



# Hey Siri, Google! Can you help me? A qualitative case study of smartphones AI functions in SMEs

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## ABSTRACT

Small to Medium Sized Enterprises are vital contributors to the economy of a country. These smaller organizations lag behind large organizations when implementing novel technologies. Smartphones offer Artificial Intelligence functions that are still being understood in the context of society and organizations alike. Recognising a research gap in Artificial Intelligence applications in the context of Small to Medium Sized Enterprises, the aim of this research study is: To explore, understand and explain smartphones AI enabled functions in the context of a case study. To achieve this aim, a qualitative study of a case study in Camden Market, London, United Kingdom was used. A sampling approach that used a non-random, snowball and purposive sampling led to 21 participants who were interviewed with open ended questions. This study found that some factors pertinent to mental, skills and usage access create a digital divide that leads to both positive and negative outcomes when using the AI Virtual Personal Assistants (VPAs) function of smartphones. In the positive outcomes, technoeustress emerged due to functions like, currency converters, language translation and weather forecasts. Negative outcomes included technostress where individuals did not understand the capabilities of VPAs. Also included in this paper are contributions and implications.

## 1. Introduction

Novel Information and Communication Technologies (ICTs) are impacting daily lives, which is assisting the current business landscape (Chatterjee et al., 2017).<sup>1</sup> A form of ICTs that has been impacting organizations, governments, and society is Artificial Intelligence (AI)<sup>2</sup> and emerging technologies such as Virtual Personal Assistants (VPAs) and chatbots (Gartner, 2020).

Smartphones, which have penetrated daily lives, have a feature of VPAs (e.g., Apple's Siri, or Google's Google Assistant) and are the mobile ICTs and AI functions used to understand the work and jobs in this study's organization (Nagy et al., 2020; Yang and Lee, 2018). Due to its capabilities, AI is viewed as a powerful tool that assists with the development of daily tasks, helping professionals optimize their response time, and enhancing stakeholders' decision-making (Costa et al., 2020).

For such reasons, AI and emerging technologies like VPA and chatbots are expected to replace almost 69 % of Managers' workload in the future (Gartner, 2020).

For over a decade, VPAs natural language processing and prediction models have been facilitating human-computer interactions, providing utilitarian benefits along with social, emotional, relational experiences, which are critical factors for users' adoption and usage (Ki et al., 2020). However, many have not considered using VPAs in their workplace. This is despite VPAs functional benefits, such as assisting users in automating tasks, which could lead to improvements in their working practices. Examples of VPAs functions that can enhance productivity and efficiency in organizations include hands-free capability, real-time translation, speech-to-text, question answering and recommendations, task tracking, time management and data analysis (Forbes, 2020). By using these functions, individuals can save time and multilingual teams can

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<sup>1</sup> As ICTs are emphasised in this study, an explanation is provided due to the variations that are rapidly occurring and leading to no single or universal definition. For this study, ICTs are defined as devices that include a networking component, systems and applications that are combined to allow people and organizations to interact in the digital world (Southern and Tilley, 2000).

<sup>2</sup> AI is still evolving as researchers understand its capabilities, which also makes it difficult to define it, but for this study, it is defined as: Artificial intelligence is a constellation of many different technologies working together to enable machines to sense, comprehend, act, and learn with human-like levels of intelligence (Accenture, 2022).

communicate more effectively. This implies that individuals can change their ways of working and craft their jobs according to the functions of the VPA.

Some organizations that could benefit from using VPAs in their daily activities are Small and Medium Size Enterprises (SMEs). SMEs account for most businesses in countries, representing 90 % of the business worldwide and are beneficial for creating employment around the globe (World Bank Group, 2020). They provide more than 50 % of total employment; thereby, contributing towards global economic development (Ibid). In the context of the UK, SMEs are any business with fewer than 250 employees, of which (0–9 employees) is defined as micro-enterprise, (10–49 employees) small enterprise, and (50–249 employees) medium-sized enterprise (Parliament, 2019). This study focuses on micro-SMEs located within an organization. These micro-entities are very small companies that will also have the nature of any two of the following: a turnover of £632,000 or less; £316,000 or less on its balance sheet; 10 employees or less (Crown, 2020). These organizations are also limited in terms of human and monetary resources, which led to this sector being considered.

In the UK, recent official statistics indicate that in 2019 there were 5.9 million SMEs, out of which 5.6 million were micro-businesses, accounting for 96 % of all businesses (Parliament, 2019), which shows the importance of the sector. By adopting technologies such as Siri or Google Assistant, SMEs at large, and micro-SMEs could increase competitiveness, become more cost-effective and enhance employee and customer interaction (Jones and Graham, 2020).

VPAs are being adopted and used much slower than other functions of the smartphone due to the digital divide where issues such as awareness, the associated infrastructure, or digital skills are matters of importance (Choudrie et al., 2021; Choudrie and Vyas, 2014). From a Scopus search it was also learnt that there are minimal studies examining VPAs in the context of SMEs, where the usability aspect within organizations is amiss, which led to the team identifying a research gap. As this study intends to examine the effects on the SMEs functioning due to VPAs, the stakeholder theory was viewed to be suitable for this research (Pouloudi et al., 2016). What has also been found is that there are minimal studies of VPAs usage in SMEs and how their impact can lead to better functioning in SMEs, given the fact that VPAs have only become commercially available in recent years (Yang and Lee, 2018). Thus, given the importance of SMEs and their impact on an economy, as well as AI, VPAs and smartphones proliferating daily lives, the motivation to overcome this gap was formed, which led to the aim of this study: *To explore, understand and explain smartphones AI enabled functions in the context of a case study.* To achieve the aim, the context and case study of this research is Camden Market, a world-famous market in London, England. By conducting this study, its contributions were viewed to be: Although there are studies focused on VPAs in SMEs, studies of AI systems assisting an SME workforce and identifying the uses of AI in SMEs are rare. Thus, a study of smartphones VPAs, the digital divide and stakeholder theory can provide a vital contribution to the knowledge areas of smartphone AI, digital inclusion from a socio-technical aspect in the context of micro-SMEs. Further, IS researchers have found that studies rarely identify how stakeholders were identified and who the stakeholders are (Pouloudi et al., 2016). Moreover, by considering these issues, this study can help SMEs increase competitiveness and enhance productivity using technology, and smartphones AI functions.

