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How does digitalisation impact social healthcare sustainability?

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1. Introduction

The healthcare sector provides a social function by delivering services to improve the global population's health and quality of life. While the healthcare structure may vary depending on governmental and institutional factors, they all share some standard features. Coiera and Hovenga (2007) captured the global healthcare sector challenges as follows:

- Human resource shortage is a significant problem caused by funding challenges and work design, negatively impacting workforce capacity.
- Increasing requirements for quality care and patient safety necessitates preventive interventions to address health problems before they emerge.
- Technological and medical advances have incited technology-driven demand, but unfortunately, they have also produced inefficient healthcare solutions.
- The ageing population (expected increase of 8.6 million in people aged 65 years and over in the UK) is generating increasing expenditure with many challenges (Coombs, 2018; Martínez-Caro et al., 2018).

These problems are further exacerbated by the realisation of environmental pollution caused by the sector, which is as high as 4.4% of carbon emissions at the global level and 3% in the UK (Breth-Petersen et al., 2022). This is contrary to the Sustainable Development Goals (SDG) on sustainable cities and communities, and climate action needed to ensure good health and wellbeing for all (UN, 2021). The response strategy to meet these challenges requires cooperation among health stakeholders and a shift towards a more efficient and sustainable system. Indeed, the European Commission (2016) stated that "policymakers have duly recognised the need to make health systems more effective, accessible and resilient at the EU and national levels".

Moreover, sustainability is a global agenda for nations and corporations (UN, 2016), so the United Nations agency for ICT declared that digital technology is a sustainability driver which aids progress towards the 17 United Nations SDGs (ITU, 2022). Digital technologies provide opportunities for the dematerialisation and decarbonisation of our productive system, improving efficiency and supporting the application of sustainable development programs and strategies across different sectors including healthcare (ElMassah and Mohieldin, 2020; Pérez-Martínez et al., 2023). Moreover, the Triple Bottom Line (TBL) has been widely adopted to assess sustainability outcomes to ensure a holistic perspective to sustainability (Pereno and Eriksson, 2020; Benedettini, 2022).

There is a growing need to provide equitable services for a heterogeneous population while maximising technological solutions and engaging patients in prevention and self-care solutions. So, the development of efficient solutions becomes necessary with the ever-increasing demand and cost of healthcare services. The transition to digitalisation and sustainable practices requires a significant shift in organisational strategy and business processes that must be well-informed by internal and external stakeholders (Pereno and Eriksson, 2020).

Digitalisation has attracted academic and practitioner interest due to its potential to disrupt markets, improve business processes and improve customer experiences (Martinez, 2019; Verhoef et al., 2019). Digitalisation has delivered benefits like easy and efficient solutions to improve patients' health and safety and support sustainability (Balta, et al., 2021; Tian and Xu, 2015), but extant research has focussed on major health providers (NHS) while ignoring the

supporting organisations like social healthcare providers. Moreover, digitalisation implementation may be affected by challenges such as a lack of organisational readiness, the capability of technology solutions, patient data privacy concerns etc., yet definite solutions are still wanting (Anderson and Agarwal, 2011; Balta et al., 2021; Zhao and Canales, 2021). This is especially difficult for social healthcare providers who are usually SMEs, supporting the primary healthcare providers like the NHS (NHS Digital 75, 2022). Indeed, they attract less attention (funding, staffing) than primary healthcare providers with a larger scale of operations and higher funding resources (ONS, 2021).

Though digitalisation has been presented as a significant catalyst towards achieving sustainability (Seele and Lock, 2017), empirical research to substantiate this claim is incipient due to the novelty and multifaceted nature of these phenomena (Del Río Castro, González Fernández and Uruburu Colsa, 2021). Consequently, the impact and influence of digitalisation on sustainability remain unknown (Seele and Lock, 2017) as their ability to maintain social and environmental sustainability is debatable (Del Río Castro, González Fernández and Uruburu Colsa, 2021 and Akande, Cabral and Casteleyn, 2019). Without a thorough understanding of the impact of digitalisation on sustainability, it is difficult to establish how digitalisation supports sustainability (Broccardo, Truant and Dana, 2023). This may be further compounded by sector or firm dissimilarities, such as size, organisational structure etc. Of course, these phenomena have not been jointly studied in the scant literature on social healthcare providers. This presents different possibilities and challenges for research on digitalisation and sustainability. This paper addresses the gap by investigating the impact of digitalisation on sustainability through the TBL framework to provide a wholistic assessment of the impact. In addition, this paper investigates a peculiar context (social healthcare) that though ignored by researchers, it plays an important role of supporting primary healthcare providers to deliver good health and quality of life in the long term.

This research addresses the gap through the theoretical lens of absorptive capacity (AC) to conceptualise healthcare digitalisation impact on sustainability in an SME social healthcare provider. AC is a dynamic capability that demonstrates a firm's ability to "exploit external knowledge through a sequential process to recognise the value of external knowledge, assimilate this new knowledge through exploratory learning, and apply assimilated knowledge to create new knowledge and value" (Cohen and Levinthal, 1990; Cousins, 2018; Rubbio et al., 2020). Dynamic capabilities refer to a firm's ability to integrate, adapt and reconfigure internal and external competencies, to respond quickly to environmental changes (Teece et al., 1997; Alkalha et al., 2021). AC enables the implementation of dynamic capability at the operational level of assimilating digital capabilities into business processes. While this theory has been applied in knowledge management and transformation in various contexts, no studies have applied it to digitalisation and sustainability in social healthcare sub-sectors.

Despite having more than 1500 papers evaluating healthcare information technology between 1967 and 1995, research effort on the topic was "just beginning". There is an "ever-growing demand for studies to explore the consequences of the current digital revolution" (Ciampi et al., 2022, pg.19).

