

The impact of social and organisational capital on service innovation capability during COVID-19: the mediating role of strategic environmental scanning

Social and
organisational
capital on SIC

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Abstract

Purpose – This purpose of this study was to examine the impact of social and organisational capital on service innovation capability among service firms in the United Arab Emirates (UAE) during the COVID-19 pandemic.

Design/methodology/approach – To test the proposed research model, data were collected using a cross-sectional questionnaire. The study sample consisted of 188 private and public service sector managers in the UAE. Partial least square-based structural equation modelling (PLS-SEM) was used to examine the research model's validity and reliability and to test the research hypothesis.

Findings – The empirical evidence indicates that during this pandemic the relationship between social capital and service innovation capability was fully mediated by strategic environmental scanning, while partially mediating the relationship between organisational capital and service innovation capability.

Practical implications – Managers in service organisations must be proactive during crises such as the COVID-19 pandemic. Specifically, they should emphasise effective environmental scanning and the tracking of customer preferences to provide customised services that are valued and meet the emerging requirements of their customers. Prioritising investment in organisational capital to enhance innovation capacity is also recommended.

Originality/value – This study is the first to examine strategic environmental scanning as a mediator between social and organisational capital and service innovation capacity during a pandemic. There were significant differences between the findings of our study and previous studies; the authors found that, during crises, management priorities change, and businesses become more reliant on organisational capital to develop service innovation capability.

Keywords COVID-19, Social capital, Organisational capital, Strategic environmental scanning, Dynamic capabilities, Service innovation capability

Paper type Research paper

1. Introduction

Economic disruption resulting from the COVID-19 pandemic has had a severe impact on businesses causing many to collapse, particularly those in tourism and hospitality (UNWTO, 2020). In the early stages of the pandemic, for example, travel restrictions, social distancing and lockdowns put over 100 million tourism-related jobs at risk, with devastating effects on countries where tourism is a major economic driver (World Travel and Tourism Council, 2020).

However, not all businesses have suffered from the effects of the pandemic. Some have developed organisational resilience (Su *et al.*, 2021), others have optimised efficiency by



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freezing tasks that add no value in the current situation (Wang *et al.*, 2021a, b), and many of those that they have been able to shift to Internet-based services, supported by remote working solutions are thriving (Nenonen and Storbacka, 2020).

It is not surprising, then, that managerial interest has focused on exploring the factors that have the potential to expand innovation capability to adapt to the “new normal”, enhance organisational performance and create or retain competitive advantages (Al-kalouti *et al.*, 2020; Singh *et al.*, 2019). Adaptation and innovation, however, rely on embedded organisational capability because an organisation’s intellectual capital is a key resource for the introduction of innovative ideas and exploring new opportunities (Chen and Tsou, 2012; Prajogo and Oke, 2016; Wendra *et al.*, 2019). While scholars have investigated how organisational practices can improve the kind of employee knowledge that fosters innovative behaviour (Wright *et al.*, 2001; Li and Zheng, 2014), the impact of intellectual capital on service innovation capability (SIC) is still under-researched (Cabrilo and Dahms, 2018; Huang and Huang, 2020).

Some studies have found that employees’ knowledge and expertise can allow organisations to produce novel and innovative ideas (Bornay-Barrachina, 2017) but understanding the external environment is also critical in guiding the development of the innovations required to address emerging issues (Said *et al.*, 2018). Environmental scanning can provide this understanding because it can be applied to both existing and future situations and thus can be used as an early warning system to plan for and mitigate the effects of unanticipated threats (Bigley, 2018).

It follows, therefore, that organisations which successfully scan the environment to understand the challenges posed by the COVID-19 pandemic will be better placed to develop appropriate solutions during the crisis (Pryour *et al.*, 2019; Carnevale and Hatak, 2020; Crawford *et al.*, 2020). Consequently, it is posited that in order to reduce the impact of the pandemic, service sector firms need to continually update their understanding of the COVID-19 environment and reorient resources to optimise or redevelop business strategies.

Previous studies have established a link between intellectual capital and SIC (e.g. Wang *et al.*, 2021a, b; Pizarro-Moreno *et al.*, 2011; Subramaniam and Youndt, 2005; Bigley, 2018; Nylén and Holmström, 2015). Some studies have also examined the relationship between intellectual capital and environmental scanning and SIC (e.g. Kalkan *et al.*, 2014; Tang, 2016; Liao, 2018). However, most have examined these constructs separately and none hitherto has investigated how these constructs can impact service innovation during a pandemic (Heinonen and Strandvik, 2020; El Chaarani *et al.*, 2021). Our study addresses this oversight and differs from previous research by collectively examining the impact of intellectual capital and strategic environmental scanning (SES) on innovation capability in the United Arab Emirates (UAE). The UAE was selected as the research site because the national government has placed high priority on adopting innovation in both industry and government. In 2021, the country was ranked 33rd globally and number one regionally in the Global Innovation Index. This was the sixth consecutive year in which the UAE’s regional leadership role in innovation was recognised.