Having introduced the research topic of this paper, the next section offers an overview of the literature on the digital divide and stakeholder theory to provide a background to this research. Next, the research design is explained. Afterwards, an analysis and discussion of the empirical findings from this study is provided. This is followed by the implications of this research for theory and practice. Finally, the limitations, future directions and conclusions are proffered.

## 2. Theoretical background

In this section a background on the digital divide and stakeholder theory is provided, which serve as the theoretical foundation for our research study. This assists with the thematic analysis and coding process of this study.

### 2.1. SMEs digital exclusion and inclusion

Due to the Covid-19 pandemic, Governments worldwide were forced to take various preventative measures, such as lockdowns, leading to significant changes in consumers' needs and an increase in social inequalities. Consequently, organizations around the globe have been forced to rethink their business models and income streams, which has accelerated the ongoing paradigm shift of the fourth industrial revolution (Hirschi, 2018; Morrar et al., 2017). Accordingly, the digital transformation of organizations in various countries, including some SMEs, has been significant. For instance, despite a tendency to limit their digitalisation activities to basic functions, various SMEs found themselves moving their operations to the online environment to retain business continuity. In particular, online platforms were instrumental in connecting SMEs with customers, resources or suppliers (OECD, 2021). Yet, despite these efforts and the proactive initiatives of governments in various countries to digitalise SMEs (OECD, 2020; BFPG, 2021), the pre-Covid-19 challenges that leave SMEs at high risk of digital exclusion remain.

Traditionally, SMEs are more susceptible to risks than their larger counterparts due to various intrinsic characteristics. Namely, lack of resources or skills, weaker cash flow, tightened credit lines and less access to government funds (Vanharanta et al., 2022). These vulnerabilities can be aggravated by global scale events such as the Covid-19 pandemic. As demonstrated by the previous 2008 global financial turmoil, socioeconomic crises tend to cause significant downturn in SMEs formation, performance and existence in the market (Asgary et al., 2020). Furthermore, SMEs face what Freeman et al. (1983) terms "a liability of smallness". In other words, the smaller the business, the more vulnerable it can be to internal and external events (Eggers, 2020). Hence, micro-SMEs, which are the focus of our study, are at an event greater risk of digital exclusion than large organizations and medium-size enterprises.

Most SMEs tend to lack the knowledge and capability needed to take advantage of the latest digital innovations (European Investment Bank, 2019). For example, the majority of SMEs lack the expertise or resources to predict business continuity or market trends (Millan et al., 2021). Yet, multinational organizations are largely benefiting from using a mix of cutting-edge technologies. Such digital technologies can be classified in seven types: mobile, social, cloud computing, platform development, big data, Internet of Things (IoT) and AI-related technologies (Sebastian et al., 2017). As a result of this lag, SMEs do not benefit from the opportunities caused by disruptions as much as large organizations do. This is due to SMEs overreliance on tacit knowledge and lack of specialised knowledge, financial resources and managerial capacity (Klein and Todesco, 2021). Conversely, large organizations have the added advantage of hiring external consultants or IT specialists to make use of cutting-edge technologies like, AI applications, machine learning and big data (Capital Economics, 2022) for the benefit of their business. For instance, usage of these cutting-edge technologies helps them realise the key drivers of digital transformation: enhancement of business processes (automation of tasks, reduction of time and cost); innovation in business models; and customer experience (Levkovskyi et al., 2020). Secondly, big data drawn from social media of the customers' feedback and experiences provides powerful insights on consumers' needs and expectations (Klein and Todesco, 2021). This enables large organizations to predict trends, anticipate opportunities, accelerate decision-making and enhance the management of resources (Vial, 2019; Guo et al., 2020). Lastly, global organizations can operate swiftly in different parts of the

world without geographical barriers.

Moreover, the exceptional growth of multinational organizations during the Covid-19 crisis (e.g. Google, Apple, Facebook, Amazon and Microsoft) has provided them with further advantages; thereby, amplifying fear of potential market power abuse (OECD, 2022), which has led to smaller organizations at higher risks of digital exclusion. As previously discussed, large organizations are harnessing the power of a diverse convergence of emerging technologies and services, such as AI, machine learning or big data. Conversely, basic steps of digitalization tend to scape SMEs. For instance, prior to the Covid-19 crisis, 80 % of SMEs in OECD countries did not engage in e-commerce sales (Bianchini and Michalkova, 2019). This is at a time when new generations of consumers are showing a strong preference for online experiences over physical stores; and large organizations are creating new value streams by harnessing the power of AI.

These differences between large organizations and SMEs amplify the digital divide, defined as “the gap between individuals, households, businesses and geographical areas at different socio-economic levels with regard to both their opportunities to access ICT and to their use of internet for a variety of activities” (OECD, 2001, p. 5). This definition is pertinent to SMEs because it does not stop at the lack of access to ICTs. Instead, it considers the required awareness and skills to make an adequate use of technologies (Choudrie et al., 2013). Access is pertinent when determining adoption and the digital divide (Van Dijk and Hacker, 2003). What Van Dijk and Hacker (2003) also argued is that access is not only applicable to the technology infrastructure, which is a view similar to the OECD (2001). Van Dijk and Hacker (2003) identified the diverse forms that lead to different types of access restrictions and cause digital divides. These are: mental access (e.g. lack of skills, computer anxiety, which we view as technostress); material access (no access to ICTs or networks connections); skills access (lack of digital skills) and usage access (lack of opportunities for usage). Although the extant literature suggests that material access is the main cause of the digital divide (eEurope (2005), there are various dimensions to the phenomenon; hence, it can be argued that the current major culprits for SMEs are mental access, usage access or skills access, besides materials access. This is because at present, connectivity and access to internet and e-mail are no longer considered to be a luxury but a fundamental part of how business operates. Hence, the main divide between large organizations and SMEs may be the level of awareness of increasingly employing complex digital technologies and services and the strategic knowledge of their usage. As business solutions and applications become more sophisticated, this digital gap broadens, which leads to a digital divide and subsequently, digital exclusion for certain individuals. Additionally, there is also the general misconception among SMEs that the cost of innovation does not outweigh the benefits of Return in Investment (ROI) (Arendt, 2008).

