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Business model pivoting and digital technologies in turbulent environments

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Abstract

Purpose – This paper draws on the Dynamic Capabilities View to discuss how Small and Medium Enterprises (SMEs) use digital technologies to develop digital capabilities that will enable them to change their current business model and trajectory -that is, to pivot- within turbulent environments, and subsequently to survive and grow.

Design/methodology/approach – We collected and analysed qualitative data from 26 SMEs in South-East England that have used digital technologies to pivot during the pandemic. The data was collected via in-depth semi-structured interviews. We analysed the data by creating first-order concepts, second-order themes, and aggregating dimensions.

Findings – Our findings suggest that (i) digital technologies enable pivoting by facilitating the creation of the following digital capability types: ‘digital sensing’, ‘digital seizing’ and ‘digital transforming’; (ii) Each of these digital capability types is underpinned by micro-foundations (sub-capabilities) and shaped by the digital culture of the organisation. (iii) these capabilities are triggered by the turbulent environment and the existing digital technologies, and are shaped by the digital culture.

Originality/value – We contribute to the literature of digital entrepreneurship as we illustrate (i) how the micro-foundations of digital capabilities, as facilitated by digital technologies, assist pivoting; and (ii) the process from key activities during pivoting to second-order themes that represent micro-foundations to digital (dynamic) capabilities for pivoting in turbulent environments. Our study highlights the importance of digital pivoting for businesses in the UK Southeast that have many aspirations for growth and innovation, whilst striving to address multiple challenges including digital divide and literacy, inflation and cost of living crisis, as well as supply chain issues.

Keywords pivoting, digital technologies, digital capabilities opportunities, barriers, SMEs, UK Southeast.

Paper type Research paper

1. Introduction

Small and medium-sized enterprises (SMEs) contribute significantly to economies worldwide (Federation of Small Businesses, 2022; OECD, 2023). In 2022 there were 5.5 million small businesses (with 0 to 49 employees) which account for 99.2% of the total business. SMEs account for 99.9% of the business population (5.5 million businesses) (Federation of Small Businesses, 2022). For instance, in the retail sector, SMEs account for around 70% of employment across the OECD, whereas micro-firms (which have less than 10 employees), account for 34% of total employment (OECD, 2023). In the South East in particular reside about 35% of the UK private small businesses (Arshed et al., 2021). Turbulent environments such as financial crises, physical catastrophes and pandemics may impact SMEs and entrepreneurs negatively (Papadopoulos et al., 2020; Mogdil et al., 2022; Beliaeva et al., 2020). For instance, the COVID-19 restrictions impacted SMEs more than larger firms; in the UK 5.94 million SMEs constitute 99.3% of all business. These employ 13.3 million people with a turnover of 1.6 trillion (Federation of Small Business, 2020).

To overcome turbulence while dealing with uncertainty, entrepreneurs need to deploy resources and achieve organisational resilience -that is, as “positively adjust and maintain functioning prior to, during, and following adversity” (Williams et al., 2017, p. 742). A response path to resilience needs to be developed (Shepherd and Williams, 2020), and in this vein, entrepreneurs need to pivot (Ries, 2011). The concept of business model pivoting has come to the foreground to denote the fact that as entrepreneurs trial different ideas, they do not achieve the desired result the first time (Zuzul and Tripsas, 2019); they need to change the course of direction and deviate from their original plans (Hampel, Tracey, and Weber, 2020). Pivoting is defined as a structured

course correction designed to test a new fundamental hypothesis' (Ries, 2011: p. 149). Business model pivoting can deal with disruptions and risks and assist in maximising opportunities (Kirtley and O'Mahony, 2023; Manolova et al., 2020; Ries, 2011). In turbulent periods, resource-constrained SMEs may realise that their current business model and trajectory cannot be sustained, and therefore they decide to transform themselves to survive and grow (Grimes, 2018; Kunisch et al., 2017; Hampel et al., 2020).

Previous literature has underlined the importance of resources -including, for instance, physical resources, knowledge, and other intangible assets- deployment and pivoting (Kunisch, Bartunek, Mueller, and Huy, 2017; Hampel et al., 2020). Business model pivoting implies the development of dynamic capabilities meaning the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments (Teece, Pisano and Shuen, 1997). It does so by focusing on the current resources and capabilities and identifying ways to apply them to new opportunities. The development and emergence of digital resources and capabilities through digital innovation and technology (Yoo et al., 2010) are central to the long-term growth of businesses (and, in our case, SMEs) (Huang et al., 2017). Digital resources and capabilities facilitated by digital technologies can help businesses pivot to seize opportunities while building resilience (Dwivedi et al., 2020; Manolova et al., 2020; Papadopoulos et al., 2020; Ye et al., 2020).

The infusion of digital technologies has become pervasive through the use of artificial intelligence (AI), machine learning, Internet of things (IoT), big data, digital platforms, social media, mobile apps, cloud computing, and blockchain (Troise et al., 2022), contributing to the rapid development and changes of several industries (Aydalot and Keeble, 2018). Literature has suggested that digital technologies facilitate the value creation of SMEs (Von Briel et al., 2018), allow novel resource combination (Amit and Han, 2018; Rietveld, 2018), and improve the development of innovative products and services (Bresciani et al., 2021). Digital technologies aim

to help SMEs navigate environments characterised by volatility, uncertainty, complexity and ambiguity (Troise et al., 2022). For SMEs, digital technologies are advancing the progress of entrepreneurship by creating opportunities for entrepreneurs to increase their capability to manage new business models and improve their companies' performances, leverage and competitiveness (Fossen and Sorgner, 2021). Digital technologies have played a key role in growing new, digital-based entrepreneurship and developing related business models (Kraus et al., 2019; Nambisan, 2017; Nambisan et al., 2019; Paul et al., 2023), offer new architectures and opportunities to innovate (Chalmers et al., 2019), gain profitability through social media (Sahaym et al., 2019) and become resilient (Mogdil et al., 2022; Onjewu et al., 2023; Santos et al., 2023), as well as innovation (Berger et al., 2021; Khurana et al., 2022; Santos et al., 2023) and digital transformation (Nankarni and Prugl, 2021). Still, there is no unified conceptualisation of the role of digital technologies within entrepreneurial modes and how digital technologies create different (micro-) foundations of dynamic capabilities - through different usage, connection, and combination (Henfridsson and Bygstad, 2013) -what in the literature is defined as 'infrastructure' (Pipek and Wulf, 2009; Ye et al., 2020).

