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Exploring how organisational features impact acceptance of AI in primary care

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I. INTRODUCTION

The integration of artificial intelligence (AI) has grown rapidly in many sectors of society. However, primary care in the UK has been largely disregarded, despite the National Health Service (NHS) prioritising the digitalisation of primary care [10]. Therefore, understanding the factors influencing AI acceptance is crucial. Although prior research has identified trust as a significant factor, it remains unclear how other factors or stakeholder perspectives may impact AI adoption. Primary care's structure as a sector of private businesses operating under one main NHS contract [12] may pose challenges to AI acceptance. With 6,514 primary care practices in England in 2022 [4], all operating independently, stakeholder perspectives across organisational levels are important to consider.

A. Primary care organisational structure

The organisational levels within the NHS are described by Asthana, Jones and Sheaff [1] as macro, meso and micro levels. The macro level includes the government, and the entire NHS network, who seek to leverage technology to improve efficiency [13]. The meso level comprises primary care management, technology providers, and secondary care health boards, which have predominantly focused on the perspectives of technology providers. The micro level is comprised of individual stakeholders, having differing requirements and views on AI. Thus, the complexity of the NHS and its multiple organisational levels, as noted by Asthana, Jones and Sheaff, represents a significant barrier to the integration of technology. The following section explores macro level to describe any barriers already identified in the literature.

1) *Macro*: Morrison [9] conducted interviews with macro level stakeholders to identify facilitators and barriers to the adoption of AI. Findings from the study reveal that barriers to AI adoption include regulatory constraints, cost implications, inadequate training, and sub-optimal IT infrastructure. These findings are in line with the UK's national AI strategy, which seeks to address the identified barriers and promote AI development across all sectors of society [13]. Macro level stakeholders are not just talking about how AI can deliver, they are actively advocating for changes to facilitate the smooth delivery of new and emerging technologies. This stands in contrast to meso level stakeholders who have not had the opportunity to express their perspectives on this subject, as discussed in the subsequent section.

2) *Meso*: A study by Ferreira, Ruivo and Reis concluded that perspectives from meso level stakeholders are particularly important to understand, but their views are often not gathered [5]. For example, although meso level practice managers have been identified as gatekeepers to GP practices, their perspectives have not been fully explored in the literature. Therefore, literature describing the views of business managers were explored [6], [8]. The findings suggest that meso level managers in the business world have expressed concerns regarding AI adoption, which are similar to those recognised by macro level stakeholders. In contrast, the perspectives of meso level stakeholders within primary care have yet to be investigated. However, if their perspectives are consistent with those of business managers, macro level stakeholders are already addressing some of the identified concerns.

3) *Micro*: Lebcir et al. [7] reviewed literature on AI from the perspective of micro level stakeholders and found that a holistic approach, which considers both technological infrastructure and organisational management, is essential for AI to be fully utilised in healthcare. While, Blease et al. [2] conducted a qualitative study on doctors' views of AI in primary care and found that doctors were skeptical about AI's ability to augment medical diagnoses but recognised its potential in administrative tasks. The literature has shown the importance of thoroughly assessing the feasibility and limitations of AI in healthcare, as well as acknowledging the differing perspectives of various stakeholders.

II. RESEARCH AIMS

This research aims to advance the understanding of the different levels of stakeholders and their requirements in the context of promoting acceptance and trust of AI within primary care. The existing literature indicates that there is a lack of trust and acceptance towards AI in primary care. Possibilities to improve acceptance or help researchers to understand the priorities of primary care, may lie in gathering more stakeholder perspectives. Our study aims to explore whether there are differing requirements across the various organisational levels that could influence acceptance and trust of AI. The research objectives being addressed within this initial study to advance the understanding of stakeholder levels and requirements are:

- 1) What are the current levels of acceptance for AI within primary care?
- 2) What level of influence does each stakeholder level have over the introduction of AI within primary care?
- 3) What are the barriers to trust and acceptance of AI within primary care at each stakeholder level?

A. Conceptual framework

Several frameworks have been developed to understand the characteristics that influence the acceptance of novel technologies. For this study, the most relevant frameworks are TAM3 [15], developed to assist managers in understanding the factors influencing technology acceptance with characteristics such as ‘perceptions of external control’ and ‘computer anxiety’. Additionally, UTAUT2 [16], which provides insight into technology acceptance from an individualistic perspective and introduces characteristics such as ‘social influence’ and ‘facilitating conditions’. The characteristics of trust are also key factors identified within the literature as a barrier to AI acceptance, which are fairness, accountability, transparency, and ethical considerations [14]. To address the research questions in this study, our conceptual model combined TAM3, UTAUT2 and trust models. The resulting framework guided hypothesis development and informed the creation of an online survey with seven key question areas. These areas cover stakeholders’ identities, levels of acceptance or influence, barriers, benefits, and attitudes towards AI explanations. The overarching aim of this investigation is to identify factors that affect AI acceptance among different stakeholders at different organisational levels, ultimately facilitating the identification of barriers and solutions to improve AI adoption in primary care.