In conclusion, exploring and understanding the level of awareness, skills and usage of digital tools such as VPAs in the context of micro-SMEs could provide SMEs with powerful knowledge to overcome their digital exclusion. Furthermore, it could raise awareness among SMEs of how to use AI innovation to rethink their business models and operations. What was also needed to further this study was an understanding of the various individuals who make use of VPAs, which led to consideration of theories like, Stakeholder theory because there is a formed understanding reliant upon the use of IS, which is suggested as a way forward by previous scholars like Pouloudi et al. (2016). Other theories such as, Actor Network theory or agency were considered, but it was found that they are not suitable to the context and aim of this study.

## 2.2. Stakeholder theory and SMEs

Stakeholder theory has been used for over thirty years (Pouloudi et al., 2016) with variations to the definitions and ways that stakeholders are identified and understood is changing according to the context of the study. A commonly applied definition is: “A stakeholder in

an organization is (by definition) any group or individual who can affect or is affected by the achievement of the organization's objectives” (Freeman, 1984, p. 46). In this definition, stakeholder theory is concerned with the problem of value creation and trade (Freeman, 1984 cited in Freeman, 2010) but has been considered in the management discipline by studying the structures, attitudes and practices which, taken together, constitutes a stakeholder management philosophy (Donaldson and Preston, 1995). In management studies, stakeholder theory is a central narrative of organizational strategies, objectives and performance (de deGooyert et al., 2017; Harrison et al., 2010). Studies have identified different types of stakeholders, e.g. Beringer et al. (2012) and Turkulainen et al. (2015) who defined stakeholders in terms of external and internal stakeholders. Internal stakeholders are recognised within an organization as formal members of an organization performing a task with organizational projects, while external stakeholders are not formal members of the organization but affected by company outcomes. Stakeholders, either internal or external are effectively managed, which accounts for the application of the stakeholder theory.

In the Information Systems (IS) area, which is not only about technology, but people and processes, the management aspect are also applicable; thus, it is acknowledged that multiple stakeholders are involved in the systems development and implementation activities, with some directly involved in the activities, whilst others not. E.g. the team developing the system and the users are directly involved with the development and implementation of a system, but government regulators influencing the use of a device, or policies are indirect; thus, not influencing the development and implementation as much as the internal stakeholders, a view similar to Pouloudi et al. (2016). In IS, stakeholders are defined as: “as the individuals, groups, organizations, or institutions who can affect or be affected by an information system (Pouloudi et al., 2016). Within the SMEs context there are tendencies to intuitively apply the principle stakeholder theory of value creation for stakeholder management (Schlierer et al., 2012) without any explanation.

What has also been noted is that in IS and the SMEs contexts there are few studies identifying the stakeholders of a study with explanations of their identification and in the VPAs and SMEs context even lesser. In the findings section we attempt to identify the stakeholders of Camden market and the impacts of VPAs using the Stakeholder Management Capability (SMC) framework that was formed by Freeman (1984). This framework was useful to identify the market's stakeholders using three layers: the rational, process and transactional levels and explained further in the findings section of this paper. For now, the research approach of this study is explained next.

## 3. Research method

The epistemological approach followed by this study is interpretivism, which enabled this research team to examine the perceptions and meanings of individuals in their contextual situation (Orlikowski and Baroudi, 1991). The research approach of this study is inductive, qualitative, and based on semi-structured interviews with market sellers/traders, visitors/customers and management individuals; thus, suggesting a subjective viewpoint (Saunders et al., 2015). The data was collected between April and August 2020 when the Covid-19 pandemic had initially hit countries across the globe and preventive measures had been enforced in England. Hence, semi-structured interviews containing open-ended questions were held virtually. Each interview involved probing that led to the interview being held for between 60 and 90 min and recorded using a voice recorder. An overall number of 21 participants were used for this study, which was deemed sufficient, as the concomitant analysis of the data collected reached theoretical saturation, where no new themes emerged from the analysis (Urquhart, 2013). The sampling approach used for the participants was a non-random, snowball convenience and purposive approach where the selection criteria was based on including individuals who were: smartphone, VPA

and internet users; connected with Camden Market in the form of a seller, management or customer role; and willing to be interviewed via a virtual platform, e.g. Skype or Zoom due to the lockdown. What was also discovered is that the participants were all self-taught smartphone users. Details of the participants are presented in [Table 1](#).

The interviews commenced with details of the participants demographics, followed by a description of the ways that the smartphone was used by them. This was followed by a conversation about the ways that the VPA was being used, where issues such as trust and risk were also considered. Similar to [Panteli and Urquhart's \(2021\)](#) study, initially, stakeholder theory or the digital divide aspects were not the focal theory of this study either. However, as data was collected, it became apparent that within the context of Micro-SMEs and the interview questions that sought information about VPAs usage in the work environment, and specifically, the stakeholder theory aspect where value creation and its impact upon the IS functions of adoption emerged. After careful scrutiny of the data, it was found that the stakeholder theory fitted and best described the data. Finally, to obtain the maximum amount of information, probing was used during the interviews.

In the next section, a reasoning for selecting Camden Market as the case study is provided.

