Adoption of AI by the HR function in the civil service

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Abstract

The penetration of Artificial Intelligence (AI) technologies into the global workforce brings transformative potential to the governance structures and use of digital platforms in public sector organizations. AI is likely to play a role in the operation of Human Resources (HR) Functions and influence how they might operate in the near future.

This paper uses the Technology Acceptance Model (TAM) to assess the readiness of the HR Function within the UK Civil Service (CSHR) to implement AI to support performance. Academic literature in relation to AI acceptance in HR functions is currently limited, so this paper aims to establish a better understanding of the current landscape and level of ambition in this area.

A quantitative research approach was adopted to determine likely behavioral intentions of workers in the HR function, if AI were implemented, by investigating key aspects of the TAM (the perceived usefulness of AI and the transparency of the CSHR in adopting AI). Whilst the results suggest that the CSHR is not ready to harness AI opportunities, employees were personally ready, despite perceiving a lack of sufficient knowledge in this area. The paper identifies that more time needs to be spent on raising awareness and upskilling the HR Function before the CS can be considered fully ready to harness these opportunities.

Keyword: Artificial Intelligence; Civil service; Human resources; Technology Acceptance Model; Capabilities

1. Introduction

The historical constraints of Artificial Intelligence (AI), in terms of limited resources and technology, are rapidly being overcome by new, advanced models adept at interpreting and learning from complex and voluminous datasets (Janiesch et al., 2021). This is enabling AI to become a critical component of the digital ecosystem that permeates our everyday experiences (Janiesch et al., 2021; Kopalle et al., 2020; Subramaniam & Venkatraman, 2019).

Within organizations, AI now has the potential to significantly alter workplace dynamics, amplify productivity, and prompt a re-evaluation of the nature of work in some areas. In some organizations, it is already being used to free up human resource (HR) professionals to focus

on system wide HR issues, since it is believed technology can achieve many of the necessary activities at a cheaper, faster and better rate than a human employee (Kolade & Owoseni, 2022). However, these changes can elicit both organizational and personal anxiety among employees (Ekandjo et al., 2023) and there is a need to ensure that security, accountability, and safety for users and systems are not compromised through the use of AI (Carrillo, 2020).

UK government investment in AI technologies demonstrates a recognition of its potential to streamline public services and contribute to economic growth (Dwivedi et al, 2021). However, public service organizations such as the UK Civil Service (CS) are typically perceived to be slow to respond to change (Sourdin et al., 2019) and there is currently little evidence to understand the readiness such organizations to accept AI, both from the perspective of the organization itself and that of its employees.

Our study, therefore, aims to use a modification of the Technology Acceptance Model (TAM) (Davis, 1989) to critically assess the UK Civil Service's readiness to implement AI within its Human Resources Function (CSHR), specifically in the realm of HR performance enhancement. While some departments have initiated explorations into AI applications, the extent and depth of their commitment to incorporating AI responsibly within HR practices, especially when it comes to governance on digital platforms, remains ambiguous.

To provide a framework to address the research aim, the objectives are:

1) To describe the current landscape of AI within the HR functions of organizations.
2) To understand the level of ambition in the CSHR in this area.
3) To assess how prepared the CSHR is for the emergence of AI and its application to their profession.

This study first discusses and evaluates the existing academic literature on the types of AI technologies already in use in HR, the ethics associated with this and the current environment affecting the CS, along with an overview of appropriate theoretical frameworks used to evaluate readiness of organisations to implement AI effectively. We then conduct a survey of HR employees in the CSHR and review the survey results using exploratory data and thematic analysis. In the final section, an overall conclusion is given, with reference to key contributors, limitations to the study, and causes for further research.

2. Literature Review

2.1. AI and HR

There are three main types of AI supporting business needs. Robotic Process Automation (RPA); Data Analytics using Machine Learning; and Cognitive Engagement and Natural Language Processing through use of intelligent agents and chatbots (Davenport and Ronanki, 2018). Traditionally, HR is perceived as an area that removes itself from the digital world and relies heavily on experience in order to make decisions. Shultz and Walt (2015) reinforce this view through their 'S-curve' management tool to illustrate HR's position in relation to these current transformative technologies. They conclude HR is in curve one, which will lead to its decline, with curve two indicating the potential that could be obtained if HR were to reimagine themselves. Shultz and Walt (2015) also argue all concepts and strategies have a shelf life and HR have not yet transitioned, instead relying on old processes and operating systems. They argue the use of AI such as cognitive technologies would provide the step change HR needs to remain productive and ultimately future proof.

Despite such a pessimistic assessment, AI is actually already being used across a range of different HR activities. There are applications that sift CVs and use algorithms to supplement or subvert human decision-making (Steinruecken, 2017). *Acuvate* uses HR chatbots to answer frequently asked questions, such as when the next pay day is and the number of day's leave remaining, as well as handing over the power of some decisions to AI, allowing HR to get on with more important strategic tasks (Gyton and Jeffery, 2017). The timeliness of this progress is reflected by the UK's Charted Institute of Personnel and Development's (CIPD) who believe AI-enabled automation is now more significant for HR than ever before as it has the potential to reshape the entire function (Gyton and Jeffery, 2017). Wu (2016) agrees progress is being made, noting that the interaction between HR departments implementing AI is becoming more creative and intuitive rather than structured and daunting. As well as AI providing an opportunity to remove some of the 'boring' tasks HR employees can become disengaged by, it can also improve morale by creating a far more efficient and responsive HR system, allowing for greater innovation and tangible benefits elsewhere (Rutter, 2017).

Yano (2017) expresses doubt on Shultz and Walt's S-curve assumption, citing *Hitachi's* HR department in Tokyo equipping 600 employees across a wide range of fields with AI wearable label sensors. HR developed an AI system which sent daily and personal messages to employee's smartphones with details on how they could optimize each day, including recommended interactions to maximize happiness and productivity. After implementing this system, the results demonstrated that the longer the department used this AI method, employee engagement and revenue levels increased. Similarly, *Satalia* uses machine learning to help

organizations predict customer behavior and they want to make the way it manages people fairer, easier and more efficient when deciding pay awards and even coaching new managers (Gyton and Jeffery, 2017). Yano and others show that AI is being utilized by some HR departments in quite innovative ways, beyond the boundaries of what might be considered traditional HR related processes and tasks. This leads Gibson (2016, citied by Yano, 2017) to reject Shultz and Walt's claim, stating instead that AI is already in use within HR departments and is being applied to address significant challenges but "*…it is just not evenly distributed yet*" (pp 46).

Spitzer's (2014) research found that 75% of current HR leaders believed their organizations were behind, even in the use of internal and external social networking technology. The organizations surveyed primarily relied on traditional recruitment techniques and advertisements on career websites. Only six percent of organizations surveyed were classified as digitally advanced. It remains no surprise that three years later, the *Sierra–Cedar HR Technology Industry* found that fewer than seven percent of the companies who participated in their survey are using, or considering using, machine learning technologies in HR (Sumser, 2017). So, for some HR organizations, AI remains a fairly new concept. Embedding digitization more generally might provide a more solid foundation from which to build. Spitzer believes HR digitalization has been limited due to organizations lacking the systems and processes required but suggests 'digital' can revolutionize the way which HR processes are currently run. Schwab (2016) agrees the lack of correct resource is a critical factor as he states "*…leaders with whom I interact all tell me that they are struggling to transform their organization to realize fully the efficiencies that digital capabilities deliver"* (pp. 34), therefore this is not just specific issue for HR leaders.

Whilst not removing themselves entirely from the AI race, it could be summarized that UK HR teams are progressing at different speeds, with many choosing a less ambitious AI approach. The literature suggests the preference appears to be focusing on using technology to improve existing established and specific HR processes and tasks (Greer, 2021). The risk to this is that HR is not necessarily considering the 'art of the possible' and a total re-imagination of what the function could really look like with integrated AI technologies at its heart. The key is not for HR to think 'we need to do some AI' and then go out looking for a problem. Instead, they need to ask how AI can create value and helpfully impact the organization's business strategy.

2.2. The ethics of AI

Research is broadly optimistic that AI will be good for HR (Gyton and Jeffery, 2017), but the technology itself is generating a huge philosophical debate. There is still a mixture of hype and sensationalism regarding the impact of '*robots*' and the extent to which it will revolutionize how people work. The truth is nobody can be sure (Watson, 2017). The concept of replacing humans with robots in key industries fuels uncertainty and anxiety. There is a view that technology could make inequality worse, unless people are very careful about how policy decisions are made. This has led to some unanswered questions about AI governance such as who will own the 'robots', or whether robots would always make the right decisions? (Tyagi, 2017).

Field experts suggest that humanity as a whole needs to prepare for the socioeconomic side effects arising from emerging technologies as there have been many cases where products/services, when fused with AI, have led to social problems. Examples include a child being injured by a security robot in a shopping center, Microsoft's chat boy 'Tay' with malicious behavioral learning and the death of an individual involved with Tesla's self-driving car (Lee and Park, 2017). Ford (2015) believes more needs to be done and has indicated that concerns for AI are so high within the scientific community, that a number of small organizations have been set up purely focused on analyzing the dangers associated with it. These organizations are investigating how they can build 'friendliness' into AI systems of the future. It is clear that appropriate governance will ultimately be crucial. Kingston (2017) plays down the fear factor of AI. He states that it is humans creating robots, so they should be designed with an 'off' switch to ensure they do not have overall operational control. As long as there is someone who has the ability to override the machine's activities, he considers AI will be beneficial to the economy whilst still remaining ethical. To prevent future issues, as well as being able to fully benefit from the potential offered, Chatila et al (2017) believes it remains important to ensure all technologies are aligned to human ethical beliefs and moral values. This is obviously easier said than done. Davies (2015) believes machines achieving intelligence is the easy part, but giving a computer an ethical point of view is near impossible. Davies indicates that installing ethics into an AI system is "…a research challenge worthy of some of the next generation's best mathematical talent" (pp 122).

Yuste et al (2017) expands this view, claiming that the existing guidelines on ethics such as the 'Asilomar Artificial Intelligence Statement of Cautionary Principles', published in 2017, signed by business leaders and AI researchers, is inadequate. If more is not done, then technology could aggravate social inequalities, especially those in developing countries. This

is partly due to a lack of investment in expensive AI technologies which will ultimately disadvantage these countries, reducing the demand for human labour and decreasing employability (Makridakis, 2017). Ultimately, Gyton and Jeffery (2017) believe HR will have a crucial role in the future of AI and be required to help make some of those moral and ethical decisions, such as if and when to automate, whether to reskill or redeploy the human workforce, and influencing resourcing decisions. The implications mean it is unlikely that the skills that HR professionals need today will be the same as those needed tomorrow.

2.3. UK civil service

In March 2013, the CS workforce comprised 448,835 employees. By June 2016, this figure had fallen to 384,000 but steadily began to rise to 392,000 by the end of March 2017 (Stanley, 2017). This increase is likely to be the reflection of recruitment following the UK's decision to leave the European Union (EU). Despite this slight growth, the CS has been at its smallest since the Second World War. Since 2010, the workforce has gradually become older and more concentrated in London. This potentially builds both a demographic and geographical challenge. The CS Workforce Plan (2016) highlights how the organization has aided in transforming the way the Government operates, improving the quality and efficiency of their services. For example, two of the biggest operational departments have seen significant technological improvements. HMRC has already automated the mail processing system, allowing their resources to be redeployed elsewhere. The Department for Work and Pensions have digitized Universal Credit, transforming the way welfare services are delivered to the public. Efficiency and effectiveness remain at the top of Government's agenda (Susskind and Susskind, 2015). They are working to create an environment across the UK that is receptive to adopting automation (Watson, 2017), whilst increased investment from the government will improve available technology (Loughran, 2017).

Such initiatives make it easier for CS departments to choose how and when to automate. The CS, and more notably HMRC, are actually 'stepping in' with AI rather than shying away from it. Davenport and Kirby (2016) believe they are "…engaging with the computer system's automated decisions to understand, monitor and improve them" (pp. 77). How involved all CS employees are in this technological transformation is less clear. There is no published AI Strategy or clear narrative, other than the CS Workforce Plan (2016), which fails to articulate in any great depth the pace or scale of their technological ambition. It references a desire to "… harness the power of the revolution in digital technology that is sweeping the world ... [this] is both a challenge and an opportunity." (pp.2). Kasparov (2017) believes it is critical

that the CS focuses on augmenting AI, as this will combine the strengths of humans and robots, enhancing human decision making. Rupert McNeil, the Government Chief People Officer agrees (Rutter 2017), noting that the future is as much about people as technology. To engage people in the topic he has personally driven a series of seminars with senior staff to explore cognitive technology which he believes "will make jobs more interesting and more empowering." (ibid pp.24).

This type of employee engagement is important as research suggests a clear correlation between salary earned by an employee and apprehension of AI, with 'white collar' workers most worried about the impact of AI on their organization. (Tyagi, 2017). This may be due to research conducted by Oxford University which showed that of 702 occupations assessed, CS areas were the most likely to see the biggest impact from AI, following advancements in machine learning and mobile robotics (Chelliah, 2017). The Future of Work Commission (Watson, 2017) offers a reminder of the scale of the challenge, indicating that technology brings vast potential to change the future of work for all UK citizens and that, currently, the country is underprepared for the change.

2.4 Theoretical framework for user readiness and acceptance of AI

As we have seen, the potential for AI in HR functions is significant but, so far, the CSHR function, amongst others, appears to be lagging behind in its implementation and use. To attempt to understand this we can look to theories around technology acceptance and change.

The Technology Acceptance Model, or TAM, (Davis, 1989) is the most prevalent model theorizing the likelihood of technology being implemented. In its original form, it suggested that perceived usefulness and ease of use of new technologies were the key factors that could explain the behavioral intentions of the potential users. Since then, there have been 2 significant updates to the TAM. The first of these (TAM2) identified the determinants of perceived usefulness (Venkatesh & Davis, 2000). TAM3 incorporates the determinants of perceived ease of use (Venkatesh and Bala, 2008).

More recently, a new version of the TAM has been developed, the ISTAM, extending its scope to incorporate transparency as a new dimension required when implementing intelligent systems such as AI (Vorm and Combs, 2022). The dimension of transparency is based on the concept of building trust with users about the technology itself and the way it will be used, with the focus being to ensure access to information about the new technology.

Whilst this newly developed ISTAM framework is largely untested, the theoretical

arguments for inclusion of transparency in AI type technology implementations are clear and there is strong evidence that trust and transparency are important in the acceptance and use of technology (e.g. Luo et al, 2022, Lee and See, 2004).

