

## **A Complexity Perspective of Dynamic Capabilities in Enterprise Project Organisations**

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### **Abstract**

Driven by the inherent tensions that exist within the '*sense*', '*seize*' '*shift*' and '*liaise*' paradigm of dynamic capabilities, we set out in this study to explore the interstices that exists between two key theoretical traditions – '*Complexity*' and '*Dynamic capabilities*'. We frame the study in the context of Small and Medium Enterprises (SMEs), particularly Micro Enterprises operating in the UK construction industry. Emergent themes were gleaned from the interview of 21 construction enterprise owner-managers based in Scotland and Northern Ireland. Findings suggest not only that SME owner-managers operating within the construction sector interpret their own role as pivotal to the success of the firm and that they assumed responsibility for identifying opportunities and operational threats to the business, but also that aspects of complexity were at play in the thinking and action implied by owner-managers when dealing with both internal and external tensions. Our main contribution is to propose a capabilities framework framed within a complexity lens that enhances the explanatory power of dynamic capabilities.

**Key Words:** Complexity, Dynamic capabilities, Adaptive tension, SME, Owner-manager

## 1.0 Introduction

How well organisations operate in hyper-competitive environments described as “*Complex, diverse, and high-velocity*” (see Eisenhardt and Martin 2000; p. 1107; Day 2011; p. 186) may be explained by reference to their ability to effectively and efficiently exploit and leverage resources which are ‘*Valuable*’, ‘*Inimitable*’, ‘*Rare*’ and drawn upon on ‘*Organizational support*’ (‘*VIRO*’) (see Al-Hanshi et al. 2022). Together, these resources serve as the foundation to the Resource-Based View (‘*RBV*’) of the firm. The RBV is a theoretical framework developed by Barney (1996), which seeks to explain how organisations maintain competitive advantage and superior performance. The RBV theory suggests that because the embedment of ‘*VIRO*’ resources within organisational routines does take considerable time, duplication by rival organisations is extremely difficult, thus providing long term operational advantage (Day 2011).

The ‘*VIRO*’ resources can be exploited and leveraged in order to respond and achieve operational efficiencies (Eisenhardt and Martin 2000; Suddaby et al. 2020). In effect, they relate to operational or organizational capabilities, in other words, “...*a high-level routine (or collection of routines) that, together with its implementing input flows, confers upon an organization’s management a set of decision options for producing significant outputs of a particular type*” (Winter 2003; p. 991). Operational capabilities are in effect, capabilities which allow firms to sustain how they perform ongoing business activities. However, for organisations operating within hyper-competitive or “*complex, diverse, and high-velocity*” environments, their challenge is not as much to sustain ongoing business, but to be able to remain competitive. This requires reshaping and reconfiguring their resources in a sustained manner, thus an emphasis on ‘*Dynamic*’ as against ‘*Operational*’ capabilities.

‘*Dynamic capabilities*’ refer to a “...*firm’s ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments*” (Teece et al. 1997, p. 516) in anticipation of changes in the business environment and in response to them. Conversely, Zahra et al. (2006) defines dynamic capabilities as “...*the abilities to reconfigure a firm’s resources and routines in the manner envisioned and deemed appropriate by its principal decision-maker(s)*” (2006; p. 918). In this context, ‘*capabilities*’ refers to “...*the capacity to perform a particular activity in a reliable and at least minimally satisfactory manner*” (Helfat and Winter, 2011: p. 1244). These competencies can be delaminated into ‘*sense*’, ‘*seize*’ ‘*shift*’ (Schoemaker et al. 2018; Teece 2018a, 2018b) and ‘*liaise*’ capabilities

(Vallaster et al. 2021). Since dynamic capabilities provide firms with the competence and fit to moderate against the negative impact of both externally and internally driven threats resulting from change (see McAdam et al. 2017), dynamic capabilities provide firms with the competence to managing firm tensions (Best et al. 2021).

In essence, organisations are only able to *achieve* short-term operational capabilities by focusing on routines rooted in their '*VIRO*'. However, to sustain and drive the market and in the process, create long-term growth, especially in hyper-competitive or "*complex, diverse, and high-velocity*" environments, organisations must develop '*Dynamic capabilities*' (Ambrosini et al. 2009). These capacities are generally non-imitable and allows the firm to shape and configure and subsequently reshape and reconfigure its resources in response to changes in the operational and business environment. Essential therefore to dynamic capabilities is that they ensure that the firm is able to develop and subsequently sustain "*...value-enhancing points of differentiation*" (Augier and Teece 2008; p. 1188). Dynamic capabilities can be discerned in terms of forms (Ambrosini et al. 2009), dimensions (Pavlou and El Sawy 2011) and levels (see Ambrosini et al. 2009).

The dynamic capabilities framework offers conceptual insight for understanding tensions within and across various firms operating in different industry sectors such as construction (Gajendran et al. 2014; Davies et al. 2016). It also offers similar insights for organisations of different ages such as new ventures (Buccieri et al. 2020), and those of different sizes, such as Small and medium Enterprises (SMEs) (Eikelenboom and de Jong 2019; Hernández-Linares et al. 2021), including micro-enterprises (Inan and Bititci 2015; Borchardt et al. 2021). The literature observes that dynamics capabilities are particularly relevant to understanding SMEs because of their particular susceptibility to change (Gajendran et al. 2014). As will be elaborated upon, the effectiveness of dynamic capabilities is dependent upon a number of factors including *complexity* (referred to as "*...the number of items or elements that must be dealt with simultaneously by an organization*" – see Scott 1992; p. 230) and environmental velocity (referred to as "*...blurred market boundaries, unclear business models, ambiguous and shifting market players and an overall industry structure that is unclear*" – see Eisenhardt and Martin 2000; p. 1111). In this study, our focus is on complexity.

Our study will be situated within the construction industry. Noting that dynamic capabilities can manifest at the individual, firm, or network level (Eisenhardt and Martin 2000; p. 1107), our unit of analysis focuses on daily decisions of construction SME owner-managers

(particularly owner-managers of construction micro-enterprises), and how they employ and are impacted by dynamic capabilities as part of their daily routines to adapt (and balance) ‘...*tension[s]*’ (Levie and Lichtenstein 2010; p. 332). We focus on these owner-managers because ‘*dynamic capabilities*’ entail the “...*reconfigure[ation] [of] a firm’s resources and routines in the manner envisioned and deemed appropriate by its principal decision-maker*” (Zahra et al. 2006: p. 918). SME owner-managers “...*have particular importance for dynamic capabilities*” (Helfat et al. 2007; p. 20). They are also the ‘...*principal decision maker*’, wielding significant and disproportionate discretion over not only how resources are allocated, but also on how routines are selected, tensions are managed and opportunities are evaluated. For these reasons, not only are the exploitation of dynamic capabilities a primary function of the attributes and characteristics of the SME owner-manager (Man et al. 2002), but also is the reality that business survival of the SMEs depends largely on their decisions (Block et al. 2015).

Although sources of complexity in SMEs are mostly external (for example, regulations competitions customers, sub-contracting arrangements in construction projects), rather than internal, when SME owner-managers make decisions, both *internally*-driven (for example, other employees within the SME) and *externally*-driven (for example, with other organisations/SMEs within the operational and business ecosystem), tensions are created which may be overcome using the ‘*sense*’, ‘*seize*’ ‘*shift*’ (Schoemaker et al. 2018; Teece 2018a, 2018b) and ‘*liaise*’ capabilities (Vallaster et al. 2021). Studying individual dynamic capabilities therefore becomes both logical and necessary to understanding the nature of these tensions and their complexity underpinnings. Yet, despite this, “...*the role that [they] key individuals play in the strategic agility process is under-researched*” (Morton 2018, p. 94). Furthermore, “...*little is known about the individual-level origins of capabilities*” (Bingham et al. 2019, p. 121). Consequently, we set out our research question:

*RQ: How do SME owner-managers utilise dynamic capabilities to identify and manage adaptive tensions and requisite resource fluidity in their daily routines?*

At this juncture, the authors deem it important to make the following observations about the heterogeneous impact of dynamic capabilities. Literature notes that a major limitation with dynamic capabilities research has been the tendency for scholars to focus their studies on a

single level of analysis while excluding others (Dansereau et al. 1999; Felin and Hesterly 2007). The problem here being the inevitable assumption that the impact of dynamic capabilities is homogeneous; in effect, that as applied to the specific level of analysis of interest, the impact of dynamic capabilities at one level is largely independent from that of other levels. For example, it assumes that the impact of dynamic capabilities at the individual-level is relatively independent from the impact of dynamic capabilities on the firm or network-level. Rothaermel and Hess (2007) have observed that this homogeneous assumption of dynamic capabilities impact has largely led to false empirical findings. They opine that the impact of dynamic capabilities is heterogeneous, in effect, dynamic capabilities will generally have a simultaneous impact across more than one level. Thus, while our unit of analysis is the individual level, in acknowledging the heterogeneity of its impact, we occasionally discuss the concepts within the firm-level context.

To address this research question, the rest of the paper is structured as follows. In section 2, we review relevant literature on *'Dynamic capabilities'*, *'Firm tensions'* and *'Complexity'*. While section 3 sets out our study methodology (including the context of the study), in section 4, we report on the findings of 21 qualitative interviews with SME owner-managers within the UK construction industry. A discussion of the research results is presented in section 5. We conclude in section 6.

## **2.0 The literature**

### *2.1 Dynamic capabilities*

Dynamic capabilities allow the organisation in question to develop new strategies which create value for the organisation. Thus, dynamic capabilities serve as the basis of new sources of competitive advantage (Suddaby et al. 2020; Hernández-Linares et al. 2021). They also enable organisations to respond to both changes which are disruptive. Ordinary (substantive) capabilities on the other hand, are those that are routine, systemised action sequences that remain mostly unchanged through time. Examples of ordinary capabilities might include accounting processes and procedures, procurement, decision making systems, budgetary systems, annual advertising planning and spend, annual staff recruitment processes and so on. As we earlier alluded to, dynamic capabilities can be discerned in terms of individual, firm, or network level.

At the individual level, dynamic capabilities have been delaminated into '*Dynamic managerial capabilities*' (Adner and Helfat 2003; Helfat and Martin 2015). These are "...the capabilities with which managers build, integrate, and reconfigure organizational resources and competences" (Adner and Helfat 2003; p. 1020). Dynamic managerial capabilities are reflective of three fundamental factors which both independently and together, impact on the decisions managers make. Adner and Helfat (2003; p. 1020-1021) identify these factors as '*managerial human capital*' (which refers to those skills managers have acquired through a process of learning), '*managerial social capital*' (which refers to how the benefits derived from social relationships can be transferred the work environment) and '*managerial cognition*' (which refers to the mental modes of managers upon which decisions are based). While the notion of '*Dynamic managerial capabilities*' extends the '*Dynamic capabilities*' concept, it assumes homogeneity. In effect, its single focus is on how managerial action impacts upon strategic (competitive) change.

That *dynamic managerial capabilities* suggests an ability to manipulate ordinary management capabilities may be challenged by complexity theory, given the dynamic nature of knowledge changes and the non-routine nature of firm tensions. The literature opines that dynamic capabilities of '*sense*', '*seize*' and '*shift*' (Schoemaker et al. 2018; Teece 2018a, 2018b) and also '*liaising*' (Vallaster et al. 2021) are all relevant to the management of tensions. '*Sensing*' will entail the SME owner-manager engaging in a process of environmental scanning. Utilising risk radars (see Marshall et al. 2019), the SME owner-manager will need to forestall and recognize environmental signals which are important in order to develop more insight of opportunities and risks. '*Seizing*' will require the SME owner-manager in a timely manner to reshape and reconfigure his resources, firm structures, processes and procedures in order to be fit to take advantage of oncoming opportunities. '*Shifting*' entails the SME owner-manager radically changing the essence of the SMEs operational base. Finally, '*liaising*' (Vallaster et al. 2021) focuses on ensuring that the SME owner-manager seeks to build and maintain close relationships between his/her firm and its internal and external stakeholders.