**Table 1**  
Total number of participants in their respective age and gender categories.

Code	Age	Gender	Highest academic qualification	Occupation	Role in the market
01FC	31–35	Male	HND/HNC/Teaching	Sales and Customer Service	Seller/Trader
02FC	31–35	Male	First Degree	Sales and Customer Service	Seller/Trader
03FC	31–35	Male	First Degree	Sales and Customer Service	Seller/Trader
04FC	51+	Female	First Degree	Sales and Customer Service	Seller/Trader
05FC	36–40	Male	Higher/Postgraduate Degree	Directors, Managers and Senior Officials	Management
06FC	36–40	Male	Higher/Postgraduate Degree	Directors, Managers and Senior Officials	Management
07FC	36–40	Male	Higher/Postgraduate Degree	Directors, Managers and Senior Officials	Management
08FC	25–30	Male	HND/HNC/Teaching	Sales and Customer Service	Seller/Trader
09FC	51+	Male	Higher/Postgraduate Degree	Self-Employed	Seller
10FC	31–35	Male	First Degree	Self-Employed	Seller
11FC	36–40	Male	First Degree	Sales and Customer Service	Seller
12FC	51+	Male	First Degree	Sales and Customer Service	Seller
13FC	18–24	Female	First Degree	Student	Visitor
14FC	31–35	Female	First Degree	Administrative and Secretarial	Visitor/Customer
15FC	46–50	Female	First Degree	Sales and Customer Service	Seller
16FC	25–30	Female	First Degree	Professional Occupation	Visitor/Customer
17FC	46–50	Female	First Degree	Professional Occupation	Visitor/Customer
18FC	25–30	Male	First Degree	Student	Visitor
19FC	31–35	Male	Higher/Postgraduate Degree	Directors, Managers and Senior Officials	Management
20FC	25–30	Male	First Degree	Professional Occupation	Management
21FC	18–24	Male	First Degree	Professional Occupation	Management

### 3.1. Research site selection

A case study is defined as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident...[and] relies on multiple sources of evidence” ([Yin, 1994](#);13). In this study, the case study is Camden Market, located in Camden Town, London; and provides a real-life context for the empirical enquiry of the application of smartphones' AI functions in an organization. The market was selected because it is regarded as one of the world's famous markets and it is a tourist attraction of London. That is, Camden is an iconic retail destination known for being London's first craft and antiques market, which maintains its reputation as Camden market for crafts ([Camden Lock, 2020](#)). [Table 2](#) identifies the prominent position of Camden Market compared to other famous markets in London. Due to its reputation and its contributions to the UK economy, Camden has financial support for the provision of Broadband connections ([The London Borough of Camden, 2022](#)); thus, fulfilling the criteria of being an internet connected location and reducing the digital divide. The market has its own broadband network that proffers Wi-fi connections that visitors can access as soon as the market is entered, by providing some personal details.

Camden Market is one of the famous old markets of London, with over 1000 places to shop, drink, eat and dance. It was established in 1974 and receives approximately 28 million visitors a year ([Camden lock, 2020](#)). Having familiarised readers to the research site of this study, the next section presents the data analysis and findings of this study.

### 3.2. Data analysis

Once the interviews were recorded and transcribed, the interpretations were sent to the participants to seek further validation or clarification. When confirmation was obtained, data analysis commenced by reading each transcript word-for-word and immersing the principal researcher in the analysis findings. Thereafter, thematic analysis and the open coding approach, a concept drawn from grounded theory, was used ([Urquhart, 2013](#)). This approach helped the research team to ensure that the data was gathered, analysed and reported meticulously ([Strauss and Corbin, 1998](#)). The followed process was followed: firstly, obtaining and identifying “first-order data” from the

**Table 2**  
Comparison of some of the most famous trading markets in London, United Kingdom.

Markets	Visitors per year	Date established	Stalls/Units	Location
Camden Market	28 million visitors (Camden lock,2020)	30th March 1974 (Camden lock,2020)	Over 1000 places to shop, eat, drink and dance (Camden lock,2020)	Camden town, London
Portobello Market	N/A	1940s ( <a href="#">Portobello Road Market, 2020</a> )	The world's largest antiques market with over 1000 dealers selling every kind of antique and collectibles ( <a href="#">Portobello Road Market, 2020</a> )	Portobello Road, London
Spitalfields Market	N/A	Regeneration programme ended in 2005 ( <a href="#">Spitalfields, 2020</a> )	Up to 110 stalls at its busiest day ( <a href="#">Spitalfields, 2020</a> )	Brushfield Street, Spitalfields, London

participants' narratives with "key concepts" created based on this data. As a guide to our analysis, we used the definitions of stakeholder theory and digital divide. Secondly, these key concepts were then further analysed in relation to the theory. Finally, selective coding was used to form constructs, called "second-order concepts". This led to an emerging theoretical storyline that is inspired by the grounded theory technique where researchers commence with an "open mind, rather than an empty head" (Dey, 1993:63) as shown in Table 3. The interpretations of the emerging storyline were then explained and clarified with the second researcher who collected the data. This also ensured that there was verification and validation, i.e. triangulation to this study's findings.

4. Findings and analysis

The findings from this study showed emerging digital divides, more so at the digital experience, skills and usage aspects. From these diverse forms of access, the value creation in positive and negative terms was identified. A summary of the findings is presented and discussed in the next sections.

4.1. Identifying the stakeholders of this study

In the literature review, it was found that IS researchers considering stakeholders (e.g. Pouloudi et al., 2016) do so without explaining how the stakeholders were identified and who they were. IS stakeholder studies were considered due to the application of VPAs from a socio-technical perspective. The theoretical background also revealed that this study is using Freeman (2010) three layers of rational, process and transaction levels to identify the stakeholders. The following sub-section explains this in more depth.

4.1.1. The 'rational' level: stakeholder identification with its stakes

At the rational level, stakeholders have to be mapped and identified by their perceived stakes. As explained earlier, there are various types of stakeholders in organizations, both internal and external stakeholders. For an IS study, which this constitutes to be due to the VPAs, the stakeholder roles are considered in terms of the investigated IS (e.g., users, developers, resisters, and so on) and where stakeholders have one or more professional and social identities that are relevant to the research context (e.g., as defined by their expertise, hierarchical position in an organization, membership of a professional association, and so on).

Table 3  
Analysing the data.