In their review of the literature on DCV in information systems research, Steininger et al. (2022) argue that studies differ in their conceptualisation of the role of IT: as an *enabler* of DCs (e.g. IT infrastructure or IT-leveraged competences) (Wamba et al., 2017) that is, a tool to achieve higher performance, where the artefact could be also intertwined with e.g. people or skills for socio-economic activity (Orlikowski and Iacono, 2001); as *embedded in the DC construct*, where the focus is on people-technology interactions and the DCs created are antecedents for organisational change or performance (Cooper and Molla, 2017); as a *context*, to explain how change takes place in technology-underpinned environments where technology is not part of the analysis; and as an *outcome/mediator of DCs*, where DCs impact on IT-related outcomes such as digital transformation/adoption, or IT-related capabilities created (Koch, 2010; Karimi and Walter, 2015)

In this paper, we conceptualise the role of digital technologies as *an enabler of DCs*. Our aim is to illustrate the role of digital technologies in the creation of capabilities and their micro-foundations that allow SMEs to pivot in turbulent environments. Our research question, hence, is as follows: How do digital technologies facilitate the creation of capabilities and their micro-foundations and enable pivoting in SMEs in turbulent environments?

We gathered and analysed qualitative data (interviews) from micro-SMEs. To support our theoretical framework, our research was informed by the dynamic capability view (DCV) (Teece et al., 1997; Schilke, 2014; Schilke et al., 2018; Steininger et al., 2022). DCV argues that when organisations are exposed to high competition and/or turbulent/dynamic environments, they develop dynamic capabilities by integrating, building, and reconfiguring their internal and external competencies (Teece et al., 1997; Eisenhardt and Martin, 2000). DCV has been used as a theoretical foundation in recent studies to discuss the micro-foundations and underlying mechanisms of digital transformation (Vial, 2017; Warner and Wager, 2019) and the role of digital capabilities in achieving supply chain resilience (Dubey et al., 2023). The DCV, hence, can provide useful insights on how IT is leveraged to drive change in dynamic and turbulent environments, which is still of much interest in the field (Galliers et al., 2012; Steininger et al., 2022)

Our findings illustrate (i) how the micro-foundations of digital capabilities as enabled by digital technologies assist pivoting and (ii) the process from key activities during pivoting to second-order themes that represent micro-foundations to digital (dynamic) capabilities for pivoting in turbulent environments. Our findings are important especially for SMEs in the south-east, where our study is located. These businesses, according to reports (Barclays, 2023; Federation of Small Businesses, 2022; Enterprise Research Centre, 2022; Statista, 2022) face multiple challenges as they are going out of the pandemic including, inter alia, how to innovate for future growth and productivity, digital literacy and adoption, inflation and cost of living crisis, and supply chain

issues (material shortage and rising costs). Therefore, the necessity to digitalise and innovate through new models by SMEs in the Southeast is immense, as, despite the problems and the negative confidence in the Southeast as they seem to be less resilient from their large counterparts, businesses have expressed aspiration for rapid growth in the next 12 months. Our study and findings respond to this by illustrating how these companies could use digital technologies to enable the development of digital capabilities that would enable them to pivot, and subsequently adapt to the current challenges. Digitalisation and digital pivoting could enable them tap into other markets, lower their transaction costs and those associated with transport/border restrictions while supporting innovation and enhancing their performance.

We contribute to the literature on digital entrepreneurship as we discuss how digital capabilities and their micro-foundations enable pivoting within turbulent environments. Furthermore, we present a model that illustrates the process from key activities during pivoting to second-order themes representing micro-foundations to digital (dynamic) capabilities for pivoting in turbulent environments.

The paper is structured into five sections. Section 2 provides an overview of the conceptual foundations based on the DCV as well as the literature on business pivoting, and digitalisation. Section 3 discusses the research design and methods, and section 4 describes the empirical findings. Finally, sections 5 and 6 discuss the findings vis-à-vis the literature and conclusions, respectively.

2. Theoretical Background and Framing

2.1 Dynamic Capability View and digital capabilities

Organisations often develop dynamic capabilities by integrating, building, and reconfiguring internal and external competencies (Teece et al., 1997; Eisenhardt and Martin, 2000) when

operating in highly competitive pressures and dynamic environments. According to Teece (2012), the dynamic capabilities of a firm are those capabilities that allow the firm: "... to integrate, build, and reconfigure internal and external resources/competencies to address, and possibly shape, rapidly changing business environments" (p. 1395).

The dynamic capability view (Teece et al., 1997) explains how firms respond to rapid and technological changes. It is an extension of the resource-based view (RBV) (Barney, 1991; Peteraf, 1993; Schilke et al., 2018) that helps understand how different resources that are difficult to imitate/replicate are combined to create capabilities that generate superior performance (Hitt et al., 2016; Chalal et al., 2020). However, the RBV does not adequately explain how resources and capabilities provide a sustainable competitive advantage in turbulent environments (e.g. Eisenhardt and Martin, 2000) or how the combination of the same resources in different settings can result in different outcomes.

Teece (2014) argues that a dynamic capability is a higher-order capability that acts as a theory of competitive advantage of a firm operating in a highly dynamic and turbulent environment. Teece (2018) argues that dynamic capabilities are multi-faceted, and firms might experience challenges identifying new business models and implementing and refining them. Following Teece (2014), we argue that dynamic capabilities need strong sensing, seizing, and transforming abilities. When it comes to these abilities being facilitated by digital technology, they are referred to as digital capabilities. They assist organisations in responding to rapid changes in turbulent environments (Warner and Wager, 2019; Dubey et al., 2023).