A key limitation of the TAM/ISTAM is that its main value is in measuring the acceptance of technology that has already been implemented. However, within the CSHR function AI is not yet being used. Whilst it is possible to evaluate the readiness of users to accept new technology by considering its perceived future usefulness and focusing on transparency in developing and implementing the technology as well as using it, it is difficult to measure ease of use prior to implementation. Further, the TAM/ISTAM focuses on behavioral intentions of users, rather than a whole business function. We posit that these need to be considered separately, even whilst being measured in the same way.

Therefore, to adequately understand readiness of the CSHR function to adopt AI, we propose 2 modifications to ISTAM; firstly, it needs to include both the behavioral intention of the users and the function itself in terms of intention to implement the new technologies. Secondly, we will not be able to consider ease-of-use ahead of implementation, so will need to understand perceived usefulness and transparency only (figure 1).

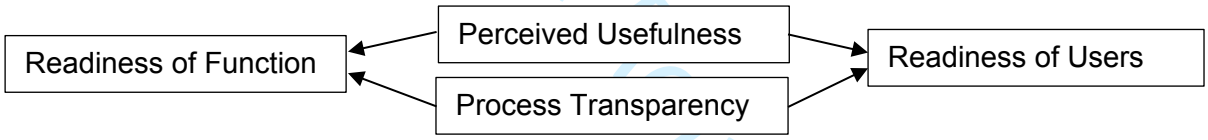

Figure 1: Framework for Technology Readiness for Adoption in CSHR

The implications of this study for exploring the value of AI in organizations are manifold; firstly, it serves as a crucial resource that sheds light on the internal perspectives and operational challenges within the CS domain. Furthermore, other public and private sector organizations can leverage the insights provided to gauge the sentiment and readiness of their workforce and functions concerning the integration of AI within their respective HR practices. Finally, this study provides a unique and unbiased view from an outside perspective on key issues surrounding the integration of AI into the HR function. By injecting personal insights into the ongoing dialogue, it contributes to a more nuanced understanding of the governance and utilization of digital platforms, thereby enriching the narrative and assisting stakeholders in navigating the complexities of this transformational journey.

3. Methodology

3.1. Research Design

Our research is solely exploratory focused, consisting of a semi-structured questionnaire to members of the HR Function in the CS. This type of research is particularly advantageous when it comes to clarifying our understanding of the scenario, particularly when they are unsure of the current employees' point of view in relation to the topic in question; AI technologies. The surveys used for this research were self-completed questionnaires (referred to as surveys) which were distributed to the professional contact across a range of HR teams positioned throughout the CS in various HR disciplines (both workers and managers). Before getting to the stage of survey distribution, it was crucial for us to negotiate access to the organization and, more importantly, gain a sense of trust among the workforce to ensure they were able to participate meaningfully (Christopher et al, 2008). In this case our research team, as a third-party member, worked within the CS and they supported us in gaining access to the organization, ensuring data collection could commence.

The survey was designed with two sections. Section one contained 18 questions. They were primarily closed questions but included two open questions to help us make easy comparisons to relate back to the third objective. The closed questions focused on the framework developed through the literature review, focusing on capturing participant's perceptions of the usefulness of AI technologies and the transparency of the organization in its consideration of participant's familiarity/knowledge of cognitive technologies. This included questions about how helpful these technologies could be, their perceptions about whether the CS has the right expertise, barriers to implementation, the main areas of HR where cognitive technologies could have the most positive impact and, ultimately, whether the participants/CS are ready to harness the opportunities presented. List and ranking questions were used to ensure participants considered all possible predetermined responses, but ultimately a preferred choice was made to identify the option that was of most relative importance to them.

The open questions solely focused on what the respondents believed to be the next best step to advance the progress of cognitive technologies within CSHR, followed by any additional comments they wished to make. This was designed to encourage participants to think about their responses before answering, ensuring the data collected was attitudinal and opinion based. The second section consisted of four closed questions to establish personal participant

information regarding job role and length of time working within HR, etc. These factual and demographic variables were readily available to the respondents and are likely to be accurate. Before the survey went live, a pilot was conducted to ensure participants would not have access issues, problems answering or recording the data. It was also useful to gauge whether the concept we wanted to explore was actually measured in the design and construct of the questionnaire (Saris and Gallhofer, 2014). The live survey was available online for three weeks, in order to get the highest response rate possible. The final number of survey participants totaled 305, representing approximately 77% of the contacted population. Due to 82 of these respondents being identified as incomplete (due to being left blank), we had 223 completed surveys to analyze. This adequate response rate helped us to avoid using misleading statistics and therefore made the results more valid to reflect CSHR as a whole.

3.2. Data analysis

As the majority of the survey questions had fixed responses, it was necessary for us to use exploratory data analysis to gain an understanding/insight from the results. As the survey had qualitative aspects, descriptive thematic analyses were also used. Braun and Clarke (2006) prescribed a six-phased method that identifies, organizes and reports themes from the dataset using thematic analyses. Essentially, the phases allowed us to familiarize ourselves with the data, enabling the production of codes that categorize highlighted themes, or in this case, phrases. Only when this was presented, through 'Word Cloud' software, could the researchers interpret the emerging patterns. This approach is useful when wanting to delve into the perspectives of different participants, highlighting the most common phrases used and producing unforeseen insights (Nowell, et al, 2017).

4. Results and Analysis

Before analyzing the results, it was important we used a technique called 'data cleaning'. This technique is critical when it comes to the validity of quantitative methods, as well as ensuring the results can be replicable (Osborne, 2013). To be able to interpret the results meaningfully, it was important from a research perspective to understand the roles occupied. The biggest response rate of 24% came from the 'Human Resources Business Partners' (HRBPs). 'Learning' represented 15% of the respondents. All the other respondents' job roles were under 10%. Despite the survey including differing categories of common HR roles, 23% of respondents identified themselves as 'Other', not seemingly occupying a role captured

within the typical main areas of HR activity. Role identity will be relevant for CSHR when considering how they tailor future communications in this area to ensure messages resonate appropriately. To gain additional insight into the wider CSHR function across the organization, understanding where the respondents came from was relevant. The biggest departmental response rates to the survey came from HMRC (29%) and the Cabinet Office (27%). This may present an opportunity to utilize interest and potential good practice in these areas to benefit the wider CSHR community.

Experience in HR was spread across the board, with the majority of respondents at either end of the spectrum. The participants with the highest response rate at 24% have worked in HR for 12 months or less, followed by those with 10 years or more at 23%. This might suggest this group is a reasonably representative sample of the audience interested enough to engage in the dialogue about cognitive technologies due to, thus providing CSHR with the opportunity to capture varying perspectives and experiences to progress activity accordingly. The majority of participants had worked for the CS for 10 years or more (35%). It is encouraging that all categories had reasonable response rate providing a balanced variety of viewpoints from a cross section of people at different stages of their career and CS experience. It will be important for CSHR to use this experience going forward to help determine the risks and handling to ensure any subsequent successful implementation of this technology.

4.1. The concept and application of cognitive technologies

The information attached to the questionnaire included a cognitive AI technologies glossary of terms, which may explain why almost two thirds of respondents were familiar with the concept, at 62% of the population. This surface-level familiarity, however, masks a deeper governance challenge - despite provided documentation, 31% remained unfamiliar, indicating potential systemic issues in how technical knowledge is disseminated across the organization. The stark contrast between claimed familiarity and actual working knowledge raises important questions about the effectiveness of current information-sharing mechanisms within CSHR.

This knowledge gap became even more apparent in the next set of results, where there was a big shift from the majority of participants agreeing with the previous statement to disagreeing with the assumption that they had sufficient knowledge about what cognitive AI technologies can do (totaling 65% of all respondents). This significant disconnect between awareness and understanding presents a critical governance challenge - without proper

understanding, departments risk implementing technologies inappropriately or making uninformed adoption decisions. This information was not covered in detail in the glossary provided. Sturgis, Roberts and Smith (2012) referred to neither agree/disagree category as a 'hidden do not know' indicating that this could be seen as a negative response to the question. It was crucial that the researchers took this concept into consideration and noted that there was potential for the neither agree/disagree category to be counted for as a negative response.

With this in mind, it was quite clear that overall respondents do not believe they know enough about cognitive AI technologies and so are highly unlikely to be able to harness the opportunities. This knowledge deficit represents a significant governance risk, as it could lead to inconsistent implementation standards and potentially harmful technology adoption decisions. This suggests a further area of development for CSHR. Not being aware of current departmental activity could be linked to the previous question. It is apparent that most participants were not aware of what their department was exploring in relation to cognitive technologies (the statement resulting in 69% of the total responses provided). This lack of awareness across departments indicates a need for stronger governance mechanisms to ensure coordinated and informed technology adoption.

4.2. Applicability to CSHR

Despite respondents reporting they were unsure about what exactly cognitive AI technologies could do, they perceived it could be helpful or have a positive impact on CSHR (showing 64% of total respondents). This optimistic outlook, while encouraging, must be balanced against the governance challenges it presents - enthusiasm without proper understanding could lead to hasty or poorly planned implementations. This response broadly supports the available academic literature (such as Yano, 2017), evidencing where AI has already been used successfully across a range of HR activities elsewhere to great effect. However, 64% of respondents believe that the CS does not have the right expertise to effectively implement cognitive AI technologies. This expertise gap represents a critical governance challenge, highlighting the need for both technical expertise and robust implementation frameworks to ensure responsible technology adoption.

4.3. Risks and barriers

The responses to the question of 'main barriers and risks' to the introduction of cognitive AI technologies revealed interconnected challenges that demand comprehensive governance solutions. The three main barriers thought to be associated with the introduction of cognitive

AI technologies to CSHR were: 25% Skills, 23% Culture and 21% Cost. These percentages reflect not just isolated challenges, but systemic issues that require integrated governance approaches. The skills gap, for instance, suggests a need for standardized training frameworks and capability assessments across departments. The cultural barrier indicates deeper organizational resistance that must be addressed through structured change management protocols. Brynjolfsson and Mitchell (2017) reinforce this, since they indicate that in order for any type of AI to be implemented, new skills, organizational changes and adjustments are required to ensure it is a success. These factors should not be underestimated, and perhaps are reflective of the HR community's experience of general change and transformation programs across the CS. The technology itself may not be the key challenge; it may be more about how people are able to embrace it. This insight suggests the need for governance frameworks that address not just technical implementation but also organizational change management.

4.4. Key HR areas of use

The question on 'key HR areas of use' received the most varied responses, revealing both opportunities and potential risks in implementation priorities. Participants believed 'self-service' was the main area of benefit for HR in terms of cognitive AI technologies with 44% of the collective overall responses over the three questions. This strong preference for self-service applications raises important governance considerations around data protection, user access management, and service quality standards.

Recruitment (20%) and workforce planning (13%) were shown as second and third key areas of importance. These areas, particularly recruitment, demand careful attention to ethical considerations and bias prevention in AI implementations. These would be areas in whichto prioritize experimentation. Within the free text comments of the survey, one participant explained how their own department was looking into a variety of automation processes to sift people at the interview stage. This kind of experimentation, while promising, highlights the need for standardized evaluation criteria and ethical guidelines across departments. It is noticeable that Employee Relations (ER) was the least popular choice throughout, followed by Leadership and OD&D. This is reassuring since these are not common areas for typical AI implementation, suggesting an apparent level of knowledge from respondents. Since every area of the HR function was selected at some point by respondents, it does infer some participants remain unsure about how these technologies could add value. This uncertainty underscores the importance of establishing clear use-case criteria and implementation guidelines. Some real-life applied case studies might be beneficial.

4.5. Benefits

It was important to understand what respondents believed the general benefits of AI technologies were to the HR function. This had mixed responses, which again reinforces the apparent absence of the appropriate level of information to make a judgement. The varying perceptions of benefits suggest a need for more structured benefit realization frameworks and measurement criteria. 'Process improvement' was thought to be the main benefit at 29% and 'efficiency' with 23%. This implies that individuals are thinking of the customer benefits rather than individual gains. While this customer-centric focus is positive, it also indicates a potential gap in understanding the broader organizational impact and transformation potential of these technologies. This presents an opportunity for CSHR to reframe the benefits narrative to focus more on the employee engagement elements (removing mundane routine tasks, focusing on value added work, leading to better job satisfaction, etc.).

The assessment of organizational readiness revealed critical gaps between individual and institutional preparedness. Participants were also asked to assess whether their HR department as well as the CSHR function itself were ready to harness the opportunities presented by cognitive technologies. The results provided a mainly negative response, with 53% of participants either disagreeing or strongly disagreeing with the statement that their HR department was ready to harness the opportunities. A further 24% remained neutral, revealing a collective total of 77% of participants not being directly positive about this position. This significant lack of confidence suggests fundamental governance issues that need addressing. The implication is, therefore, Departments as a collective were perceived not to be ready. 50% of participants disagreed or strongly disagreed that the CSHR Function was ready to harness cognitive technologies, with a further 32% choosing a neutral response. Revealing 82% do not feel positive about this position, perceiving CSHR to be less ready than the other Departments. This perception gap between central and departmental readiness indicates a need for more coordinated preparation and implementation strategies.

4.6. A good next step for CSHR

All 305 participants were asked what they would consider to be the next best step to advance the progress of cognitive technologies within CSHR. A Word Cloud helped us to understand the most frequent/key words and terminologies presented within the question (Figure 1). The bolder the word, the more times it occurred within the responses. After ignoring

the expected words such as cognitive/technologies/technology, the next four commonly used words were understanding 12%, benefits 12%, people 11% and awareness 10% (Appendix B). This pattern reveals a critical insight into organizational priorities - the focus on understanding and awareness over technical implementation suggests a recognition of the need for foundational governance structures before technical deployment. The emphasis on 'people' alongside 'benefits' indicates a desire for balanced implementation that considers both human and operational factors.

Figure 1: A good next step - Word Cloud

A need to build capability and upskill the community is a very strong theme emerging from the responses to this question, which should include a greater understanding of costs and opportunities. This capability gap represents a significant governance challenge - without standardized competency frameworks and training protocols, departments risk inconsistent implementation approaches. One participant noted what was needed was a *"clear explanation of what that functionality is (what it does) and what it would take to implement (cost and cultural requirements) ...until then it'll never be more than a dreamy theoretical conversation with so many ifs and buts to be of any use." This insight highlights the need for practical, structured implementation frameworks that address both technical and cultural dimensions.*

Increased investment, use of 'proof of concepts' and case studies were deemed useful interventions to help encourage experimentation and implementation, critically to take place

both inside and outside of 'Whitehall' based locations. This geographical consideration raises important governance questions about ensuring consistent standards across diverse locations while allowing for local adaptation. Creating a 'HR Centre of Expertise' was thought to be important. *"Establish a network of actively interested/skilled practitioners to share what is being worked on in departments. Possibly have a dedicated function within HR to lead and promote best practice."* This suggestion for centralized expertise indicates recognition of the need for coordinated governance structures.