At a firm level, the literature opines that SMEs maintain much different (and higher order) capabilities than other larger (and sometimes), well established organisation (Teece 2014; Karami et al. 2020). The same applies at the individual level where we have seen the development of the concepts such as '*Dynamic integrative capabilities*' (Eikelenboom and de

Jong 2019), ‘*Dynamic exchange capabilities*’ (Siaw and Sarpong 2021) and of ‘*Dynamic entrepreneurial capabilities*’ (see for example, Lanza and Passarelli 2014).

While the literature on dynamic capabilities appears to suggest that specific higher order capabilities reside within SME owner-managers who drive change, there is also a recognition that these capabilities may be embedded in the various routines and processes of the SMEs where they serve as the basis for resource, structural, process and procedure reconfiguration. Following a systematic review of the literature published on dynamic capabilities between 2004 and 2021, Loureiro et al. (2021) provides a very comprehensive and detailed comparison of not only how dynamic capabilities has been conceptualised in the literature (see Loureiro et al. 2021; p. 3), but also its various measurement indicators/factors (see Loureiro et al. 2021; p. 9).

## 2.2 *Dynamic capabilities and organisational performance*

There is empirical evidence to support the notion that dynamic capabilities have a positive impact on long term and sustained performance of organisations (Drnevich and Kriauciunas 2011; Protogerou et al. 2012; Hernández-Linares et al. 2021; Nyamrunda and Freeman 2021). For example, the work of Drnevich and Kriauciunas (2011) focused on Chilean firms and work done by Protogerou et al. (2012) which found that dynamic capabilities had a direct impact on operational capabilities which in turn, resulted in a significant performance improvement (in effect, that dynamic capabilities *indirectly* impacted on firm performance). They however found the *direct* impact of dynamic capabilities on firm performance not to be significant.

Factors likely to mitigate the influence of dynamic capabilities on organisational performance of organisations include firm ‘*age*’ and ‘*size*’. The literature on how SME ‘*age*’ positively impacts on the relationship between dynamic capabilities and organisations performance for example suggest that newer organisations are not weighed down by the rigidities and ‘locked down’ knowledge and processes which is characteristic of older firms. These rigidities are likely to impede much needed learning which is needed for effective exploitation of dynamic capabilities (Buccieri et al. 2020). In terms of ‘*size*’, the literature primarily opines that ‘*size*’ is likely to negative impact the relationship between dynamic capabilities and organisations performance (Dangelico et al. 2017; Hernández-Linares et al. 2021). Size in this instance being related to smaller sized SMEs (Arend 2014). There are a number of reasons why this will be the case including the (i) inability to spread learning costs

across a wider selection of resources and a (ii) smaller capacity to absorb knowledge. Both factors are hallmarks of resource availability constraints likely to be experienced by smaller SMEs. Dangelico et al. (2017) found that in large manufacturing organisations, specific dynamic capabilities (in these instances '*reconfiguration*' and '*resource building*'), had a greater positive impact on performance against other capabilities assessed.

All dimensions of dynamic capabilities do not enhance SME performance in the same manner (Hernández-Linares et al. 2021). Studies undertaken by Arend (2014) matched and mapped resource decisions to the external small business environment, focusing on their capacity of these enterprises to grow. SME are generally more likely to develop capabilities which are much more focused and most likely to reside with the SME owner-manager who is likely to have extensive power and control over resources. Mudalige et al. (2019) on the other hand undertook a multi-level examination of the impact of impact of dynamic capabilities on SME internationalization efforts, finding that dynamic capabilities deemed 'owner-specific'; in order words, entrepreneur characteristics – which includes (i) entrepreneurial orientation, (ii) social capital and (iii) human capital (primarily, prior experience). Hernández-Linares et al. (2021) found based on data obtained from a sample of SMEs in Spain that the link between the '*sense*' and '*learn*' dynamic capability was moderated by how customer needs were prioritized and how products and services were developed to satisfy these needs.

### *2.3 Dynamic capabilities and firm tensions*

The literature alludes to tensions emerging within an organisation when it undergoes change; especially when such change radically modifies its dominant logic (Khanagha et al. 2014). These tensions can also arise due to the organisations various stakeholders holding multiple, contradictory and divergent perspectives and expectations (Chipulu et al. 2019; Ojiako et al. 2014, 2015, 2022; Doyle et al. 2021). Tensions also come about because of the need for relationships to be built and communication to be maintained between entities within and across the operational and business ecosystem. In effect, tensions arise because in any form of interaction (either internally or externally focused), individual member elements will be expected to not to be in interaction with other elements within the same system, but also with other elements outside the system (Freixanet et al. 2020). These interactions lead to various action and responding action by different parties in the process leading to relationship 'loops'. In "*complex, diverse, and high-velocity*" environments, these loops are not linear.



There are different types of tensions that an SME can experience. In addition to experiencing tensions which are either *internally* or *externally* driven, drawing from the literature, SMEs can experience tensions between the need for exploitation *versus* exploration (Smith and Tushman, 2005), control *versus* collaboration (Sundaramurthy and Lewis, 2003), efficiency *versus* flexibility (Adler et al. 1999), and the focus on profit *versus* the focus on corporate social responsibility (Margolis and Walsh, 2003). Smith and Lewis (2011) further identifies four broad categories of firm tensions as (i) '*Learning*' tensions – these tensions are usually driven by change and involve tensions that emerge within the organisation as past knowledge is set aside in favour of new ideas (ii) '*Belonging*' tensions – which arise within an organisation between the individual seeking to maintain his or her own distinctiveness (for example, in terms of personal value systems), and the need of the individual to work within a group – maintaining group cohesion and identity and (iii) '*Organizing*' tensions which emerge within the organisation – following change – there are tensions as relates to the development and use of various processes. Other organizing related tensions includes the question of whether or not or the extent to which control is maintained over resources within the organisation. Smith and Lewis (2011) identify (iv) '*Performance*' as the final tension. These tensions emerge following different and often contradictory demands among the firm's various stakeholder groups.

#### *2.4 Dynamic capabilities in the construction industry*

The notion of '*Dynamic capabilities*' has been applied to the construction industry. Recent examples of work in this area coming from Gajendran et al. (2014) and Aghimien et al. (2021). For example, using data gleaned from an Australian case study, Gajendran et al. (2014) sought to examine how the process of innovation may drive performance improvements in construction SMEs – finding the likelihood that dynamic capabilities potentially reduced how relevant it was for SMEs to maintain innovation focus. Aghimien et al. (2021), sought to articulate the necessary dynamic capabilities required by the South African construction sector in the unfolding fourth industrial revolution (4IR). Their study found that '*transformation capabilities*' focused on factors such as knowledge management and technology governance as imperative for the construction industry.

It must be pointed out that the literature on dynamic capabilities has served as an important foundation for understanding how in effect, SMEs operate, and the literature has

been seen to exhibit some inconsistencies. Zahra et al. (2006) highlight that an example of such inconsistency is that most dynamic capabilities are identified after the event which means that the argument on whether they do exist or not is framed within the context of the entity being successful (in terms of for example profitability). They also point to the practice of construing the existence of these capabilities primarily from the point of an organisations ability to operate within fluidity in the business environment. However, as they (Zahra et al. 2006) note, its usefulness extends well beyond changes to business conditions to the need for constant resource reconfiguration.

### 2.5 Complexity

Burnes (2005) highlights that '*Complexity theory*' or more appropriately, '*Complexity theories*' is an all-encompassing terms referring to interdisciplinary research conducted across varying disciplines of science that includes mathematics, physics and biology that grew out of general systems theory in the 1950s. Over the last few years, complexity theory research has grown from the early theoretical and philosophical work of McKelvey (1997, 1999), to the more recent empirical work of, for example that of McKelvey (2016) and Bhatia et al. (2021). With this growth, there is increasing evidence to suggest that complexity theory is becoming more prominent in the sphere of a number of disciplines such as operations management (see for example, Ferreira and Saurin 2019) and project management (Cooke-Davies et al. 2007; Geraldi et al. 2011; Pitsis et al. 2014). Cooke-Davies et al. (2007) for example suggests that complexity has major consequences for project management, especially when we note that much of project management research and practice remains uncoded – on this basis, thinking about complexity within the context of projects management allows for new ways of thinking about obdurate problems that appear to be manifest in project management practice. Geraldi et al.'s (2011) contribution to the discourse was to put forward a five-dimension complexity-based typology of project management that sought to relate abstract types of complexity (complexity as imagination, perception and sence-making – see Marshall et al. 2019; p. 648) to the indicators expressing complexity as concrete, in other words, context-specific description (see Marshall et al. 2019; p. 648).

Complexity theory fits a situation of dynamic business change where formal planning is difficult to implement owing to *uncertainty* or *non-linearity* (Anderson 1999; Burnes 2005). Complexity theories can be utilised to better understand how SME dynamic

capabilities (and proficient managerial action) may reduce the likely negative impact of limited resources on the SMEs ability to reshape and reconfigure its resources, firm structures, processes and procedures in response to changes in the operational and business environment. This is because of the reality that due to resource constraints, SME activities are highly vulnerable to contextual contingencies and external changes to the operational and business environment. Aghimien et al. (2021) highlights that each of these different opportunities have significant influence on each other; in effect, the *sensing* capability is construed to influence the capability to *seizing* opportunities (see Lee and Yoo 2019) which in turn is construed to influence the capacity to *shifting* and transform (Teece 2007).

The literature, suggests there are a number of key *features* of complexity. These includes dynamism (Burnes 2005) interdependence, multiplicity and heterogeneity (Ahmadi et al. 2017) and non-linearity (Stacey 1995); all which are likely to result in the outcome of management decisions being highly characterised by unpredictability and uncertainty (see Burnes 2005; Schneider et al. 2017). The existence of complexity implies that management decisions are unlikely to be optimal and that 'normative' laws of instrumental cause and effect will not be applicable. This is why the information-processing is quite important under conditions of complexity (Bystrom and Jarvelin 1995). However, drawing from Eisenhardt and Martin (2000), one approach to dealing with the effect of complexity is to employ the use of simple routines framed around similarly loosely framed structures.