	First-order data	Key idea	Second-order concepts
Stakeholder Theory	"I need to use the payment machine with an internet connection. For this, Camden is very good as there is a very good network coverage here. I am learning how to connect the machine to the internet and make my work go fast. However, due to the numbers of jobs that I have, for instance, for translation, searching, payments and such, the broadband here is not enough and I have to use my personal mobile data for that." (O9FC)	The customer realised the importance of a good network coverage in Camden. Camden is famous for that.	Traders were attracted to Camden due to its good network coverage, which aligns with Van Dijk and Hacker's material access view.

Internal stakeholders are recognised as formal members of a project coalition and usually support a project (Beringer et al., 2012). Examples include developers, or users of the innovative technologies such as, the customers, traders or managers in the market. External stakeholders are not the formal members of the project coalition, but they may directly or indirectly affect or be affected by the project or organizational outcomes (Turkulainen et al., 2015). For instance, the suppliers to the traders of the market. The orders are placed much faster by the traders with the aid of VPAs and in this case, indirectly affect the customers and managers.

4.1.2. The 'process' level: stakeholder theory

For the process levels, organizational processes are structured in a way to reflect and align organizational and stakeholder goals and expectations. Thus, the internal stakeholders have higher expectations of the VPAs than the external stakeholders. E.g. the manager of the market could have higher expectations of the VPA than a council worker who has little interaction with the market traders.

4.1.3. The 'transactional' level: interacting with stakeholders

At the transactional level, there is a negotiation of transactions or "bargains" with stakeholders sufficient for "balancing" competing interests and surfacing discontent. In this case, the internal stakeholders such as, the traders and managers as well as customers all have an equal chance of using the VPAs and not that one position outweighs the other. Fig. 1 identifies and shows the stakeholders of Camden Market.

Having identified the stakeholders of this study, the next sections explain and understand whether a digital divide exists, and the value created by having no digital divide.

4.2. The digital divide, smartphones, and application of the stakeholder theory: technostress

Stakeholder theory involves value creation for stakeholder management (Schlierer et al., 2012). As mentioned, Camden and the market are well supported for internet connections as it is recognised that this provision is necessary for the daily functioning of the market and pertinent for the economy of Camden. This becomes evident from the observations at the entrance of the market. As soon as the boundaries of the market are reached, information in the form of brochures is provided and advises visitors to the market that a Wi-fi connection is available by providing their name and email address.

To verify our observations, all the participants were asked about broadband, which replies revealed an awareness of the strong broadband network. This was evident from some sellers/traders citing broadband as a pulling factor for them operating in the market, which is Van Dijk and Hacker (2003) material access leading to a digital divide. "I need to use the payment machine with an internet connection. For this, Camden is very good as there is a very good network coverage here. I am learning how to connect the machine to the internet and make my work go fast. However, due to the numbers of jobs that I have, for instance, for translation, searching, payments and such, the broadband here is not enough and I have to use my personal mobile data for that" (O9FC). From this reply it is learnt that the network coverage offered in Camden enabled sellers/traders to use smartphones for work activities, which aligns with the 'material access' digital divide issue of Van Dijk and Hacker (2003).

Following Van Dijk and Hacker (2003) this study sought to identify the other barriers to access that could lead to a digital divide. In this case, the mental, skills and usage access divides emerged. Whilst there was some awareness of the uses of VPAs (usage opportunities), it was found that the awareness of the uses of VPAs were sometimes reduced due to added stress, which this research team termed as technostress. Technostress is defined as: "a negative psychological state associated with the use or the 'threat' to use new technologies," which leads to "anxiety, mental fatigue, scepticism, and sense of ineffectiveness" (Salanova et al., 2013). Prior research on technostress has primarily suggested that the condition is damaging and can have harmful impacts on

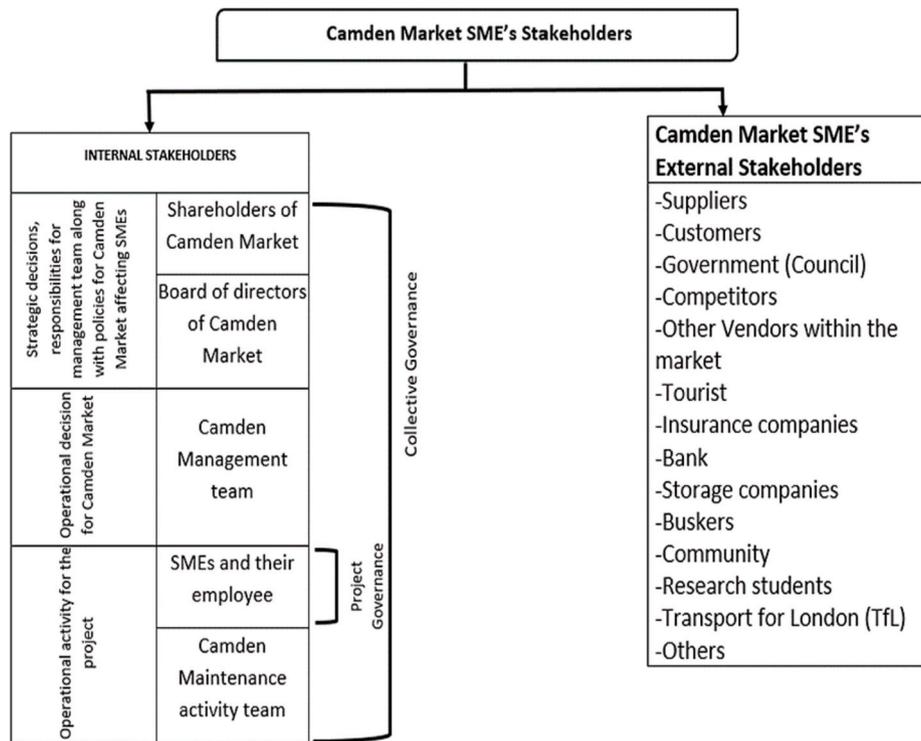


Fig. 1. The internal and external stakeholders of Camden Market in terms of Freeman's three layers.

employees' work performance (Tarafdar et al., 2019).