Sensing capabilities are about scanning the external environment and creating, learning, and interpreting activities (Teece, 2007). *Seizing* capabilities is "...where action and commitment enter the picture while accounting for the genuine risk of pursuing dead-end strategies based on incomplete or biased information" (Day and Schoemaker, 2016, p. 63). SMEs may use tangible and intangible resources to take advantage of emerging opportunities -it is about making

investment decisions. This means that SMEs become agile, thereby adjusting their internal processes to the external dynamic changes: “the capacity of an organisation to efficiently and effectively redeploy/redirect its resources to value-creating and value protecting (and capturing) higher-yield activities as internal and external circumstances” (Teece et al., 2016, p. 17). Agility can be related to (i) co-creation with customers, that is, ‘customer agility’ (ii) cooperation with external partners, that is, ‘partnering agility’, and (iii) internal process agility, that is ‘operational agility’ needed to achieve financial performance (Sambamurthy et al., 2003). *Transforming* capabilities help SMEs realise the potential of strategic change and are needed to put into practice the opportunities that have been created and discovered by sensing and seizing. Sousa-Zomer et al. (2020) argue that transforming capabilities is about the ability of SMEs to transform their business models and resource base, that is, to put the strategy into action. An SME with transforming capabilities “is one with an entrepreneurial mindset cultivated within the firm” (p. 1108). Such capabilities depend on the culture and structure of SMEs (Sousa-Zomer et al., 2020; Dubey et al., 2023; Warner and Wager, 2019).

The DCV view and digital capabilities are used in order to understand how SMEs pivot in turbulent times. We discuss business model pivoting and technologies in the next sections.

2.2 Business model pivoting

Over the last few years, scholars have discussed start-ups' success (Flechas Chaparro and de Vasconcelos Gomes 2020) through their business models (Zott and Amit, 2017). Pivoting (Ries, 2009) has been at the centre of their inquiry, as it signifies the abandonment or redirection of the current course of action, involving irreversible commitments and potentially putting the start-up's survival into question (Ries, 2011; Hampel et al., 2020; Pillai et al., 2020). Business model pivots are designed primarily to provide customer focus value creation, key resources, and key processes (Ojala, 2016; Teece, 2018; Morgan et al., 2020). So far, literature has interpreted Ries's

definition of pivoting in different ways, e.g. related to strategic decisions (Brenk et al., 2019) or with evaluation and exploitation of new business and market opportunities (Shepherd and Williams, 2018; Shepherd and Gruber, 2020), or business model replacements (Teece, 2018). In this paper, we follow the view of Ye et al. (2020), defining pivoting as a change in the strategic action of an SME.

Scholars have discussed pivoting from different perspectives. For instance, the focus has been on the process of pivoting and how it emerges, as well as who is affected and the level of effect and its consequences (Hempel et al., 2020; Pillai et al., 2020; Wood et al., 2019). Hempel et al. (2019) focused on how to manage different stakeholder groups when pivoting occurs as part of firm strategy, the substitution of existing business models (Teece, 2018), or change in putting ideas into practice (Axelson and Bjurstrom, 2019). In contrast, Shepherd and Gruber (2020) argued that pivoting is about testing new hypotheses. Other scholars have studied pivoting from the organisational learning perspective (McGrath, 2010; Boddington and Kavadias, 2018), or the antecedents of pivoting from the entrepreneurs' cognitive and decision-making perspectives (Grimes, 2018; Sala et al., 2021; Ye et al., 2020).

Within unstable and turbulent environments, SMEs may follow business model pivoting: they switch their product or service offerings to take advantage of emerging opportunities (Morgan et al., 2020), or to reinvent products, services and business models (Kuckertz et al., 2020) and develop a response path to resilience (Shepherd and Williams, 2022). Pivoting deals with disruptions and risks and assists in maximising opportunities (Kirtley and O'Mahoney, 2020; Manolova et al., 2020; Ries, 2011). Yet, literature has overlooked how entrepreneurs can respond to turbulent environments and crises (e.g. Doern et al., 2019; Saridakis, 2012). There are relatively few scholars studying how SMEs survive, and when this happens, the focus is more on the social aspects of entrepreneurship (Williams and Shepherd, 2016a, 2016b). Still, all these

scholars highlight that entrepreneurial pivoting has not been attended to extensively, whether pivoting is necessary or beneficial (Morgan et al., 2020).

Literature on pivoting has studied the importance of resources (physical resources, knowledge, and other intangible assets) (Kunisch, Bartunek, Mueller, and Huy, 2017; Hampel et al., 2020). These scholars argue that pivoting is dependent on resources that create dynamic capabilities. These capabilities enable SMEs to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments (Teece, Pisano and Shuen, 1997). Such capabilities can be facilitated through digital technology and innovation (Yoo et al., 2010; Huang et al., 2017), which are discussed in the next section.

2.3 Digital technologies

Digital technologies are accelerating how companies do business (Rothberg and Erickson, 2017). Apart from the internal operational efficiency advancement, digital technologies help organisations to enhance market orientation through advanced market knowledge (Cenamor et al., 2019), transforming value creation (Li et al., 2018; Yadav and Pavlou, 2014; Rachinger et al., 2018) and improve performance (Ainin et al., 2015; Bouncken et al., 2019, Haas et al., 2016; Vial, 2019); provide customised products to respond to customer needs (Barnes et al., 2012). Digital technologies (i.e. new apps, services, and platforms) and the increased power of social media have modified the entire structure of business models (Saebi et al., 2017; Volberda et al., 2018). In terms of crisis, SMEs face challenges and adopt digital technologies to overcome them and build upon their resilience capability (Khurana et al., 2022). They tend to be technologically less sophisticated and have a lower capital reserve, fewer assets, and lower levels of productivity than larger firms (OECD, 2020). So far, limited research has focused on how entrepreneurs develop strategies to operate and become resilient in (and following) disruptions/crises (Cucculelli and Peruzzi, 2020; Doern, 2016; Ogawa and Tanaka, 2013).

With the advent of digital technologies, SMEs use pivoting to frequently change their business models because of scarce resources and external market conditions (Nambisan, 2016; Ojala, 2016; Ghezzi and Cavallo, 2020). Nambisan (2017) highlights the importance of theorising digital technologies in shaping entrepreneurial opportunities, decisions, actions and outcomes. Ye et al. (2020: p2) investigated “how to design a business model that allows a new venture to develop digital resources, which can effectively facilitate pivoting”. Digital resources and internal and external competencies can help in creating dynamic capabilities that can facilitate pivoting and build resilience (Dwivedi et al., 2020; Manolova et al., 2020; Papadopoulos et al., 2020; Ye et al., 2020; Teece et al., 1997; Eisenhardt and Martin, 2000).