The practical experience shared by one respondent - *"In my own department we are currently introducing chatbot technology for answering routine employee questions and for directing people via the intranet to appropriate answers. We are looking at various automation processes for sifting people at interview stage. I am heavily engaged in looking at future work design as a result of technology change in my sector (transport) e.g. the impact of driverless trains autonomous vehicles drones etc."*

There was a cautionary note from another, "*Cognitive technology needs to be considered alongside other technology enhancements being considered to give a joined-up approach*". This observation points to the need for integrated technology governance frameworks that consider the entire digital ecosystem. Practically, effective and accurate data management processes were thought to be an essential foundation. The warning about "garbage in garbage out" syndrome underscores the critical importance of data governance and quality standards as foundational elements of successful implementation. *"We would have to ensure that we have reliable data for any automated process to use otherwise we risk 'garbage in garbage out' syndrome whereby we efficiently automate processes that subsequently reach entirely incorrect conclusions because the inputs are erroneous"*. Appropriate employee engagement was deemed imperative. "*Excite people show what is possible at the top end of the technology. Show what the technology could be doing in 5 years' time. Get people passionate and enthused about its potential benefits."* This will be particularly crucial since one participant to the question about advancing cognitive technologies within CSHR replied "*Not sure we should*." This may reflect some automation anxiety which exists. *"You need to tell people what jobs will be lost and when you expect them to go so that they can make informed choices about their futures."*

4.7. Free text

The 13% response rate to the free text question revealed important insights about

organizational readiness and risk perception. The observation that the CS is not typically an "early adopter" as they cannot "afford to take those risks" reflects a deeper governance challenge - balancing innovation with responsible risk management. This risk-averse culture, while potentially protective, could also hinder necessary technological advancement if not properly managed through appropriate governance frameworks.

The contrasting aspiration of "Let's be brave and ambitious!" against concerns about risk, highlights the need for governance structures that enable innovation while maintaining appropriate controls. The perception that "technology is not the answer to all our problems" alongside views that it "would greatly assist employees" reveals a nuanced understanding of technology's role that should inform governance approaches.

The emphasis on "bringing all departments up to the same speed" highlights the critical governance challenge of ensuring consistent implementation across a complex organization. This becomes particularly important when considering ethical implications, as noted in academic literature. The need to address job displacement concerns while promoting innovation requires carefully crafted governance frameworks that balance technological advancement with employee welfare.

These varied perspectives underscore the importance of developing comprehensive governance structures that address not just technical implementation, but also change management, ethical considerations, and employee engagement. The findings suggest that successful implementation will require a balanced approach that considers both opportunities and risks, while ensuring appropriate controls and standards are in place.

5. Conclusion

5.1. Discussion and Conclusion

In the rapidly evolving landscape where cognitive technologies intersect with HR functions, this study aimed to ascertain the Civil Service HR's readiness to capitalize on the opportunities that such technologies present. Reflecting on the identified objectives, the study uncovered pivotal insights into the integration, governance, and potential future trajectory of digital platforms in the realm of HR.

The research concludes that, while individual departments demonstrate varying levels of maturity regarding cognitive technology integration, there is a collective imperative to strengthen governance and responsibly utilize digital platforms. HR professionals must emerge as advocates and orchestrators of change, guiding the Civil Service towards an inclusive and

strategically aligned adoption of AI. The efficacy of these digital platforms in HR will rely on a governance structure that upholds ethical standards, maintains public trust, and ensures that the Civil Service remains at the forefront of innovative workforce management.

The novelty of this research lies in its focused examination of cognitive technology readiness within the UK Civil Service HR function, an area that has been underexplored in prior literature. The findings reveal nuanced insights into the current landscape, ambition levels, and preparedness of CSHR in harnessing these technologies. Notably, the study highlights the discrepancy between individual readiness and organizational readiness, emphasizing the need for targeted upskilling and engagement initiatives.

5.1.1. Current Landscape of Cognitive Technologies in HR

The heterogeneous adoption of cognitive technologies within HR suggests a nascent, albeit growing, appreciation for the transformative capabilities of these tools. The focal use in recruitment and self-service underscores a movement towards digital platforms that augment efficiency and personnel development. However, this engagement is still in its embryonic stage, especially when compared to global counterparts, such as those in Tokyo. The UK Civil Service must not only foster technology-driven efficiencies but also establish governance frameworks that ensure responsible and ethical use. A robust governance model must be instituted to oversee the integration of AI into HR functions, one that anticipates and pre-empts the displacement of human labour and mitigates potential inequalities.

5.1.2. Ambition in the Use of Cognitive Technologies within HR/CS

The literature review reveals a conspicuous scarcity of public sector publications delineating ambitions or definitive plans for cognitive technology integration within the CSHR or broader Civil Service. Whilst some UK HR departments are contemplating cognitive technologies in very innovative ways, we found minimal academic literature available in the public domain written by government authors that outlines the aspiration or clear plans for adoption within the CSHR Function or the broader CS itself.

Whilst the CS Workforce Plan (2016-2020) refers to technology in its broadest sense, as part of data and digital changes, it does not specifically reinforce the use of cognitive technologies. Unsurprisingly, there is much written by consultancy firms and press organizations indicating how government and the public sector might look, along with the accompanying myths and hypes related to significant job losses and threats to jobs *"... Robots could replace 250,000 public sector workers by 2030"* (Information Age, 2017 para 4). This

gap is notable despite governmental rhetoric hinting at a future automated bureaucracy. While the CS Workforce Plan discusses technology, it does not distinctly advocate for cognitive technologies, in stark contrast to narratives from consultancy firms and media outlets that prognosticate substantial public sector job losses due to automation.

The findings highlight an urgent need for the Civil Service to articulate a clearer and more cohesive governance strategy on the use of digital platforms in HR. This strategy should outline not only the adoption of cognitive technologies but also the governance protocols, ensuring accountability, transparency, and ethical use.

5.1.3. Preparedness for Cognitive Technology Emergence in HR

The readiness of the HR Function for cognitive technology proliferation is evidently lacking. To rectify this, a concerted effort in upskilling the CSHR community is imperative. Furthermore, the creation of robust governance policies is critical to steer the deployment of these technologies on digital platforms. These policies should define the scope of AI use within HR, align with ethical standards, and safeguard data privacy. The presence of advanced cognitive tools such as chatbots within other Civil Service sectors underscores the urgency for CSHR to leverage existing technical expertise, develop an integrated communication strategy, and foster a digital platform governance ethos.

The research concludes that while individual departments demonstrate varying levels of maturity regarding cognitive technology integration, there is a collective imperative to strengthen governance and responsibly utilize digital platforms. HR professionals must emerge as advocates and orchestrators of change, guiding the Civil Service towards an inclusive and strategically aligned adoption of AI. The efficacy of these digital platforms in HR will rely on a governance structure that upholds ethical standards, maintains public trust, and ensures that the Civil Service remains at the forefront of innovative workforce management. CSHR's window to establish a governance model that resonates with the dynamism of digital platforms and the exigencies of ethical AI integration is narrow; it is incumbent upon them to act with alacrity to remain ahead of the curve.

5.2. Research contributions

5.2.1. Theoretical contributions

This research makes substantial theoretical contributions to the academic understanding of cognitive technology adoption in public sector organizations, particularly in the context of HR transformation. A significant theoretical contribution lies in the extension and modification

of the Technology Acceptance Model (TAM) framework. Building upon Davis's (1989) original TAM and its subsequent iterations (TAM2 and TAM3), this research advances theoretical understanding by adapting the recent Intelligent Systems Technology Acceptance Model (ISTAM) to the specific context of public sector HR functions.

The study's theoretical framework extends ISTAM by incorporating two crucial modifications that enhance its applicability to pre-implementation scenarios in public sector organizations. First, it introduces a dual-level analysis that considers both individual user acceptance and functional organizational readiness, addressing a significant gap in existing technology acceptance theories. Second, it adapts the model to pre-implementation contexts by focusing on perceived usefulness and transparency, recognizing the limitations of assessing ease-of-use before actual implementation. This theoretical advancement provides a more nuanced understanding of technology readiness in public sector contexts, particularly where cognitive technologies have not yet been fully deployed.

The research's theoretical contribution is particularly valuable in its integration of transparency as a critical dimension in cognitive technology adoption. Building upon the work of Vorm and Combs (2022) and supporting evidence from studies by Luo et al. (2022) and Lee and See (2004), this study demonstrates how transparency and trust interact with traditional technology acceptance factors in the public sector context. This theoretical insight helps explain why conventional approaches to technology adoption may need modification when applied to public sector contexts, particularly in areas involving artificial intelligence and cognitive technologies.

Furthermore, this research advances theoretical understanding of the interplay between technological capability and organizational culture in public sector digital transformation. The modified theoretical framework developed through this study provides new insights into how institutional characteristics unique to civil service organizations influence their approach to technological advancement. By examining the intersection of institutional theory and technological innovation, the study reveals important theoretical insights about the tension between traditional public sector values and the imperative for technological advancement.

The research makes a significant contribution to the academic and practical understanding of governance and digital platform integration with cognitive technologies in the CS, particularly within the CSHR sector. This contribution is paramount given the stark paucity of literature focused on the nuanced application of such technologies in the UK CS context. The

theoretical framework developed through this research provides a foundation for understanding how public sector organizations can effectively evaluate and prepare for cognitive technology adoption while maintaining their commitment to public service values and ethical governance.

Additionally, the research enriches theoretical understanding by considering the role of digital platforms as conduits for cognitive technology implementation within the CS. The study's theoretical framework illuminates the complex relationship between governance structures, organizational culture, and technological innovation in public sector contexts. This advancement in theoretical understanding is particularly valuable given the growing importance of ethical considerations in public sector digital transformation.

These theoretical contributions not only advance academic understanding but also provide a robust foundation for practitioners working to implement cognitive technologies in public sector contexts. The modified ISTAM framework developed through this research offers a practical tool for assessing and preparing for cognitive technology adoption, whilst maintaining the necessary focus on transparency and trust that is crucial in public sector implementations.

5.2.2. Practical contributions

The practical implications of this research are substantial and multifaceted, building upon the theoretical foundations established through our modified ISTAM framework. The research enriches the debate by considering the role of digital platforms as conduits for cognitive technology implementation within the CS. By doing so, it brings to the fore the potential of digital platforms to revolutionize HR services through enhanced data analytics, machine learning capabilities, and automated processes, while also critically examining the imperative of maintaining human oversight and ethical considerations in these technological interactions.

The study's findings, viewed through the lens of our modified ISTAM framework, provide practical guidance for organizations navigating the early stages of cognitive technology adoption. The emphasis on transparency and perceived usefulness, rather than just ease of use, offers practical insights for change management strategies in public sector organizations. This is particularly relevant for HR practitioners who must balance the potential benefits of cognitive technologies with the need to maintain trust and transparency among stakeholders.

For individuals interested in joining the CS or exploring the impact of cognitive technologies, this research serves as a crucial resource that sheds light on the internal perspectives and operational challenges within the CS domain. The findings demonstrate how the theoretical dimensions of transparency and perceived usefulness manifest in practical

implementation challenges, providing valuable insights for change management strategies. Furthermore, other public and private sector organizations can leverage the insights provided to gauge the sentiment and readiness of their workforce concerning the integration of cognitive technologies within their respective HR practices.

The practical application of our modified theoretical framework also reveals important considerations for governance structures. The study underscores the importance of establishing governance frameworks that are both agile and comprehensive in addressing the risks and opportunities of cognitive technology deployment. These practical insights are particularly valuable given the unique challenges faced by public sector organizations in maintaining transparency while driving technological innovation.

Finally, this study provides a unique and unbiased external perspective on key issues surrounding the integration of cognitive technologies into the HR function. By injecting personal insights into the ongoing dialogue, it contributes to a more nuanced understanding of the governance and utilization of digital platforms, thereby enriching the narrative and assisting stakeholders in navigating the complexities of this transformational journey. The combination of theoretical advancement and practical insights provides a comprehensive foundation for organizations seeking to implement cognitive technologies while maintaining public trust and organizational effectiveness.

The practical contributions of the work extend to the development of implementation strategies that account for both the individual and organizational readiness factors identified in our theoretical framework. These insights help organizations better understand and address the gap between individual acceptance and organizational preparedness, providing practical guidance for developing targeted interventions and support mechanisms. This dual-level understanding, grounded in our modified ISTAM framework, offers practical tools for organizations to assess and enhance their readiness for cognitive technology adoption while maintaining their commitment to transparency and public service values.

Through these theoretical and practical contributions, this research not only advances academic understanding but also provides actionable insights for practitioners navigating the complex landscape of cognitive technology adoption in public sector organizations. The findings suggest that successful implementation requires a carefully balanced approach that considers both theoretical frameworks and practical realities, particularly in the context of public sector HR functions.

5.3. Research limitations

In conducting this research, we remained external to the organization and were not, therefore, privy to internal strategic discussions around the implementation of cognitive technologies within the CS, thus potentially hindering the validity of the study. The primary focus of this research did not concentrate on international HR departments or equivalent government organizations across the world. This research is only valid therefore within the UK CS context. There always remains a possibility that, despite the survey being anonymous, participants may not have answered the questions accurately. This may be due to employees being concerned about a perceived risk between cognitive technology and roles being potentially displaced, meaning they responded to the questions more optimistically rather than their actual belief. Even though this was a possibility, Labott et al (2013) argues surveys actually helps communication within organizations, enhancing new insight for people as well as reports in improvements in health and the aiding of others.

Despite this study contributing to closing the gap in the literature,the CS encompasses a huge range of business areas and disciplines, so further research would provide a more rounded assessment of the current landscape. Many participants who responded to this research were not aware of what cognitive technologies were or what value they provided. This indicates more upskilling/training needs to take place to inform and educate. Once this position is addressed, revisiting this survey with similar questions would provide a measure of progress and be of benefit to the organization. This way, correlations and differences can be identified between the two surveys, providing clear outline for areas of further focus and priority. More in-depth studies could also be carried out to determine the impact of implementing such technologies on government policies as well as workplace happiness.

References

Braun, V. and Clarke, V. (2017). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), pp.77-101.

Brynjolfsson, E. and Mitchell, T. (2017). What can machine learning do? Workforce implications. *Science*, 358(6370), pp.1530-1534.

Carrillo, M. R. (2020). Artificial intelligence: From ethics to law. Telecommunications Policy, 44(6), 101937.

Chace, C. (2015). *Surviving AI*. 1st ed. Three Cs, pp.170.

Chatila, R., Firth-Butterflied, K., Havens, J. and Karachalios, K. (2017). The IEEE Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems [Standards]. *IEEE Robotics and Automation Magazine*, 24(1), pp.110-110.