III. PRELIMINARY FINDINGS

The survey received 104 responses from primary care employees across the UK, including 30 at the macro level, 21 at the meso level, and 53 at the micro level. The collected data was subjected to cleaning and descriptive analysis, which showed that the sample was reflective of the demographics of the NHS workforce, with 76% female and 22% male participants [11]. Quantitative and qualitative data were analysed using statistical and thematic techniques, and key phrases were identified from the open-ended questions [3]. Preliminary findings are discussed in the following section.

1) *Research objective 1: Current acceptance levels of AI:* The initial data suggests that AI is being used in daily lives, with 50% of respondents indicating that they are currently using it. Additionally, the data shows that voice assistants (33%), banking (22%) and travel directions (25%) are the most common areas of AI application. However, it is worth noting that a small proportion of respondents (6%) were uncertain about their usage of AI. Further analysis reveals that the use of AI in work situations is comparatively low, with only 3% of respondents reporting its usage. This finding is significant as it highlights a disparity between the use of AI in general and its use in primary care. This emphasises the need for further investigation to understand the reasons for the lack of acceptance within the primary care sector.

2) *Research objective 2: Influence and AI acceptance:* The survey revealed that meso-level stakeholders perceived a greater level of influence over the introduction of AI than macro-level stakeholders. Specifically, 50% of meso-level stakeholders believed they had the ability to influence AI adoption, while only 10% of macro-level stakeholders held this view. Therefore, prioritising engagement with stakeholders at the meso-level is recommended as part of AI implementation efforts. Moreover, meso stakeholders perceived that macro

stakeholders would want them to use AI (75%), while only 40% of micro stakeholders held this belief about meso-level stakeholders. This finding is significant, as AI usage by colleagues was found to positively influence other stakeholders’ trust in AI and their intention to use it. However, initial findings suggest that the influence of colleagues was dependent on the transparency and appropriateness of the data being examined. These findings suggest that stakeholder perceptions of influence, as well as trust and intention to use AI, are influenced by stakeholder level, and that engaging with meso-level stakeholders is crucial for the successful implementation of AI. Further research is needed to validate these results and to explore in more depth the factors that influence stakeholder perceptions of influence and trust in AI.

3) *Research objective 3: Barriers to AI acceptance:* Perceived barriers to implementing AI in primary care include deskilling of the workforce, training needs, and concerns about data accuracy and decision-making. Interestingly, stakeholders at meso level expressed the greatest concern about deskilling, with 75% citing it as a barrier, compared to 50% of micro and macro-level stakeholders. Trust in AI was found to be influenced by several factors, including deskilling, data security, accountability, fairness, and understanding. Ethical and moral standards were identified as the most important characteristics for building trust, followed by compliance with primary care policies and regulations. The findings suggest that strong ethical considerations, accountability, and transparency are necessary for fostering trust among stakeholders in primary care. Future research should address stakeholders’ concerns about the ethical implications of AI use and its potential impact on human decision-making.

IV. CONCLUSION AND NEXT STEPS

This research identified stakeholders’ views on AI in primary care. The study found that AI is commonly used in daily life, particularly in areas such as voice assistants, banking, and travel directions. However, the low usage of AI in work situations within primary care requires further investigation to understand the reasons for its lack of acceptance. Stakeholder perceptions of influence, trust, and intention to use AI were found to vary depending on their level of involvement, with meso-level stakeholders having the highest perceived influence. Colleagues’ use of AI positively influenced stakeholders’ trust and intention to use it, with transparency and appropriate data being essential factors. The perceived barriers to AI implementation were deskilling, training needs, data accuracy, and decision-making concerns. A thorough consideration of these factors is necessary to ensure the successful implementation of AI in primary care. The study also found that stakeholders’ trust in AI was influenced by ethical considerations, accountability, fairness, and understanding. Therefore, developing and implementing AI with strong ethical considerations, accountability, and transparency is necessary to foster trust among primary care stakeholders. Further analysis of the full data set is required to guide the development of an overarching research question. The next stage of this research will use the results of the survey to define the research gap, develop further research objectives and design the subsequent phases of the main research project.

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