Researchers have investigated the digitalisation of healthcare and healthcare sustainability, but there is a lack of studies that employ the dual lens of digitalisation and sustainability to investigate the SME social healthcare sub-sector for the development of competitive advantage. Hence, this study aims to address the research gap by answering the research question: What is the impact of digitalisation on sustainability (TBL) in the social healthcare sector?

This study provides a perspective on the impact of digitalisation on healthcare sustainability research by using rich qualitative methodology as used by researchers studying health

digitalisation and sustainability (Pereno and Eriksson, 2020) through an empirical case study. This is strengthened by a rich qualitative data collection method through interviews and supported with archival information from a social healthcare provider, like Acciarini, et al., 2021; Benedettini, 2022. Qualitative methodology is most suitable for unexplored areas and requires in-depth research to generate insights to address the research question (Pratt et al., 2020; Duymedjian & Rüling, 2010). This study contributes to the understanding of healthcare digitalisation and sustainability by advancing the theorisation of these concepts (Balta et al., 2021; Majchrzak et al., 2016) by employing the AC theory. Thus, it has generated insights on the impact of digitalisation on organisational sustainability to further the knowledge base of digitalisation and sustainability in the social health sector. Notably, it demonstrates a practical application of the TBL sustainability framework to assess sustainability. This study makes a unique contribution as one of the first to investigate the impact of digitalisation on sustainability by applying the TBL in the social healthcare sector. Moreover, the implications of this study for social healthcare providers can provide foresight for SMEs considering digitalisation to understand how this can enable the achievement of sustainability outcomes. The following section in the paper reviews the literature, followed by the methodology adopted. Section 4 presents the research findings, followed by discussions and implications for practitioners and researchers.

2. Literature Review

2.1. Healthcare digitalisation

The ability of digital technologies to optimise business processes to increase efficiency and overall improvement has led to significant transformation across different industries (Matt et al., 2015; Gavrilov et al., 2020). From a critical perspective, key factors that are forcing digital transformation are the global impact of the world wide web, big data and accompanying capabilities; industry competition and emerging business models; and changing consumer behaviour toward online and digital channels (Verhoef et al., 2021). Clarification is provided to eliminate confusion over digitalisation and related terms (Gavrilov et al., 2020; Beaulieu and Bentahar, 2021). The digital transformation process begins with *digitisation* (encoding analog or creating digital versions of physical objects (Gavrilov et al., 2020; Verhoef et al., 2021; Ciampi et al., 2022). Although it digitises information and processes, digitisation does not deliver value-creating activities to improve firm competitiveness. The next phase of *digitalisation* uses digital technologies to optimise business processes to grasp new business opportunities and maximise customer experience (Ramaswamy and Ozcan, 2016; Hajli and Featherman, 2018; Ciampi et al., 2022). While digitalisation improves business processes and creates opportunities, the changes it imposes on organisations create many challenges that, if not addressed, could hinder the benefit realisation. At the mature stage, *digital transformation* permeates the whole organisation to create new business models value creation and achieve competitive advantage (Teece, 2010; Verhoef et al., 2021; Ciampi et al., 2022). The complexity of digital transformation and its revolutionary impact on company business models makes it a futuristic attainment, as Forbes reported that “84% of companies fail at digital transformation” (Bruce, 2016). IBM confirmed that 60% of the 380 corporate IT leaders declared that their IT program was not ready for the future (Helm, 2021). Consequently, most firms are undergoing digitalisation.

Most researchers heralded the benefits of digitalisation in healthcare to deliver better value at lower costs, including the opportunity to revolutionise value delivery (Schiafone et al., 2021; Kokshagina, 2021). At the operational level, improved communication through email and intranet achieves efficiency and enhances collaboration across internal and external stakeholders (Ramaswamy and Ozcan, 2016). Improved use of intelligent devices and

equipment help to enhance the customer and user experience (Balta et al., 2021). At the strategic level, digitalisation facilitates learning and decision-making by equipping strategic leaders with data and digital resources to inform strategic choices (Baptista et al., 2020; Morton, 2020) (Balta, et al., 2021)

Healthcare digitalisation research can be captured into three broad areas.

1. Prior studies have focused on prioritising the patients or empowering the patients or customers as active participants in the digitalisation process (Magalhães et al., 2020, Martínez-Caro et al., 2018; Kokshagina, 2021, Balta et al. 2021).
2. Another line of enquiry focusing on the value of digitalisation to critical stakeholders, including employees, other healthcare professionals, and the whole ecosystem (Balta et al., 2021; Zhao and Canales, 2021; Binci et al., 2021; Burton-Jones et al., 2020).
3. Thirdly, other researchers have emphasised the practice of data management, knowledge management and organisational learning about digitalisation (Gavrilov et al., 2020, Zhao and Canales, 2021; Ciampi et al., 2022)

Digitalisation challenges include technology's suitability to different users (Martin et al., 2011; Gavrilov et al., 2020), context and stakeholder requirements or privacy concerns (Agarwal et al., 2010; Balta et al., 2021). Nevertheless, innovative firms employ their capabilities to overcome these challenges to create and capture value.

While digitalisation research is gaining interest (Balta et al., 2021; Hajli and Featherman, 2018), no known research publication exists on SMEs in the social healthcare sector. Crişan et al., 2021 argued the need to provide an in-depth perspective within individual sectors, yet social healthcare has been largely ignored (Martínez-Caro et al., 2018). Though Magalhães et al., 2018 confirmed that private healthcare providers in social care are employing digitalisation for cost control quality improvement, resource optimisation and better customer relations, the authors failed to address the impact of the changes imposed by digitalisation on business practices and the nature of work.

This study aims to investigate the impact of digitalisation on social healthcare TBL sustainability. While Beaulieu and Bentahar, 2022 aimed to design a roadmap for healthcare digitalisation initiatives, it focused on the product supply chain while ignoring internal business processes and knowledge management. Burton-Jones et al., 2020, evaluated digitalisation in healthcare, but their study focussed on the large complex digital transformation of a whole hospital which does not apply to SMEs. This study aims to address the gap highlighted by Ciampi et al., 2022, pg.19, (Karimi and Walter, 2015; Vial, 2019) of an “ever-growing demand for studies to explore the consequences of the current digital revolution” in a social care context.