Cheng, X., Cohen, J., & Mou, J. (2023). AI-enabled technology innovation in e-commerce. Journal of Electronic Commerce Research, 24(1), 1-6.

Chelliah, J. (2017). Will artificial intelligence usurp white collar jobs? *Human Resource Management International Digest*, 25(3), pp.1-3.

Christopher, S. et al (2008). Building and Maintaining Trust in a Community-Based Participatory Research Partnership. *American Journal of Public Health*, 98(8), pp.1398-1406.

Civil Service Workforce Plan (2016 – 2020). *Civil Service Crown Copyright*, pp.2-23. Available at: https://www.gov.uk/government/publications/civil-service-workforce-plan-2016-to-2020 [Accessed 10 Apr. 2019]

Cunningham, D. (2016). Applying AI. 39(4), pp.11-12.

Davenport, T. and Kirby, J. (2016). *Only humans need apply*. 1st ed. New York: HarperCollins Publishers, pp.11-32.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319–340. https://doi.org/10.2307/249008

Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., ... & Williams, M. D. (2021). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. International Journal of Information Management, 57, 101994.

Ekandjo, T., Cranefield, J., & Chiu, Y. T. (2023). HUMAN-AI COLLABORATION IN EVERYDAY WORK-LIFE PRACTICES: A COREGULATION PERSPECTIVE.

Fernandes, T., & Oliveira, E. (2021). Understanding consumers' acceptance of automated technologies in service encounters: Drivers of digital voice assistants' adoption. Journal of Business Research, 122, 180-191.

Ford, M. (2015). *Rise of the Robots*. 1st ed. St Ives, England: Oneworld Publications, pp.220-234.

Frank, M., Roehrig, P. and Pring, B. (2017). Book Highlight-Your New Raw Materials: Data Is Better Than Oil. *Global Business and Organizational Excellence*, 36(3), pp.64-72.

Greer, C. R. (2021). Strategic human resource management. Pearson Custom Publishing.

Gyton, G. and Jeffery, R (2017) 'AI and HR', *People Management*, CIPD Enterprises Ltd, August, pp.24-28.

Ibáñez, J. C., & Olmeda, M. V. (2022). Operationalising AI ethics: how are companies bridging the gap between practice and principles? An exploratory study. AI & SOCIETY, 37(4), 1663-1687.

Information Age (2017). *Robots will be running the UK Government, says Chancellor.* [online] Available at: http://www.information-age.com/robots-running-uk- government-chancellor-123468548/ [Accessed 28 Mar. 2019].

Institute for Government (2017). *Whitehall Monitor 2017: Government doing too much as it prepares for Brexit.*

Janiesch, C., Zschech, P., & Heinrich, K. (2021). Machine learning and deep learning. Electronic Markets, 31(3), 685-695.

Kasparov, G. (2017). *Deep Thinking: Where Machine Intelligence Ends and Human Creativity Begins.* 1st ed. Croydon, England: John Murray, pp.222-248.

Kolade, O., & Owoseni, A. (2022). Employment 5.0: The work of the future and the future of work. Technology in Society, 102086.

Kopalle, P. K., Kumar, V., & Subramaniam, M. (2020). How legacy firms can embrace the digital ecosystem via digital customer orientation. Journal of the Academy of Marketing Science, 48, 114-131.

Labott, S., Johnson, T., Fendrich, M. and Feeny, N. (2013). Emotional Risks to Respondents in Survey Research: Some Empirical Evidence. *Journal of Empirical Research on Human Research Ethics*, 8(4), pp.53-66.

Lee, J. D., & See, K. A. (2004). Trust in automation: Designing for appropriate reliance. Human Factors, 46(1), 50–80. https://doi.org/ 10.1518/hfes.46.1.50_30392

Leonhard, G. (2016). *Technology vs. humanity*. 1st ed. United Kingdom: Fast Future, pp.70-106.

Lindzon, J. (2017). *Welcome To The New Era Of Human Resources | Fast Company*. [online]

Fast Company. Available at: https://www.fastcompany.com/3045829/welcome-to-the-new-era-of-human- resources [Accessed 23 Oct. 2018].

Luo, R. Du, N. Yang, X. (2022) Evaluating Effects of Enhanced Autonomy Transparency on Trust, Dependence, and Human-Autonomy Team Performance over Time, International Journal of Human–Computer Interaction DOI:10.1080/10447318.2022.2097602 **38**:18-201962-1971

Makridakis, S. (2017). The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms. *Futures*, 90, pp.46-60.

McIntyre, N. (2017). *Government will invest £20m in robots and artificial intelligence.* [online] The Independent. Available at: http://www.independent.co.uk/news/uk/home-news/government-digital-strategy-technology-robotics-artificial-intelligence-investment-a7600046.html [Accessed 8 Nov. 2018].

Nowell, L et al (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods,* 16(1), pp.1-13

Oliveira, F., Kakabadse, N., & Khan, N. (2022). Board engagement with digital technologies: A resource dependence framework. Journal of Business Research, 139, 804-818.

Osborne, J. (2013). *Best practices in data cleaning*. Thousand Oaks, Calif.: SAGE, pp.8-9.

Parliament UK (2017), *Lords Select Committee, 'What should the Government do about Artificial Intelligence?'* Available at: https://www.parliament.uk/business/committees/committees-a-z/lords-select/ai-committee/news-parliament-2017/education-and-government-ministers-session/ [Accessed 8 Nov. 2018]

Potapov, A. and Rodionov, S. (2014). Universal empathy and ethical bias for artificial general intelligence. *Journal of Experimental and Theoretical Artificial Intelligence*, 26(3), pp.405-416.

Powers, D. and Powers, A. (2014). The incremental contribution of TOEIC® Listening, Reading, Speaking, and Writing tests to predicting performance on real-life English language tasks. *Language Testing*, 32(2), pp.151-167.

Rahman, M. (2016). The Advantages and Disadvantages of Using Qualitative and Quantitative Approaches and Methods in Language "Testing and Assessment" Research: A Literature Review. *Journal of Education and Learning*, 6(1), pp.102.

Rutter, T. (2017). People's Republic of Whitehall. *Civil Service World*, (271), pp.24.

Schultz, C. and Walt, H. (2015). *Reinventing HR: Strategic and Organizational Relevance of the Human Resources Function*. 1st ed. Randburg, South Africa: Knowres Publishing, pp.113-125.

Schwab, K. (2016). *The Fourth Industrial Revolution*. 1st ed. Geneva, Switzerland: World Economic Forum, pp.34.

Sourdin, T., Burke, T., & Li, B. (2019). Just, quick and cheap?: Civil dispute resolution and technology. Macquarie Law Journal, 19, 17-38.

Spitzer, B. (2014). HR in the Digital Age. *Workforce Solutions Review*, 5(1), pp.15- 17.

Stanley, M. (2017). *Civil Service - Numbers*. Available at: http://www.civilservant.org.uk/information-numbers.html [Accessed 12 Dec. 2018].

Steinruecken, C. (2017). We will have to decide whether to hire humans or machines. *People Management*, May 2017, pp.13.

Stevenson, A. (2010). In: *Oxford Dictionary of English*. Oxford: Oxford University Press, pp.89.

Sturgis, P., Roberts, C. and Smith, P. (2012). *Middle Alternatives Revisited*. Sociological Methods and Research, 43(1), pp.15-38.

Subramaniam, M., Iyer, B., & Venkatraman, V. (2019). Competing in digital ecosystems. Business Horizons, 62(1), 83-94.

Sumser, J. (2017). Artificial Intelligence: Ethics, Liability, Ownership and HR. *Workforce Solutions Review*, 8(3), pp.24-26.

Sun, T. and Miklos, V. (2017). Deep Learning and the Future of Auditing. *Journal of CPA*, pp.24-29.

Susskind, R. and Susskind, D. (2015). *The Future of the Professions*. 1st ed. Oxford, England: Oxford University Press, pp.145-182.

Taffel, S. (2023). Data and oil: Metaphor, materiality and metabolic rifts. New media & society, 25(5), 980-998.

Thiebes, S., Lins, S., & Sunyaev, A. (2021). Trustworthy artificial intelligence. Electronic Markets, 31, 447-464.

Tyagi, A. (2017). Artificial Intelligence: Boon or Bane? *IUP Journal of Computer Sciences*, 11(2), pp.43-56.

Venkatachalam, S. (2017). *Why 2017 is the year of Artificial Intelligence*. [online] Forbes.com. Available at: https://www.forbes.com/sites/forbestechcouncil/2017/02/27/why-2017-is-the-year-of- artificial-intelligence/#a781f1757a1b [Accessed 23 Oct. 2018].

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management Science, 46(2), 186–204. https://doi.org/10.1287/mnsc. 46.2.186.11926.

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. Decision Sciences, 39(2), 39. https://doi.org/10.1111/j.1540-5915.2008.00192.x

Vorm E.S. & Combs, D.Y.J. (2022) Integrating Transparency, Trust, and Acceptance: The Intelligent Systems Technology Acceptance Model (ISTAM), International Journal of Human–Computer Interaction, 38:18-20, 1828-1845, DOI: 10.1080/10447318.2022.2070107

Watson, T (2017). *Report on the Future of Work Commission.* Available at: https://d3n8a8pro7vhmx.cloudfront.net/campaigncountdown/pages/1052/attachments/original/1512946196/Future_of_Work_Commission_Report,_December_2017.pdf

?1512946196 [Accessed 8 Apr. 2019].

Wu, W. (2016). Digital HR: The Business of people is fast becoming the business of bytes. *Workforce Solutions Review*, 7(5), pp.16-19.

Yano, K. (2017). How Artificial Intelligence Will Change HR. *People and Strategy*, 40(3), pp.42-46.

Yuste, R. et al (2017). Four ethical priorities for neurotechnologies and AI. *Nature*, 551(7679), pp.159-163.

Appendix A: Survey

Cognitive Technologies (an umbrella term for Robotic Process Automation, Artificial Intelligence, Machine Learning, etc).

1. I am familiar with the concept of Cognitive Technologies

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

2. I am satisfied I have sufficient knowledge about what Cognitive Technologies can generally do

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

3. I agree Cognitive Technologies could be helpful to CSHR

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

4. I agree the HR function in the Civil Service has the right expertise to help effectively implement Cognitive Technologies

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

5. I feel comfortable being able to contribute to any potential Cognitive Technologies debate/discussion connected with the HR function

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

6. I am aware of what my department is exploring in relation to Cognitive Technologies

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

7. I think the main areas of HR where Cognitive Technologies could have the most positive impact are: (Rank your top 3)

ER	Wellbeing	Talent	Recruitment	Self Service
Workforce Planning	ODandD	Learning	Leadership	Engagement

8. I think the main benefit of cognitive technology is: (Select one)

Employee engagement: Increasing staff engagement by reducing routine and repetitive work	**Compliance:** Better accuracy in our data, reducing error	**Employee satisfaction:** Allowing opportunities for HR to focus on more strategic valued added work	**Process Improvement:** Enhancing our performance – speed and quality of work	**Accuracy:** More consistent and better decision making
Efficiency: Improved customer service and access to information 24/7	Other (Free Text):			

9. I think the main barrier or risk associated with any introduction of cognitive technologies to the HR function in the Civil Service is: (Select one)

Culture	Employee Engagement	Employee Relations	Nature of our work	Stakeholders
Timing	Current Government Agenda	Skills	Cost	Other

10. I believe my HR Department is ready to harness the opportunities presented by Cognitive Technologies

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

11. I believe that the HR function in the Civil Service is ready to harness the opportunities presented by Cognitive Technologies

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

12. As part of the HR function, I am ready to harness the opportunities presented by Cognitive Technologies

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

13. What would you consider to be the next best step to advance the progress of cognitive technologies within CSHR?

14. Any other comments

About you (optional)

15. What is your primary HR related job role? (Select one)

HRBP	HRD	Talent	Recruitment	HR Ops
Workforce Planning	ODandD	Learning	Leadership	Other

16. What department do you work in? (Select one)

Prime Minister's Office	Attorney General's Office	Cabinet Office	Department for Business, Energy and Industrial Strategy	Department for Communities and Local Government
Department for Digital, Culture, Media and Sport	Department for Education	Department for Environment, Food and Rural Affairs	Department for Exiting the European Union	Department for International Development
Department for International Trade	Department for Transport	Department for Work and Pensions	Department of Health	Foreign and Commonwealth Office
HM Treasury	Home Office	Ministry of Defence	Ministry of Justice	Northern Ireland Office
Office of the Advocate General for Scotland	Office of the Leader of the House of Commons	Office of the Leader of the House of Lords	Office of the Secretary of State for Scotland	Office of the Secretary of State for Wales
UK Export Finance	HMRC	Other		

17. How long have you worked in HR?

0-12 months	1-3 years	3-5 years	5-10 years	10 years+

18. How long have you worked in the Civil Service?

0-12 months	1-3 years	3-5 years	5-10 years	10 years+

Appendix B: World Cloud (frequency of words)

	A	B	C
1			
2		word	freq
3		technologies	33
4		cognitive	31
5		technology	20
6		understanding	15
7		benefits	15
8		people	14
9		awareness	13
10		can	12
11		service	11
12		departments	11
13		work	11
14		function	10
15		better	9
16		use	9
17		get	8
18		means	8
19		need	7
20		will	7
21		implement	6
22		knowledge	6
23		upskilling	5

Adoption of AI by the HR function in the civil service

Abstract

The penetration of Artificial Intelligence (AI) technologies into the global workforce brings transformative potential to the governance structures and use of digital platforms in public sector organizations. AI is likely to play a role in the operation of Human Resources (HR) Functions and influence how they might operate in the near future.

This paper uses the Technology Acceptance Model (TAM) to assess the readiness of the HR Function within the UK Civil Service (CSHR)~~,~~ to implement AI to support performance. Academic literature in relation to AI acceptance in HR functions is currently limited, so this paper aims to establish a better understanding of the current landscape and level of ambition in this area.

A quantitative research approach was adopted to determine likely behavioral intentions of workers in the HR function, if AI were ~~adopted~~implemented, by investigating key aspects of the TAM (the perceived usefulness of AI and the transparency of the CSHR in adopting AI). Whilst the results suggest that the CSHR is not ready to harness AI opportunities, employees were personally ready, despite perceiving a lack of sufficient knowledge in this area. The paper identifies that more time needs to be spent on raising awareness and upskilling the HR Function before the CS can be considered fully ready to harness these opportunities.