When using digital technologies to pivot, SMEs should possess the necessary capabilities to route through the digital landscape. It is about possessing the necessary *sensing capabilities* to predict trends for digitalisation and continuously refining digital transformation strategies (Warner and Wager, 2019). Sensing, from an IT perspective, has highlighted the capacity to monitor the external environment and the value of external information (Pavlou and El-Sawy, 2006; Montazemi et al., 2012). *Seizing capabilities* can help SMEs be agile; for those SMEs using digital technologies, Dubey et al. (2023) define digital agility as “organisational capability powered by digital technologies that enable the organisation to rapidly sense, seize and transform emerging opportunities and reduce their risks in a highly turbulent environment” (p. 5). Literature on seizing capabilities focuses on knowledge and how it is applied (Cooper & Molla, 2017) as well as how resources are allocated (Sambamurthy et al., 2003). Digital transformation capabilities are related to the ability of an SME to create digital strategies/business models by enabling digital technologies to facilitate innovation and responsiveness while achieving operational excellence; studies have focused mainly on how to restructure and transform resources with IT (Mikalef and Pateli, 2017; Cooper and Molla, 2017). A digital culture (Grover, 2022, p. 712) “has been described as a distinct culture that reflects a digital mindset”. Some important key concepts used in our study are presented in Table 1.

Table 1 here

Business model pivoting implies the development of dynamic (in our study, digital) capabilities, that is, the start-ups' ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments (Teece et al., 1997). Scholars have identified sub-capabilities for dynamic capabilities for digital transformation (Warner and Wager, 2019), and others have conceptualised and investigated the antecedents of digital transforming capabilities and their effect on firms' competitive advantage. However, research has not acknowledged the importance of DT in business model pivoting and how the value of these models that are based on the firm's capabilities (Bundy et al., 2017; Kunc and Bhandari, 2011) in the context of SMEs (Appelbaum et al., 2012; Gruber et al., 2015; Randall, 2018) is assessed. Literature has been sparse in building the empirical and theoretical knowledge base on technology pivots (Bohn and Kundisch, 2020; Nambisan, 2017) and providing empirical evidence from non-tech firms that decide to pivot using digital technologies. Scholars argue that the 'empirical and theoretical knowledge base on technology pivots is, then, still nascent' (Bohn and Kundisch, 2020: p. 5), especially during disruptions and turbulent environments (Morgan et al., 2020).

Thus, the purpose of this study is to discuss how entrepreneurs use digital technologies to pivot in turbulent environments, in particular how digital technologies as resources and 'infrastructure' (Pipek and Wulf, 2009; Ye et al., 2020) facilitate the creation of capabilities and enable pivoting to take place. Drawing on the DCV and digital capabilities we turn to understand how micro-foundations of digital capabilities as facilitated by digital technologies assist pivoting.

3. Research Methodology

3.1 Research design

We conducted a qualitative study to unveil how SMEs use digital technologies and create digital capabilities to pivot in turbulent environments (Eisenhardt and Graebner, 2007; Warner and Wager, 2019; Ye et al., 2022). We used qualitative methods to collect and analyse data and make sense of pivoting using digital technologies in turbulent times. The study is focused on small businesses in the South-East of England-Kent region. South-East was England's most successful region for private businesses, accounting for over a third of the UK's businesses. In March 2022, there were 65,230 enterprises in Kent; most of the enterprises in Kent (90.2%) are micro-enterprises (with up to 9 employees, and most enterprises in Kent (99.4%) are classed as companies which operate within the private sector (ONS, 2022). Table 2 extrapolates our purposeful sample. We used pseudonyms to maintain the confidentiality of each participating firm and participant. The participants are SME owners/entrepreneurs, hence senior executives. They have deep knowledge and experience in running companies as well as digital transformation.

Table 2 here

3.2 Data collection

The study's empirical data were collected at the southeast of UK. The southeast has about 35% of the UK private small businesses (Arshed et al., 2021). According to Statista (2022), in 2019 the southeast was second behind London area in the number of SMEs, that is 939,000. Within 2022 SMEs were optimistic in anticipating a year of relative stability as the pandemic receded but at the end of the year after autumn they were impacted by challenges such as inflation and cost of living crisis, digital divide and literacy, and supply chain challenges leading to material shortages and increasing pricing (Barclays, 2023; Enterprise Research Centre, 2022; Federation of Small Business 2022; Statista, 2022). At the same time the need for innovation and growth was massive while companies encouraged hybrid working practices. Therefore, the southeast presented an

interesting context for our study given the focus on digital innovation/growth and the related aforementioned challenges.

In this study data were collected using in-depth semi-structured interviews. The rationale for adopting in-depth semi-structured interviews was to allow the researchers to address the 'how' and 'why' questions (Yin, 2009; Eisenhardt and Graebner, 2007). To deal with reflexivity issues (Galdas, 2017; Haynes, 2012; Hradecky et al., 2022; Merlin and Gaddefors, 2023), one author conducted all the interviews, but the interview process was co-designed within the author team. One interviewer was used to establish rigor.

The interview sample has been based on three criteria: companies that are in the process of or have pivoted through the use of digital technologies, and firms which employ up to 9 employees and operate in the Kent region. A purposive snowball approach has been adopted to collect data. The participants have been recruited through the Kent and Medway Chamber of Commerce.

Twenty-six interviews were conducted with SME owners/entrepreneurs between June and December 2022. Those businesses have pivoted to using digital technologies or are in the process. The selected SME initially approached the interviewees via e-mail. The duration of the interviews ranged between 60 to 90 minutes. The interviews were conducted on the MS teams platform. We also recorded detailed handwritten notes during and immediately after each interview to acknowledge reflexivity (e.g. Emerson et al., 1995). Confidentiality was assured, and any information that could reveal any participants' identity was removed or changed. We asked participants to talk about the challenges they are facing, adopting business model pivoting strategies through digital technologies during turbulent times. Also we asked them to identify the digital technologies used by the businesses and how digital technologies reduce the risk associated with uncertainty and seize growth opportunities. Other questions were on how the business responds to the opportunities using digital technologies and the challenges created by digital technologies and how the organisation's current resources and capabilities have been used.

