bodies throughout space and time when engaging in the interactive world of technology:

Mangers found that the multitenancy, elasticity, and scalability characteristics of human cloud systems are unaffected by their interventions or material output because they adhere to predetermined IT settings. [SMED7; SMEE9; SMEF10; SMEJ2]

Between human/material agencies imbricated in the virtual domain of technology, analytical boundaries exist:

Managers further reported that multitenancy, elasticity, and scalability are all properties of the human cloud that occur independently of the designer due to the virtualization characteristics of IT. [SMEA10; SMEI9]

Human/material agencies can accomplish social goals by non-physical and digital means:

Managers reported that a human cloud that scales up or down IT resources achieves social outcomes as a utility to IT users. [SMEA3; SMEE7; SMEG9; SMEI5]

Human/material agencies entangled in the virtual world are more likely to work at the coding layer:

Mangers reported that APIs are developed by systems engineers to integrate with other organisational systems. [SMEA9; SMEC10; SMEE8; SMEJ5]

Technological Spirituality (Spiritual Level)

The essence or strategic goals of technology are referred to as the technology's spirit. Spirit can be found by delving into the technology's philosophy, which is based on the system's design metaphor (e.g., human cloud is ubiquitous-anywhere and on any device access via Internet browsers). The features that technology incorporates, as well as how they are named and presented, reveal the spirit of technology (e.g., elasticity, scalability,

configurability and multitenancy of human cloud services and applications). The nature of the user interface (e.g., human cloud is web-based) and training materials and online guidance facilities can reveal the spirit of the company (e.g., dashboards and online tutorials). Finally, the spirit of technology can be seen in system support and maintenance (for example, the vendor maintains and supports cloud applications) as well as system integrations (e.g., use of web-services and APIs).

Managers must understand the materiality of technology's ability to achieve the organisation's strategic objectives due to human/material agencies imbricated at the spirit stage:

Managers chose a human cloud system to reduce operating and human resource costs and increase productivity and communication levels while also gaining access to cutting-edge cloud technologies. [SMEA1; SMED4; SMEE2; SMEJ2;]

The imbrication of human and material agencies becomes inseparable at the spiritual level. Social and material become necessarily inseparable at this stage. To put it another way, managers' "quotidian interaction" with technology becomes an unspoken practise of daily life:

Managers reported that in their social work, they were concerned about their on premise IT system's failure to meet users' expectations, and thus is imbricated at spirit stages. This suggests that managers and their material property are inextricably connected. [SMEA6; SMEC7; SMEE5; SMEI8]

The assemblage dissolves analytical barriers between human and technology as human/material agencies imbricate at the spiritual level. The human mind is an intricate assemblage of human/material organisations.

Managers addressed their on premise IT system issues with subordinates, family members, and outsiders/vendors in order to collect information for a thorough solution, such as the human cloud. [SMEB1; SMED10; SMEH4; SMEJ4]

Human/material agencies imbricated at the spiritual level form a recursively interconnected human/material assemblage with a social result:

Managers who are dealing with difficult technical problems have a strong desire to improve the system. [SMEB3; SMEC1; SMEH10; SMEI1]

In terms of practise, human/material imbrication at the spiritual level remains an enthusiastic stance that varies from person to person.

Managers were consistent in reporting their enthusiasm about migrating on premise IT systems to the human cloud model for the sake of improved communication, increased productivity and cost minimisation. [SMEF4; SMEH5; SMEI6; SMEJ9]

Summary of Findings

Our findings show that organisational leaders, such as managers are imbued with technology on a spiritual level, enforcing organisational routines to achieve the organisation's technology strategic goals. Managers, according to our findings, are more likely to support the maintenance of hardware and software that fits with the human cloud model, which greatly relies on these components. As a result, managers tend to follow organisational routines on "how to" fix the system, becoming imbricated with the technology's materiality. Our research shows that managers engage with technology on a spiritual level, analysing the system's purpose to deliver organisational routines more effectively. Organisational routines are used by managers to enforce rules and guidelines and ensure that the system achieves its strategic objectives, and ultimately achieves the objectives of the organisation.