There are two *streams* of the complexity notion (Burnes 2005; p. 74 & 77; Geraldi et al. 2011; p. 968). The first stream focuses on the idea of '*Complexity-in*' (see Geraldi et al. 2011; p. 968) which focuses on the complexity characteristics of operational and business environments. '*Non-linearity*' is a key attribute of '*Complexity-in*'. Thus, even the slightest change to any parameter within the operational and business environment can result in radical changes in the way that the entire environment behaves (Anderson 1999). The second stream focuses on the idea of '*Complexity-of*' (see Geraldi et al. 2011; p. 968). Here, the interest is on how individual organisations respond to such complexity. '*Complexity-of*' therefore refers to a conceptual/analytical framework that allows for the accounting of organisational behaviour as "...consisting of numerous varied, but intricately interrelated parts with business outcomes likely to be dynamic, irregular, non-linear and unpredictable" (see Burnes 2005; Schneider et al. 2017). In this study, we will draw upon the second stream (complexity theory) to explore the first stream (complexity of the operational and business

environment). We do so because as pointed out by McKelvey (2004), since the essence of SMEs is to create value and new market creation, the utilisation of complexity remains the preferred theoretical lens. Drawing from Schneider et al. (2017), SMEs can enhance their dynamic response to complexity in one of two ways, both with associated tensions. First, they can seek to create complexity within their internal processes and structures. Such forms of complexity will result in *internally*-driven tensions which emanate for example as disagreements arise between the SME owner-manager and individual employees over priorities and the question of how quickly adjustments to existing routines or how the SMEs resource base can be enhanced in relation to perceived priorities. Second, complexity will result in *externally*-driven tensions. These arise as for example, the SME owner-manager grapples with how to modify, rejuvenate and refresh its resource base in response to fast evolving customer demands or in response to changes within the processes and structures of collaborative partners (such as suppliers).

### **3.0 Research methodology**

#### *3.1 The UK construction industry*

Our study is set within the context of the United Kingdom (UK) construction industry. The construction industry is recognised in the literature to represent one of the most value-based sectors of the national economies of most countries (Venkatachalam et al. 2019). In the UK, the construction industry contributes approximately 6% to the country's national GDP. In 2018, this was valued at approximately £117 billion (Rhodes 2019). The construction industry is a vital sector of the economy in that it provides the design, development, maintenance and operational capabilities for the infrastructure which serves as the key foundations for the economy to operate upon (Ojiako et al. 2018).

SMEs account for 99.9% of the population of businesses contributing to a turnover of approximately £1.6 trillion to the UK's economy (Federation of Small Businesses 2021). Furthermore, at the start of 2020, there were approximately 5.9 million small businesses operating in the UK (an increase of 1.9% against 2019). A significant number of SMEs in the UK are involved in construction and infrastructure delivery and operations. With 99% of construction companies operating in the UK being SMEs (Federation of Master Builders 2021), there is no doubt that SMEs are the key driving force of the UK construction industry. Given the importance of SMEs to the construction industry, the broader context of how SMEs or

more appropriately, SME owner-managers, respond to internally and externally driven tensions through dynamic capabilities becomes significantly of interest.

### *3.2 Complexity, SMEs and the construction industry*

*“Construction projects are characterised by complexity in both design and production”* (Khan et al. 2016; p. 192). Construction is construed as *“...amongst the most complex of all production undertakings”* (Winch 1989; p. 338). Baccarini (1996) further states that *“...the construction process may be considered the most complex undertaking in any industry”* (p. 201). Complexity arises in the construction industry because of not only the nature of fragmentation within the industry (Khan et al. 2016), but also because of the multiplicity and interdependence among its various unique tasks (Bashir et al. 2022). This means that often than not, the output from construction generally appears radically different from how they were originally conceptualised. Complexity has led to the construction industry to be susceptible to low productivity (Hasan et al. 2018), time and cost overruns (Haaskjold et al. 2021), poor quality of products (Haaskjold et al. 2021), under-achievement in terms of learning (Venkatachalam et al. 2019) and disputes (AlRaeesi and Ojiako 2021; Ojiako et al. 2018, 2021).

The complex nature of the construction industry is a major factor to consider when exploring how SME owner-managers utilise their dynamic capabilities in order to identify and manage adaptive tensions and requisite resource fluidity as part of their daily routines. SMEs owner-managers operating in the construction industry do not exhibit any specific heterogeneity; some for example are engaged in the provision of very specialist consultancy services while others do not appear to exhibit specific expertise. Others appear to prefer bidding for work as sub-contractors while others will work as the main contractor (usually in very specialist areas). Tensions are quite challenging for SME owner-managers to deal with and often, this is despite efforts to enhance responsiveness (Nyamrunda and Freeman 2021). In fact, construction SME owner-managers are likely to be less capable to deal with very fluid and/or unpredictable changes which arguably explains why there is a high rate of business failure among construction SMEs (Ulubeyli et al. 2018). As a result of their limited resources, SMEs operating within the construction industry are more than likely to employ very simplified control and planning systems. They are also more than likely to have the staff fulfilling multiple roles while adopting very simple management reporting systems. Studies

by Turner et al. (2009, 2010) for example found standard project mechanisms as being unsuitable for SMEs because of their formality.

The dynamic nature of the business environment SME owner-managers are facing is illustrated well by the recent rise in cyber-crime (Osborn and Simpson 2017), and the construction industry's response in relation to cyber security (Pradeep et al. 2021). More specifically, the tensions offer both opportunities and threats for construction SMEs, creating new knowledge and enhancing the value of dynamic states theory in explaining rapid change (Levie and Lichtenstein 2010). The creation of a whole new industry has resulted from what appears to have been an informal and largely criminal code breaking initiative in the 1980's and 1990's to a more professional and organised system designed to penetrate company data file and systems software to bring about failure, theft (of cash or data) or blackmail opportunities (Shook 2016). These threats have been felt within the construction industry following its widespread digitisation which means that substantial amounts of industry data which is highly commercially sensitive (for example, personal data, documents, and high value specifications and drawings), are now being developed, amended, shared and stored online using innovations such as intelligent contracts and blockchains (McNamara and Sepasgozar 2021).

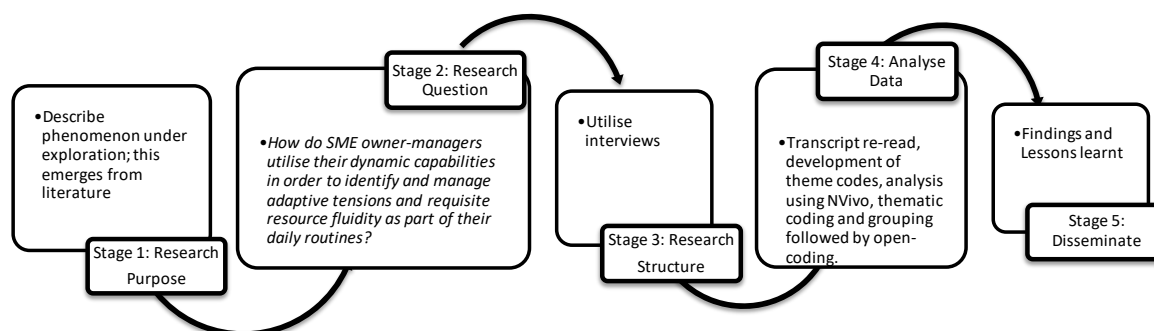
With all these in mind, complexity theory is back on the agenda as a relevant collection of theories against which this generative emergence and associated virulent change and new internally and externally driven tensions in SMEs can be examined (Lewis et al. 2007; Sun et al. 2021).

### *3.3 Research approach*

Our research approach was developed from the earlier works of McKelvey (2004), Boyer and Swink (2008), and Morris et al. (2012). More specifically, in order to complement the theoretical development of complexity theory into small business research, McKelvey (2004; p. 330), has called for research which involves '*thicker*' (qualitative) accounts and descriptions of phenomenon. Morris et al. (2012) on the other hand had called on researchers to provide richer insights into the nature of entrepreneurship by focusing on the lived experiences of SME owner-managers. Boyer and Swink (2008; p. 339) earlier had opined that, "*...the study of operations management is a social science*". Interestingly, this is a view maintained by project management scholars such as Cicmil et al. (2006) and Blomquist et al. (2010). With

these in mind, our adopted methodology is *'interpretivist'* in nature, seeking to elaborate meaning from interview text. More specifically, we adopt as our philosophical stance *'social constructivism'* (Adams 2006) which is one of the numerous *interpretivist* paradigms available (see Williamson 2006). The focus of *interpretivism/social constructivism* is to gain an appreciation of how people construct their social reality base on “...*the world of human experience*” (Cohen and Manion 1994, p.36). In effect, by emphasising that our “...*reality is socially constructed*” (Mertens 2005, p.12), of */social constructivism* is heavily reliant on the “participants’ views of the situation being studied” (Creswell 2003, p.8). In Figure 1 (below), we present a research roadmap that articulates the research method utilised in this study. This roadmap is adapted from earlier studies by Ojiako et al. (2013) and Al-Hanshi et al. (2022).

**FIGURE 1: Research roadmap**



### 3.4 Background on the contributing SMEs

Research in operations management had traditionally been dominated by quantitative-oriented studies that sought to employ “...*mathematical modelling aimed at sharply defined problems*” (Narasimhan 2014; p. 201) in order to facilitate “...*deeper mathematical foundation and understanding*” (Fisher 2007, p. 368). More recent studies however point to a broadening of research within the operations management discipline to now include questions focused on “...*the what*”. According to Handfield and Melnyk (1998; p. 324), these types of questions are best addressed using qualitative approaches such as interviews.

Furthermore, operations management research is also increasingly focusing on research topics such as competitiveness and strategy, both which are best served by qualitative studies (see Narasimhan 2014; Soltani et al. 2014).

Utilising a similar approach to Chipulu et al. (2014) and Al-Hanshi et al. (2022), identification and recruitment of the interviewees in our study was predominantly undertaken within the extensive professional networks within the construction industry maintained by the authors. Thus, the data was drawn mainly from interviews of 21 construction SME owner-managers based in Scotland and Northern Ireland. The respondents were identified as founder SME owner-managers who had maintained overall control of their organisation as it had become established and guided its development from creation through to evolving into a larger business entity. These SMEs were also selected as they were strategically deemed to be clusters vital to economic growth in these two regions. The organisations had been in existence for a minimum of 3 years and were growing (by revenue and number of employees). All employed fewer than 9 staff (thus in essence, micro enterprises). This is reflective of the general profile of most construction firms. As observed by Holt (2013), approximately 50% of all UK construction firms have one employee while approximately 85% have between one and three employees. Studies by the RSA (2014), suggest that up to 95.4% of UK businesses are micro-enterprises/businesses (between 0-9 employees). Research has identified six characteristics of construction SMEs that make them particularly susceptible to complexity. For example, Sexton and Barrett (2003) identify four characteristics of construction SMEs as (i) limited resource capacity (ii) limited resources for external interaction which implies being susceptible to limited information flow (iii) dominated/ significant and disproportionate discretion by single owner-manager (iv) inability to maintain adequate cash flow leading to limited ability to invest in innovative activities. Khan et al (2016), identified two further such characteristics as (v) a lack of processes with associated feedback loops able to provide performance information in real-time and (vi) poor systems integration. The firms selected exhibited majority of these characteristics.

We highlight that while a number of studies have treated most SMEs as a homogenous group, resulting in the outcome of comparisons (and resultant implications) often problematic (see Tassabehji et al. 2019), substantial homogeneity exists in our sample to warrant its use for viable comparisons. This is because not only does our sample exhibit substantial homogeneity in terms of SME type (all employed less than ten employees, thus



are micro enterprise – see European Commission 2020), but also industry type (construction industry only). Table 1 below provides background information on the contributing SMEs.