2.2. Healthcare sustainability

The responsibility of nations and cooperations to adhere to sustainability requirements has led to 197 countries pledging decarbonisation and CO₂ reduction at the United Nations Climate Change Conference (UN, 2021). Indeed, the SDGs especially those on good health and wellbeing; industry, innovation and infrastructure, impact directly on the health and social care operations. Consequently, firms can focus on competitive advantage and ‘sustainability advantage’ as true value creation does not consider economic benefits without environmental responsibilities (Willard, 2012; Savitz and Weber, 2014; Stanford et al., 2023). The broader health sector has been criticised for releasing 3% of the global carbon footprint, juxtaposed with the health expenditure costs of 10% of global economic output (Karliner et al., 2019, Breth-Petersen et al., 2022). Paradoxically, the global health sector, which aims to save people, is damaging the environment and negating the achievement of the SDGs. At the national level,

the NHS revealed its plan to become the world's first carbon net-zero national health system by achieving net-zero carbon emissions by 2040 (NHS England, 2020). Nevertheless, healthcare subsectors such as social healthcare providers have a role to play though their operations are less visible.

Sustainability researchers have coined 'sustainable healthcare' or 'climate-smart healthcare' to demonstrate the focus on promoting sustainable approaches within the healthcare sector (Benedettini, 2022), though there is a lack of consensus on the definition of these concepts (Fischer, 2015; Braithwaite et al., 2019; Pereno and Eriksson, 2020). In general, healthcare researchers (Pereno and Eriksson, 2020; Benedettini, 2022) have adapted the TBL framework, though some have replaced the 'people' component with 'health' (Breth-Petersen et al., 2022). The TBL framework applies to social healthcare as their operations need to promote a social perspective to care provision and reduce environmental impact while sustaining the economic value of healthcare systems (Pereno and Eriksson, 2020). Nevertheless, the context of social healthcare in which caregivers are undervalued requires a consideration of the caregivers along with the clients being cared for. However, achieving the TBL remains hazy as an understanding of the interdependency between the three components is under-explored.

The intersection between sustainability and digitalisation has been recognised by governments (European Economic and Social Committee, 2020) and corporations (Kiron and Unruh, 2018), given the role of digitalisation in fostering sustainable practices. Nevertheless, this remains uncharted territory (Aksin-Sivrikaya and Bhattacharya, 2017; Pereno and Eriksson, 2020). Where attempts have been made to understand the impact of digitalisation and sustainability, such as in the fashion and food sectors, researchers (Capurro et al., 2023) have concentrated on multinationals while overlooking SMEs. This leaves the area underdeveloped, thus necessitating a focused investigation, particularly from SMEs.

2.3. Absorptive Capacity (AC)

AC is the ability to capture, integrate and apply new knowledge (Cohen and Levinthal, 1990) by frequently modifying external expertise for internal applications (Mowery and Oxley, 1995). Knowledge asset development depends on maximising data from internal and external sources (Audretsch and Belitski, 2023) aided by advanced technologies to achieve innovation and value creation (Hervas-Oliver, Sempere-Ripoll and Boronat-Moll, 2021; Duong et al., 2022).

Following a critical literature review, Zahra and George (2002) redefined Cohen and Levinthal's (1990) three-dimensional model into four dimensions of AC which build upon each other to develop DCs. These dimensions have been classified into potential AC (knowledge acquisition and assimilation capabilities) and realised AC (knowledge transformation and exploitation) (Zahra and George, 2002; Camisón and Forés, 2010). Both components of the four dimensions are crucial because they are individually insufficient for the development of DC. Before knowledge asset exploitation, there must be acquisition and assimilation. Likewise, acquisition and assimilation are inadequate for competitive value creation and value capture. Researchers have conceptualised these dimensions in diverse ways based on their idiosyncrasies and the research contexts (Wacker, 2004; Todorova and Durisin, 2007; Camisón and Forés, 2010). Many of these are quantitative researchers who seek to quantify and measure concepts which are subjective in nature. The capabilities are often intangible and intrinsically embedded in the processes and practices of organisations. Yet, researchers have ventured into quantifying and reducing the complex capabilities into figures which is oversimplified and inadequate (Frank and Roessl, 2015, Gilman and Salder, 2021). This study, therefore, aims to demonstrate the application of these capabilities in the real-life context through a qualitative investigation of social healthcare digitalisation impact on sustainability.

3. Methodology

The research context is vital in research methodology as this affects the data and the interpretation of the findings (Brennen et al., 2022). The study investigates a social care provider SME in the UK. The SME is a UK-based franchise of a global brand in social healthcare sector where relationship-led home care is customised to the client (older adults) and their needs. The sector rarely gets any attention in the literature, though it comprises SMEs supporting the primary healthcare providers like the NHS (NHS Digital 75, 2022). The main client base are senior adults, thus the notion of digitalisation within such context is intriguing, especially where digitalisation efforts converge with sustainability to deliver visible outcomes. This research methodology involved a three-step approach; first, an exhaustive literature review was conducted to establish the research gap and design the research questions for data collection. Next was the empirical investigation of the theoretical phenomena in practice by interviewing industry experts at a social healthcare SME. This was supported with archival information provided by the industry experts. Finally, the findings were analysed and validated with the industry expert to inform publication.