We also report the five key concepts in sociomateriality: materiality, inseparability, relationality, and interdependence. Materiality refers to the physical, digital, and nonphysical characteristics of material artefacts that do not change over time and space, as well as the performativity and practise associated with them. According to inseparability, human and material agencies exist as separate or inseparable entities. The term "relationality" refers to the existence of any "analytical boundaries" between human and material imbrications. Practice delves into the various forms of bodily and mental activities, as well as objects and their applications in the realms of understanding, emotion, and motivational knowledge, whereas performativity delves into the ability of human and material agents to achieve social goals.

This paper explores the imbrication of human and material agencies at these elementary levels (materiality, virtuality, and spirit) with respect to five aforementioned notions of sociomateriality to gain a better understanding of the social outcomes. Table 1 summarises our discussions (findings) on the implications of the human cloud business model on organisational routines. When human and material agencies imbricate at the materiality, virtual, and/or spirit levels of technology, in the context of both on premise IT systems and human cloud business models, we ask what it means in terms of the five notions of sociomateriality. As part of our knowledge contribution, we summarised and categorised our findings of the materiality, virtuality and spirituality levels under the five notions of sociomateriality. However, to determine how this influences the organisational routines of the organisations, we report additional findings regarding the impact of the levels and perspectives of sociomatiality on the changing organisational routine practices in line with the organisational routines theory.

Table 3: Summary of Findings in relation to the Imbrication Levels of Human and Material Agencies

Human/material Agencies Imbrication Levels					
	Materiality	**Inseparability**	**Relationality**	**Performativity**	**Practice**
Materiality	In human cloud business model, the hardware relocates to data centres ("cloud"), and software is accessed through a web-based virtualized abstraction layer. This helped to streamline processes through providing efficient data management and human resource services, which in turn made the transition to purely a digital business a seamless process.	A manager may decide to restart the IT system; otherwise, the system will remain "on" until a physical or electronic fault occurs.	Social interactions can be triggered by human agency or a dysfunctional IT mechanism that calls for managerial involvement.	Human agency might start or install a software application. The programme runs in order to achieve the desired results.	**M**anagers have different abilities when it comes to communicating with and controlling human cloud systems. To avoid direct assistance on human cloud, managers changed organisational routines to regulate between managerial control of certain processes and others to be managed by the human cloud.
Virtually	Manager fails to troubleshoot human cloud systems and escalates the problem to a systems engineer, demonstrating that most IT personnel are unable to work in the virtual world of IT.	Multitenancy, elasticity, and scalability characteristics of human cloud systems are unaffected by managers' interventions or material output because they adhere	Multitenancy, elasticity, and scalability are all properties of the human cloud that occur independently of the designer due to the virtualization characteristics of IT.	Human cloud system that scales up or down IT resources achieves social outcomes as a utility to IT users.	APIs are developed by systems engineers to integrate with other organisational systems.

		to predetermined IT settings.			
Spirit	Managers chose a human cloud system to reduce operating and human resource costs and increase productivity and communication levels while also gaining access to cutting-edge cloud technologies.	In their social work, managers were concerned about their on premise IT system's failure to meet users' expectations, and thus is imbricated at spirit stages. This suggests that managers and their material property are inextricably connected.	Managers addressed their on premise IT system issues with subordinates, family members, and outsiders/vendors in order to collect information for a thorough solution, such as the human cloud.	Findings indicate that managers who are dealing with difficult technical problems have a strong desire to improve the system.	Managers are enthusiastic about migrating on premise IT systems to the human cloud model for the sake of improved communication, increased productivity and cost minimisation.

Role of Organisational Routine Changes

Performative to Ostensive Change (Selective Variations)

The ostensive aspects of routines require the performative aspect of routines to be created, maintained, and modified. The performative aspects (actions or performances) that the ostensive aspect of the routine guides or accounts for may be altered by actors. As a result, as an unintended effect of action, performative aspects enact ostensive aspects of the routine, and thus variations in performative actions may become institutionalised and alter ostensive aspects of the organisational routine, resulting in organisational change. For instance, our observations and focus groups showed that managers alter routines such as the way IT systems support is carried out when they transitioned to the human cloud:

SME managers [SMEA10] stated that in the traditional routines, they would delegate their tasks to their employees, typically face-to-face, but all that changed when moving to the human cloud as everything now has to be reported over a computer network. The pattern persisted until it became the accepted method of resolving such a problem. Although the managers found the human cloud model efficient, they did realise that it took away some of the natural socialness they once revered [SMEB8].