**TABLE 1: SME sample profile**

Company	Company Type	Firm Size (No of employees)	Firm age (years)	Interviewee Role	Background and Experience	Duration of Interview
MiE1	Construction consultancy	4	4	Director	Site development	50 minutes
MiE2	Construction consultancy	5	3	Partner	Site development	45 minutes
MiE3	Construction consultancy	7	4	Proprietor	Site development	55 minutes
MiE4	Construction consultancy	3	4	Technical Director	Site development	40 minutes
MiE5	Construction technology	4	7	General Manager	Surveying instrumentation	45 minutes
MiE6	Construction technology	4	6	Owner	Design and software development	45 minutes
MiE7	General construction	8	9	Technical Director	Site based	45 minutes
MiE8	General construction	4	7	General Manager	Site based	50 minutes
MiE9	General construction	3	10	Managing Director	Site based	55 minutes
MiE10	Concept design	9	8	Director	Site based	40 minutes
MiE11	General construction	7	6	Proprietor	Site based	45 minutes
MiE12	General construction	4	7	Owner	Site based	50 minutes
MiE13	General construction	4	8	Founder	Site based	45 minutes
MiE14	General construction	5	8	Manager	Site based	50 minutes
MiE15	Specialized construction	7	8	Chief Executive Officer	Spreader truck hire	40 minutes
MiE16	Specialized construction	8	11	Director	Earth moving	45 minutes
MiE17	Specialized construction	5	10	Founder	Earthworks	50 minutes

MiE18	Specialized construction	5	12	Technical Director	Earthwork and soil stabilization	40 minutes
MiE19	Specialized construction	7	11	Business Development Director	Pneumatic tanker operator	55 minutes
MiE20	Training	7	4	Technical Director	HSE Training (Hazards, Safeguarding & Control)	40 minutes
MiE21	Training	9	3	Managing Director	Project management training	50 minutes
(MiE) Micro enterprise < 10 employees						

### 3.5 Sampling

Following protocols articulated in Chipulu et al. (2014), Al-Hanshi et al. (2022) and Ojiako et al. (2022), we first undertook a pilot study by conducting two interviews to check for accuracy and relevance. Prior to piloting, the two interviewees were briefed extensively on the aim of the study and the interview protocols to be utilised. The feedback provided was then employed to revise and improve the interview protocols, especially as relates to clarity. Following this, the revised interview protocols were sent back to the two interviewees for checking. This pilot stage involved lengthy and unstructured interviews of up to three hours, to (i) explore conversationally the work context, (ii) to obtain a practice view of the potential issues and (iii) to uncover potential variances and similarities with the theoretical backdrop that was identified earlier in our research. The interviews covered the following topics: (i) role of the owner entrepreneur in leading and making decisions; (ii) how and when planning and performance evaluation occurs; (iii) how external opportunities and threats are identified and by whom; (iv) the nature of competition, collaboration and creativity in the industry concerned and (v) questions relating to how tensions were managed. Sampling followed a purposive approach (Rapley 2014). This enabled the research to focus on obtaining more granular perspectives on the phenomena identified earlier. The interviewees were however drawn from different operational elements within the construction SME space in order to preclude unrepresentative themes inadvertently emerging from the interviews. Following piloting, ten further interviews were conducted and after analysing the data, we were able to establish thematic saturation. The final seven interviews allowed us to shift the interview

emphasis toward challenging the established theoretical assumptions further to provide a foundation for proposing adaptations to theory and creating a substantive opportunity to contribute to the field. We note as has been highlighted by Saunders et al. (2018), that theoretical data saturation is a critical element of emerging insights being repeatable. In this study, while our data is drawn from 21 interviews, we did not glean any further major insights apart from the confirmation of our findings after conducting 17 interviews (after these interviews, we did not as during data analysis derive any additional nodes). Throughout the study, we were very mindful of research ethics, especially as relates to anonymity of interviewees (van Den Hoonaard 2003).

### *3.6 Data collection*

The interview data was collected over a seven-month period between February 2019 and September 2020. Transcripts from all interviews were transcribed from a digital recorder into a database created on Microsoft Excel. The interviews commenced by approaching the concepts of dynamic capabilities, business, dynamic states and complexity thinking from an open standpoint, interviewing owner-entrepreneurs with a loose framework of questions designed to encourage reflection and exploration of various facets of their operations including work processes, identification and response to sources of adaptive tension, flexible resource architectures and permeable organisational boundaries. Approximately half of the interviews were conducted at the premises/place of operations of the SME owners while the others were conducted online. One point needs to be addressed at this juncture is the ancillary impact of the sudden emergence of the Covid-19 pandemic, the government mandated lockdowns in the UK (see Institute for Government 2021), and its resultant disruption to our data collection. The UK government mandated a national lockdown which commenced on 23 March 2020 at a point we had conducted approximately half of the interviews. Following social distancing mandates coming into effect, the authors had to consider whether to suspend data collection on its entirety or change the mode of data collection (see Bierer et al. 2020). The authors chose to suspended data collection and recommence this exercise in June 2020 using online mediums. This lead to all subsequent interviews being conducted online (via Zoom).

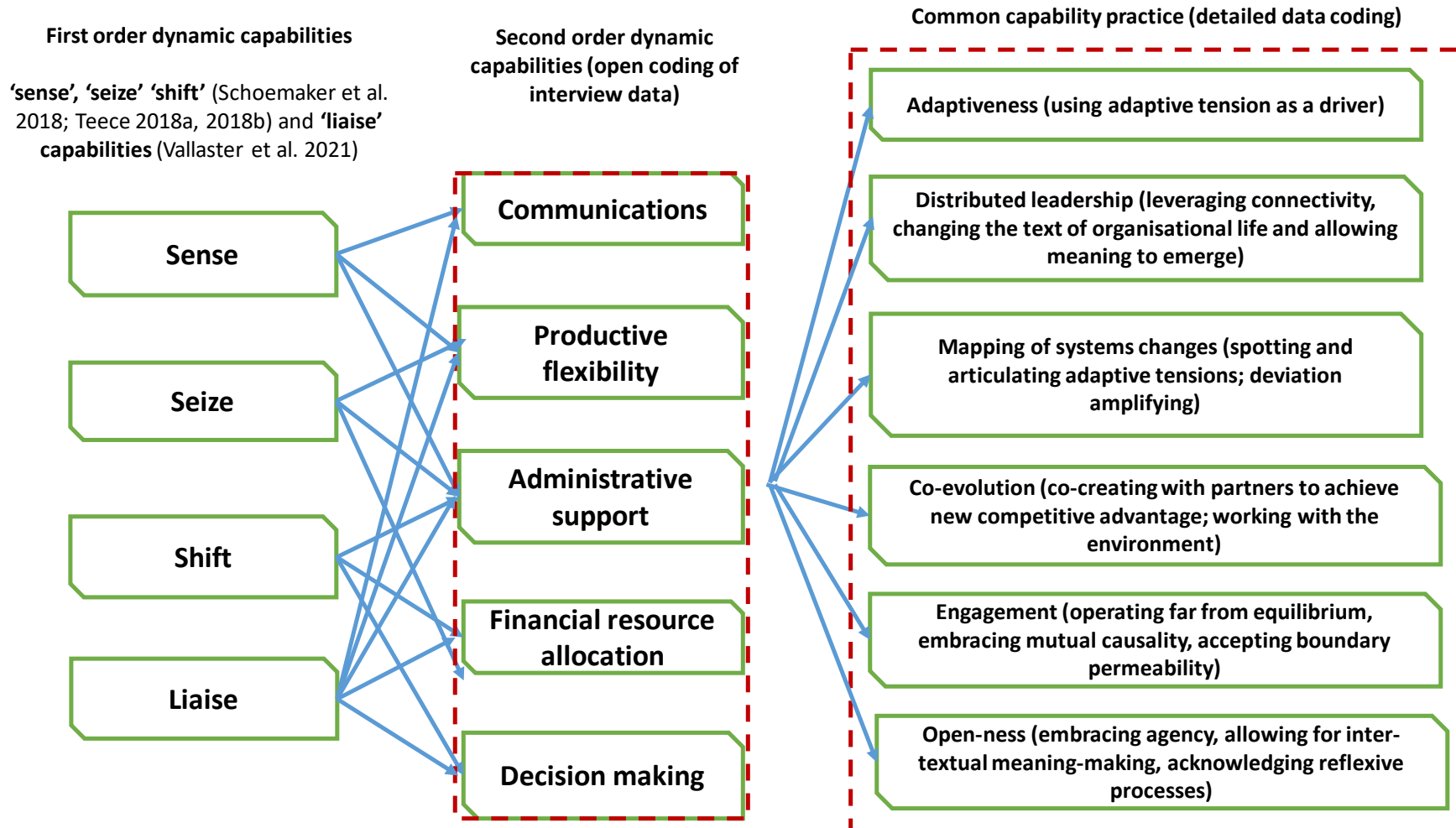
### *3.7 Data analysis*

To analyse the resultant data, content analysis was employed (see Krippendorf 1980). Content analysis is generally well regarded as a flexible, replicable and systematic approach for the analysis of text-based narratives that can be employed to conduct research which is socially-oriented (Mayring 2004). One key interest among the authors is that the use of content analysis is consistent with discretionary code selection and development (Webley 2010). Drawing upon Krippendorf (1980) and Vaismoradi et al. (2013), we employed a six-staged approach to content analysis. Generally speaking, (i) the first stage employed in data analysis was *'Verbatim transcription of interviews'* (ii) we then undertook *'Identification of relevant concepts'* – focused on the generation of parent nodes based on the questions posed to the interviewees. For each node which denoted the individual points raised with the interviewees, we generated sub-categories drawing upon the actual terminology employed by individual interviewees. Thus, in the case of the first node that was generated, that is *'Co-evolution and engagement (Organisational boundaries)'*; we created two topics, namely; *'Boundary flexibility'* and *'Boundary rigidity'*. Interviewees' responses were based on codes drawn from quotations taken verbatim from the interview transcripts. The third stage entailed (iii) *'Defining the relationship types'*. Our focus at this stage was to identify through a process of iteration, emergent themes. The intention being to facilitate the generation of separate analytical templates in a progressive manner. This stage also entailed focusing on finding relationships between various emergent topics and then undertaking to revise them following the transcripts being read again.

Where possible, coding was also revised to enable new themes to be identified. Checking of these codes was undertaken by the third author. The emergent themes from this exercise were determined to represent the various interviewees' views on how construction SME owner-managers do utilise their dynamic capabilities to identify and manage adaptive tensions and requisite resource fluidity as part of their daily routines. In the fourth stage of our analysis, (iv) *'Textual coding'* was undertaken. This stage involved utilising literature for cross-validation, especially as relates to concept identification. Our focus at this stage was to examine as relates to the research question, similarities and differences in the views expressed by the different interviewees. The next stage of the data analysis entailed (v) transposing all the transcripts into a database built using Microsoft Excel following the upload onto NVivo. This process was undertaken in order to ensure that the structure of the text was maintained. NVivo is a popular data analysis software programme that offers very

efficient and robust qualitative data analysis (see Leech and Onwuegbuzie 2011). Of particular interest is that NVivo supports the generation of data strings which are much more detailed than would be possible through manual coding (Basit 2003). Once the transcripts were uploaded onto NVivo, we then undertook the (vi) '*Analysis of the results*'. This stage will be undertaken in the next section of the paper and involves providing a detailed narrative of the results of the data analysis. In Figure 2 (also below), we present the common capability practice observations from the research data coding.

**FIGURE 2: Common capability practice observations from research data**



## 4.0 Findings

Set within the context of the UK construction industry, the paper set out to explore how SME owner-managers utilise their dynamic capabilities to identify and manage adaptive tensions and requisite resource fluidity as part of their daily routines. Having in the previous section analysed the data, in this section, we report on the emergent determining factors need to be in place to ensure that SMEs/SME owner-managers can take full advantage of their inherent dynamic capabilities.