3.1 Data collection

The investigation of an under-researched context necessitates an exploratory study at the initial stage. Hence, this research is an exploratory study which embraces the flexibility of a qualitative methodology (Pratt et al., 2020; Duymedjian and Rüling, 2010) for an in-depth investigation to conceptualise emerging findings from empirical cases (Brennen, 2022) rather than a quantitative methodology. Through in-depth interviews guided by semi-structured questions, the study delved into respondents' feelings and experiences in their peculiar context (Gubrium and Holstein, 2009). Therefore, researchers focusing on healthcare digitalisation and sustainability have embraced the rich qualitative methodology (Pereno and Eriksson, 2020; Benedettini, 2022), using semi-structured interviews (Corbin and Strauss, 1990) as the most suitable data collection method to provide comprehensive findings within the research context. This was coupled with archival information (Acciarini et al., 2021) to expand the investigation and ensure no important details were missing. Interviewees were experts that were knowledgeable about the company's strategy and processes. They possessed knowledge, skills, and roles involving them in the situation of interest (Gläser and Laudel, 2009).

Essential research information, such as participant information and consent form, providing the research aim and objectives, were circulated to respondents before the interviews to minimise any bias, adhere to research ethics and ensure the suitability of respondents. The interviews lasted between 30 and 60 mins to gain a rich understanding from the perspectives of staff across the organisation. As a result, the interviewees were the Managing Director (MD), Registered Care Manager (RCM), Head of Care Professionals (HCP) and Quality and Compliance Officer (QCO).

3.2 Data analysis

Data analysis was done based on Pratt et al., 2020; Duymedjian & Rüling 2010's bricolage of 'conceptual leaping' to engage with distinct techniques for analysing the in-depth research findings to generate insights to address the research question. Specifically, the interpretive process of analysing the findings requires a thorough understanding of the context to address the research question (Brennen, 2022). Grodal et al.'s 2020 categorisation theory was employed to identify relevant categories for coding the data based on theoretical concepts. First- and second-order codes were generated (Strauss & Corbin, 1990) by analysis data from

participant responses to develop generalisable insights (Figure 1). As categorisation must be constructed based on existing theory (Grodal et al.'s 2020), sustainability and digitalisation, formed the main theoretical dimensions in this study. The analysis process was iterative as the initial categories were refined to generate the final categories (Grodal et al.'s 2020; Locke, Feldman, & Golden-Biddle, 2015). In addition to categorising data under both dimensions, the interrelationship between the dimensions was established, as shown in the findings and analysis.

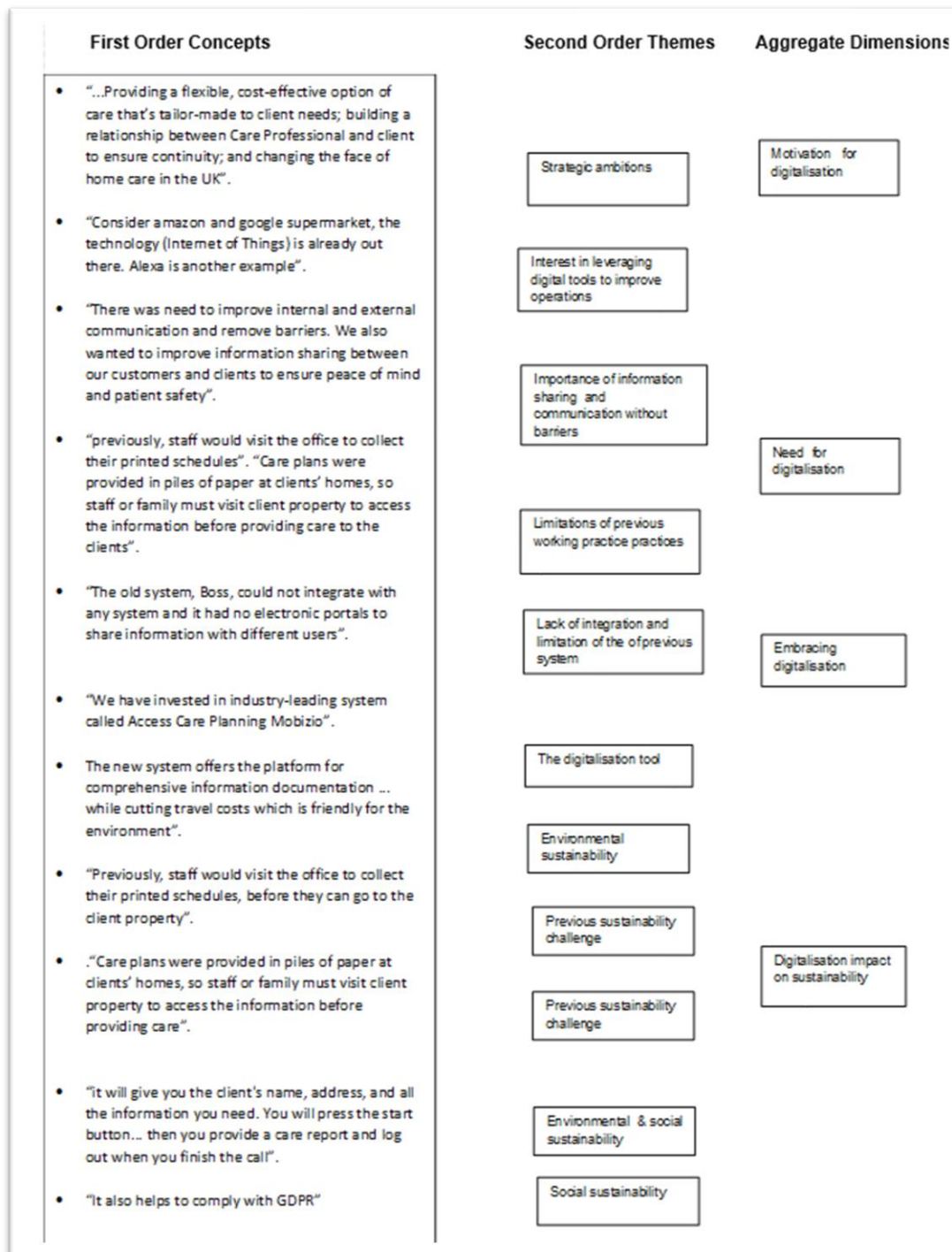


Figure 1: Data structure from research findings based on Grodal et al. (2020).