Both public and private sector organisations within the UAE are also focusing on the development of innovation capabilities for new services (Parahoo *et al.*, 2017; Al Marri, 2021). Consequently, the UAE provides an ideal context in which to investigate the impact of social capital (SCA) and organisational capital (OCA) on SIC. This choice of research context is further supported by the UAE’s Vision 2021, which focuses on transforming its economy into a model where growth is driven by knowledge and innovation (www.vision2021.ae/en/uae-vision).

The findings of this paper provide valuable theoretical and practical contributions to the SIC literature by extending some prior findings from non-disruptive environments. The main contribution of this study is its interpretation of the mediating effect of SES on the

relationship between OCA and SCA and SIC. Additionally, using dynamic capability theory, we learned what processes support innovation capability in complex, unpredictable environments like the COVID-19 pandemic (Baden-Fuller and Teece, 2020).

Enhancing SIC by pursuing new services while simultaneously expanding existing services during a pandemic may be difficult for service managers. Our research findings will assist managers in service organisations to be proactive in such crises. We acknowledge the importance of managers' ability to scan the environment effectively and track customer preferences to provide customised services promptly during crises and build their organisational and SCA.

In the following sections, our review of the relevant literature includes dynamic capability theory, service innovation capabilities, intellectual capital and SES. The theoretical framework guiding the study is then presented, along with the underlying hypotheses derived from the review of the literature. We then outline the method, followed by the analysis, discussion and conclusions, which embrace the paper's limitations and implications for further research.

2. Literature review

2.1 *Dynamic capability theory*

Dynamic capabilities refer to the strategic processes that support innovation and allow businesses to adapt, integrate and reconfigure competencies, resources and procedures to respond to unpredicted environmental changes (Teece, 2012; Pisano, 2000). As strategic capabilities, they play a key role in shaping the ecosystem within organisations and are distinct from what Teece (2012) describes as ordinary capabilities, which include the patterns associated with an organisation's processes and mechanisms (Teece, 2018a; Winter, 2003). However, ordinary capabilities can be integrated with dynamic capabilities to respond to emerging business challenges and to build on existing competitive advantages (Teece, 2012).

Dynamic capability theory involves three main activities or steps. These are (1) sensing opportunities and threats, (2) seizing opportunities and (3) retaining competitiveness by reconfiguring a firm's resources to fit with the opportunities identified in step one (Davies *et al.*, 2016). To take advantage of opportunities, organisations need a comprehensive business model that reflects their strategic capabilities and must be able to reposition that model in response to changing environmental conditions (Birkinshaw and Ansari, 2015). This includes adapting the internal elements of the organisation's innovation strategy to align its capabilities and resources with identified opportunities (Teece, 2018a).

Dynamic capability theory also presents opportunities to advance service innovation and strategic repositioning by recognising that certain resources are central to the development of competitive advantage (Kindström *et al.*, 2012; Teece, 2012). Consequently, theory plays a key role in supporting organisations when they adapt to environmental changes and explore new areas of innovation, while simultaneously exploiting existing resources and capabilities (Davies *et al.*, 2016).

Since dynamic capabilities play a major role in reshaping the business ecosystem and, given that COVID-19 has introduced numerous non-routine functions that require novel solutions, we argue that higher level competencies are needed in times of crisis to rapidly respond to changes in a business's environment (Heinonen and Strandvik, 2020). Moreover, because dynamic capability theory includes the realignment of resources to capitalise on emerging opportunities, the resource-based view considers it an advanced perspective. It includes issues related to the way in which businesses enhance and retain resources over time (including intellectual capital) and adapt resources according to market changes (such as those caused by COVID-19) to respond to changing customer needs. Studies have indicated that a resource-based view is a key element that current research lacks (Teece, 2018a).

With this in mind, we employ dynamic capability theory to guide the research through a focus on assessing the impact of SCA and OCA on SES and SIC. This is because previous studies have mainly concentrated on product-related research, prompting scholars to call for the theory to be employed in service environments as well (Kindström *et al.*, 2012).

2.2 Service innovation capability (SIC)

Innovation is a critical element in organisational strategy as a driver of performance and in creating competitive advantage (Lestari *et al.*, 2020; Bristow and Healy, 2018; Damanpour, 1991). In service contexts, innovation also allows the co-creation of customer value, which in turn plays a key role in the development of memorable service experiences (Woodruff, 1997; Buehring and O'Mahony, 2019). A review of the literature confirms that most previous studies have focused on product and process innovation, with few studies investigating service innovation (Delgado and Mills, 2020). One explanation for this may be the lack of a coherent definition of service innovation, which was a factor that emerged in the systematic review of 1,301 service innovation articles published between 1979 and 2014 by Gustafsson *et al.* (2020). They identified 84 definitions of service innovation, noting that published service innovation studies have been discipline-specific, concentrating, for example, on marketing, management and operations research as separate domains.