### 4.1 Innovation and the creative processes

The outcome of the interviews points to SME owner-managers highlighting that:

*“...we were able to cope with changes in the business environment through innovation” (Respondent MiE18)*

This view supports the view that construction SME owner-managers recognised that innovation was critical to their competitiveness. Although being the case, the respondents also acknowledged their limited capacity to exploit innovation because of:

*“...the reality that we have limited resources, especially when dealing with customers who have requirements that require unique solutions” (Respondent MiE14)*

There was a recognition among SME owner-managers of the importance of releasing the creative abilities of their employees. Thus, focusing on creatively served as one approach to enhancing innovation. Thus, when asked how creativity could be encouraged or controlled by SME owner-managers, it was observed that:

*“Getting to the point where you realise you are stifling the creativity and capability of the staff, and then think about what we were doing there. How did it happen? So how can we then change it? We need to embed some kind of openness in our business to stop killing the flow of ideas” (Respondent MiE4)*

Innovation can lead to both internally and externally driven tensions because:

*“...you have to create an organization which can both be flexible and efficient and there are no shortcuts. You cannot just become flexible and then it costs [] too much money to be there”* (Respondent MiE3)

Interview data mapped directly into the concept of tensions and it will appear that the SME owner-managers may be displaying discernment of when and how to address adaptive tensions by employing strategies that either *encourage* or *control* (in order words, limit) innovation and creativity. When asked to reflect on the conditions necessary to either *encourage* or *control* innovation and creativity:

*“When you are in production and you are spending huge money — blinkers have to go on, because if you don't you'll be changing the thing and you'll never get it finished — that is a big discipline”* (Respondent MiE17)

*“You just need to know when to stop unless you will never be finished and it takes discipline to know the right time to do so”* (Respondent MiE4)

*“Trying to generate ideas raises the likelihood of intense disagreements...sometimes you lose good people because you just can't agree with them”* (Respondent MiE2)

The interviewees were citing internally or externally driven challenges (tensions) as negatively impacting upon innovation. However, Respondents MiE17 and MiE4 were identifying times when variety amplification is counter-productive and divisive to the organisational task in hand. The attenuation of innovation becomes important in achieving planned work outcomes and the capability to change emphasis is paramount. In sum therefore, as relates to *'Innovation and creative processes'*, we found that:

Finding 1 – The findings suggests that SME owner-managers (i) recognised that innovation was critical to their competitiveness (ii) that to cater for complexity, it was important to release the creative abilities of employees and (iii) that SME owner-managers may have been displaying discernment of when and how to address adaptive tensions. Thus, in sum,



innovation can lead to both internally and externally driven tensions which can be addressed by either its amplification or attenuation.

#### 4.2 Leadership

The respondents related to the ways in which they saw the phenomena of leadership playing out in their particular organisation. Leadership was important in the management of tensions because as observed:

*“Staff see us as stallion heads, a team of three pushing the business forward”*  
(Respondent MiE7)

We observed a gravitation towards more autocratic forms of leadership. Thus for example, it was noted that:

*“Actually we are a very classical line-organisation with clear reporting lines and defined leadership. It is pretty static; it is not directly flexible. Process organisation could be more flexible. Here it is not. It is pretty traditional conservative line-organisation”* (Respondent MiE10)

The statements by Respondent MiE7 and MiE10 contain potentially interesting portrayal of how leadership is framed within some construction SMEs. However, this position does not tell the entire story. As had been observed:

*“... We are not seen to be 'heavy' with our staff I think we are nurturing; at the same time, it is a soft version of command and control”* (Respondent MiE8)

This suggests a recognition of the need to balance leadership styles and their contingency on the prevailing context.

A further question that arose related to the impact of complexity on SME owner-manager ability to manage *internally* and *externally* driven tensions. The opinion among the respondents was that complexity did place a premium on the need for SME owner-managers to:

*“[We need to] be able to create solutions which are situation-specific at clock speed”*

(Respondent MiE21)

The demand for such situation-specific knowledge raises questions on the need to develop more flexible styles of leadership. Also of interest is the creation of flexible routines and footprints of knowledge. The findings also suggest that proper attention and management of tensions requires SME owner-managers to acknowledge the nature of opposing stakeholder interests. Thus the observation that:

*“I generally try to pre-empt problems arising within the firm by ensuring that all employees do feel that their concerns are receiving the same attention as those of other colleagues”* (Respondent MiE20).

The presence of multiple stakeholders is likely to substantially increase not only the emergence of competing expectations, but also individual and firm-level tensions. Thus, as observed, when asked to describe the nature of leadership, it was suggested that:

*“The more we can let staff contribute in a way that they can, the more we move forward the pace, they solve the problems rather than us solving the problems. I think we’ve been a little bit too command and control.”* (Respondent MiE8).

In effect, there was a need to ensure a balance between nurturing and the control of staff in a manner that allowed space for more open and honest participatory decision-making. The importance of SME owner-manager judgement as relates to centralisation of decision making or exerting less control and empowering staff through open conversation is a theme which strongly emerges among the respondents. Complexity capability practice would tend to suggest a more distributed style to facilitate emergence and conversational flow. In sum therefore, as relates to ‘Leadership’, we found that:

Finding 2 – The findings suggest that (i) that leadership was important in the management of tensions (ii) that construction SME owner-managers gravitated towards more autocratic

forms of leadership when faced with complexity although (iii) there was a recognition of the need to balance leadership styles and their contingency on the prevailing context. We further found that (iv) that there was a demand for situation-specific knowledge which raised questions on the need to develop more flexible styles of leadership. In sum, our findings suggest that SME owner-managers must engage with the tensions associated with the need to balance between 'autocratic' and more 'community-based' forms of leadership.

#### 4.3 Planning

Planning generally involves assessing environmental signals for opportunities. There was a general recognition of the value of planning by the respondents. For example, it was not only opined that:

*"I act as a channel really of info on what's going on in the wider world. If I see an opportunity, I discuss it within the business and we decide on if we can take it forward or not. If it's a 'yes' I place it in the business plan and we put some figures and data around it"* (Respondent MiE8).

But also, it was observed that:

*"it [planning] gave us much needed opportunity to undertake some detailed thinking about the future without really demanding too much in terms of time and costs"* (Respondent MiE11).

The quote above demonstrates this sensitivity in that the respondents are articulating a strong grasp of the purpose of planning. However, there were signs of growing scepticism among the SME owner-managers in relation to the need for planning as it was suggested that:

*"In our business we are time-poor and so detailed planning to me is a waste of time. We get project finance in place and work to strict deadlines. It's much less formal than you imagine"* (Respondent MiE10)

Furthermore, highlighting external sensitivity to evidence of planning, it was also observed that:

*“Basically we get on with our work until sponsors deadlines loom. Then we stop what we are doing, hastily write a business plan and do what we have to do in securing our financial future. Once we have done this we get back to the creative process”* (Respondent MiE18).

The respondents here almost seem to either regard formal planning as something they would rather not do or something that is necessary and will have to be done. One possible reason for SME owner-manager scepticism of planning may be that the process is resource intensive and for the SME owner-manager, overbearing. Not having substantial regard to planning meant that when undertaken, the process was much less disciplined as had been suggested by MiE18. More specifically, when asked to describe their approach to planning, it was observed that:

*“I act as a channel really of info on what’s going on in the wider world. If I see an opportunity, I discuss it within the business and we decide on if we can take it forward or not. If it’s a ‘yes’ I place it in the business plan and we put some figures and data around it”* (Respondent MiE8).

This may suggest a lack of formalized planning processes (thus the observation that *“...I place it in the business plan and we put some figures and data around it”*). There is a strong sense of causal reasoning in the planning system employed and an inherent weakness in the inflexibility of the approach. Thus the suggestion that:

*“Although we stick to a three year planning cycle because that seems to work with the bank, I am not convinced that it is that flexible considering that things can change very quickly in our business”* (Respondent MiE14)

A very different planning culture could however be gleaned from Respondent MiE18’s original statement that *“Basically we get on with our work until sponsors deadlines loom”* which suggests a more fluid, flexible approach to business priorities and planning.

Complexity may not necessarily see the end of planning. As rigidity would generally not be associated with an ideal complexity stance, from a complexity standpoint the central

intention is to map the perturbations of the system, the adaptive tensions and emerging deviations and to communicate these observations to stakeholders. In sum therefore, as relates to *'Planning'*, we found that:

Finding 3 – Our findings suggests that (i) there was a general recognition of the value of planning by SME owner-managers (ii) respondents appeared to regard formal planning as something they would rather not do or something that is necessary and will have to be done. In sum, our findings suggest that causal reasoning in planning and an inherent weakness in its inflexibility engages a tension between what SME owner-managers have to do (largely because of external pressures - strategic planning) and what they would rather not do (because of a perception of that planning processes are overbearing and resource intensive - anti-planning).

As we will show, co-evolution engages both internal and external networks to mitigate against the potential limitations associated with the concerns of SME owner-manager's about planning. This leads us into the next theme.

#### *4.4 Co-creation and engagement*

Since the collaborative environment within which SMEs operate is socially constructed, the action of SMEs and the consequences of these actions are determined not only by its owner-managers, but by intense nature of its interaction with internal and external actors and stakeholders and a recognition that these interactions are necessary. Thus, an observation that:

*"Our Technical Director spends much of his time connecting through the web to other software engineers finding new algorithms and contributing to the global 'open source' community" (Respondent MiE 2)*

Here, a deliberate stance toward collaboration and cross-boundary engagement is being articulated. Competitive advantage is seen as being dependent on this connectivity with respondent's perspectives on organisational boundaries being that permeability would be the preferred complexity stance, while rigidity would be less conducive. Respondents also alluded to the way in which the wider systems environment of the organisation is seen to overlap or 'partner' with the organisation itself.

*"I am coming to my point that thanks to globalization and thanks to computer technique [...], you can be flexible. You can use advantages created by globalization"*  
(Respondent MiE5)

The owner-manager views may represent a recognition of the importance of the *external* integrative function of dynamic capabilities. In effect, that the SME owner-manager may be seeking to integrate their capabilities and resources with that of other external entities. This allows for an expansion of 'reach' despite limited resources. To facilitate integrative capabilities, the SME owner-manager seeks to forge cross-boundary relationships with collaborative partners, in the process, making considerable savings on resourcing costs. At the same time, the SME owner-manager is able to enhance access to new, unique, valuable and complementary resources which would otherwise take considerable time and effort (and costs), to develop and access internally. An *internal* integrative perspective on the other hand, will imply the SME focusing on its internal capabilities and resources. Enhanced performance from internal integration comes about because the internal staff/employee engagement that is required to drive this process will inevitably lead to an optimization of resource usage. However, when posed with the same question, an emphasis on the *external* integrative as against *internal* integrative function of dynamic capabilities was generally being reiterated. Thus, it was also noted that:

*" We took a clear strategic decision as a company that that wasn't the market we were going to play in. We would play in the supply side to it and find partners who were equal or as strong as we were creatively in the downstream side and hence we needed to build strong partnerships and that was the business model"* (Respondent MiE 1)

The subtlety in the similarities between the views of highlights that since SMEs are socially constructed, its response to challenges are determined not only by its owner-managers, but by intense cross organisational engagement.

In mainstream dynamic capabilities thinking, opportunities or knowledge changes are identified through established routines of analysing and evaluating resources and practices.