In this case, participants mentioned experiencing frustration for various different reasons. Initially, customers/visitors experienced technostress due to VPAs issues when processing natural language. For example, by not being able to understand various accents, which led to answers or recommendations that differed from the anticipated ones. Additionally, another cause of concern mentioned by participants was the lack of privacy when using VPAs commands. "...I feel using the phone directly (typing) is more convenient than talking to Siri because sometimes it doesn't give me what I want. So yeah, I think because of the communication problem, I don't get the exact thing that I am expecting from Siri. So I prefer to use it directly... It sometimes miscommunicates what I'm saying when I command. So, that might be one of the reasons... Generally I prefer typing because you don't have to make any noise, you don't have to disturb anyone around you and no one can hear you. So it's more discreet and convenient, I guess, from my point of view." (18FC).

Other traders also mentioned feeling frustration and experiencing delays caused by the VPA function. They mentioned that these delays had a negative impact on productivity and customer relations. "Siri is mostly good at small sentences like, 'how are you?' or 'how you doing?' But when you talk about big sentences or a paragraph then of course, Siri gets confused and Siri is like: 'Ok... I couldn't get it', it means you have been wasting time verifying the solution and means a customer could go away" (10FC).

These examples show that while natural language processing is continuously improving, human language is immensely complex, posing challenges that VPAs are yet to fully overcome; thereby, causing the digital divide. Additionally, some participants' observations indicate that certain aspects of VPAs and not a lack of digital skills caused them technostress.

#### 4.3. The digital divide, smartphones, and application of the stakeholder theory: technoestress

The previous section considered whether value was being created or not and identified technostress as a negative consequence of the digital

divide. In this section, the benefits of a VPA are explained.

When individuals were aware of and actively used smartphones' AI functions, their digital skills and confidence grew, which contributed to enhanced management capabilities, and impacted the way that individuals managed their activities. For instance, individuals mentioned planning their days with the aid of a VPA. A visitor stated: "It definitely helps with management, time management especially, I could use various Google functions to book my appointments or if I have a deadline here, that helps"(14FC). Thus, the visitor extended the job boundary of a smartphone to include that of a management system, which meant that the visitor was no longer just someone interested in visiting and seeing a tourist attraction. By extending the job boundary, digital inclusion had occurred with the tourist becoming a customer. This had led to the tourist tasks changing along with their own identity. This had meant that the tourist who was an external stakeholder had become a direct and internal stakeholder who created value from the VPA. Therefore, with the aid of a VPA, the role of a visitor, which might have been to be only a tourist had been expanded to become a customer to the market, which meant the existence of a new relationship that did not exist prior to the VPA.

Similarly, a Management team member mentioned: "I have used VPAs in the past, as a reminder to book something in my calendar or anything I want to be reminded of, I just set it up and it does its jobs, it reminds me of my appointments so that I don't miss them....So, it does help to become productive and also reminds me to do things I that I really want to do. So, it is an integral part of my life." (20FC). "I mean, I can plan my day and know what will happen for a couple of days... I mean, it gets you organised and then you can even manage your time, so time management, your productivity and things get more organised, done smoothly and you are more efficient."(19FC).

Both, the visitor and the management team members (internal stakeholders) were aware of and recognised the potential of VPAs in assisting them with reminders and prompts that allowed them to be more efficient and save time. It is worth noting that these participants were digital natives and avid smartphone users, with good knowledge of the use of VPAs. Participant 20 F also mentioned how the time management function of his smartphone's VPA allowed him to attend

appointments on time and to ensure that market stall hire payments were also collected in a timely manner. This helped preventing outstanding payments from market traders and enhanced his relationship with them. This was pertinent because Camden market stall locations are highly sought due to their popularity.

Conversely, other traders were unaware of the VPA function on their smartphones, and thought it was too complex to use or did not have time to figure out how to use it. Hence, they limited their smartphone usage to more basic functions, such as charging customers or messaging their staff. For example, “Well, I use the smartphone for my credit card transactions. For this, I am using Sum Up,<sup>3</sup> as it is very useful because when I started using it, it was very quick to set up. It took me half hour to set up. Now, my transactions are really good because it is fast and it is cheap as well (12FC).” Another seller mentioned: “We have a WhatsApp group in the sales team so every person can see, you know, the daily targets and the daily results... yeah, we share the information in the chat group and... For example, if on Monday someone's working there, and they are selling below the target, if the weather is okay, everything's fine. You know, so afterwards, my employees can think: ‘Okay, maybe we change our sales strategies with good weather. Maybe we're doing some more promotions to keep the customer coming in’. With WhatsApp, I can contact my part-time staff, at the end of the day when they finish off. Then, they send the daily results to me and I can compare it with my target and see if it's alright sometimes, and if they did quite well; I can see it straight away; then I can give them a bonus” (07FC).

For those that were aware of and used the VPA function of their mobile phones actively, this technology was pertinent and allowed value creation of diverse forms, e.g. offering advantages such as real-time translation or checking the weather forecast to predict sales. “(The VPA) helps me a lot because not every person speaks English. So, whenever I want to communicate with them, I use Google Translate. So, it makes it easier to communicate for both of us, you know, rather than not understanding each other (10 FC)”. The real-time translation function of VPAs also assisted these sellers/traders in building a trusting relationship with customers. “Google assistant helps me a lot, by simply translating a language it's helping a lot because I have so many customers. From my experience, if I have a translator in Google, Apple or whatever, you know, they feel comfortable, they might recommend their friends as well: ‘...Okay, you know, there's a shop there, we support this product, you know, they use a translator... If you don't know English or any kind of languages, they can translate to you’... so there is a chance of other customers, coming towards me as well; potential customers, I would say, thinking that they can be comfortable buying any products from me... knowing that, you know, even though they can't speak English, we can communicate with each other. So, it makes them a little bit comfortable and it builds trust between us. So, there is a chance of them coming over and using our service again (10FC)”.

These explanations reveal that even though a VPA is challenging, it leads to a good experience, which is described as technoeustress. As Tarafdar et al. (2019) explain: “technoeustress, which explains how individuals appraise IS as challenging or thrilling, and experience consequent ‘good’ stress which motivates them to engage in coping behaviours that lead to positive outcomes” (Tarafdar et al., 2019; 9).