4. Findings

The SME is a supportive organisation of the NHS as situated at the bottom of the NHS pyramid in the health and social care providers section shown in Figure (2). This highlights the SME social healthcare provider's position at the bottom of the pyramid along with other providers. Yet, they play a significant role in helping the top of the pyramid, including the NHS, in stabilising and functioning effectively which aligns with the SDG on partnerships for the goals. The first part of the questionnaire focused on digitalisation, followed by sustainability. The interviews revealed that the motivation for digitalisation was fuelled by industry trends where "caregivers are undervalued" (the MD added); hence there is a prediction of 165,000 vacancies in UK social care. This workforce shortage created uncertainty about the sustainability of UK health and social care. Therefore, innovating SMEs must find opportunities to mitigate the challenge. Digital technology offers potential solutions as they promise to improve work design through automation or semi-automation of tasks to minimise the need for human intervention. The MD also stated, "consider amazon and google supermarket, the technology (Internet of Things) is already out there. Alexa is another example". The MD employed absorptive capacity to sense potential opportunities outside the sector with a view towards acquisition and assimilation. However, these examples were advanced forms of digitalisation situated at the mature stage of digital transformation. While digital transformation is an ideal aspiration for the SME in the longer term, this must be preceded by the digitalisation stage.

Moreover, the management demonstrated clear evidence of dynamic capabilities as senior management can sense external opportunities to the sector and modify and leverage resources to exploit them to develop a sustainability advantage. Leadership focus on technological capabilities coupled with expert judgement by senior management initiated the reconfiguration of competencies and capabilities to respond to the business environment needs.

This led to the investigation of the SME's strategic objectives. The MD affirmed, "...providing a flexible, cost-effective option of care that's tailor-made to client needs; building a relationship between care professional and the client to ensure continuity; and changing the face of home care in the UK".

Two of these objectives are focused on internal operations. In contrast, the third is focused on external reputation building to create the image of a pioneering firm seeking to change industry practice for good. The internal objectives focus on customising care to meet client needs and creating a bond between the care professional and the client. There is an emphasis on cost-effective operations and flexibility. With such ambitions, the role of digitalisation cannot be ignored due to the opportunities it offers. Again, the mention of continuity relates to the viability and sustainability of business operations. This highlights the importance of digitalisation and sustainability at the strategic level, though digitalisation received more attention as the rest of the sector reveals.

Supporting organisations

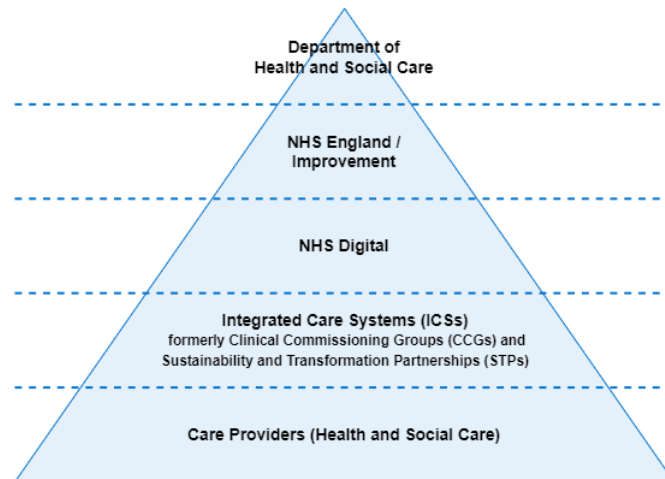


Figure 2: Supporting organisations to the NHS (NHS Digital 75, 2022)

Understanding the motivation for embracing digitalisation from the MD's perspective was necessary. The respondent replied, "there was the need to improve internal and external communication and remove barriers. We also wanted to improve information sharing between our customers and clients to ensure peace of mind and patient safety". This demonstrates an understanding of the importance of information sharing among stakeholders, as data and information form the bedrock of knowledge development. Notably, there is a recognition of the importance of communication and the need to limit information asymmetry for effective coordination to maximise value creation. Timely information must be shared and communicated internally and externally with stakeholders to improve stakeholder trust and assurance of care delivery to clients. There is an identification of existing barriers, some of which emerged from the manual forms of data collation and storage, which is time-consuming. Hence data is usually historical rather than current. These often led to reactive decision-making rather than a proactive approach. These barriers must be removed to create superior value for clients and customers and achieve the SME's strategic objectives.

The need to improve data and communication was prioritised, so the digitalisation effort addressed this need. The MD confirmed, "we have invested in an industry-leading system called Access Care Planning Mobizio". "This required staff training on how to use it effectively, and we're sure it will make a difference in our service provision". This new system promises several benefits to care providers. One was to support the digitisation of care documents and processes while enabling staff to concentrate on delivering care to clients.

The initial findings reveal that human resource needs arising from the industry and the evidence of the digitalisation capabilities from other sectors have motivated the interest of senior management to seek digitalisation as a solution.

Before discussing the new system, it is essential to analyse the previous system to further identify the need for digitalisation.

The RCM declared, "previously, staff would visit the office to collect their printed schedules, before they can go to the client property". The previous practice involved several visits to the office and the client's property to obtain schedule information and care plans, which were provided in printed form before care delivery. "Care plans were provided in piles of paper at

clients' homes, so staff or family must visit client property to access the information before providing care". In addition, "handwritten reports from care visits were not accessible to the office staff until care professionals made return visits to the office to give these in". Though the company did not mention it, the process had implications for environmental sustainability. The nature of home care delivery has environmental implications as staff typically travel to attend client properties. As location, time and distance may be unpredictable, staff must travel in their cars, rather than employing sustainable means of bicycles, trains or busses. Manual operation of this process can only exacerbate sustainability concerns due to high reliance on printed information and a scheduling process that is not optimised, leading to multiple staff travel.