The notion of complexity tells us something quite different. More specifically, it supports the view that boundaries around organizations, markets, sub-systems and systems ought to be identified but that the purpose of this identification is to understand the cross-boundary activity in order to create opportunities. Thus:

*“...we are wide in our perspective and are also looking for opportunities everywhere within the industry”* (Respondent MiE7)

*“There are those who make good things in China, well and cheap, you can transport it here”* (Respondent MiE5)

The findings indicate that the SME owner-managers perceiving their organisations to be dwelling within a wider system. Viewing themselves as part of the wider business community allows the dynamic states approach to percolate through business outlook. Tensions are more likely in our view to be ‘sensed’ by the SMEs owner-manager following this approach. The findings show that respondents perhaps would not necessarily, without prompt, describe their world in complexity terms. In sum therefore, as relates to ‘*Co-creation and engagement*’, we found that:

Finding 4 – Our findings suggests that (i) the action of SME owner-managers and the consequences of their actions were determined by the nature of interaction with internal and external actors and stakeholders and a recognition that these interactions are necessary. However, often than not (ii) because external integrative knowledge allowed for reach expansion due, a major part of SME owner-managers being successful with dealing with complexity. Thus, in sum, SME owner-managers must engage with the tensions associated with the need to balance between ‘*internally driven*’ and more ‘*externally driven*’ development of dynamic capabilities.

A cross-section of interviewee responses is summarised and placed into themes is shown in Table 2 (below). In the next section, we present a discussion of the theoretical context of the findings.

**TABLE 2: Cross-section of interviewee responses organised into themes**

Innovation and the creative processes	Leadership	Planning	Co-creation and engagement (Organisational boundaries)	Co-creation and engagement (Dwelling)
<p><b>Innovation amplification</b> Getting to the point where you realise you are stifling the creativity and capability of the staff, and then think about what we were doing there. How did it happen? So how can we then change it? <b>Respondent (MiE4)</b></p> <p>It is also important to have some kind of a policy, a standard on how everything will be done in order to use the same methods and do everything in Java, so that no one sits and does it in C or something else. And that is kind of... It has to do with how you write the documentation, how you code. So it is about many things. The more you can standardize it, the more flexible space you create for the future. <b>Respondent (MiE16)</b></p>	<p><b>Autocratic</b> Staff see us as stallion heads, a team of three pushing the business forward. I am possibly more egotistical than the others. As soon as we see political and egoistical attitudes we are trying to stamp them down. <b>Respondent (MiE7)</b></p> <p>Actually we are a very classical line-organisation with clear reporting lines and defined leadership. It is pretty static; it is not directly flexible. Process organisation could be more flexible. Here it is not. It is pretty traditional conservative line-organisation. <b>Respondent (MiE10)</b></p>	<p><b>Strategic planning</b> Recommendations on strategy are given by the senior members of the team, and anything that is fundamental to the business needs their agreement. At this higher level, it is ultimately senior member of the team that makes the decision. <b>Respondent (MiE 15)</b></p> <p>Although we stick to a three year planning cycle because that seems to work with the bank, I am not convinced that it is that flexible considering that things can change very quickly in our business. <b>Respondent (MiE14)</b></p>	<p><b>Boundary flexibility</b> Our Technical Director spends much of his time connecting though the web to other software engineers finding new algorithms and contributing to the global 'open source' community. <b>Respondent (MiE2)</b></p> <p>I am coming to my point that thanks to globalization and thanks to computer technique, huh, you can be flexible. You can use advantages created by globalization. There are those who make good things in China, well and cheap, you can transport it here. <b>Respondent (MiE5)</b></p>	<p><b>Work focus</b> The day-to-day work of (...the organisation) is about immersing themselves in their work. Occasionally, a venture capitalist will say, 'Where is your business plan?' And we have to stop one conversation, go write a plan. We've been going two or three years now. These venture capitalists can see what we are about. I just want to say let's rip the plan up, and let us get on with doing our job. <b>Respondent (MiE4)</b></p> <p>We deliberately set aside time each week for talking, socialising, sharing stories and ideas. I want these guys to be close knit as a team so they can help each other when the pressure is on. <b>Respondent (MiE16)</b></p>
<p><b>Innovation attenuation</b> When you are in production and you are spending huge money — blinkers have to go on, because if you don't you'll be changing the thing and you'll never get it finished — that is a big discipline. <b>Respondent (MiE17)</b></p> <p>No, it is not possible, it is not possible. So, if you will be flexible towards customers, you have to create an organization which can both be flexible and efficient and there are no shortcuts. You cannot just become flexible and then it costs bloody too much money to be there. <b>Respondent (MiE3)</b></p> <p>Actually you could say that every unique customer solution creates inflexibility in the future because it will be very complicated to drift, it will be very resource demanding. The more you can get all customers to use one solution or one system in a single way the better. <b>Respondent (MiE14)</b></p>	<p><b>Community</b> The more we can let staff contribute in a way that they can the more we move forward the pace, they solve the problems rather than us solving the problems. I think we've been a little bit too command and control. We are not seen to be 'heavy' with our staff I think we are nurturing; at the same time, it is a soft version of command and control. <b>Respondent (MiE8)</b></p> <p>There is no doubt about it that a smaller company is more flexible than a big one. Because in big companies there is a bureaucracy and that brings structure and hierarchy. <b>Respondent (MiE16)</b></p>	<p><b>Anti-planning</b> Basically we get on with our work until sponsors deadlines loom. Then we stop what we are doing, hastily write a business plan and do what we have to do in securing our financial future. Once we have done this we get back to the creative process. <b>Respondent (MiE18)</b></p> <p>In our business we are time-poor and so detailed planning to me is a waste of time. We get project finance in place and work to strict deadlines. It's much less formal than you imagine. <b>Respondent (MiE10)</b></p>	<p><b>Boundary rigidity</b> We took a clear strategic decision as a company that that wasn't the market we were going to play in. We would play in the supply side to it and find partners who were equal or as strong as we were creatively in the downstream side and hence we needed to build strong partnerships and that was the business model. <b>Respondent (MiE1)</b></p> <p>We run a tight ship here. We get our heads down and we produce the goods. People think that because we are design-driven we turn up to work in monkey suits. Not so, we keep ourselves to ourselves and we ignore the outside world for long periods of time. We have to deliver. <b>Respondent (MiE18)</b></p>	<p><b>Fragmented culture</b> Our company is project-driven so we tend to focus on one project at a time and work in dedicated, separate groups. We work fairly rigidly, not as you might expect, and we do our work and go home at the end of the day. We are focused and I suppose fairly closed. <b>Respondent (MiE10)</b></p> <p>We are a strange collection of creative individuals. My view is that I just need to let them get on with things. If they don't produce they have to move on. Finance dictates these decisions ultimately. <b>Respondent (MiE19)</b></p>



## 5. Discussion

Our findings surfaced a number of factors that provide insight into how SME owner-managers rely upon dynamic capabilities to identify and manage tensions and requisite resource fluidity. As we now show, our findings suggest the existence of four interacting factors that may explain how SME owner-managers utilise their dynamic capabilities to identify and manage adaptive tensions and requisite resource fluidity as part of their daily routines. These findings are now discussed.

### *5.1 Innovation amplification v Innovation attenuation*

Our findings suggest that there was widespread recognition among the respondents that innovation is a key factor in explaining the competitiveness and performance of SMEs. This is supported by literature (see Golovko and Valentini 2011). Different types of innovations (e.g organisational, technological, product and marketing) and the manner of their deployment, can have a different effect on firm competitiveness and performance (Bodlaj et al. 2020).

Our findings also pointed to an acknowledgement that innovation can create both internally and externally driven tensions. This is a point also acknowledged in the literature (see for example, Madrid-Guijarro et al. 2013; Smith et al. 2017; Mathias et al. 2018). However, majority of the respondents appeared more concerned with internally as against externally driven tensions. A focus on encouraging creativity among employees was cited as one approach towards addressing these internally driven tensions. The literature observes that internally and externally driven tensions emanating from innovation may set-off 'traps' among SME owner-managers. For example, as relates to '*exploitative*' traps; wary of risks, the SME owner may gravitate towards developing and focusing on one form of familiar innovation while neglecting other types. This creates a '*competency*' trap in that the SME owner-manager may well develop competency or expertise in one type of innovation, however at the expense of running the risk of failing to do so in emergent innovation thus exposing the SME to changes in the market. Conversely, gravitating towards '*explorative*' innovation means that the SME owner-manager may end up in a 'failure' trap where he/she is constantly engaged in risk taking which increases each time a failure occurs.

The process of innovation entails an element of complexity (Freixanet et al. 2020). Complexity can emerge for example when a set of tensions informs or leads to the development of further tensions (Sheep et al. 2017). One means of addressing such

complexity may be to create knowledge that is based on routines with a limited amount of hard-coded rules (see Eisenhardt and Martin 2000).

Combined together, these multiple linked tensions and their resultant complexity can have an *amplified* or *attenuated* impact on innovation. We found that a willingness of SME owner-managers to release the creative abilities of their employees by actively changing the work environment allowed for the emergence of *amplification* of innovation to occur (that is, the reward obtained from participating in the innovation process – see Raasch and von Hippel 2013). However, we also found the emergence of innovation *attenuation* of innovation. This emerges where at a certain point, the cost of innovation begins to outweigh its purported ability to drive SME performance. This can occur for example when communication and coordination costs associated with the introduced innovation ends up outweighing any benefit to be gleaned from the innovation. Associated inertia and rigidity from these communication and coordination costs leads complexity and ultimately, to an attenuation of innovation (Ojiako et al. 2013).

## 5.2 Autocratic v Community-focused forms of leadership

Our findings pointed to leadership being important in the management of tensions. The literature conceptualises leadership as the set of activities related to decisions focused on delivering successful outcomes for an organisation (Leslie and Canwell 2010). Leadership is particularly important within the context of SMEs because of the degree of proximity between SME owner-managers, their employees and stakeholders.

Our findings suggested a gravitation towards more predictable (and autocratic) forms of leadership. These forms of leadership are usually efficiency driven. This finding aligns with the literature. SME owner-managers are the key decision makers and arguably, due to high levels of efficacy (see Eniola 2020), are generally very poor team players and therefore less likely to engage in collaborative decision-making unlike managers in larger and more established organisations (Eisenhardt and Martin 2000; p. 1107; Ambrosini et al. 2009; p. S10; Augier and Teece 2009; p. 417-418). There is also literature that opines that organisations facing life threatening episodes are more likely to be best served by autocratic forms of leadership (Muczyk and Steel 1998). Reasons for this includes their ability to instil confidence among the organisations stakeholders. O'Kane and Cunningham (2014) notes that the adoption of more assertive and centralised forms of leadership is characteristic of leadership

styles during periods of major change where they may be concern and disquiet not only among employees, but also external stakeholders. Yet, in also finding a recognition among the respondents of the need to balance leadership styles and their contingency on the prevailing context, the stated position on more predictable (and autocratic) forms of leadership does not tell the entire story.

Thus, from strategic management literature (Eisenhardt and Martin 2000; Carmeli and Halevi 2009; Fernhaber and Patel 2012), we have been able to build a broader picture of the leadership capabilities necessary to effectively manage tensions under conditions of complexity.

The first of these strategic management literatures highlights the need for '*Situation-specific knowledge*'. Generally, in markets which are moderately complex, SME owner-managers are able to call upon some level of tacit knowledge to deal with change. However, when the operational and business environment is highly complex, reliance on tacit knowledge built on routines becomes irrelevant and instead, a premium is placed on the development of almost instantaneous situation-specific knowledge. The second of these literatures relates to the idea of '*Absorptive capacity*'. Absorptive capacity in this context refers to the ability of the SME owner-manager to be able to *acquire* (that is, to identify and secure), *assimilate* (that is, integrate into his/her pre-existing schema of knowledge), *transform* (convert into new cognitive structures and schema), and *exploit* (incorporate into decision making process), new new and externally generated knowledge (Saad et al. 2017). Such absorptive capacities will enable the SME owner-manager to be alert and act on opportunities. Such alertness highlighted in the findings. A core element of absorptive capability is the need to be able to create shared meanings with other stakeholders, of which such open communication was highlighted in the findings as essential to the management of complexity.