The final questions were on how the resources and capabilities have been used to new opportunities during turbulent times, how digital technologies help businesses to redefine their capabilities (resources, knowledge, competences), and finally, what has been the outcome of digital technologies. After 26 interviews, we reached the point where no additional data was to be found, and the researchers saw similar instances repeatedly, reaching theoretical saturation (Glasser and Strauss, 1967: p. 61).

3.3 Data analysis

Our data analysis focused on pivoting via digital technologies. Interview transcriptions were coded, and additional codes were generated through repeated use by the respondents. The authors clustered together codes to generate themes, which were analysed to create findings outlined in section 4. Our analysis broadly followed the guidelines by Miles and Huberman (1994) to analyse data, that is, creating first-order concepts, second-order themes, and aggregate dimensions. We moved back and forth between data and theory (literature) to extract the themes (Locke, 2001). To ensure reliability, open coding (First order concepts) took place by two of the researchers within our team, and during the next phase of coding, similarities and differences between the coders were checked; any differences were solved through discussion.

Our data structure is presented in Figure 1. Following Gioia et al. (2013) this figure serves as both a visual aid and an illustration of our analysis in three phases using first-order concepts (Phase 1), second-order themes (Phase 2), and aggregate dimensions (Phase 3). In the first phase, open coding using keywords that reflected the respondents' views on the use of digital technologies for building capabilities and enabling pivoting took place. At this stage, data spoke to us (Ifere et al., 2022). Initial codes emerged that covered how capabilities can be created (micro-foundations), allowing us to develop the first-order codes. Following the first-order codes, we further explored in-depth the dataset in terms of the impact of these micro-foundations and how they can form capabilities; these formed our second-order themes. These themes were then abstracted into the

“higher-order conceptual and theoretical dimensions in the third phase” (Ifere et al., 2022: p. 121). The data structure also illustrates the process from key activities during pivoting to second-order themes representing micro-foundations to digital (dynamic) capabilities for pivoting in turbulent environments.

Figure 1 here

4. Findings

Our findings suggest that SMEs pivot in turbulent environments by using technology to create three types of digital capabilities: ‘digital sensing capabilities’, ‘digital seizing capabilities’, and ‘digital transforming capabilities’. For each one of these types, (i) we present their underlying sub-capabilities (micro-foundations) as they stemmed from our analysis and (ii) how they are related to each other through a process model -digital capabilities model for pivoting.

4.1 Building digital sensing capabilities

The participants highlighted the use of digital technologies in enabling them to create capabilities that help them pivot during the period of COVID-19. It was evident from their responses that the traditional approach to pivoting had shifted towards digital -pivoting; still, there were different views on what capabilities were needed to achieve this. In terms of ‘sensing’, the following building blocks (subthemes) were identified:

Digital audience segmentation

The interviewees argued that digital technologies were vital as they enabled the development of sensing capabilities related to *understanding competition and market shifts*. Such an understanding is important, as it would help them identify their competitors and the market and its dynamics especially when it came to turbulent environments (COVID-19):

“... as more people flood to it [technology], the cost of that advertising and the results and our understanding of the market becomes better. So there are a lot of things happening in these areas. And we’ve got quite hands-on with digital, we’ve got quite hands-on with the strategy of that...” (Interviewee 5)

As the SMEs were using technologies to sense the environment, they would also get to understand what kind of offerings their competitors are providing vis-à-vis their own offerings. It was interesting to note that the owners were not interested in understanding the offerings but in how to devise plans for implementing these new offerings (e.g. services, products):

“I try to move the team into the new opportunity. I think we need to start seeing the trends and what people are moving towards, and we need to start then winning those type of projects and working on those type of projects that upskills the team, and then they will move into it. Because, like, yeah, there’s certain software and ways to do things that are no longer applicable now.” (Interviewee 5)

Digital future prediction/forecasting

The interviewees highlighted the importance of digital technologies in sensing and monitoring the environment by acquiring external information. This information could then be used to establish a digital presence and mindset was important, to this shift towards ‘digital future’. This was dependent on (a) the digital strategy of the company, especially when planning to establish a long-term digital direction:

“...we offered them the opportunity, especially at the beginning, to get some digital advice ...And some of them had to change direction because some of them wanted equipment, but then, with the same amount spent on digital marketing, for example, they would increase their revenue so much that they could get the needed equipment and also have increased income.” (I11) Interviewee 11

and (b) investing proactively in digital technologies (such as big data analytics tools) to understand future trends. Interviewees mentioned that investment they made some years ago

before the pandemic has helped them survive and prosper in the turbulent COVID-19 environment. The importance of having the right skills and culture was also highlighted:

“...we need to start seeing the trends and what people are moving towards, and we need to start winning those types of projects and working on those projects that upskill the team, and then they will move into it...Sometimes we are trying to think further down the road and whether we want to niche into something.” (Interviewee 6)

4.2 Building digital seizing capabilities

At the ‘seizing’ cluster, the interviewees underlined that strategic agility and adaptability were at the heart of digitally-enabled pivoting. Strategic agility and adaptability for the interviewees meant (a) ‘efficiency and effectiveness’:

“So yes, you would hope that our use of technology is going to increase sales. But also always say you’ve only got two levers – effectiveness and efficiency. And we’re just going to improve our business processes, which we will do using a business process management tool, which will enable us to be much more rigorous... we will see benefits in effectiveness and efficiency, as well as the economic benefits of making the right offering to people at the right time.” (Interviewee 14)

For some, using technology to pivot meant *balancing digital costs and benefits*. This could happen through controlling expenses while at the same time developing and offering new products/services as well as supporting clients:

“During the pandemic, we actually kind of grew will be efficient...because many of whom we were working with were in e-commerce. We saw the opportunity, and we went for it... So in e-commerce, that kind of went up, and everyone was ordering online, so many of our customers were seeing boosts in that. So to begin with, it was pretty good. We also have some American clients, so it was great offering them ” (Interviewee 16).

Such capabilities are ordinary/operational. They allow firms to survive at the current environment by supporting/improving the processes by which products and services are offered to customers.