The RCM also added, "The return visits may not happen on the same day that the visit was carried out depending on the number of care visits scheduled for each day". "The process was prone to human error due to legibility of writing, hence the risk of misreading content. In addition, there was the risk of information loss". The practice of care provision also had implications for data accuracy and security, schedule optimisation and the quality of care. The manual recording process meant that the information might not be legible for the user, e.g., the scheduler, to process the information accurately. Again, one or two pages of data could go missing in transit, leading to inefficiency and potential errors in decision-making. The company may become liable under the law if valuable information is lost.

In addition, "the old system, Boss, lacked integration capability with any system and had no electronic portals to share information with different users. Also, audits took as long as four weeks" (RCM added). The old system brought limitations to the digital capabilities of care provision. Lack of system integration restricted data access. It also lacked electronic portals to allow staff or client's family to access care data without physical visits. It also stretched the duration of the process audit due to information asymmetry. This will impact the quality of care because when audits take too long to complete, process improvements will be delayed until audits have been carried out. This will hinder the achievement of the SME's aspiration to provide flexible, personalised care and change "the face of home care in the UK". This would also threaten the objective of ensuring business 'continuity', which will affect financial and operational sustainability. More findings demonstrate the limitations of the existing system and its impact on care delivery operations, and the barriers it has brought to information sharing and communication. This necessitates the need for digitalisation to overcome these problems.

The need for a new system has been firmly established as it could circumvent manual record keeping and physical storage, which are prone to error, often time-consuming and less secure. It promises data security and integration to ensure full accessibility of timely information to meet the needs of different users.

The RCN explained that the "ACP mobizio system normally integrates smart recruitment, people planner system and e-learning systems to provide access to different users. It improved transparency among the admin staff, care professionals and client family". At the operational level; the HCP stated, "it will give you the client's name, address, and all the information you need. You will press the start button... then you provide a care report and log out when you finish the call". "It also helps to comply with GDPR". "It loads up the care plan and allows you to read the updated care plan before attending the property". "All info is sent directly to the back office, visible to everybody else". "It's a good little tool, actually".

The QCO added, "for instance, I was checking on a client just last night, and one of the care pros commented that the oven didn't seem secure in its unit. So, this morning we've already

spoken to the family, and they've given her a reason for that and that they're gonna go and check it now... it's just instant. We might not have been picked up in the past unless a care pro telephoned the office”.

The impact of digitalisation enabled the integration between the mobile app and the back-office system to provide real-time information to different users. It provided flexible options for data entry to system users and information sharing with stakeholders. The system also enables customisation in service delivery by taking account of the client's profile in selecting the most suitable care professional to meet the need. This enables improved care delivery as a care professional can consult the client's care plan with relevant information to deliver the best care before arriving at the client's property. It also improved scheduling and responding to alerts raised as access to real-time data in the office helps to optimise the scheduling process and respond to concerns through alerts raised. There is also better information sharing with the client's family as they can obtain real-time information about their loved one and reply promptly. This will ensure the viability and sustainability of business operations.

“The new system offers the platform for comprehensive information documentation including emergencies, power of attorney etc., while cutting travel costs which is friendly for the environment” (RCN explained). This statement emphasises the benefits of digitalisation, including environmental sustainability. Notably, this is the first mention of environmental sustainability throughout the interviews. There was an implicit mention of economic sustainability (only) in establishing the need for digitalisation, but after embracing digitalisation, the outcomes affect the three components of the TBL sustainability. This meant that there was a lack of understanding of the interaction between the environmental, social and economic components of sustainability. The result of sustainability is provided in the flow chart in Figure (3).

Though sustainability was not the primary motivation for embracing digitalisation, the outcome of digitalisation directly impacts sustainability. This demonstrates the link between the two theoretical dimensions while validating the TBL.

Nevertheless, some challenges associated with the system implementation included “some care professionals (2% of the whole) who used the paper in the old system have struggled to adapt to the app. But we do work with themto support them”. “Though we can see when care professional has logged in when they've logged out, sometimes it depends on the signal in the area”. “It might be some hours or a day later before they realise it has not actually worked. So, this is where we've got to reconcile through accounts and ensure the client doesn't get overcharged”.

“ACP mobizio is good, but sometimes it doesn't link everything with people planner potentially, leading to a system error. So, for service reviews for instance, every three months,