Having explored and explained the findings of this study, the next section provides a discussion of the findings.

## 5. Discussion

This study used a qualitative approach that applied interpretivism and thematic analysis to a case study of Camden market's Micro-SMEs, through the lens of digital divide and stakeholder theory. It was found that Camden market is a tourist attraction that offers incentives, such as free wireless broadband once individuals' details are provided. This free offering led to digital inclusion in the form of sellers/traders in the

market using their smartphones VPA functions for different purposes. For instance, payment methods are being used in a faster manner with the available internet infrastructure. However, when determining whether VPAs were useful, it was found that for some participants, some VPAs functions led to negative outcomes in the form of technostress. For example, when there were issues processing natural language due to individuals' accents; or when there were environmental disturbances. This was particularly evident when traders/sellers were not familiar with the translation feature and struggled to find it. However, once the knowledge and experience occurred, the VPA translation feature was viewed to be very easy and sought after and led to the sellers/traders digital inclusion.

Equally, other participants mentioned feeling lack of privacy when using VPAs. This was because they would have to speak into the device and that would have meant someone could be listening to the conversation. Examples of this included providing any personal details, or financial details such as a bank account. In this situation, it was felt that VPAs were ineffective, required additional time from the user and could potentially lead to loss of customers, which would mean a reduction in profits for the organization.

Conversely, the findings also revealed that smartphones' AI functions could lead to positive outcomes where the smartphone is used not only for making calls, reading and sending emails, or internet searching, but the boundaries of the device were extended to become personal organizers, language translators or weather forecasting devices, which we described as technoeustress. In terms of stakeholder theory, this meant that some of the roles of individuals changed. As an example, a tourist was not only a visitor to the market, but by forming a relation with a seller/trader, the tourist became a customer and became an internal stakeholder instead of being only an external stakeholder.

In terms of the sellers/traders, they were not only selling items, but had become trusted retailers due to the translation service offered by the VPA. This was a preserving role as described by Wrzesniewski and Dutton (2001) because the sellers were conducting extra work, i.e., using the real-time translation AI function to build a rapport that led to trust to sell their products and services. Due to the positive outcomes resulting from the smartphone's AI functions, the presence of technoeustress, defined as “positive stress from the use of ICTs” (Tarafdar et al., 2019) occurred in the findings. What was also learnt is that due to the VPAs, the working practices of the traders/sellers were improved, which meant that there were efficiencies in terms of time and costs. For example, a trader suggested that prior to the VPA, a retailer who had currency conversion knowledge and information would have to be identified. In turn, the trader would have to seek that person and that meant leaving the stall. In turn, this meant that there was a risk of losing a potential customer, theft and in such instances, traders either forewent transactions involving currency conversions, which meant a loss, or were at risk of theft too.

Having explored, explained, and understood the application of smartphones' AI functions in Micro-SMEs within the Camden Market organization, a conceptual framework that is shown in Fig. 2 was formed where some factors pertinent to mental, skills and usage access create a digital divide that leads to both positive and negative outcomes that this study identified.

In terms of SMEs and ICT adoption and drawbacks, similar to the findings of Vanharanta et al.'s (2022) Finnish study, our findings also show that time management and prioritization are both a challenge and hindrance for managers and employees in Micro-SMEs. In our study, time management is pertinent for the SMEs productivity; with the VPAs functions allowing an extension of work tasks and roles of the individuals. Thus, this study is diverse as it offers an explanation and understanding of the issues of the digital divide in terms of the stakeholder theory that led to the identification of a positive and negative form of stress. Additionally, as sellers/traders are the front end of the business, and are internal stakeholders, they are involved in ensuring that VPAs serve the customers' needs and requirements. Hence,

<sup>3</sup> Sum Up is a credit card reader for small businesses that can be used with a smartphone.

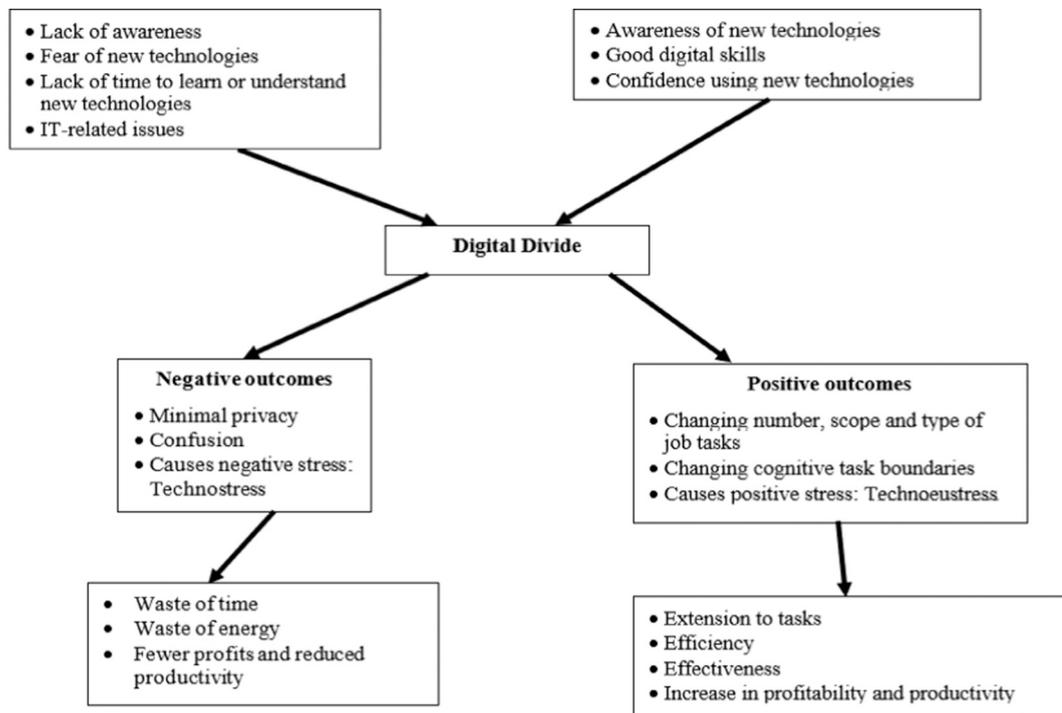


Fig. 2. - Positive and negative outcomes of the digital divide caused by VPAs usage and adoption in SMEs.

decisions affecting customers are made by the sellers/traders rather than the managers. The managers are involved more at the higher, market task level rather than to be involved with the customers. What is also apparent, but cannot be generalised is that the higher-level internal stakeholders, i.e. managers could be those who do not have the required skills or knowledge; thereby, causing the digital divide and being digitally excluded.