Keyword: Artificial Intelligence; Civil service; Human resources; Technology Acceptance Model; Capabilities

1. Introduction

The historical constraints of Artificial Intelligence (AI), in terms of limited resources and technology, are rapidly being overcome by new, advanced models adept at interpreting and learning from complex and voluminous datasets (Janiesch et al., 2021). This is enabling AI to become a critical component of the digital ecosystem that permeates our everyday experiences (Janiesch et al., 2021; Kopalle et al., 2020; Subramaniam & Venkatraman, 2019).

Within organizations, AI now has the potential to significantly alter workplace dynamics, amplify productivity, and prompt a re-evaluation of the nature of work in some areas. In some organizations, it is already being used to free up human resource (HR) professionals to focus

on system wide HR issues, since it is believed technology can achieve many of the necessary activities at a cheaper, faster and better rate than a human employee (Kolade & Owoseni, 2022). However, these changes can elicit both organizational and personal anxiety among employees (Ekandjo et al., 2023) and there is a need to ensure that security, accountability, and safety for users and systems are not compromised through the use of AI (Carrillo, 2020).

UK government investment in AI technologies demonstrates a recognition of its potential to streamline public services and contribute to economic growth (Dwivedi et al, 2021). However, public service organizations such as the UK Civil Service (CS) are typically perceived to be slow to respond to change (Sourdin et al., 2019) and there is currently little evidence to understand the readiness such organizations to accept AI, both from the perspective of the organization itself and that of its employees.

Our study, therefore, aims to use a modification of the Technology Acceptance Model (TAM) (Davis, 1989) to critically assess the UK Civil Service's readiness to implement AI within its Human Resources Function (CSHR), specifically in the realm of HR performance enhancement. While some departments have initiated explorations into AI applications, the extent and depth of their commitment to incorporating AI responsibly within HR practices, especially when it comes to governance on digital platforms, remains ambiguous.

To provide a framework to address the research aim, the objectives are:

1) To describe the current landscape of AI within the HR functions of organizations.
2) To understand the level of ambition in the CSHR in this area.
3) To assess how prepared the CSHR is for the emergence of AI and its application to their profession.

This study first discusses and evaluates the existing academic literature on the types of AI technologies already in use in HR, the ethics associated with this and the current environment affecting the CS, along with an overview of appropriate theoretical frameworks used to evaluate readiness of organisations to implement AI effectively. We then conduct a survey of HR employees in the CSHR and review the survey results using exploratory data and thematic analysis. In the final section, an overall conclusion is given, with reference to key contributors, limitations to the study, and causes for further research.

2. Literature Review

2.1. AI and HR

There are three main types of AI supporting business needs. Robotic Process Automation (RPA); Data Analytics using Machine Learning; and Cognitive Engagement and Natural Language Processing through use of intelligent agents and chatbots (Davenport and Ronanki, 2018). Traditionally, HR is perceived as an area that removes itself from the digital world and relies heavily on experience in order to make decisions. Shultz and Walt (2015) reinforce this view through their 'S-curve' management tool to illustrate HR's ~~positon~~position in relation to these current transformative technologies. They conclude HR is in curve one, which will lead to its decline, with curve two indicating the potential that could be obtained if HR were to reimagine themselves. Shultz and Walt (2015) also argue all concepts and strategies have a shelf life and HR have not yet transitioned, instead relying on old processes and operating systems. They argue the use of AI such as cognitive technologies would provide the step change HR needs to remain productive and ultimately future proof.

Despite such a pessimistic assessment, AI is actually already being used across a range of different HR activities. There are applications that sift CVs and use algorithms to supplement or subvert human decision-making (Steinruecken, 2017). *Acuvate* uses HR chatbots to answer frequently asked questions, such as when the next pay day is and the number of day's leave remaining, as well as handing over the power of some decisions to AI, allowing HR to get on with more important strategic tasks (Gyton and Jeffery, 2017). The timeliness of this progress is reflected by the UK's Charted Institute of Personnel and Development's (CIPD) who believe AI-enabled automation is now more significant for HR than ever before as it has the potential to reshape the entire function (Gyton and Jeffery, 2017). Wu (2016) agrees progress is being made, noting that the interaction between HR departments implementing AI is becoming more creative and intuitive rather than structured and daunting. As well as AI providing an opportunity to remove some of the 'boring' tasks HR employees can become disengaged by, it can also improve morale by creating a far more efficient and responsive HR system, allowing for greater innovation and tangible benefits elsewhere (Rutter, 2017).

Yano (2017) expresses doubt on Shultz and Walt's S-curve assumption, citing *Hitachi's* HR department in Tokyo equipping 600 employees across a wide range of fields with AI wearable label sensors. HR developed an AI system which sent daily and personal messages to employee's smartphones with details on how they could optimize each day, including recommended interactions to maximize happiness and productivity. After implementing this system, the results demonstrated that the longer the department used this AI method, employee engagement and revenue levels increased. Similarly, *Satalia* uses machine learning to help

organizations predict customer behavior and they want to make the way it manages people fairer, easier and more efficient when deciding pay awards and even coaching new managers (Gyton and Jeffery, 2017). Yano and others show that AI is being utilized by some HR departments in quite innovative ways, beyond the boundaries of what might be considered traditional HR related processes and tasks. This leads Gibson (2016, citied by Yano, 2017) to reject Shultz and Walt's claim, stating instead that AI is already in use within HR departments and is being applied to address significant challenges but "…*it is just not evenly distributed yet*" (pp 46).

Spitzer's (2014) research found that 75% of current HR leaders believed their organizations were behind, even in the use of internal and external social networking technology. The organizations surveyed primarily relied on traditional recruitment techniques and advertisements on career websites. Only six percent of organizations surveyed were classified as digitally advanced. It remains no surprise that three years later, the *Sierra–Cedar HR Technology Industry* found that fewer than seven percent of the companies who participated in their survey are using, or considering using, machine learning technologies in HR (Sumser, 2017). So, for some HR organizations, AI remains a fairly new concept. Embedding digitization more generally might provide a more solid foundation from which to build. Spitzer believes HR digitalization has been limited due to organizations lacking the systems and processes required but suggests 'digital' can revolutionize the way which HR processes are currently run. Schwab (2016) agrees the lack of correct resource is a critical factor as he states "…*leaders with whom I interact all tell me that they are struggling to transform their organization to realize fully the efficiencies that digital capabilities deliver"* (pp. 34), therefore this is not just specific issue for HR leaders.

Whilst not removing themselves entirely from the AI race, it could be summarized that UK HR teams are progressing at different speeds, with many choosing a less ambitious AI approach. The literature suggests the preference appears to be focusing on using technology to improve existing established and specific HR processes and tasks (Greer, 2021). The risk to this is that HR is not necessarily considering the 'art of the possible' and a total re-imagination of what the function could really look like with integrated AI technologies at its heart. The key is not for HR to think 'we need to do some AI' and then go out looking for a problem. Instead, they need to ask how AI can create value and helpfully impact the organization's business strategy.

2.2. The ethics of AI

Research is broadly optimistic that AI will be good for HR (Gyton and Jeffery, 2017), but the technology itself is generating a huge philosophical debate. There is still a mixture of hype and sensationalism regarding the impact of '*robots*' and the extent to which it will revolutionize how people work. The truth is nobody can be sure (Watson, 2017). The concept of replacing humans ~~by~~with robots in key industries fuels uncertainty and anxiety. There is a view that technology could make inequality worse, unless people are very careful about how policy decisions are made. This has led to some unanswered questions about AI governance such as who will own the 'robots',~~?~~ or whether robots would always make the right decisions? (Tyagi, 2017).

Field experts suggest that humanity as a whole needs to prepare for the socioeconomic side effects arising from emerging technologies as there have been many cases where products/services, when fused with AI, have led to social problems. Examples include a child being injured by a security robot in a shopping center, Microsoft's chat boy 'Tay' with malicious behavioral learning and the death of an individual involved with Tesla's self-driving car (Lee and Park, 2017). Ford (2015) believes more needs to be done and has indicated that concerns for AI are so high within the scientific community, that a number of small organizations have been set up purely focused on analyzing the dangers ~~affiliated~~ associated with ~~AI~~it. These organizations are investigating how they can build 'friendliness' into AI systems of the future. It is clear that appropriate governance will ultimately be crucial. Kingston (2017) plays down the fear factor of AI. He states that it is humans creating robots, so they should be designed with an 'off' switch to ensure they do not have overall operational control. As long as there is someone who has the ability to override the machine's activities, he considers AI will be beneficial to the economy ~~while~~ whilst still remaining ethical. To prevent future issues, as well as being able to fully benefit from the potential offered, Chatila et al (2017) believes it remains important to ensure all technologies are aligned to human ethical beliefs and moral values. This is obviously easier said than done. Davies (2015) believes machines achieving intelligence is the easy part, but giving a computer an ethical point of view is near impossible. Davies indicates that installing ethics into an AI system is "…a research challenge worthy of some of the next generation's best mathematical talent" (pp 122).

Yuste et al (2017) expands this view, claiming that the existing guidelines on ethics such as the 'Asilomar Artificial Intelligence Statement of Cautionary Principles', published in 2017, signed by business leaders and AI researchers, is inadequate. If more is not done, then technology could aggravate social inequalities, especially those in developing countries. This

is partly due to a lack of investment in expensive AI technologies which will ultimately disadvantage these countries, reducing the demand for human labour and decreasing employability (Makridakis, 2017). Ultimately, Gyton and Jeffery (2017) believe HR will have a crucial role in the future of AI and ~~will~~ be required to help make some of those moral and ethical decisions, such as if and when to automate, whether to reskill or redeploy the human workforce, and influencing resourcing decisions. The implications mean ~~that~~ it is unlikely that the skills that HR professionals need today, will be the same as those needed tomorrow.

2.3. UK civil service

In March 2013, the CS workforce comprised 448,835 employees. By June 2016, this figure had fallen to 384,000 but steadily began to rise to 392,000 by the end of March 2017 (Stanley, 2017). This increase is likely to be the reflection of recruitment following the UK's decision to leave the European Union (EU). Despite this slight growth, the CS has been at its smallest since the Second World War. Since 2010, the workforce has gradually become older and more concentrated in London. This potentially builds both a demographic and geographical challenge. The CS Workforce Plan (2016) highlights how the organization has aided in transforming the way the Government operates, improving the quality and efficiency of their services. For example, two of the biggest operational departments have seen significant technological improvements. HMRC has already automated the mail processing system, allowing their resources to be redeployed elsewhere. The Department for Work and Pensions have digitized Universal Credit, transforming the way welfare services are delivered to the public. Efficiency and effectiveness remain at the top of Government's agenda (Susskind and Susskind, 2015). They are working to create an environment across the UK that is receptive to adopting automation (Watson, 2017), whilst increased investment from the government will improve available technology (Loughran, 2017).

Such initiatives make it easier for CS departments to choose how and when to automate. The CS, and more notably HMRC, are actually 'stepping in' with AI rather than shying away from it. Davenport and Kirby (2016) believe they are "…engaging with the computer system's automated decisions to understand, monitor and improve them" (pp. 77). How involved all CS employees are in this technological transformation is less clear. There is ~~not a~~no published AI Strategy or clear narrative, other than the CS Workforce Plan (2016), which fails to articulate in any great depth the pace or scale of their technological ambition. It references a desire to "… harness the power of the revolution in digital technology that is sweeping the world ... [this] is both a challenge and an opportunity." (pp.2). Kasparov (2017) believes it is critical

that the CS focuses on augmenting AI, as this will combine the strengths of humans and robots, enhancing human decision making. Rupert McNeil, the Government Chief People Officer agrees (Rutter 2017), noting that the future is as much about people as technology. To engage people in the topic he has personally driven a series of seminars with senior staff to explore cognitive technology which he believes "will make jobs more interesting and more empowering." (ibid pp.24).

This type of employee engagement is important as research suggests a clear correlation between salary earned by an employee and apprehension of AI, with 'white collar' workers most worried about the impact of AI on their organization. (Tyagi, 2017). This may be due to research conducted by Oxford University which showed that of 702 occupations assessed, CS areas were the most likely to see the biggest impact from AI, following advancements in machine learning and mobile robotics (Chelliah, 2017). The Future of Work Commission (Watson, 2017) offers a reminder of the scale of the challenge, indicating that technology brings vast potential to change the future of work for all UK citizens and that, currently, the country is underprepared for the change.

2.4 Theoretical framework for user readiness and acceptance of AI

As we have seen, the potential for AI in HR functions is significant but, so far, the CSHR function, amongst others, appears to be lagging behind in its implementation and use. To attempt to understand this we can look to theories around technology acceptance and change.

The Technology Acceptance Model, or TAM, (Davis, 1989) is the most prevalent model theorizing the likelihood of technology being implemented. In its original form, it suggested that perceived usefulness and ease of use of new technologies were the key factors that could explain the behavioral intentions of the potential users. Since then, there have been 2 significant updates to the TAM. The first of these (TAM2) identified the determinants of perceived usefulness (Venkatesh & Davis, 2000). TAM3 incorporates the determinants of perceived ease of use (Venkatesh and Bala, 2008).

More recently, a new version of the TAM has been developed, the ISTAM, extending its scope to incorporate transparency as a new dimension required when implementing intelligent systems such as AI (Vorm and Combs, 2022). The dimension of transparency is based on the concept of building trust with users about the technology itself and the way it will be used, with the focus being to ensure access to information about the new technology.

Whilst this newly developed ISTAM framework is largely untested, the theoretical

arguments for inclusion of transparency in AI type technology implementations are clear and there is strong evidence that trust and transparency are important in the acceptance and use of technology (e.g. Luo et al, 2022, Lee and See, 2004).

A key limitation of the TAM/ISTAM is that its main value is in measuring the acceptance of technology that has already been implemented. However, within the CSHR function AI is not yet being used. Whilst it is possible to evaluate the readiness of users to accept new technology by considering its perceived future usefulness and focusing on transparency in developing and implementing the technology as well as using it, it is difficult to measure ease of use prior to implementation. Further, the TAM/ISTAM focuses on behavioral intentions of users, rather than a whole business function. We posit that these need to be considered separately, even whilst being measured in the same way.

Therefore, to adequately understand readiness of the CSHR function to adopt AI, we propose 2 modifications to ISTAM; firstly, it needs to include both the behavioral intention of the users and the function itself in terms of intention to implement the new technologies. Secondly, we will not be able to consider ease-of-use ahead of implementation, so will need to understand perceived usefulness and transparency only (figure 1).