The third of these strategic management literatures relates to the notion of '*Leadership ambidexterity*' which is rooted in the idea that managers who perform not only multiple, but also competing roles; and do so differently, are likely to be more effective under conditions of complexity. Leadership ambidexterity implies an "*...ability to exhibit contrary or opposing behaviours*" (Denison et al. 1995; p. 526). Several studies allude to leadership ambidexterity as a means of addressing these tensions (Jansen et al. 2016; Kauppila and Tempelaar 2016; Papachroni and Heracleous 2020). Papachroni and Heracleous (2020; p. 4)

observe that ambidexterity serves as the ‘corporate glue’ for managing firm tensions as they emerge. The simultaneous pursuing both *explorative* and *exploitative* endeavours allow the SME owner-manager to develop new routines (for exploration), while simultaneously exploiting existing ones (for exploitation). Undertaking these different tasks goes a long way towards equipping the SME owner-manager with the capabilities for multi-taking and the simultaneous management of firm objectives which are contradictory in nature. Leadership ambidexterity directs leaders to develop the requisite cognitive ability to deal with emergent firm tensions, in the process, simultaneously, shaping and configuring and subsequently reshaping and reconfiguring its resources. Effectively managing any associated tensions therefore depends on the ability of the SME owner-manager to deal with simultaneous, activities which may be *explorative* (for example, based on new opportunity identification/disruptive innovation – which may entail ‘community-based’ forms of leadership) and *exploitative* (for example, based on existing opportunity leveraging/incremental innovation- which may entail predictable (and autocratic) forms of leadership) (see March 1991; Jansen et al. 2005).

### *5.3 Strategic planning v Anti-planning*

Failure rates of construction firms appear much higher than other industries (Assaad and El-Adaway 2020). Furthermore, the mutual interdependency of firms operating in the construction sector (Castro et al. 2009) means that the failure of one construction SME can have a serious and catastrophic domino effect on the sustainability of other firms (Holt 2013). All these serve as major imperatives for construction SMEs to “...engage in a structured evaluation of alternatives” (O’Neill et al. 1987, p. 38; Gibson and Cassar 2002; p. 172). This is essentially, ‘*Planning*’.

The question of how and to what extent planning contributes to firm competitiveness and performance remains unsettled in the literature. Thus, while it will appear that there is widespread acceptance on the need for planning (Gibson and Cassar 2002), questions have remained over whether planning should be more incremental/informal or whether planning should be more formal and comprehensive (see Honig and Samuelsson 2012; Block and Petty 2020). Despite this, we had found a general recognition among the respondents of the value of planning. The literature acknowledges that planning is an effective means of dealing with uncertainties associated with the competitive environment (O’Cass et al. 2012). However, we

also found that the general attitude among the SME owner-managers was that formalised planning was something they would rather not on their own initiative engage in, but something they will find necessary to do because of external pressure. This created three instances of tensions; one related to (i) the question of whether or not to undertake planning at all, the second focused on (ii) the likely tensions with external stakeholders (primarily, financiers and funders) if planning was not undertaken and the third focused on (iii) the creative process, more specifically, whether the creative process engaged wider systemic connectivity as against deliberate design.

The use of external pressure to drive managerial practice in firms is recognised in the literature (see Muhammad Auwal et al. 2020); with such external pressure being in any of three forms (or their combination). In SMEs this will be in the form of '*mimetic*' pressure (where the SME facing uncertainties, seeks to mimic other organisations), '*coercive*' pressure (influence exerted by firms upon which the SME largely depends on, such as its essential customers), or '*normative*' (demands that come from society-wide expectations). External coercive pressure as being reported in our study are usually seen as the most influential on SMEs because they prompt the adoption of specific practice only as a means to mitigate against potential damage to relationships with specific customers.

Another reason driving the reluctance of the SME owner-managers to voluntarily adopt more formalised planning may relate to size. Gibson and Cassar (2002) had found that the determination to engage in planning by small firms were largely determined by a number of factors which includes (i) size (ii) volume (iii) training, (vi) intention to change operations, and (vii) the major decision-maker's education. In particular, they found that smaller firms (as in the case of our study which focused on micro-enterprises), were less likely to engage in formalized planning. The key reason being that SME owner-manager do not have readily available, the necessary firm resources and infrastructure to support formalised (and often extensive), planning endeavours (Scott 2021).

We did not find any evidence to suggest that the manifestation of complexity would necessarily see the end of planning; rather, one approach to dealing with the effect of complexity is to employ the use of simple planning methods that were coupled with loosely articulated processes (see Eisenhardt and Martin 2000).

#### *5.4 Co-creation: Boundaries (flexibility v rigidity) and Dwellings (work focus v fragmented focus)*

We had found that the action of SME owner-managers and the consequences of their actions were determined by the nature of interaction with internal and external actors and stakeholders and a recognition that these interactions were necessary. Generally, SMEs owner-managers seeking to develop firm capabilities which are distinct from competitors by either pursuing strategies within their specialisation or at times (but very rarely), focusing primarily on activities beyond their traditional domain. They may also adopt a dual purpose strategy which involves simultaneously focusing on the development of their speciality (exploitation) and also collaborative activities (exploration) (Faridian and Neubaum 2021).

In seeking to integrate and reconfigure organizational resources, three capabilities become important; (i) *'Dynamic entrepreneurial capabilities'* (see for example, Lanza and Passarelli 2014), (ii) *'Dynamic integrative capabilities'* (Eikelenboom and de Jong 2019) and (iii) *'Dynamic exchange capabilities'* (Siaw and Sarpong 2021).

In this context, *'Dynamic entrepreneurial capabilities'* (see for example, Lanza and Passarelli 2014) will focus on the capacity of the SME owner-managers to engage in not only the identification of opportunities, but also to proactively engage risk taking while being more tolerant to ambiguity. This is in effect, the first key element of resource reconfiguration. There are reasonable arguments for higher order capabilities to be espoused by SMEs owner-managers in this instance including (i) that in addition to being susceptible to considerable resource constraints, (ii) most SMEs generally tend not to possess a large catalogue of prior experience meaning that they are more than (larger and much older established organisations), to engage in improvisation. *'Dynamic integrative capabilities'* on the other hand will refer to the processes that the SME owner-manager will engage in order to ensure that firm resources are integrated in a manner that leads to their reconfiguration. Herein, the main focus of this capability is to ensure that the SME owner-manager is able to integrate his/her firm resources with that of other actors and stakeholders. They are two approaches. One may involve focusing on integrating existing resources with the capabilities of their employees (thus, internally focused). Doing this allows not only for a continuous exchange of knowledge and ideas between employees and the SME owner-manager, but also prevents wasted efforts (primarily, through duplication). It also increases trust between

employees and also between the SME owner-manager and his/her employees, a key requirement for creativity to foster (Eikelenboom and de Jong 2019).

The SME owner-manager may decide to engage in activities that span across firm boundaries, networks and value chains. In the process, the SME owner-manager may seek to integrate their firm resources with those from outside entities (external integrative). Such endeavours are likely to lead to the need to form alliances, partnerships and other collaborative ventures with a myriad of stakeholders and entities with complementary resources. Through sustained and purposeful engagement with partners, the SME owner-manager is able to gain access to new markets (and funding), expert users and new knowledge that they would not have been able to do on their own. In effect, SME owner-managers are driven to engage in external integrative activity in order to readily access VIRO resources held by other firms without having to develop these capabilities from scratch.

Our finding that external integrative capabilities allowed for reach expansion appears to contradict findings from previous studies. For example, Radhakrishnan et al. (2018) highlighted that external integrative collaboration does not necessarily translate into improved performance. In fact, Bagchi et al. (2005) reports a negative relationship between external integration and supply chain costs. Both studies in effect conclude that external integrative capabilities do not necessarily result in promised enhanced performance for SMEs.

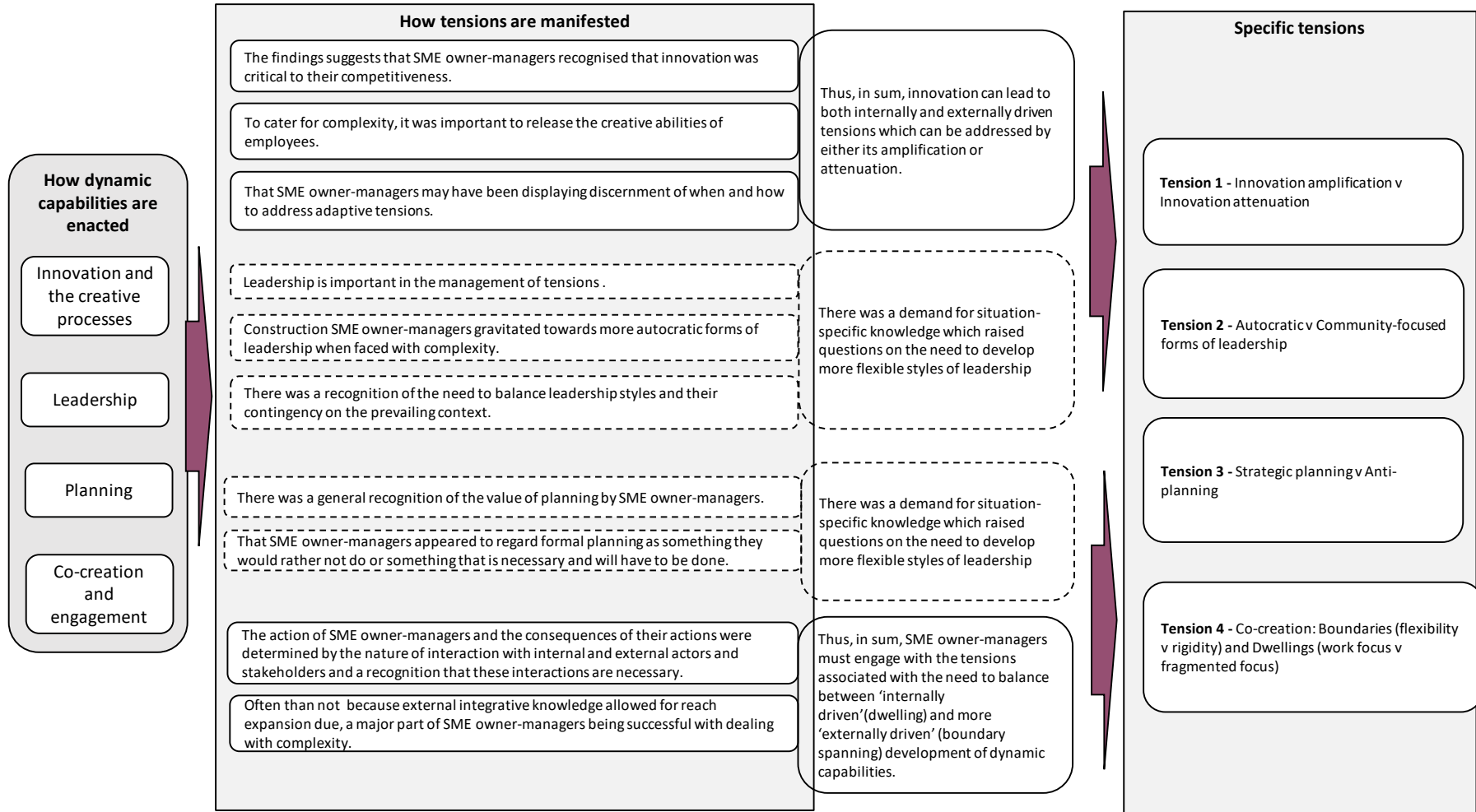
One major challenge associated with external integrative capabilities is that it is laden with complexity. Complexity raises particular questions on the value of alliances, partnerships and other collaborative endeavours. For example, in recent studies, McKelvie et al. (2018) compared the impact of internally and externally developed knowledge on innovation in new ventures; finding that in highly dynamic (complex) environments, externally generated knowledge had a less significant impact than internally generated knowledge. The main drawback associated with externally generated knowledge (and we will say, in the context of our study, external integrative capabilities), is that the search for, acquisition and configuration of such capabilities makes substantial cognitive (Dahlander et al. 2016) and cost (Cassiman and Valentini 2015) demands on SME owner-managers that may outweigh potential benefits, especially when considering the resource constraints, they face.