As part of relevant actions that managers take in organisational routines, our findings suggest that these performative actions might also be institutionalised into ostensive aspects of the organisational routine and bring effects such as creation, maintenance, and modification of organisational routines, as well as changes to a larger organisational context:

The motivation of managers performing user support is not to create, maintain or modify the ostensive aspect of the routine, but rather aim to overcome an organisational issue such as a lack of productivity shown by some workers, which now can be better monitored via the human cloud due to virtualisation technologies and monitoring systems. However, some outcomes of engaging in actions has some effect on the structure (ostensive) that constrain and enable further actions. [SMED2]

Ostensive to Performative Change (Selective Retention)

The ostensive feature of routines can be used by actors as a reference on how actions should be taken or for accounting actions that have already been taken. "Guiding, accounting, and referring" are terms used to refer to the use of the ostensive aspect in relation to the performative aspect of routine. Our results suggest that managers use such

terms to exercise control over their own employee's performances in order to indicate that some performances are part of a recognisable routine and to legitimise some performances as appropriate for that routine [SMEE1; SMEF7; SMEG4; SMEI10].

Our findings have also revealed that guiding can be used as a model for behaviour or a target:

SME managers insisted on using the human cloud to overcome their organisational challenges owing to the need of streamlining processes through better alternative communication channels such as operating via video conferencing and desktop sharing applications such as Team Viewer and Zoom in order to promote efficient productivity and ultimately meet their targets. [SMEH3]

Additional findings revealed that changes in the ways human and material agencies imbricate at the material, interactive, and spirit levels of technology occurred with the implementation of the human cloud business model [SMEC9; SMED8]. This shows that these entanglements between human and material agencies create "organisational residue," such as organisational routines or innovations, which remain even though their creators are no longer present. Therefore, organisational transition is often brought on by the recursive existence of performative and ostensive elements of organisational routines, hence organisational remnants and improvements in organisational routines could be institutionalised to establish a novel form of sociomateriality.
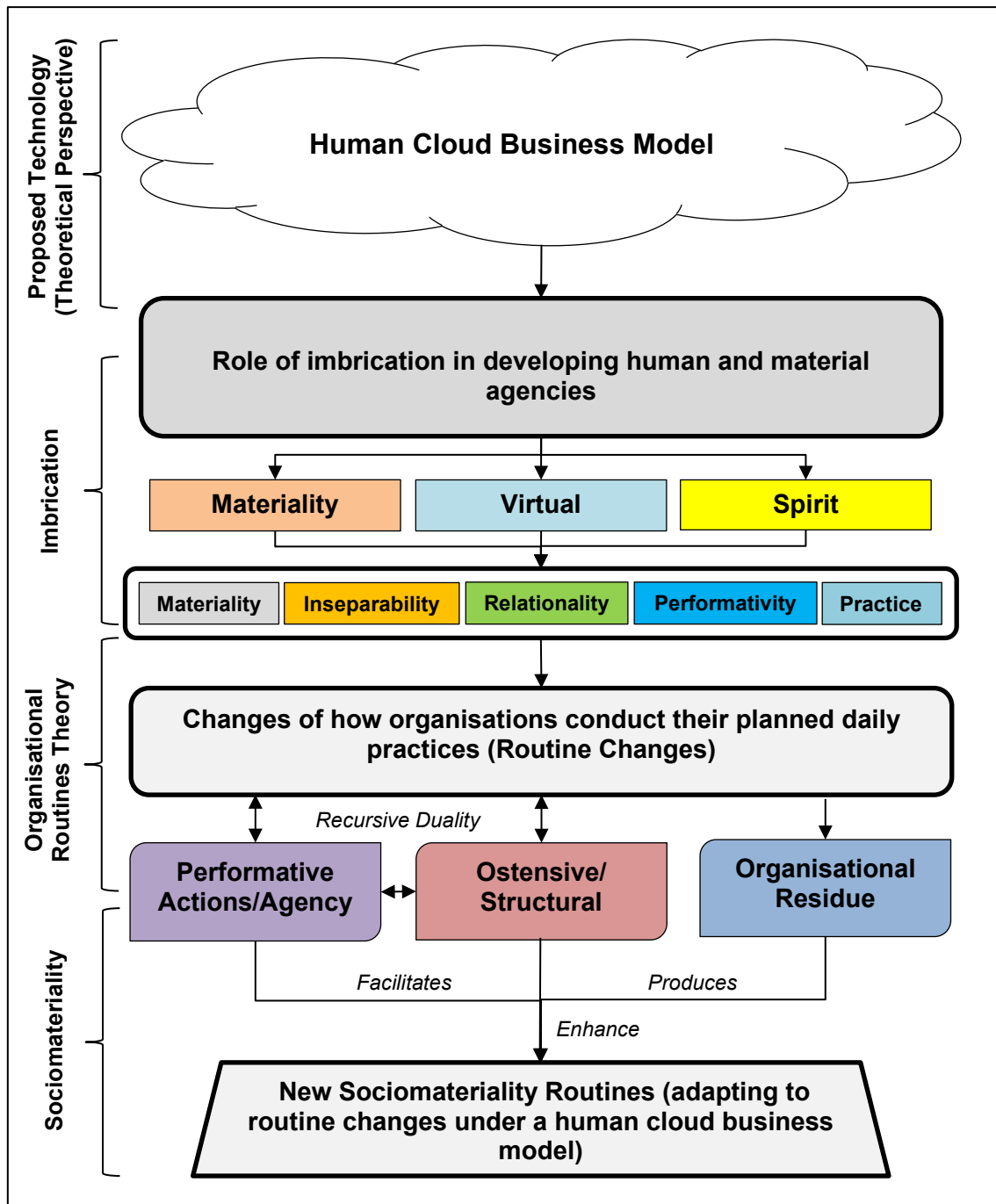
Figure 1: Implication of Human Cloud Business Model