(b) 'Freedom and flexibility':

"...the business model, I'd say, is more of a freedom sort of business model, if that's one if such a thing exists. We're far more mobile now, we're far more, the capability of us to work in, no matter where is there and the ease to be able to do that and I encourage that. So, from my perspective, I feel like that is what it's like. So I don't know if that's an official business model or not, but that's what we've done."

(Interviewee 18)

The companies' decision to pivot was also shaped by their intention to change how they innovate (new products) and allocate resources:

"So the speed that we can get a new product out there and get a label out there – and packaging and labelling [resources] is one of the biggest challenges for a business like ours... So that enables us to get it fairly quickly to market. So if we want to introduce a new product, we can design the labelling ourselves." (Interviewee 10).

To seize opportunities, companies should decide to balance between online and offline worlds:

"Right now, it's 50-50 I would say. You've got the organisations that have gone remote, and they are doing everything remotely, they are hiring remotely, so they just require their staff to come in maybe once a month for team building days sort of thing, maximum of two to three days a month." (Interviewee 16)

Such capabilities are strategic. They allow firms to explore new opportunities (new/innovative products and services), new strategic thinking and possible business model changes to survive in turbulent environments.

4.3 Building digital transforming capabilities

The SMEs highlighted digital transforming capabilities as vital in (a) digitalising organisational structures:

“So it changed my business, obviously, when the pandemic hit, and during COVID, we were very lucky in the fact that we had the foresight to invest in our [technology], pre-pandemic. So when the pandemic hit, we were very grateful that our customers many customers— were supporting local small businesses like ourselves.” (Interviewee 17)

but also (b) in digitalising current business models:

“...because of business rates and such like, it’s cheaper for lots, so for a number of businesses to have more of an online presence [...] They can reach more people outside of their, you know, of their local or their environment. So I think that’s the way forward, that sort of digital transformation as you put it, that’s the way forward. And most businesses are getting to that point where they’ve realised, or they realise, that that’s the way forward.” (Interviewee 3).

Digital capabilities enable through digital technologies to help the companies to get *products/services in front of and interact with major global players:*

“We’ve actually got a food product and as an agency, we own that product and we’re building it and growing it. ... we do all the marketing and all that for it, and we sell it directly... it could be, in the future, that [name of brand] goes to the moon, and it goes big. And our team is fully focused on global or international growth of that...I think that’s just the business model-type thing.” (Interviewee 5)

Digital technologies enabled some of the companies to digitally transform. This meant that they would be able to create and use new capabilities to achieve their strategic goals and objectives. The firms would be able to transform their current business models, activities and processes, the way they create and appropriate value as well as subsequently improve their performance.

4.4 Building digital culture

The interviewees highlighted the role of digital culture in gaining deeper and broader insights into pivoting using digital technologies.

“So a lot of people will think that technology is the answer. But actually, the answer is always a culture change. So that people will think they can solve a problem by throwing technology at it, but if you haven’t persuaded the people that you’re expected to use the system that it’s a good idea – and that’s where we’ve had success over the years.” (Interviewee 14)

Digital culture is enabled through (a) digital technology literacy, which can support a SMEs digital transformation:

“So if you go to, for example, cities like London, like Dubai or the State of California, wherever, there is an understanding of technology, and there’s more willingness from people to adopt new technologies and try something out. Whereas I’ve run into that a lot in [...], where the shop owners or the business owners are often older generations, so they’re more likely to just need a little bit more convincing than you would in cities where they have” (Interviewee 12).

As SMEs may lack the skills and expertise to use technology in order to create capabilities to pivot, they should be able to acquire these skills in terms of, for instance, information literacy, digital collaboration and creation of digital content as well as problem-solving -the so-called “21st century skills” (Zahoor et al., 2023) that have an impact on digital technologies’ use and subsequently the digital capabilities that enable pivoting to take place. Training, hence, was deemed important:

“I’m also training my staff, and we’re getting into new software together. We’re looking at new software that can help us improve what we provide to the customers. And as we learn about these things, or as we train to do like a certain task, it’s always good to have the understanding that, even though it’s just me

building a website, but the core of it is me problem-solving, or me thinking creatively about a solution or creatively about a design or something.” (Interviewee 13).

(b) Digital technology leadership as driving the digital pivoting and digitalization. Here the interviewees highlighted the role of instrumental, interactive and participative leadership that can influence behaviors towards digital pivoting:

“A successful transformation programme demands to be driven from the top. It cannot be forced in the organisation and must be driven from the top. Must have the full-hearted support at senior level and board level, and then, in turn, must take cognizance cognizance of how the whole organisation runs. So those organisations that want successful transformation programmes must be driven from the top, not at the IT level – at the main board level.” (Interviewee 13).

For a digital culture to flourish and enable digital sensing, seizing, and transforming, the entrepreneurs underlined the importance of creating a *digital corporate memory*, as well as was necessary to shift from ‘working with data’ to ‘thinking with data:

“It [technology] has transformed the way we work with data and the way that staff think about data. I think the staff would quite happily go and sit and do their work, then they’d have their paper forms, and then they’d count up and do their tallies, and we’d get our stats out of it... Now, they’re putting it all into this central repository, and they can now realise that they can cut and slice it in so many different ways. They’re all so excited about data again. It’s really reignited a passion about data.” (Interviewee 21)

From our findings above, we present a process framework that discusses how entrepreneurs create digital capabilities for digital pivoting. The starting point is the turbulent environment and the existing digital technologies that trigger the building of dynamic capabilities, and these are shaped by the digital culture (figure 2). Our interviewees highlighted that the technological innovations that have taken place over the last years have enabled SMEs to use technology to

sense what is out there in the external environment by developing capabilities with regards to prediction/forecasting as well as on how to be able to serve different markets (if any) (audience segmentation); technologies such as big data and artificial intelligence are crucial. By developing digital sensing capabilities, the next step for the interviewees was to use technologies to seize these opportunities through technology (digital seizing capabilities): ‘agility’, ‘adaptability’ and ‘balancing the offerings between the online and offline world’ are crucial and are facilitated by business model innovations to be able to rapidly exploit new market opportunities. As organisations were using technology to develop these ‘digital seizing capabilities’, the next step would be to redesign their internal processes and change their mindset so as to establish a seamless digital environment; these are highlighted by the interviewees as digital transforming capabilities. Within all these stages, ‘digital culture’ is important. The interviewees highlighted the employees’ literacy and knowledge of technological trends and tools as well as appropriate support (from the leadership team) and how organisational knowledge is ‘stored’ and used (digital corporate memory).