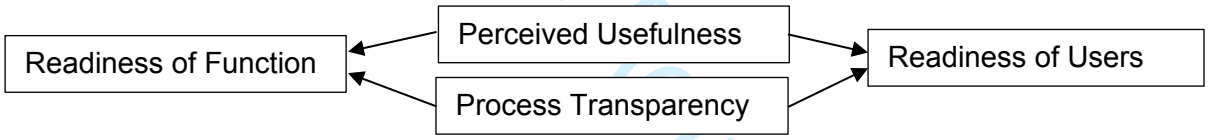

Figure 1: Framework for Technology Readiness for Adoption in CSHR

The implications of this study for exploring the value of AI in organizations are manifold; firstly, it serves as a crucial resource that sheds light on the internal perspectives and operational challenges within the CS domain. Furthermore, other public and private sector organizations can leverage the insights provided to gauge the sentiment and readiness of their workforce and functions concerning the integration of AI within their respective HR practices. Finally, this study provides a unique and unbiased ~~perspective~~view from an outside perspective on key issues surrounding the integration of AI into the HR function. By injecting personal insights into the ongoing dialogue, it contributes to a more nuanced understanding of the governance and utilization of digital platforms, thereby enriching the narrative and assisting stakeholders in navigating the complexities of this transformational journey.

3. Methodology

3.1. Research Design

Our research ~~remained~~ is solely exploratory focused, consisting of a semi-structured questionnaire to members of the HR Function in the CS. This type of research is particularly advantageous when it comes to clarifying our understanding of the scenario, particularly when they are unsure of the current employees' point of view in relation to the topic in question; ~~–~~ AI technologies. The surveys used for this research were self-completed questionnaires (referred to as surveys) which were distributed to the professional contact across a range of HR teams positioned throughout the CS in various HR disciplines (both workers and managers). Before getting to the stage of survey distribution, it was crucial for us to negotiate access to the organization and, more importantly, gain a sense of trust among the workforce to ensure they were able to participate meaningfully (Christopher et al, 2008). In this case, our research team, as a third-party member, worked within the CS ~~,~~ and they supported us in gaining access to the organization, ensuring data collection could commence.

The survey was designed with two sections. Section one contained 18 questions. They were primarily closed questions but included two open questions to help us make easy comparisons to relate back to the third objective. The closed questions focused on the framework developed through the literature review, focusing on capturing participant's perceptions of the usefulness of AI technologies and the transparency of the organization in its consideration of participant's familiarity/knowledge of cognitive technologies. This included questions about how helpful these technologies could be, their perceptions about whether the CS has the right expertise, barriers to implementation, the main areas of HR where cognitive technologies could have the most positive impact and, ultimately, whether the participants/CS are ready to harness the opportunities presented. List and ranking questions were used to ensure participants considered all possible predetermined responses, but ultimately a preferred choice was made to identify the option that was of most relative importance to them.

The open questions solely focused on what the respondents believed to be the next best step to advance the progress of cognitive technologies within CSHR, followed by any additional comments they wished to make. This was designed to encourage participants to think about their responses before answering, ensuring the data collected was attitudinal and opinion based. The second section consisted of four closed questions to establish personal participant

information regarding job role and length of time working within HR, etc. These factual and demographic variables were readily available to the respondents and are likely to be accurate. Before the survey went live, ~~an important~~a pilot ~~test~~ was conducted to ensure participants would not have access issues, problems answering or recording the data. It was also useful to gauge whether the concept we wanted to explore was actually measured in the design and construct of the questionnaire (Saris and Gallhofer, 2014). The live survey was available online for three weeks, in order to get the highest response rate possible. The final number of survey participants totaled 305, representing approximately 77% of the contacted population. Due to 82 of these respondents being identified as incomplete (due to being left blank), we had 223 completed surveys to analyze. This adequate response rate helped us to avoid using misleading statistics and therefore made the results more valid to reflect CSHR as a whole.

3.2. Data analysis

As the majority of the survey questions had fixed responses, it was necessary for us to use exploratory data analysis to gain an understanding/insight from the results. As the survey had qualitative aspects, descriptive thematic analyses were also used. Braun and Clarke (2006) prescribed a six-phased method that identifies, organizes and reports themes from the dataset using thematic analyses. Essentially, the phases allowed us to familiarize ourselves with the data, enabling ~~them to produce~~the production of codes that categorize highlighted themes, or in this case, phrases. Only ~~until~~ when this was presented, through ~~software such as~~ 'Word Cloud' software, could the researchers interpret the emerging patterns. This approach ~~was~~ is useful when wanting to delve into the perspectives of different participants, highlighting the most common phrases used and producing unforeseen insights (Nowell, et al, 2017).

4. Results and Analysis

Before analyzing the results, it was important we used a technique called 'data cleaning'. This technique is critical when it comes to the validity of quantitative methods, as well as ensuring the results can be replicable (Osborne, 2013). To be able to interpret the results meaningfully, it was important from a research perspective to understand the roles occupied. The biggest response rate of 24% came from the 'Human Resources Business Partners' (HRBPs). 'Learning' represented 15% of the respondents. All the other respondents' job roles were under 10%. Despite the survey including differing categories of common HR roles, 23% of respondents identified themselves as 'Other', not seemingly occupying a role captured

within the typical main areas of HR activity. Role identity will be relevant for CSHR when considering how they tailor future communications in this area to ensure messages resonate appropriately. To gain additional insight into the wider CSHR function across the organization, understanding where the respondents came from was relevant. The biggest departmental response rates to the survey came from HMRC (29%) and the Cabinet Office (27%). This may present an opportunity to utilize interest and potential good practice in these areas to benefit the wider CSHR community.

Experience in HR was spread across the board, with the majority of respondents at either end of the spectrum. The participants with the highest response rate at 24% have worked in HR for 12 months or less, followed by those with 10 years or more at 23%. This might suggest this group is a reasonably representative sample of the audience interested enough to engage in the dialogue about cognitive technologies due to, thus providing CSHR with the opportunity to capture varying perspectives and experiences to progress activity accordingly. The majority of participants had worked for the CS for 10 years or more (35%). It is encouraging that all categories had reasonable response rate providing a balanced variety of viewpoints from a cross section of people at different stages of their career and CS experience. It will be important for CSHR to use this experience going forward to help determine the risks and handling to ensure any subsequent successful implementation of this technology.

4.1. The concept and application of cognitive technologies

The information attached to the questionnaire included a cognitive AI technologies glossary of terms, which may explain why almost two thirds of respondents were familiar with the concept, ~~resulting in~~at 62% of the population. This surface-level familiarity, however, masks a deeper governance challenge - despite provided documentation, 31% remained unfamiliar, indicating potential systemic issues in how technical knowledge is disseminated across the organization. The stark contrast between claimed familiarity and actual working knowledge raises important questions about the effectiveness of current information-sharing mechanisms within CSHR.

This knowledge gap became even more apparent in the next set of results, where there was a big shift from the majority of participants agreeing with the previous statement to disagreeing with the assumption that they had sufficient knowledge about what cognitive AI technologies can do (totaling 65% of all respondents). This significant disconnect between

awareness and understanding presents a critical governance challenge - without proper understanding, departments risk implementing technologies inappropriately or making uninformed adoption decisions. This information was not covered in detail in the glossary provided. Sturgis, Roberts and Smith (2012) referred to neither agree/disagree category as a 'hidden do not know' indicating that this could be seen as a negative response to the question. It was crucial that the researchers took this concept into consideration and noted that there was potential for the neither agree/disagree category to be counted for as a negative response.

With this in mind, it was quite clear that overall respondents do not believe they know enough about cognitive AI technologies and so are highly unlikely to be able to harness the opportunities. This knowledge deficit represents a significant governance risk, as it could lead to inconsistent implementation standards and potentially harmful technology adoption decisions. This suggests a further area of development for CSHR. Not being aware of current departmental activity could be linked to the previous question. It is apparent that most participants were not aware of what their department was exploring in relation to cognitive technologies (the statement resulting in 69% of the total responses provided). This lack of awareness across departments indicates a need for stronger governance mechanisms to ensure coordinated and informed technology adoption.

4.2. Applicability to CSHR

Despite respondents reporting they were unsure about what exactly cognitive AI technologies could do, they perceived it could be helpful or have a positive impact on CSHR (showing 64% of total respondents). This optimistic outlook, while encouraging, must be balanced against the governance challenges it presents - enthusiasm without proper understanding could lead to hasty or poorly planned implementations. This response broadly supports the available academic literature (such as Yano, 2017), evidencing where AI has already been used successfully across a range of HR activities elsewhere to great effect. However, 64% of respondents believe that the CS does not have the right expertise to effectively implement cognitive AI technologies. This expertise gap represents a critical governance challenge, highlighting the need for both technical expertise and robust implementation frameworks to ensure responsible technology adoption.

4.3. Risks and barriers

The responses to the question of 'main barriers and risks' to the introduction of cognitive AI technologies revealed interconnected challenges that demand comprehensive governance

solutions. The three main barriers thought to be associated with the introduction of cognitive AI technologies to CSHR were: 25% Skills, 23% Culture and 21% Cost. These percentages reflect not just isolated challenges, but systemic issues that require integrated governance approaches. The skills gap, for instance, suggests a need for standardized training frameworks and capability assessments across departments. The cultural barrier indicates deeper organizational resistance that must be addressed through structured change management protocols. Brynjolfsson and Mitchell (2017) reinforce this, since they indicate that in order for any type of AI to be implemented, new skills, organizational changes and adjustments are required to ensure it is a success. These factors should not be underestimated, and perhaps are reflective of the HR community's experience of general change and transformation programs across the CS. The technology itself may not be the key challenge; it may be more about how people are able to embrace it. This insight suggests the need for governance frameworks that address not just technical implementation but also organizational change management.

4.4. Key HR areas of use

The question on 'key HR areas of use' received the most varied responses, revealing both opportunities and potential risks in implementation priorities. Participants believed 'self-service' was the main area of benefit for HR in terms of cognitive AI technologies with 44% of the collective overall responses over the three questions. This strong preference for self-service applications raises important governance considerations around data protection, user access management, and service quality standards.

Recruitment (20%) and workforce planning (13%) were shown as second and third key areas of importance. These areas, particularly recruitment, demand careful attention to ethical considerations and bias prevention in AI implementations. These would be areas in which to prioritize ~~any~~ experimentation ~~with~~. Within the free text comments of the survey, one participant explained how their own department was looking into a variety of automation processes to sift people at the interview stage. This kind of experimentation, while promising, highlights the need for standardized evaluation criteria and ethical guidelines across departments. It is noticeable that Employee Relations (ER) was the least popular choice throughout, followed by Leadership and ~~ODandD~~OD&D. This is reassuring since these are not common areas for typical AI implementation, suggesting an apparent level of knowledge from respondents. Since every area of the HR function was selected at some point by respondents, it does infer some participants remain unsure about how these technologies could add value. This uncertainty underscores the importance of establishing clear use-case criteria and

implementation guidelines. Some real-life applied case studies might be beneficial.

4.5. Benefits

It was important to understand what respondents believed the general benefits of ~~cognitive~~ AI technologies were to the HR function. This had mixed responses, which again reinforces the apparent absence of the appropriate level of information to make a judgement. The varying perceptions of benefits suggest a need for more structured benefit realization frameworks and measurement criteria. 'Process improvement' was thought to be the main benefit at 29% and 'efficiency' with 23%. This implies that individuals are thinking of the customer benefits rather than individual gains. While this customer-centric focus is positive, it also indicates a potential gap in understanding the broader organizational impact and transformation potential of these technologies. This presents an opportunity for CSHR to reframe the benefits narrative to focus more on the employee engagement elements (removing mundane routine tasks, focusing on value added work, leading to better job satisfaction, etc.).

The assessment of organizational readiness revealed critical gaps between individual and institutional preparedness. Participants were also asked to assess whether their HR department as well as the CSHR function itself were ready to harness the opportunities presented by cognitive technologies. The results provided a mainly negative response, with 53% of participants either disagreeing or strongly disagreeing with the statement that their HR department was ready to harness the opportunities. A further 24% remained neutral, revealing a collective total of 77% of participants not being directly positive about this position. This significant lack of confidence suggests fundamental governance issues that need addressing. The implication is, therefore, Departments as a collective~~,~~ were perceived not to be ready. 50% of participants disagreed or strongly disagreed that the CSHR Function was ready to harness cognitive technologies, with a further 32% choosing a neutral response. Revealing 82% do not feel positive about this position, perceiving CSHR to be less ready than the other Departments. This perception gap between central and departmental readiness indicates a need for more coordinated preparation and implementation strategies.

4.6. A good next step for CSHR

All 305 participants were asked what they would consider to be the next best step to advance the progress of cognitive technologies within CSHR. A Word Cloud helped us to understand the most frequent/key words and terminologies presented within the question

(Figure 1). The bolder the word, the more times it occurred within the responses. After ignoring the expected words such as cognitive/technologies/technology, the next four commonly used words were understanding 12%, benefits 12%, people 11% and awareness 10% (Appendix B). This pattern reveals a critical insight into organizational priorities - the focus on understanding and awareness over technical implementation suggests a recognition of the need for foundational governance structures before technical deployment. The emphasis on 'people' alongside 'benefits' indicates a desire for balanced implementation that considers both human and operational factors.

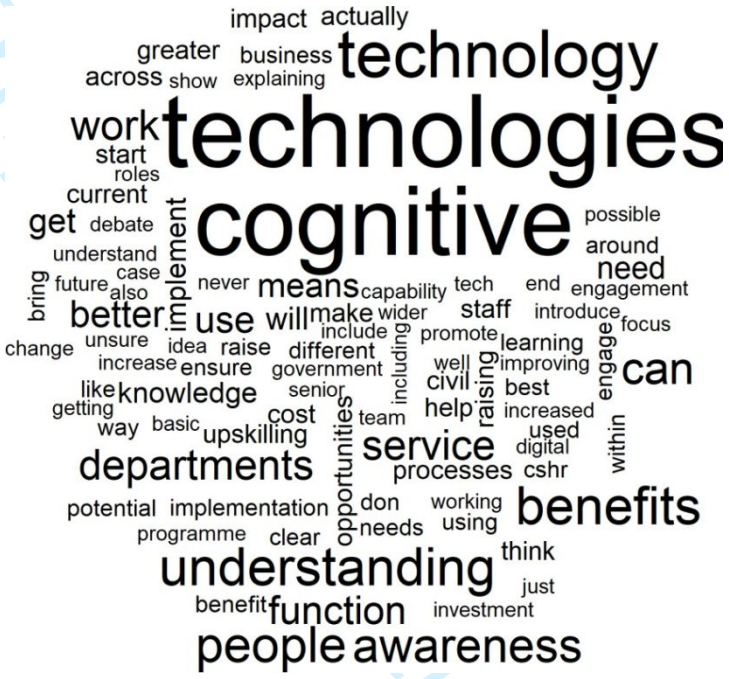

Figure 1: A good next step - Word Cloud

A need to build capability and upskill the community is a very strong theme emerging from the responses to this question, which should include a greater understanding of costs and opportunities. This capability gap represents a significant governance challenge - without standardized competency frameworks and training protocols, departments risk inconsistent implementation approaches. One participant noted what was needed was a *"clear explanation of what that functionality is (what it does) and what it would take to implement (cost and cultural requirements) ...until then it'll never be more than a dreamy theoretical conversation with so many ifs and buts to be of any use." This insight highlights the need for practical, structured implementation frameworks that address both technical and cultural dimensions.*

Increased investment, use of 'proofs of concepts' and case studies were deemed useful

interventions to help encourage experimentation and implementation, critically to take place both inside and outside of 'Whitehall' based locations. This geographical consideration raises important governance questions about ensuring consistent standards across diverse locations while allowing for local adaptation. Creating a 'HR Centre of Expertise' was thought to be important. *"Establish a network of actively interested/skilled practitioners to share what is being worked on in departments. Possibly have a dedicated function within HR to lead and promote best practice."* This suggestion for centralized expertise indicates recognition of the need for coordinated governance structures.