While defining and measuring innovation across various disciplines have posed some challenges (Adams *et al.*, 2006; McMurray *et al.*, 2021), the rise of the service economy has sharpened the organisational focus on the benefits of service innovation, particularly its positive impact on business performance (Feng *et al.*, 2020). A practical definition, therefore, presents service innovation as the advancement of new services that are considered novel and valued by an organisation's target market (Flint *et al.*, 2005). This has allowed researchers and practitioners to consider a more pragmatic approach based on an organisation's ability to develop and market new services (Tang, 2014). As a result, the assessment of innovation capability has focused on competitive advantages that increase customer value (Helkkula *et al.*, 2018).

Scholars have also explored the connection between dynamic capabilities and resource-based theory. For example, Guan and Ma (2003) described innovative capability as a firm's ability to support innovation by using resources from various business functions such as human resource management (HRM), marketing and finance. Mendoza-Silva's (2020) comprehensive study found that many of the determinants of innovation capability have not been widely examined.

But studying them is important; the literature on innovation capability, while increasing, is still not considered comprehensive (Montreuil *et al.*, 2020; Mendoza-Silva, 2020). This is because most previous research has focused on the impact of research and development on an organisation's ability to innovate, with few studies exploring the impact of a wider range of constructs on innovation capability – especially within the service sector (Figueiredo *et al.*, 2020; Botelho, 2020).

Organisational level research and development has also focused on digital technology to increase innovation capability, but this has mainly been from the perspective of the IT department (Acosta-Prado, 2020; Zawislak *et al.*, 2012). That focus has shifted, however to the importance of digital transformation, particularly on its relations with disruptive business models (Kohli and Melville, 2018; Grossman, 2016), supported by the use of software-based technologies and big data analysis to understand and predict customer needs (Müller *et al.*, 2016; Nambisan *et al.*, 2017).

As well as predicting customers' needs, however, it is essential for service organisations to be able to respond to these predictions by introducing service enhancements or new services that customers value (Duan *et al.*, 2020; Kandampully, 2002). This requires an understanding

of the impact of the environmental changes like the COVID-19 pandemic that influence customers' preferences in terms of specific services, their attributes and performance (Hu *et al.*, 2021; Skååén *et al.*, 2015). However, implementing changes to adapt to unpredictable business environments, such as the current pandemic, involves internal and external processes, like anticipating how competitors will respond to changing conditions (Al-Omouh *et al.*, 2020). This requires resource agility (Martinez-Sanchez *et al.*, 2021), which relies on knowledge acquisition and creativity as well as the intellectual capital embedded in an organisation (Bigley, 2018; Li *et al.*, 2019).

2.3 Intellectual capital

Intellectual capital is defined as the collective knowledge that an organisation employs to gain competitive advantages; it has three dimensions: human, SCA and OCA (Yüksel *et al.*, 2021; Youndt *et al.*, 2004). Human capital refers to an individual's skills, information, expertise and competence developed through education, training, institutional knowledge and work experience (Youndt *et al.*, 2004; Marginson, 2019).

SCA comprises the knowledge ingrained in an organisation that has been acquired through developed networks as well as internal and external relationships. As such, SCA represents the net worth of all the relations developed by employees in and outside the organisation (Bhagavatula *et al.*, 2010; Adler and Kwon, 2002).

OCA consists of organisational systems, management structures, processes and procedures that are often unique to individual organisations (Eisfeldt and Papanikolaou, 2013). This includes the systematic storage of knowledge in databases, catalogues, handbooks, patents and frameworks (Youndt *et al.*, 2004). OCA is considered a significant component of intellectual capital because it supports the development of institutionalised knowledge, complements human and SCA, and is recognised as a continuous creator of organisational value (Carmona-Lavado *et al.*, 2010).

Our review of the literature uncovered early work by Leana and Van Buren (1999) that examined the employment practices that foster SCA. Youndt and Snell (2004) have also examined the nexus between HRM systems and innovation, highlighting the mediating role of intellectual capital. Others have studied the role of specific work arrangements that may improve the development of the work environment as well as the sharing of knowledge assets and HR practices (Swart and Kinnie, 2010).

Additionally, a few studies have investigated the role of environmental scanning as a potential moderator in the development of innovation capability. These include Liao's (2018) study, which focused on environmental innovations in the manufacturing sector based on the theory of SCA, and Tang's (2016) study of the critical tools that hotel managers require for introducing new services. Neither study examined the relationship between intellectual capital and innovation capability, but both highlighted the value of SES, in one case for supporting environmental innovation (Liao, 2018), and in the other for developing new services that create competitive advantages (Tang, 2016). As a result, we include SES as a possible mediator in the relationship between SCA and OCA and the capacity for service innovation.