Figure 2 here

5. Discussion

This qualitative study examined how micro-SMEs pivot using digital technologies within turbulent environments based on the COVID-19 era. We aimed to make sense of the process by which this happens as the entrepreneurs discussed their lived experiences with digital pivoting (Chia and MacKay, 2007; Gioia et al., 2013). By focusing on strategists’ perspectives (Chia and MacKay, 2007; Whittington, 2006; Warner and Wager, 2019), we emphasised their individual views concerning the practice of the activities of pivoting using digital technologies and the capabilities developed through these technologies.

Following Velu (2017) and Warner and Wager (2019), we asked the entrepreneurs to take a DCV view and share their experiences with digital pivoting. From our findings we identified ten micro-

foundations (sub-capabilities) of ‘digital sensing’, ‘digital seizing’, and ‘digital transforming’ capabilities and hence digital pivoting (Figure 1). We proposed a process model (Figure 2) that provides these micro-foundations, as facilitated by digital technologies and digital culture.

Our study contributes to the literature on digital entrepreneurship (e.g. Nambisan et al., 2017; Kraus et al., 2018) as it unveils the micro-foundations of digital capabilities as facilitated by digital technologies that enable pivoting. Identifying and discussing these micro-foundations is important, as they are the factors that trigger and enable the creation of dynamic capabilities for pivoting using digital technologies. We follow Wagner and Wager’s (2019) view that these micro-foundations can constitute a system of digital capabilities that reflect the view of what types of dynamic (digital) capabilities are needed to pursue pivoting in turbulent environments. Hence, our study is a direct response to the literature calls to investigate look into the micro-foundations that explain how digital transformation unfolds in practice (Vial, 2019), as well as the role of digital technologies (resources and infrastructure) in pivoting for small firms (Ye et al., 2020). Our findings also address Morgan et al.’s (2020) call for more research on the decisions to embark on pivoting based on exogenous shocks such as disruptions and turbulent environments (Grimes, 2018; Kunisch et al., 2017; Hampel et al., 2020). We extend the study of Warner and Wager (2019), who have conceptualised and investigated the antecedents of digital transforming capabilities and their effect on firms’ competitive advantage in that we do not focus on digital transformation, but we regard digital technologies as *sine qua non* in digital pivoting that entrepreneurs seek to achieve during turbulent times. Our process model, hence, is different from Wagner and Wager (2019) in that it does not seek to explicate those capabilities that are needed for digital transformation; on the contrary, it presents digital technologies as facilitating the creation of those factors (micro-foundations) which develop in digital capabilities to help the SMEs sense, seize, and transform, and hence pivot in turbulent environments.

Comparing our process model/micro-foundations to Teece (2007), our proposed micro-foundations are digitally-enabled and are oriented towards understanding and dealing with turbulent environments. In terms of sensing capabilities, our micro-foundations coincide with the ones by Teece (2007) in terms of identifying market segments and changing customer needs as well as digital future prediction by investing in customer and R&D innovation. In terms of seizing capabilities, our model differs from Teece (2007) in that the proposed micro-foundations aim at strategic agility and adaptability, balancing online/offline and efficiency as these have been identified as important in turbulent environments. Leadership and communication are important (as presented in Teece's (2007) framework) but are overarching in our model, under digital culture. Whereas the micro-foundations of the 'transforming capabilities' for Teece (2007) are about continuous alignment and realignment of tangible and intangible assets to enhance value, in our work the transforming capabilities are about using digital technology as an enabler to re-design organizational structures and establish a seamless digital environment by, inter alia, digitalizing current business models and interacting/collaborating with multiple stakeholders.

Our second contribution lies in underlining and theorising the role of digital technologies in shaping entrepreneurial opportunities, decisions, and decisions actions (Nambisan, 2017) by using the DCF and digital capabilities perspectives (Sousa-Zomer et al., 2020; Dubey et al., 2023). Our study addresses the call by scholars to understand better 'infrastructiring' (Pipek and Wulf, 2009; Ye et al., 2020) as the creation of digital capabilities through the usage of technology (Henfridsson and Bygstad, 2013) that are necessary for pivoting. In particular, we discuss the importance of building digital sensing capabilities (Nambisan et al., 2017) in market segmentation as well as prediction/forecasting for sensing unexpected external turbulences. Furthermore, our findings suggest that building digital seizing capabilities requires strategic adaptability and agility (Teece et al., 2016; Peteraf et al., 2013), as well as a balance between digital costs and benefits to achieve business model innovation (Volberda et al., 2018). Finally, our study underlines the importance of digital culture for digital sensing, seizing, and transforming capabilities. The

cultivation of such a culture depends on how to create a digital corporate memory to learn from the past and avoid repeating the same mistakes digital leadership (Brock and Wagenheim, 2019; Schiuma et al., 2021; Al-Nuaimi et al., 2022; Porfirio et al., 2021), and literacy (Cetindamar et al., 2021; Rippa and Meoli, 2020) to induce digital capabilities and pivoting.

Based on our discussion, we can propose the following:

P1. The use of digital technologies by SMEs enables them to pivot by creating digital capabilities ('digital sensing', 'digital seizing' and 'digital transforming').

P2. Digital sensing capabilities assist SMEs that pivot in market segmentation by enabling prediction/forecasting for sensing unexpected external turbulences.

P3. Digital seizing capabilities assist SMEs that pivot in achieving strategic adaptability and agility as well as a balance between digital costs and benefits to achieve business model innovation in turbulent environments.

P4. Digital transforming capabilities assist SMEs that pivot in redesigning and digitalising their internal processes and business models, and changing their mindset to establish a seamless digital environment as they seek to interact and collaborate with multiple stakeholders in turbulent environments.

P5. Digital culture enables SMEs to stimulate digital capabilities and pivot by creating digital corporate memory supported by strong digital leadership and literacy.