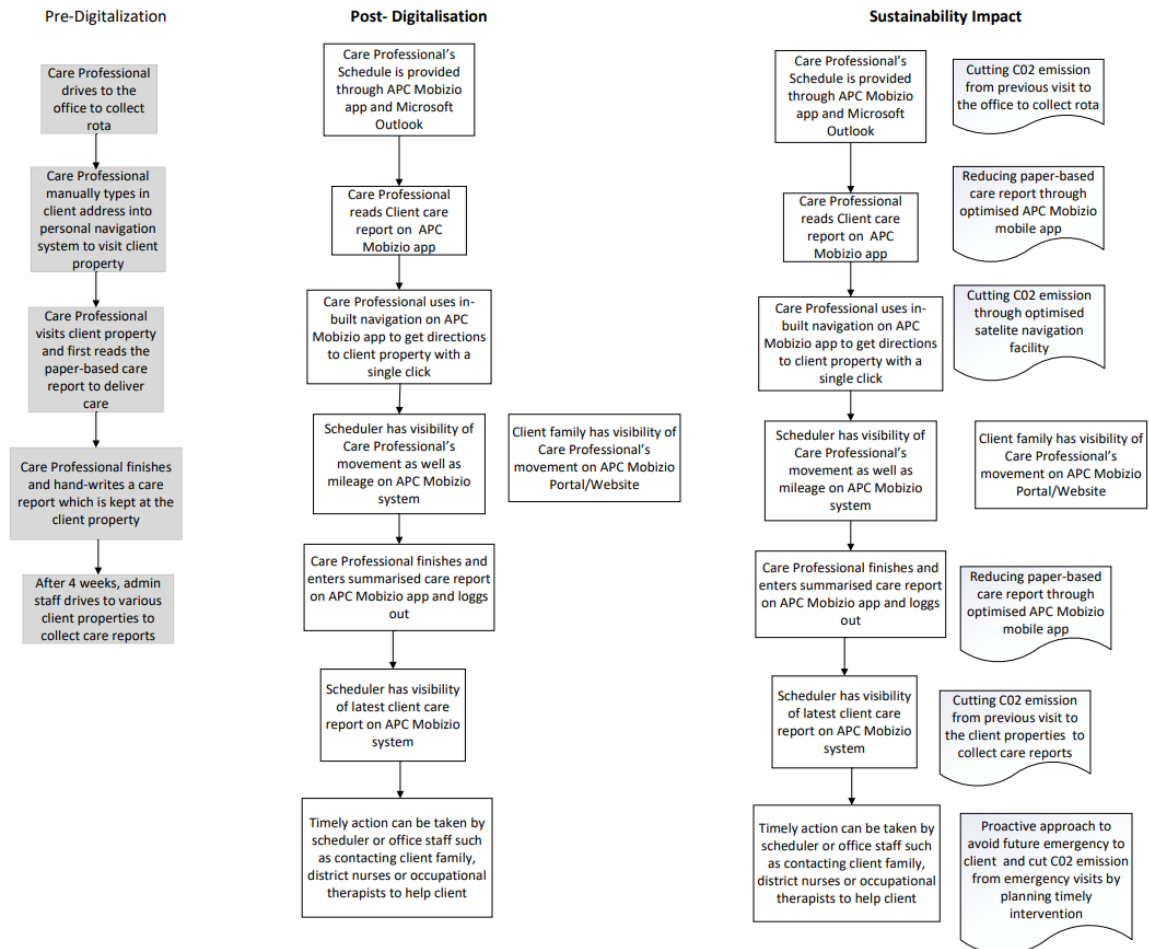


Figure 3: Impact of digitalisation on sustainability based on data analysis

you must manually go in and correct system errors because otherwise, if you run a report, it throws all of your service reviews". "But we are getting ready to change systems as such. So, I think the new one will be incorporating a lot more because it's gonna be more advanced, isn't it? It's piloting now".

The findings show some challenges like, staff acceptance, occasional network problems and lack of system integration which delay information recording or leads to erroneous data generation. These challenges are common with digitalisation projects; however, what is also remarkable is that the company is addressing these challenges effectively, with plans to move to an advanced system which will overcome the limitations of the existing, one as shown by the pilot being undertaken.

By employing digital technologies, companies can achieve sustainability while embracing social and environmental perspectives and an economic focus. The benefits of digitalisation have outweighed the challenges and yielded positive outcomes for sustainability, as shown in Figure (3). The findings reveal that the SME was motivated towards digitalisation with less attention to sustainability, yet the sustainability outcomes achieved demonstrate the interaction between the two phenomena while showing the interaction between the TBL sustainability components.

5. Discussion

Both academics and practitioners have highlighted the critical role of the healthcare sector globally. However, the sector's negative contribution to the environment has also attracted

public interest, thereby requiring urgent attention to the development of sustainable approaches to healthcare. While recent literature presents new initiatives such as ‘sustainable healthcare’ and ‘climate-smart healthcare’, this is impacted by a lack of consensus on the definition and implementation of these concepts. In addition, sub-sectors, such as social healthcare, which support primary healthcare providers like the NHS, are often ignored. Nevertheless, social healthcare providers are seeking ways of mitigating the challenges faced by the sector to ensure sustainability. Digitalisation has been heralded in the literature for the capabilities it enables firms to develop to reap economic benefits, thereby making it an attractive option for innovative firms. While sustainability and digitalisation have become significant drivers in decision-making, they are usually investigated separately in the literature. Though, researchers have hinted at the possibility of a convergence of the two dimensions in organisations, these studies are inadequate. Concerning social healthcare, no studies have investigated the two dimensions to date. First, this paper contributes to the discussion by investigating the impact of digitalisation and sustainability through the TBL framework to provide a wholistic assessment of the impact. Secondly, this paper investigates a peculiar context (social healthcare) that though ignored by researchers, it plays an important role of supporting primary healthcare providers to deliver good health and quality of life in the long term.

This paper contributes to the discussion by employing a rich qualitative methodological approach using interviews with various staff within a social healthcare provider SME to draw insights into the impact of digitalisation on sustainability. The findings reveal that the SME embraced digitalisation because of the need to overcome the sector challenges. The SME aspired to maximise digitalisation capabilities to deliver competitive personal social healthcare solutions to clients. Given the limitations of the previous system, relating to efficiency, data security etc., the SME demonstrated the application of AC to identify digital technologies to combat the problems. Though the new technology was not without its shortfalls, the benefits outweighed the limitations. Remarkably, the impact was far beyond their expectations. It did not only help to improve and advance the business processes (economic sustainability), but it led to reduction of staff travels, use of paper record and optimisation of care operations, thereby achieving the environment and social perspectives of the TBL. Specifically, the study established that the motivation for digitalisation was driven by sector challenges such as workforce capacity, an ageing society which increases demand etc. with an implicit mention of economic sustainability. However, the sustainability requirement expected of all firms includes the three components of the TBL. Thus, this study is one of the first to assess the impact of digitalisation on sustainability with the application of the TBL in social healthcare context and the outcomes are presented in Figure (4).