The practical experience shared by one respondent - *"In my own department we are currently introducing chatbot technology for answering routine employee questions and for directing people via the intranet to appropriate answers. We are looking at various automation processes for sifting people at interview stage. I am heavily engaged in looking at future work design as a result of technology change in my sector (transport) e.g. the impact of driverless trains autonomous vehicles drones etc."*

There was a cautionary note from another, "*Cognitive technology needs to be considered alongside other technology enhancements being considered to give a joined-up approach*". This observation points to the need for integrated technology governance frameworks that consider the entire digital ecosystem. Practically, effective and accurate data management processes were thought to be an essential foundation. The warning about "garbage in garbage out" syndrome underscores the critical importance of data governance and quality standards as foundational elements of successful implementation.

~~Practically, effective and accurate data management processes were thought to be an essential foundation.~~ *"We would have to ensure that we have reliable data for any automated process to use otherwise we risk 'garbage in garbage out' syndrome whereby we efficiently automate processes that subsequently reach entirely incorrect conclusions because the inputs are erroneous".* Appropriate employee engagement was deemed imperative. "*Excite people show what is possible at the top end of the technology. Show what the technology could be doing in 5 years' time. Get people passionate and enthused about its potential benefits."* This will be particularly crucial since one participant to the question about advancing cognitive technologies within CSHR replied "*Not sure we should*." This may reflect some automation anxiety which exists. *"You need to tell people what jobs will be lost and when you expect them to go so that they can make informed choices about their futures."*

4.7. Free text

The 13% response rate to the free text question revealed important insights about organizational readiness and risk perception. The observation that the CS is not typically an "early adopter" as they cannot "afford to take those risks" reflects a deeper governance challenge - balancing innovation with responsible risk management. This risk-averse culture, while potentially protective, could also hinder necessary technological advancement if not properly managed through appropriate governance frameworks.

The contrasting aspiration of "Let's be brave and ambitious!" against concerns about risk, highlights the need for governance structures that enable innovation while maintaining appropriate controls. The perception that "technology is not the answer to all our problems" alongside views that it "would greatly assist employees" reveals a nuanced understanding of technology's role that should inform governance approaches.

The emphasis on "bringing all departments up to the same speed" highlights the critical governance challenge of ensuring consistent implementation across a complex organization. This becomes particularly important when considering ethical implications, as noted in academic literature. The need to address job displacement concerns while promoting innovation requires carefully crafted governance frameworks that balance technological advancement with employee welfare.

These varied perspectives underscore the importance of developing comprehensive governance structures that address not just technical implementation, but also change management, ethical considerations, and employee engagement. The findings suggest that successful implementation will require a balanced approach that considers both ~~the~~ opportunities and risks, while ensuring appropriate controls and standards are in place.

5. Conclusion

5.1. Discussion and Conclusion

In the rapidly evolving landscape where cognitive technologies intersect with HR functions, this study aimed to ascertain the Civil Service HR's readiness to capitalize on the opportunities that such technologies present. Reflecting on the identified objectives, the study uncovered pivotal insights into the integration, governance, and potential future trajectory of digital platforms in the realm of HR.

The research concludes that, while individual departments demonstrate varying levels of

maturity regarding cognitive technology integration, there is a collective imperative to strengthen governance and responsibly utilize digital platforms. HR professionals must emerge as advocates and orchestrators of change, guiding the Civil Service towards an inclusive and strategically aligned adoption of AI. The efficacy of these digital platforms in HR will rely on a governance structure that upholds ethical standards, maintains public trust, and ensures that the Civil Service remains at the forefront of innovative workforce management.

The novelty of this research lies in its focused examination of cognitive technology readiness within the UK Civil Service HR function, an area that has been underexplored in prior literature. The findings reveal nuanced insights into the current landscape, ambition levels, and preparedness of CSHR in harnessing these technologies. Notably, the study highlights the discrepancy between individual readiness and organizational readiness, emphasizing the need for targeted upskilling and engagement initiatives.

5.1.1. Current Landscape of Cognitive Technologies in HR

The heterogeneous adoption of cognitive technologies within HR suggests a nascent, albeit growing, appreciation for the transformative capabilities of these tools. The focal use in recruitment and self-service underscores a movement towards digital platforms that augment efficiency and personnel development. However, this engagement is still in its embryonic stage, especially when compared to global counterparts, such as those in Tokyo. The UK Civil Service must not only foster technology-driven efficiencies but also establish governance frameworks that ensure responsible and ethical use. A robust governance model must be instituted to oversee the integration of AI into HR functions, one that anticipates and pre-empts the displacement of human labour and mitigates potential inequalities.

5.1.2. Ambition in the Use of Cognitive Technologies within HR/CS

The literature review reveals a conspicuous scarcity of public sector publications delineating ambitions or definitive plans for cognitive technology integration within the CSHR or broader Civil Service. Whilst some UK HR departments are contemplating cognitive technologies in very innovative ways, we found minimal academic literature available in the public domain written by government authors that outlines the aspiration or clear plans for adoption within the CSHR Function or the broader CS itself. ~~This is a little surprising particularly since the Chancellor has already stated an expectation that 'robots will be running government'.~~

Whilst the CS Workforce Plan (2016-2020) refers to technology in its broadest sense, as

part of data and digital changes, it does not specifically reinforce the use of cognitive technologies. Unsurprisingly, there is much written by consultancy firms and press organizations indicating how government and the public sector might look, along with the accompanying myths and hypes related to significant job losses and threats to jobs *"... Robots could replace 250,000 public sector workers by 2030"* (Information Age, 2017 para 4). This gap is notable despite governmental rhetoric hinting at a future automated bureaucracy. While the CS Workforce Plan discusses technology, it does not distinctly advocate for cognitive technologies, in stark contrast to narratives from consultancy firms and media outlets that prognosticate substantial public sector job losses due to automation.

The findings highlight an urgent need for the Civil Service to articulate a clearer and more cohesive governance strategy on the use of digital platforms in HR. This strategy should outline not only the adoption of cognitive technologies but also the governance protocols, ensuring accountability, transparency, and ethical use.

5.1.3. Preparedness for Cognitive Technology Emergence in HR

The readiness of the HR Function for cognitive technology proliferation is evidently lacking. To rectify this, a concerted effort in upskilling the CSHR community is imperative. Furthermore, the creation of robust governance policies is critical to steer the deployment of these technologies on digital platforms. These policies should define the scope of AI use within HR, align with ethical standards, and safeguard data privacy. The presence of advanced cognitive tools such as chatbots within other Civil Service sectors underscores the urgency for CSHR to leverage existing technical expertise, develop an integrated communication strategy, and foster a digital platform governance ethos.

The research concludes that while individual departments demonstrate varying levels of maturity regarding cognitive technology integration, there is a collective imperative to strengthen governance and responsibly utilize digital platforms. HR professionals must emerge as advocates and orchestrators of change, guiding the Civil Service towards an inclusive and strategically aligned adoption of AI. The efficacy of these digital platforms in HR will rely on a governance structure that upholds ethical standards, maintains public trust, and ensures that the Civil Service remains at the forefront of innovative workforce management. CSHR's window to establish a governance model that resonates with the dynamism of digital platforms and the exigencies of ethical AI integration is narrow; it is incumbent upon them to act with alacrity to remain ahead of the curve.

5.2. Research contributions

5.2.1. Theoretical contributions

This research makes substantial theoretical contributions to the academic understanding of cognitive technology adoption in public sector organizations, particularly in the context of HR transformation. A significant theoretical contribution lies in the extension and modification of the Technology Acceptance Model (TAM) framework. Building upon Davis's (1989) original TAM and its subsequent iterations (TAM2 and TAM3), this research advances theoretical understanding by adapting the recent Intelligent Systems Technology Acceptance Model (ISTAM) to the specific context of public sector HR functions.

The study's theoretical framework extends ISTAM by incorporating two crucial modifications that enhance its applicability to pre-implementation scenarios in public sector organizations. First, it introduces a dual-level analysis that considers both individual user acceptance and functional organizational readiness, addressing a significant gap in existing technology acceptance theories. Second, it adapts the model to pre-implementation contexts by focusing on perceived usefulness and transparency, recognizing the limitations of assessing ease-of-use before actual implementation. This theoretical advancement provides a more nuanced understanding of technology readiness in public sector contexts, particularly where cognitive technologies have not yet been fully deployed.

The research's theoretical contribution is particularly valuable in its integration of transparency as a critical dimension in cognitive technology adoption. Building upon the work of Vorm and Combs (2022) and supporting evidence from studies by Luo et al. (2022) and Lee and See (2004), this study demonstrates how transparency and trust interact with traditional technology acceptance factors in the public sector context. This theoretical insight helps explain why conventional approaches to technology adoption may need modification when applied to public sector contexts, particularly in areas involving artificial intelligence and cognitive technologies.

Furthermore, this research advances theoretical understanding of the interplay between technological capability and organizational culture in public sector digital transformation. The modified theoretical framework developed through this study provides new insights into how institutional characteristics unique to civil service organizations influence their approach to technological advancement. By examining the intersection of institutional theory and technological innovation, the study reveals important theoretical insights about the tension

between traditional public sector values and the imperative for technological advancement.

The research makes a significant contribution to the academic and practical understanding of governance and digital platform integration with cognitive technologies in the CS, particularly within the CSHR sector. This contribution is paramount given the stark paucity of literature focused on the nuanced application of such technologies in the UK CS context. The theoretical framework developed through this research provides a foundation for understanding how public sector organizations can effectively evaluate and prepare for cognitive technology adoption while maintaining their commitment to public service values and ethical governance.

Additionally, the research enriches theoretical understanding by considering the role of digital platforms as conduits for cognitive technology implementation within the CS. The study's theoretical framework illuminates the complex relationship between governance structures, organizational culture, and technological innovation in public sector contexts. This advancement in theoretical understanding is particularly valuable given the growing importance of ethical considerations in public sector digital transformation.

These theoretical contributions not only advance academic understanding but also provide a robust foundation for practitioners working to implement cognitive technologies in public sector contexts. The modified ISTAM framework developed through this research offers a practical tool for assessing and preparing for cognitive technology adoption, ~~while~~ whilst maintaining the necessary focus on transparency and trust that is crucial in public sector implementations.

5.2.2. Practical contributions

The practical implications of this research are substantial and multifaceted, building upon the theoretical foundations established through our modified ISTAM framework. The research enriches the debate by considering the role of digital platforms as conduits for cognitive technology implementation within the CS. By doing so, it brings to the fore the potential of digital platforms to revolutionize HR services through enhanced data analytics, machine learning capabilities, and automated processes, while also critically examining the imperative of maintaining human oversight and ethical considerations in these technological interactions.

The study's findings, viewed through the lens of our modified ISTAM framework, provide practical guidance for organizations navigating the early stages of cognitive technology adoption. The emphasis on transparency and perceived usefulness, rather than just ease of use, offers practical insights for change management strategies in public sector organizations. This

is particularly relevant for HR practitioners who must balance the potential benefits of cognitive technologies with the need to maintain trust and transparency among stakeholders.

For individuals interested in joining the CS or exploring the impact of cognitive technologies, this research serves as a crucial resource that sheds light on the internal perspectives and operational challenges within the CS domain. The findings demonstrate how the theoretical dimensions of transparency and perceived usefulness manifest in practical implementation challenges, providing valuable insights for change management strategies. Furthermore, other public and private sector organizations can leverage the insights provided to gauge the sentiment and readiness of their workforce concerning the integration of cognitive technologies within their respective HR practices.

The practical application of our modified theoretical framework also reveals important considerations for governance structures. The study underscores the importance of establishing governance frameworks that are both agile and comprehensive in addressing the risks and opportunities of cognitive technology deployment. These practical insights are particularly valuable given the unique challenges faced by public sector organizations in maintaining transparency while driving technological innovation.

Finally, this study provides a unique and unbiased ~~perspective from an outside~~external perspective on key issues surrounding the integration of cognitive technologies into the HR function. By injecting personal insights into the ongoing dialogue, it contributes to a more nuanced understanding of the governance and utilization of digital platforms, thereby enriching the narrative and assisting stakeholders in navigating the complexities of this transformational journey. The combination of theoretical advancement and practical insights provides a comprehensive foundation for organizations seeking to implement cognitive technologies while maintaining public trust and organizational effectiveness.

The ~~research's~~ practical contributions of the work extend to the development of implementation strategies that account for both the individual and organizational readiness factors identified in our theoretical framework. These insights help organizations better understand and address the gap between individual acceptance and organizational preparedness, providing practical guidance for developing targeted interventions and support mechanisms. This dual-level understanding, grounded in our modified ISTAM framework, offers practical tools for organizations to assess and enhance their readiness for cognitive technology adoption while maintaining their commitment to transparency and public service values.

Through these theoretical and practical contributions, this research not only advances academic understanding but also provides actionable insights for practitioners navigating the complex landscape of cognitive technology adoption in public sector organizations. The findings suggest that successful implementation requires a carefully balanced approach that considers both theoretical frameworks and practical realities, particularly in the context of public sector HR functions.

5.3. Research limitations

In conducting this research, we remained external to the organization and were not, therefore, ~~unsighted on~~privy to internal strategic discussions around the implementation of cognitive technologies within the CS, thus potentially hindering the validity of the study. The primary focus of this research did not concentrate on international HR departments or equivalent government organizations across the world. This research is only valid therefore within the UK CS context. There always remains a possibility that, despite the survey being anonymous, participants may not have answered the questions accurately. This may be due to employees being concerned about a perceived risk between cognitive technology and roles being potentially displaced, meaning they responded to the questions more optimistically rather than their actual belief. ~~Ethical considerations must be acknowledged regarding the reliability of this study and any others.~~ Even though this was a possibility, Labott et al (2013) argues surveys actually helps communication within organizations, enhancing new insight for people as well as reports in improvements in health and the aiding of others.