The Digital Divide has been considered in SMEs where it was found that within rural based SMEs digital connectivity is essential for businesses of all sizes to conduct rudimentary daily tasks, as well as seeking business growth (Morris et al., 2022). This study has also found that digital connectivity is essential, where this study explained that not only a smartphone, but the VPA functions are becoming essential for businesses to conduct, not only, daily tasks, but is important for business growth. We utilised an urban context in our case, which identifies the novelty of this study. Further, due to the micro-SMEs in Camden market, there is further novelty with the largest contribution being an SME study with an emphasis on the digital divide and stakeholder theory. This study also provides a contribution in the form of an identification of stakeholders in a market with reasoning provided for the identification.

## 6. Theoretical contributions and practical implications

This study has implications for academia, industry and policymakers. Firstly, as studies focusing on smartphones VPAs functions for the digital divide and stakeholder theory with an explanation of how the stakeholders were identified are scarce; thus, this study contributes to academia by bridging the gap in the literature of AI smartphones functions in the context of SMEs. Furthermore, the implications of this exploratory research are that the conceptual framework and the findings could lay the groundwork for future studies to advance knowledge in this area. Further, the application of stakeholder theory within the SMEs and AI context are few, so this study provides insights that could lead to the application of other forms of AI in SMEs future studies. For instance, this study could examine stakeholder theory in the context of technostress and the digital divide in future studies.

For industry, this study contributes by deepening the understanding

of the impact of AI smartphone functions, particularly VPAs, in terms of stakeholders and the digital divide issues in SMEs. SMEs are organizations that have limited monetary or human resources, so this study shows entrepreneurs the benefits of using AI that is available within their daily lives. Thus, SME owners, managers and entrepreneurs could use the empirical evidence from this study to identify and improve on working practices emerging from the use of VPAs. For example, when converting the currency on a busy day may not be very easily possible due to the trader not being able to call the bank or speak to the currency conversion trader in the market due to the fear of losing customers. In this instance, if a trader understands how to use the currency conversion app or identify websites that can convert currencies very easily, then the process of currency conversion could be pursued and customers not lost. Similarly, increased awareness of the potential of VPAs could in turn, free them from repetitive low value-added tasks and enhance communication in multicultural settings. That is, the VPA translation feature could allow the trader and customer to communicate and thereby increase the numbers of customers in the market. Furthermore, pursuing upskilling through tailored training and development for an effective implementation of AI smartphone solutions could enhance their response time, productivity and work tasks. Lastly, despite the evidence from this study on the numerous advantages posed by AI smartphone functions for SMEs, the risks associated with their usage, such as privacy risks or technostress should not be ignored.

Finally, for policymakers this study provides insights that could be absorbed for future policies and strategies development, to assist in narrowing the existing digital divide between large organizations and SMEs. Especially when large organizations, being early adopters, perceive the largest gains from cutting-edge technologies while SMEs lag behind in awareness and usage, despite being the backbone of global economies. Thus, the development of further policies that support SMEs in building a culture of data could not only help improve their business management practices, but also promote the much-needed digital inclusion by levelling the playing field.

## 7. Conclusions

SMEs are vital contributors to the growth of an economy and are also organizations that have been lagging behind large organizations when using novel ICTs. Presently, AI in the form of VPAs in smartphones are impacting daily life activities. Research studies of the impacts of smartphone AI functions are scarce, which led to this team recognising a research gap. To fulfil this gap, an aim was formed: *To explore, understand and explain the smartphone AI enabled functions in the context of an SME case study.* To fulfil this aim, the case study of Micro-SMEs within the Camden Market organization was used to identify the positive and negative outcomes of smartphones AI functions. It was recognised that the negative outcomes of VPAs usage were: VPAs' issues with processing natural language, lack of privacy, environmental disturbances and technostress. These negative outcomes led to delays and decreased productivity. Contrastingly, the positive outcome of VPA usage led to an extension of processes and roles of individuals, also leading to technostress. Ultimately, it was recognised that an adequate digital infrastructure is important for organizations of all sizes and warranted an exploration and understanding.

### 7.1. Limitations and future work

Our study is not without limitations. Firstly, this study follows an explorative qualitative method with a small number of participants. Thus, the findings cannot be generalised to the larger population or SMEs of a different nature. As generalisation was beyond the scope of this research, future studies could use quantitative methods on a large sample population to overcome this limitation. Secondly, this study could be replicated among SMEs from different industries in the UK to enable cross-sector comparisons. Furthermore, as our research was conducted during the Covid-19 lockdowns in the UK, a longitudinal approach could extend the findings beyond the context of the Covid-19 pandemic. On a wider level, this research could serve as a stimulus for future human-computer interaction studies with a focus on SMEs.

### CRedit authorship contribution statement

- Conception or design of the work: Jyoti Choudrie, Nuga Manandhar
- Data collection: Nuga Manandhar
- Data analysis and interpretation: Jyoti Choudrie, Carolina Castro, Chike Obuekwe, Nuga Manandhar
- Drafting the article: Jyoti Choudrie, Carolina Castro, Chike Obuekwe, Nuga Manandhar
- Critical revision of the article: Jyoti Choudrie, Chike Obuekwe
- Final approval of the version to be published: Jyoti Choudrie

### Declaration of competing interest

There was no funding provided for this study. This was an individually pursued research project.<sup>1</sup>

### Data availability

According to the ethics form, every thing had to be anonymised, so no data is provided.

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