The TBL framework has been applied in the sustainability literature, especially healthcare sustainability, thereby validating their appropriateness to assess the sustainability impact of digitalisation in social healthcare. The study applied the TBL to assess the impact of digitalisation in sustainability in a social healthcare SME. Thereby, it demonstrated the interaction between the environment, economic and social dimensions of the TBL to argue that environmental stewardship and social equity are critical components that must be achieved alongside economic viability to achieve corporate sustainability as shown in Figure (4). Though the SME embraced digitalisation for economic sustainability, the outcome has delivered environment, social and economic components, thereby demonstrating the interconnectivity among the three TBL components. Of course, digitalisation did not come without some challenges related to network connection, minimal resistance from staff and system integration problems. However, the interviews also

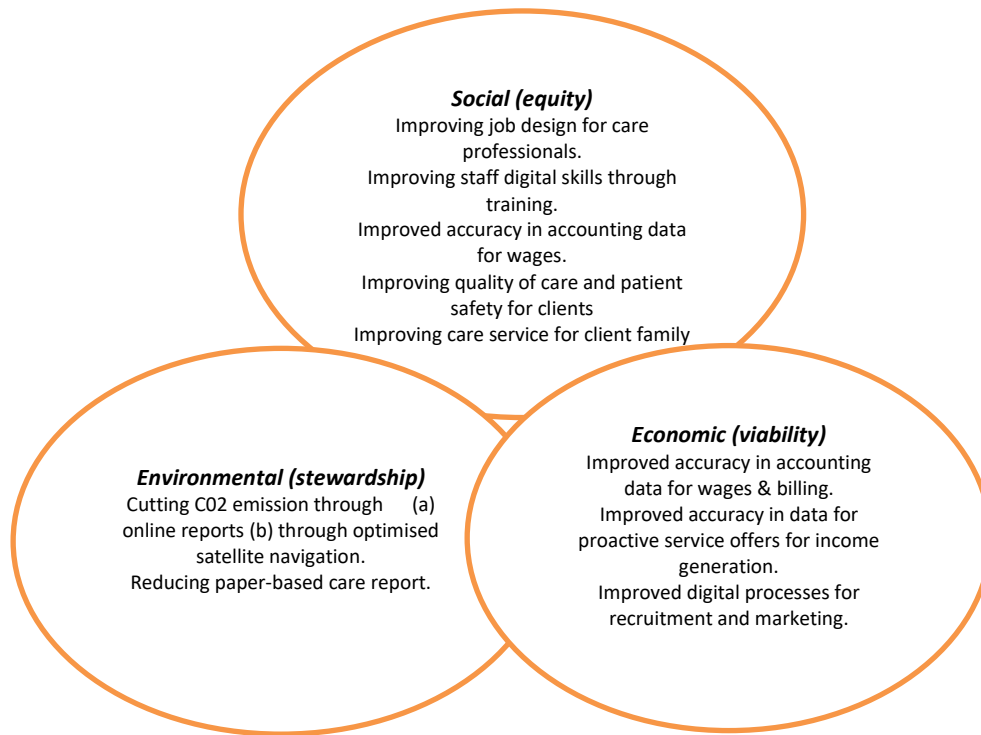


Figure 4: TBL application based on data analysis

reveal that the SME is effectively mitigating these challenges with a plan to embrace an advanced version of digitalisation to overcome some challenges.

5.1. Practical Implications

The interviews findings provide a clear demonstration of the link between economic, social and environment sustainability, as digitalisation impacted on all three components. Therefore, practitioners must adopt a holistic perspective to sustainability, beyond the economic focus. All components of sustainability are important, especially with the global call for the healthcare sector to reduce its carbon footprint and the NHS' pledge to achieve net zero by 2040. So, no component of the TBL should be ignored by supporting firms to the NHS. The findings also demonstrate how one decision can impact other aspects of the organisation such as a digitalisation having an impact on sustainability. So, this necessitates that decision-makers must adopt a holistic view to managing organisations as one decision can have either a positive or negative impact on the rest of the firm including stakeholders such as staff and clients.

The findings confirm that digitalisation may not provide the answers to all social healthcare sector problems, but it provided more benefits than limitations. Though challenges with staff acceptance, occasional network problems and lack of system integration were identified, the benefits led to the achievement of TBL sustainability.

Thus, the SME adopted a proactive approach to overcome these limitations and started piloting an advanced system to address some challenges of the existing system. Firms must be proactive to assess the impact of sustainability and develop means to overcoming limitations to achieve greater benefits of digitalisation.

5.2. Theoretical Implications

Digitalisation and sustainability are major topics in academic research. Usually, they are investigated independently, but there is an emerging perspective seeking to understand the interaction between the two subject areas. Digitalisation focusses on exploiting the capabilities of digital technologies to advance business processes and operations to maximise value creation and value capture (economic sustainability). Sustainability seeks to ensure that business operations are conducted in a manner that protects the planet, promotes social development while maximising resource usage to avoid waste in the long term. Both phenomena, hence there is a growing interest in research that investigates these concepts jointly. This study contributes to the incipient areas focussing on the convergence of the two phenomena to achieve sustainability advantage through sustainable operations.

The generalisability of the results can be viewed in different ways. Fundamentally, the research findings are generalisable to SME social care providers as the literature and empirical findings confirm that the sector challenges apply to the global healthcare sector. Social care providers form a sub-sector of the supporting institutions to the leading healthcare institutions such as the NHS. This structure is typical in many western countries; hence the findings are generalisable to social care providers adopting digitalisation. In addition, some respondents possessed knowledge and experience from other social care companies and confirmed that the challenges and experiences are similar across the sector. This also explains why the SME's strategic objective was to 'change the face of home care' in the sector. The qualitative methodology enabled a rich investigation of the social healthcare sector to generate accurate and valuable findings from the social healthcare provider.

Moreover, the implications of this study for social healthcare providers can provide foresight for SMEs considering digitalisation to understand how this can enable sustainability.

5.3. Limitations and Future research

Research limitations relates to internal validity of findings due to the small number of interviews conducted in this the study.

Although secondary sources were also consulted, data triangulation and validation is difficult. So, data validation is influenced by the relies on researcher judgement to identify essential themes.

Future research could build on the qualitative findings of this study to conduct a mixed-method study that embraces both qualitative and quantitative approaches for a richer investigation of the impact of digitalisation on sustainability. This could involve cases from more social health providers to build on the research area. Further investigation of the interaction between the TBL components could help to advance this research area.