Conclusion

This paper largely looked into organisational routine theories and the sociomateriality perspective of the human cloud business model, both concepts remain to be underexplored. Previous IS research on the impact of cloud computing innovations on human capital was focused on broad consequences rather than the individual service level. Although some previous research explored the implications of human cloud

adoption in relation to organisation operations and market, there remains a significant paucity in empirical evidence on how organisations were influenced by the new social structures of the human cloud business model, and lack of consideration of the incidents and procedures that contributed to the changes in the organisation. The contribution of this paper to the relevant body of literature is therefore unique in the way that it provides fresh insight as the findings extend existing theory (Hazen, 2016), as such we extend the knowledge on how human cloud conduct is performed and imbricated both individual and technology capabilities to initiate organisational change within UK's SMEs. The findings of our research accordingly reveal the following; *firstly,* human and material agencies imbricate/entangle at materiality, virtual world, and/or the spirit of technology. The imbrications, on the other hand, are dependent on an individual's capabilities or ability sets. *Secondly,* the imbrications create a variety of social outcomes, such as rituals or emerging technologies as organisational residues. *Finally,* the influences of sociomaterial activities vary, depending on individual capabilities when imbricating with artefacts at either the material, virtual, or spirit of technology.

The paper findings additionally contribute to management practice by identifying several aspects that should be considered and leveraged by executive managers. *First,* it provides insight on how technical objects entangled in sociomaterial practises can alter how humans react to organisational routines performative aspects. *Second,* it demonstrates how materiality, the virtual world, and the spirit of technology provide fundamental levels at which humans communicate with material. *Third,* it verifies that the specific levels at which human and material entangle are defined by an individual's capability or skill set.

The paper also implicates a number of limitations. For instance, a multi-case study strategy was used and thus may have required an in-depth longitudinal analysis to stand on richer details. Additionally, the special existence of the human cloud business model should be explored further in relation to other technologies, such as Internet of Things, Big Data, Virtual Reality and more. Finally, the research adopts a focused view by exploring UK SMEs' staff interactions rather than a broader spectrum of organisations at a different scale and location.

Our paper also reveals avenues of further research. In view, future research should explore how IT systems support other IT technologies in order to expand the

organisational routines theory. Furthermore, an in-depth analysis should unveil other micro-level routines to see how performative and ostensive elements of routines change as new innovations are introduced. Further research should also explore the changes in organisational routines due to changes in sociomateriality of technology in different contexts.

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