Despite this study contributing to closing the gap in the ~~literature~~literature,~~, it has only scratched the surface. The~~the CS encompasses a huge range of business areas and disciplines, so further research would provide a more rounded assessment of the current landscape. Many participants who responded to this research were not aware of what cognitive technologies were or what value they provided. This indicates more upskilling/training needs to take place ~~in order~~ to inform and educate. Once this position is addressed, revisiting this survey with similar questions would provide a measure of progress and be of benefit to the organization. This way, correlations and differences can be identified between the two surveys, providing clear outline for areas of further focus and priority. More in-depth studies could also be carried out to determine the impact of implementing such technologies on government policies as well as workplace happiness.

References

Braun, V. and Clarke, V. (2017). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), pp.77-101.

Brynjolfsson, E. and Mitchell, T. (2017). What can machine learning do? Workforce implications. *Science*, 358(6370), pp.1530-1534.

Carrillo, M. R. (2020). Artificial intelligence: From ethics to law. Telecommunications Policy, 44(6), 101937.

Chace, C. (2015). *Surviving AI*. 1st ed. Three Cs, pp.170.

Chatila, R., Firth-Butterflied, K., Havens, J. and Karachalios, K. (2017). The IEEE Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems [Standards]. *IEEE Robotics and Automation Magazine*, 24(1), pp.110-110.

Cheng, X., Cohen, J., & Mou, J. (2023). AI-enabled technology innovation in e-commerce. Journal of Electronic Commerce Research, 24(1), 1-6.

Chelliah, J. (2017). Will artificial intelligence usurp white collar jobs? *Human Resource Management International Digest*, 25(3), pp.1-3.

Christopher, S. et al (2008). Building and Maintaining Trust in a Community-Based Participatory Research Partnership. *American Journal of Public Health*, 98(8), pp.1398-1406.

Civil Service Workforce Plan (2016 – 2020). *Civil Service Crown Copyright*, pp.2-23. Available at: https://www.gov.uk/government/publications/civil-service-workforce-plan-2016-to-2020 [Accessed 10 Apr. 2019]

Cunningham, D. (2016). Applying AI. 39(4), pp.11-12.

Davenport, T. and Kirby, J. (2016). *Only humans need apply*. 1st ed. New York: HarperCollins Publishers, pp.11-32.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319–340. https://doi.org/10.2307/249008

Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., ... & Williams, M. D. (2021). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. International Journal of Information Management, 57, 101994.

Ekandjo, T., Cranefield, J., & Chiu, Y. T. (2023). HUMAN-AI COLLABORATION IN EVERYDAY WORK-LIFE PRACTICES: A COREGULATION PERSPECTIVE.

Fernandes, T., & Oliveira, E. (2021). Understanding consumers' acceptance of automated technologies in service encounters: Drivers of digital voice assistants' adoption. Journal of Business Research, 122, 180-191.

Ford, M. (2015). *Rise of the Robots*. 1st ed. St Ives, England: Oneworld Publications, pp.220-234.

Frank, M., Roehrig, P. and Pring, B. (2017). Book Highlight-Your New Raw Materials: Data Is Better Than Oil. *Global Business and Organizational Excellence*, 36(3), pp.64-72.

Greer, C. R. (2021). Strategic human resource management. Pearson Custom Publishing.

Gyton, G. and Jeffery, R (2017) 'AI and HR', *People Management*, CIPD Enterprises Ltd, August, pp.24-28.

Ibáñez, J. C., & Olmeda, M. V. (2022). Operationalising AI ethics: how are companies bridging the gap between practice and principles? An exploratory study. AI & SOCIETY, 37(4), 1663-1687.

Information Age (2017). *Robots will be running the UK Government, says Chancellor.* [online] Available at: http://www.information-age.com/robots-running-uk- government-chancellor-123468548/ [Accessed 28 Mar. 2019].

Institute for Government (2017). *Whitehall Monitor 2017: Government doing too much as it prepares for Brexit.*

Janiesch, C., Zschech, P., & Heinrich, K. (2021). Machine learning and deep learning. Electronic Markets, 31(3), 685-695.

Kasparov, G. (2017). *Deep Thinking: Where Machine Intelligence Ends and Human Creativity Begins.* 1st ed. Croydon, England: John Murray, pp.222-248.

Kolade, O., & Owoseni, A. (2022). Employment 5.0: The work of the future and the future of work. Technology in Society, 102086.

Kopalle, P. K., Kumar, V., & Subramaniam, M. (2020). How legacy firms can embrace the digital ecosystem via digital customer orientation. Journal of the Academy of Marketing Science, 48, 114-131.

Labott, S., Johnson, T., Fendrich, M. and Feeny, N. (2013). Emotional Risks to Respondents

in Survey Research: Some Empirical Evidence. *Journal of Empirical Research on Human Research Ethics*, 8(4), pp.53-66.

Lee, J. D., & See, K. A. (2004). Trust in automation: Designing for appropriate reliance. Human Factors, 46(1), 50–80. https://doi.org/ 10.1518/hfes.46.1.50_30392

Leonhard, G. (2016). *Technology vs. humanity*. 1st ed. United Kingdom: Fast Future, pp.70-106.

Lindzon, J. (2017). *Welcome To The New Era Of Human Resources | Fast Company*. [online] Fast Company. Available at: https://www.fastcompany.com/3045829/welcome-to-the-new-era-of-human- resources [Accessed 23 Oct. 2018].

Luo, R. Du, N. Yang, X. (2022) Evaluating Effects of Enhanced Autonomy Transparency on Trust, Dependence, and Human-Autonomy Team Performance over Time, International Journal of Human–Computer Interaction DOI:10.1080/10447318.2022.2097602 **38**:18-201962-1971

Makridakis, S. (2017). The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms. *Futures*, 90, pp.46-60.

McIntyre, N. (2017). *Government will invest £20m in robots and artificial intelligence.* [online] The Independent. Available at: http://www.independent.co.uk/news/uk/home-news/government-digital-strategy-technology-robotics-artificial-intelligence-investment-a7600046.html [Accessed 8 Nov. 2018].

Nowell, L et al (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods,* 16(1), pp.1-13

Oliveira, F., Kakabadse, N., & Khan, N. (2022). Board engagement with digital technologies: A resource dependence framework. Journal of Business Research, 139, 804-818.

Osborne, J. (2013). *Best practices in data cleaning*. Thousand Oaks, Calif.: SAGE, pp.8-9.

Parliament UK (2017), *Lords Select Committee, 'What should the Government do about Artificial Intelligence?'* Available at: https://www.parliament.uk/business/committees/committees-a-z/lords-select/ai-committee/news-parliament-2017/education-and-government-ministers-session/ [Accessed 8 Nov. 2018]

Potapov, A. and Rodionov, S. (2014). Universal empathy and ethical bias for artificial general

intelligence. *Journal of Experimental and Theoretical Artificial Intelligence*, 26(3), pp.405-416.

Powers, D. and Powers, A. (2014). The incremental contribution of TOEIC® Listening, Reading, Speaking, and Writing tests to predicting performance on real-life English language tasks. *Language Testing*, 32(2), pp.151-167.

Rahman, M. (2016). The Advantages and Disadvantages of Using Qualitative and Quantitative Approaches and Methods in Language "Testing and Assessment" Research: A Literature Review. *Journal of Education and Learning*, 6(1), pp.102.

Rutter, T. (2017). People's Republic of Whitehall. *Civil Service World*, (271), pp.24.

Schultz, C. and Walt, H. (2015). *Reinventing HR: Strategic and Organizational Relevance of the Human Resources Function*. 1st ed. Randburg, South Africa: Knowres Publishing, pp.113-125.

Schwab, K. (2016). *The Fourth Industrial Revolution*. 1st ed. Geneva, Switzerland: World Economic Forum, pp.34.

Sourdin, T., Burke, T., & Li, B. (2019). Just, quick and cheap?: Civil dispute resolution and technology. Macquarie Law Journal, 19, 17-38.

Spitzer, B. (2014). HR in the Digital Age. *Workforce Solutions Review*, 5(1), pp.15- 17.

Stanley, M. (2017). *Civil Service - Numbers*. Available at: http://www.civilservant.org.uk/information-numbers.html [Accessed 12 Dec. 2018].

Steinruecken, C. (2017). We will have to decide whether to hire humans or machines. *People Management*, May 2017, pp.13.

Stevenson, A. (2010). In: *Oxford Dictionary of English*. Oxford: Oxford University Press, pp.89.

Sturgis, P., Roberts, C. and Smith, P. (2012). *Middle Alternatives Revisited*. Sociological Methods and Research, 43(1), pp.15-38.

Subramaniam, M., Iyer, B., & Venkatraman, V. (2019). Competing in digital ecosystems. Business Horizons, 62(1), 83-94.

Sumser, J. (2017). Artificial Intelligence: Ethics, Liability, Ownership and HR. *Workforce Solutions Review*, 8(3), pp.24-26.

Sun, T. and Miklos, V. (2017). Deep Learning and the Future of Auditing. *Journal of CPA*, pp.24-29.

Susskind, R. and Susskind, D. (2015). *The Future of the Professions*. 1st ed. Oxford, England: Oxford University Press, pp.145-182.

Taffel, S. (2023). Data and oil: Metaphor, materiality and metabolic rifts. New media & society, 25(5), 980-998.

Thiebes, S., Lins, S., & Sunyaev, A. (2021). Trustworthy artificial intelligence. Electronic Markets, 31, 447-464.

Tyagi, A. (2017). Artificial Intelligence: Boon or Bane? *IUP Journal of Computer Sciences*, 11(2), pp.43-56.

Venkatachalam, S. (2017). *Why 2017 is the year of Artificial Intelligence*. [online] Forbes.com. Available at: https://www.forbes.com/sites/forbestechcouncil/2017/02/27/why-2017-is-the-year-of- artificial-intelligence/#a781f1757a1b [Accessed 23 Oct. 2018].

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management Science, 46(2), 186–204. https://doi.org/10.1287/mnsc. 46.2.186.11926.

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. Decision Sciences, 39(2), 39. https://doi.org/10.1111/j.1540-5915.2008.00192.x

Vorm E.S. & Combs, D.Y.J. (2022) Integrating Transparency, Trust, and Acceptance: The Intelligent Systems Technology Acceptance Model (ISTAM), International Journal of Human–Computer Interaction, 38:18-20, 1828-1845, DOI: 10.1080/10447318.2022.2070107

Watson, T (2017). *Report on the Future of Work Commission.* Available at: https://d3n8a8pro7vhmx.cloudfront.net/campaigncountdown/pages/1052/attachments/original/1512946196/Future_of_Work_Commission_Report,_December_2017.pdf

?1512946196 [Accessed 8 Apr. 2019].

Wu, W. (2016). Digital HR: The Business of people is fast becoming the business of bytes. *Workforce Solutions Review*, 7(5), pp.16-19.

Yano, K. (2017). How Artificial Intelligence Will Change HR. *People and Strategy*, 40(3),

pp.42-46.

Yuste, R. et al (2017). Four ethical priorities for neurotechnologies and AI. *Nature*, 551(7679), pp.159-163.

Appendix A: Survey

Cognitive Technologies (an umbrella term for Robotic Process Automation, Artificial Intelligence, Machine Learning, etc).

1. I am familiar with the concept of Cognitive Technologies

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

2. I am satisfied I have sufficient knowledge about what Cognitive Technologies can generally do

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

3. I agree Cognitive Technologies could be helpful to CSHR

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

4. I agree the HR function in the Civil Service has the right expertise to help effectively implement Cognitive Technologies

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

5. I feel comfortable being able to contribute to any potential Cognitive Technologies debate/discussion connected with the HR function

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

6. I am aware of what my department is exploring in relation to Cognitive Technologies

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

7. I think the main areas of HR where Cognitive Technologies could have the most positive impact are: (Rank your top 3)

ER	Wellbeing	Talent	Recruitment	Self Service
Workforce Planning	ODandD	Learning	Leadership	Engagement

8. I think the main benefit of cognitive technology is: (Select one)

Employee engagement: Increasing staff engagement by reducing routine and repetitive work	**Compliance:** Better accuracy in our data, reducing error	**Employee satisfaction:** Allowing opportunities for HR to focus on more strategic valued added work	**Process Improvement:** Enhancing our performance – speed and quality of work	**Accuracy:** More consistent and better decision making
Efficiency: Improved customer service and access to information 24/7	Other (Free Text):			

9. I think the main barrier or risk associated with any introduction of cognitive technologies to the HR function in the Civil Service is: (Select one)

Culture	Employee Engagement	Employee Relations	Nature of our work	Stakeholders
Timing	Current Government Agenda	Skills	Cost	Other

10. I believe my HR Department is ready to harness the opportunities presented by Cognitive Technologies

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

11. I believe that the HR function in the Civil Service is ready to harness the opportunities presented by Cognitive Technologies

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

12. As part of the HR function, I am ready to harness the opportunities presented by Cognitive Technologies

Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree

13. What would you consider to be the next best step to advance the progress of cognitive technologies within CSHR?

14. Any other comments

About you (optional)

15. What is your primary HR related job role? (Select one)

HRBP	HRD	Talent	Recruitment	HR Ops
Workforce Planning	ODandD	Learning	Leadership	Other

16. What department do you work in? (Select one)

Prime Minister's Office	Attorney General's Office	Cabinet Office	Department for Business, Energy and Industrial Strategy	Department for Communities and Local Government
Department for Digital, Culture, Media and Sport	Department for Education	Department for Environment, Food and Rural Affairs	Department for Exiting the European Union	Department for International Development
Department for International Trade	Department for Transport	Department for Work and Pensions	Department of Health	Foreign and Commonwealth Office
HM Treasury	Home Office	Ministry of Defence	Ministry of Justice	Northern Ireland Office
Office of the Advocate General for Scotland	Office of the Leader of the House of Commons	Office of the Leader of the House of Lords	Office of the Secretary of State for Scotland	Office of the Secretary of State for Wales
UK Export Finance	HMRC	Other		

17. How long have you worked in HR?

0-12 months	1-3 years	3-5 years	5-10 years	10 years+

18. How long have you worked in the Civil Service?

0-12 months	1-3 years	3-5 years	5-10 years	10 years+

Appendix B: World Cloud (frequency of words)

	A	B	C
1			
2		word	freq
3		technologies	33
4		cognitive	31
5		technology	20
6		understanding	15
7		benefits	15
8		people	14
9		awareness	13
10		can	12
11		service	11
12		departments	11
13		work	11
14		function	10
15		better	9
16		use	9
17		get	8
18		means	8
19		need	7
20		will	7
21		implement	6
22		knowledge	6
23		upskilling	5