Finally, our study contributes to the DCV literature in that it discusses how technology can help create dynamic digital capabilities that can facilitate pivoting (Dwivedi et al., 2020; Manolova et al., 2020; Papadopoulos et al., 2020; Ye et al., 2020; Teece et al., 1997; Eisenhardt and Martin, 2000; Warner and Wager, 2019). From the DCV perspective, we provide empirical evidence on technology (digital) pivots, thereby addressing the need to build more knowledge (Bohn and Kundisch, 2020; Nambisan, 2017). Furr and Eisenhardt (2021) claim that the RBV is powerful under risk conditions, whereas Strategy Creation View (Alvarez and Barney, 2007) under uncertainty conditions. However, in this case, we are not concerned with how the resources and

capabilities come from -as explained by the strategy creation view- but how the resources and capabilities (as we use DCV in this case) can be a source of competitive advantage (Barney et al., 2021). Therefore, we provide a nuanced view of the role of digital technologies and how they enable capabilities in pivoting, addressing challenges of implementation and opportunities (Dwivedi et al., 2021; Nambisan, 2017; Upadhyay et al., 2021).

From a managerial perspective, our study sheds light upon the micro-foundations of digital capabilities for digital pivoting. Managers could consider these as a list of capabilities that need to be in place or developed to pivot successfully in turbulent environments. If they are already pivoting, they could assess their capabilities against our proposed micro-foundations to check the progress or success of their initiatives. With regards to the UK southeast SMEs in particular, our findings are relevant to their post-pandemic challenges related to innovation/growth, digital adoption and literacy as well as rising costs. Our study provides useful lessons for managers on what type of capabilities they would need to create through the use of digital technologies in order to pivot, if necessary, in turbulent environments. For policy makers and devolved authorities in the southeast, our study underlines the importance of supporting SMEs in their digital technology investments through appropriate policies and infrastructure investments. More importantly, they can support SMEs by developing and offering a coordinated approach/policy to digital literacy and inclusion across the area that will benefit businesses and support organisations by creating a digital culture. In this vein, they will contribute to the development of digital capabilities by enhancing the digital culture of the area, thereby benefiting SMEs as technologies evolve in the post-pandemic world.

6. Conclusion

This paper focused on how entrepreneurs use digital technologies to pivot in turbulent environments, drawing on qualitative case study data in the COVID-19 era. The paper makes two important contributions to the digital entrepreneurship literature: firstly, it unveils the micro-foundations of digital capabilities as facilitated by digital technologies that assist pivoting; and secondly, it presents a process model from key activities during pivoting to second-order themes that represent micro-foundations to digital (dynamic) capabilities for pivoting in turbulent environments.

There are also limitations related to this study. Firstly, the likelihood of researchers' reflexivity in this qualitative inquiry as unsettling and questioning "the nature of knowledge, and ultimately our purpose and practice as researchers" (Cunliffe, 2003, p. 985). In this research, we adopted a 'relationally reflexive approach' (Cunliffe, 2003) that involves interrogating and questioning our assumptions and the way we position ourselves in relation to others in the research in our methodology, interactions, and research accounts" (Cunliffe and Karunanayake, 2013 p. 385). Secondly, our data analysis was conducted manually, iterating among coding, verifying, and exploring the research data (Saldana, 2009); computer-aided/assisted qualitative data analysis software may have also assisted in increasing the transparency and trustworthiness of the research process (O'Kane et al., 2021). Thirdly, another limitation could refer to the thematic saturation point that relies on data collection, coding and analysis (Glasser and Strauss, 1967; Goulding, 2002; O'Reilly et al., 2012). In this research, after coding several incidents into a single theme, no new aspects of the theme were illuminating, hence reaching saturation. Fourthly, the study focused on micro-SMEs within a single country and area (South East), and therefore the results may not be applicable in other countries and contexts. Finally, the interviews were conducted online, on the MS Teams platform; conducting in-person interviews could perhaps give interesting insights (Howlett, 2021), being more intimate compared to recorded MS Teams discussions.

Future research could focus on the micro-foundations of digital capabilities for pivoting in other types of SMEs. Survey research could be conducted so as to get more generalisable results. Furthermore, future research could emphasise the role of the different types of operations in creating the necessary digital capabilities for pivoting or on other types of turbulent environments to better understand the digital capabilities that underpin pivoting. More research could be on the role of culture in its different dimensions that facilitates the creation of each of the different micro-foundations of digital capabilities and enable digital pivoting. It may also be fruitful to examine the potential impact of digital pivoting on organisational culture.

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Appendix -Interview questions

How old is the business that you are managing?

In which industry the business belongs to?

Tell us about your business activities?

Since the start of the pandemic and the first national lockdown in March 2020, what were the key challenges/barriers that your business has experienced? Could you please give examples?

Which have been the key priorities for the business activities in pre-Covid 19 era?

As a result from Covid-19, have you altered the businesses priorities?/Or the way that you are conducting businesses? Please give us examples.

How did your business pivot or adopt their business models during times of covid-19 era described by uncertainty and change?

Which action plan have you taken, from one hand to reduce risk associated with the pandemic and for the other to seize opportunities for future growth in post Covid-19 era?

How entrepreneurial opportunities have been formed and enacted in an increasingly digital world?

How does your firm respond to the opportunities of using Technology (digital transformation)? Could you please provide some examples?

How does your firm respond to the challenges of digital technology adoption?

How does technology make your business unique (create a digital identity for your business)? Could you please provide some examples?

How have the organisation's current resources and capabilities been used? Did you identify ways to apply these resources and capabilities to new opportunities during the pandemic? Please provide examples. (actually here you need to define what you mean by resources and capabilities).

How did digital technologies help businesses to redefine their capabilities (resources, knowledge, competences)? Could you please provide some examples?

Could you please give some examples of digital technologies that your business have used during the pandemic?

What role does digital technology play in business model pivots for sustainability of the business?

Which digital opportunities and capabilities are created and exploited, could you provide some examples?

What are the outcomes of digital technologies and business model pivots for your businesses (financial and non-financial)? Could you please provide some examples?

How do you define value for your business? How has this definition changed because of digital technology? Please provide examples.

Have COVID-19 changes resulted in permanent changes in overall business goals? Have you adopted a balance of social and economic outcomes for your business, could you please give some examples?

Could you please provide some examples on the creation of value through novel resource combinations?

Could you please provide some examples on whether, how and when strategic leaders engage with digital transformation?

Any ideas/comments/or things we have not discussed?