Since *integration* is socially constructed, achieving a higher order of *integrative* orientation with partners will be determined by '*Dynamic exchange capabilities*' (Siaw and Sarpong 2021). These are basically specific "...*embedded, sustained and habitual patterns that*

*become the foundation for competitive advantage”* (Marcos-Cuevas et al. 2016; p. 98), which determines the extent to which the SME owner-manager is able to develop and maintain relationships with other actors in order to co-create and co-capture value. *‘Dynamic exchange capabilities”* are basically dynamic capabilities that focus on the exchange processes required to facilitate resource integration. Our findings and their practical implications are summarised in Figure 3 (below).



**FIGURE 3: Summary of the findings and practical implications**



## 6.0 Conclusion

In this study, the authors have undertaken a fine-grained study to explore within the context of the UK construction industry, how SME owner-managers utilise dynamic capabilities to identify and manage adaptive tensions and requisite resource fluidity as part of their daily routines. Emergent themes were gleaned from the interview of 21 construction SME owner-managers based in Scotland and Northern Ireland. Our study makes contribution to the dialogue on dynamic capabilities by specifically extending the literature in three ways.

First, our study contributed to discussions within the dynamic capabilities ecosystems literature by providing specific insights on the determining factors needed to ensure that SMEs/SME owner-managers can take full advantage of their inherent dynamic capabilities. More importantly, we identified the existence of four such determining factors broadly categorized under (i) *Innovation and the creative processes* (the idea that innovation may drive both internally and externally driven tensions), (ii) *Leadership* (that to deal with such tensions, SME owner-managers need to develop balanced leadership capabilities) (iii) *Planning* (a recognition that planning inflexibility generated tension for the SME owner-manager) and (iv) *Co-creation and engagement* (which entails balancing between dwelling and boundary spanning focused dynamic capabilities).

Second, our study provided detailed insight into the interacting factors that that may explain how SME owner-managers utilise their dynamic capabilities to identify and manage adaptive tensions and requisite resource fluidity as part of their daily routines. These were identified as (i) *'Innovation amplification'* versus *'Innovation attenuation'* (ii) *'Autocratic'* v *'Community-focused forms of leadership'* (iii) *'Strategic planning'* v *'Anti-planning'* and (iv) Co-creation: Boundaries (*'flexibility'* versus *'rigidity'*) and Dwellings (*'work focus'* versus *'fragmented focus'*).

Third, the study contributes by shedding light on how dynamic capabilities interacts with complexity. As Stacey (1995) identified *'self-organization'* as a dynamic capability related to nonlinearity (and by implication, complexity). The interface between *'Dynamic Capabilities'* and *'Complexity'* arises in that complexity helps explain how organisations are able to strive to gain competitive advantage by reconfiguring their resource base, firm structures, processes and procedures in response to changes in the business environment. Organisations reconfigure their resources base and self-reorganise in order to perform competitively. As this reconfiguration proceeds, the organisation increases its capabilities in a manner which

allows for its operation within emerging business environments. Thus, an organisation which has reached peak performance within a specific environment is only able to maintain and transfer its developed capabilities to an emergent or new business environment if it has been operating at the edge of complexity. Figure 4 (below) reflects the interface between ‘*Dynamic Capabilities*’ and ‘*Complexity*’ as perceived by the interviewees.

**FIGURE 4: The interface between ‘*Dynamic Capabilities*’ and ‘*Complexity*’**



The diagram shows a series of continuums. These radical agendas and propensity to change existing working practices mirrors organised complexity and can result in successful outcomes for firms. For each system within the firm, there is an optimum level of control that provides effective outcomes for the firms. Too much control will eliminate enterprise which would deprive these firms of a key advantage over larger concerns. This purposeful behaviour towards the attainment of a goal shows elements of dynamic capabilities in different forms.

### 7.1 Implications

The findings from our study does provide guidelines for small business managers. It emerges that, in small businesses, we suggest that our study offers a useful contribution to the

understanding of how small business managers interacts with their social world and how these interactions play out in the form of internally and externally driven tensions. We also assert that the business and operational environment are at least as important as individual small business manager traits. Furthermore, small business managers need to constantly shape and configure and subsequently reshape and reconfigure their resources in order to match environmental changes. Managers often ignore the inter-subjectivity of organisational life in dynamic states and we had presented in this study a strong rationale for dynamics capabilities research to consider complexity capabilities in relation to adaptive tensions and planning approaches that are underpinned by permeability and emergence and leadership that is open and flexible to cultivate work that is inimitable, creative and paradoxically complex yet simple.

We also showed how important it was for small business managers to develop dynamic capabilities. We also provided guidance to small business managers on the specific capabilities they require to successfully compete within their business environment. We also articulated the relevant tensions likely to be experienced that was associated with each of the specific capabilities. For example, as relates to the '*Leadership*' capabilities, we not only showed the overbearing benefits of more inclusive and transformational forms of leadership, but also highlighted its interrelationship with the '*Co-creation*' capabilities. Furthermore, we surfaced that individual managerial capabilities may not on their own, be adequate to address associated co-creation tensions and complexity, instead, it is likely that the combined use of different sets of dynamic capabilities (in our study, '*Dynamic entrepreneurial capabilities*', '*Dynamic integrative capabilities*' and '*Dynamic exchange capabilities*') that will likely facilitate small business managers to successfully weave through the complexity of the business and operational environment within which it operates. This is a particularly interesting finding noting that the interdependences of dynamic capabilities have not surfaced in recent dynamics capabilities literature, such as the work of Lütjen et al. (2019). We opine that further examination of these interdependencies should be on the agenda for future research. In sum, our findings are useful for managers in the construction industry keen to enhance firm performance – especially as relates to their management processes, tactics tools. Our proposition is that the findings can facilitate more holistic understanding of industry-specific dynamic capabilities, its major challenges and associated tensions.

## 7.2 Limitations and suggestions for future research

There are four main limitations associated with this study. First, although we acknowledge that based on the data gathered, the study appears to be dealing with micro-enterprises, 'SMEs' were employed as the conceptual base and empirical setting of the study based on the position expressed by the Department of International Trade (2020), that "...SMEs encompasses micro, small and medium-sized enterprises" (p. 5). The position that micro firms/enterprises are encompassed within SMEs is shared by some scholars (see for example, Liberman-Yaconi et al. 2010; p. 71; Lahiri 2014; p.1). However, using SME as conceptual base and empirical setting may raise questions about the conceptual framing of our study. This is especially the case noting that there are differences (although very subtle), between small and micro-enterprises (see Inan and Bititci 2015).

The second limitation of the study is that given that our chosen context was the construction industry and the homogeneity of the data sample, it may be challenging to generalise our findings to the wider operations management environment or in fact, larger firms due to the peculiar characteristics of the industry and that of construction SMEs which as we had earlier highlighted, make them particularly susceptible to complexity.

The third limitation with the study relates to the timescales over which the data was collected. It would have been ideal to collect data over a specific defined timescale in order to limit likely event-specific questions. However, our study did not build into the interview protocols despite the inevitable impact of the Covid-19 data collection disruptions which we reported upon earlier. Furthermore, while this disruption inevitably led to the survey consisting of two different sets of interviews (interviews conducted prior to lockdown – and interviews conducted after lockdown commenced), we have not taken this event into consideration – either in terms of our examination of the dynamic capabilities themselves or in fact, during our data analysis. Both limitations however serve as opportunities for future studies.

The fourth limitation with the study is that we paid little or no attention to wider political factors prevalent within the construction industry and the possible impact these political factors may have on dynamic capabilities. Yet, the literature not only highlights the political importance of construction to national economies (for example, it is used to regulate public policy – see AlRaeesi and Ojiako 2021), but also the reality that much research on

dynamic capabilities has ignored this vital importance of politics on the enactment of dynamic capabilities (see for example, Loureiro et al. 2021).

Despite the limitations we have identified, by undertaking this study, the authors were afforded the prospect of engaging in exhaustive and detailed dialogue with a wide-ranging spectrum of actors within the construction industry. This aided a fine-grained examination and elucidation of the factors impacting upon how construction SME owner-managers employed dynamic capabilities to identify and manage adaptive tensions and requisite resource fluidity as part of their daily routines.

A number of opportunities for future research are provided by our study that will advance our understanding in the field of dynamic capabilities. For example, micro-enterprise theories could be explicitly used to develop the conceptual base of any similar future empirical studies. Most importantly, we acknowledge the potential of changes in our discussions and conclusions if the study had been conducted purely through a micro-enterprises lens.

Another area that future studies could focus on is on the specific organisational and managerial changes that may occur during the appearance and handling of complexity and dynamic capabilities perspective as the theory gets employed in micro enterprises. The challenge off course is that micro firms are ultimately extremely centralized, although less complex and formalized than larger firms. However, in micro firms, owner-managers of micro-enterprises are more likely to utilise their dynamic capabilities to identify and manage adaptive tensions and requisite resource fluidity in their daily routines at a more heightened state than owner-managers of small enterprises (Lieberman-Yaconi et al. 2010). This is because dynamic capabilities are likely to be more magnified in micro than in small firms. Driving these differences are (i) the availability of internal resources to the enterprise and (ii) questions of how owner-managers of micro enterprises approach their efforts to reshape and reconfigure these resources in a sustained manner. This is because as compared to small enterprises, owner-managers of micro-enterprises are more than likely to find delegation impossible (Lieberman-Yaconi et al. 2010). They are also more likely to exhibit managerial discretion in absolute terms (Smith et al. 1988). This is compared to the owner-manager of small enterprises who is only likely to exhibit significant and disproportionate discretion (Helfat et al. 2007). Such discretion means that the development and use of dynamic capabilities by micro enterprise owner-managers is likely to narrowly focused. Thus the efforts by micro

enterprises to simplify their processes rather than engaging in networking which larger firms tend to focus upon.

To conclude this paper, it appears that the dynamics capabilities theory and how we understand its various manifestations is primarily limited to organisations structured against traditional hierarchical structures. However, once we cease to focus on these organisational forms, it is safe to say that how we understand dynamic capabilities becomes much more narrow. As we commence in the 4IR, we are likely to experience the emergence of temporal and autopoietic networked modelled organisational forms exhibiting different forms, types and levels of complexities. For this reason, we do encourage the exploration of dynamic capabilities and firm performance that is contextualised within emergent organisational forms.

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