2.4 Strategic environmental scanning

The COVID-19 pandemic has created unforeseen changes that require an ongoing understanding of environmental conditions, market competition and consumer behaviour (Bigley, 2018). Consequently, organisations need to capitalise on current competencies and explore new and innovative ways to respond to market requirements (Hu *et al.*, 2021). To achieve competitive advantages in this dynamic setting, firms must continually acquire new knowledge that enables them to adapt their services to meet emerging customer needs (Nenonen and Storbacka, 2020; Abu Salim *et al.*, 2021).

From a service sector perspective, [Danneels and Sethi \(2011\)](#) have defined SES as the attainment and use of information about demands, circumstances and relationships. The view of [Den Hertog et al. \(2010\)](#) is that it assists in the creation of competitive advantages because it allows service sector organisations to respond by combining external perspectives with internal capabilities to provide organisations with competitive advantages.

While SES can help to identify turning points in the external environment ([Gold et al., 2019](#); [Said et al., 2018](#)), it is critical to act on this information to mitigate negative impacts on business performance ([Kim et al., 2013](#)). Moreover, when SES is supported by SCA and OCA, opportunities to develop innovation capability are increased ([Pizarro-Moreno et al., 2011](#)). In this study we incorporate these constructs in our theoretical framework and draw on the literature to develop our supporting hypotheses.

2.5 Developing the theoretical framework

The conceptual framework developed for this study incorporates four main constructs: SCA, OCA, SES and SIC. The study is based on dynamic capability theory and on previous models that have shed light on the relationship between either intellectual capital or SES and innovation capability (e.g. [Wang et al., 2021a, b](#); [Cabrilo and Dahms, 2018](#); [Bigley, 2018](#); [Leitner, 2011](#); [Pizarro-Moreno et al., 2011](#); [Kalkan et al., 2014](#); [Subramaniam and Youndt, 2005](#); [Nylén and Holmström, 2015](#)). Thus, we extend the work of [Tang \(2016\)](#) and [Liao's \(2018\)](#) earlier noted work by examining the impact of SCA and OCA during the COVID-19 pandemic on the development of SIC mediated by SES.

Since knowledge acquired from employees, the organisation and its networks improves the ability to develop novel products, services and processes, innovation can be summarised as a product of investments and improvements in intellectual capital ([Subramaniam and Youndt, 2005](#)). OCA, unlike human capital, is retained in the organisation even after employees leave. Thus, this knowledge resource, which is institutionalised in the organisation, can enhance innovation, since the development of new services and methods may entail building on existing knowledge ([Youndt et al., 2004](#)). Information and communication technology infrastructure in the firm can also enhance innovation by facilitating structured information research, repository, recovery, analysis, transmission and distribution ([Torrent-Sellens et al., 2016](#)). Research indicates that SCA can also enhance innovation because the knowledge that supports innovation is not confined inside an organisation. A significant number of advanced innovations are the result of external and cross-industrial collaborations ([Hauge et al., 2017](#)). In summary, inter-organisational alliances tend to increase information sharing and learning which ultimately enhances innovation ([Pérez-Luño et al., 2011](#)). Therefore, we can infer the following hypotheses:

H1. Organisational capital positively impacts on SIC.

H2. Social capital positively impacts on SIC.

The impact of the COVID-19 pandemic has affected the world's economies by predicting an imminent economic recession ([Kuckertz et al., 2020](#); [GDA, 2020](#)). Like many previous crises, the pandemic is also disrupting conventional organisational functions and capabilities ([Williams et al., 2017](#)). Scholars indicate that, to survive manage in the crisis, organisations need to be resilient and invest in the skills and resources that can help them to adapt to current business conditions ([Doern et al., 2019](#)). Resilience has been found to be a significant factor in crisis management because it entails an organisation's ability to continue to operate with a specific focus on the resources it must employ ([Doern et al., 2019](#); [Williams et al., 2017](#)). Resilience strategies have also been used effectively to reduce the impact of the COVID-19 pandemic in the tourism sector in Vietnam ([Su et al., 2021](#)).

An organisation's decisions related to deciding which resources to accumulate and invest in and how to combine and detach existing resources are primarily based on SES (Aldehayyat, 2015). Responding effectively to SES can reduce the negative effects of crises and assist in restoring the operational functionality of an organisation (Williams *et al.*, 2017).

Environmental scanning rests on the collection of two sources of information. These are data that are external to the organisation and pertain to competitors, government entities and customers, and internal data related to employees, managers and decision-makers. Internal sources also include reports and memoranda as well as documented procedures or manuals (Aldehayyat, 2015). Intellectual capital, therefore, in the form of OCA and SCA, is expected to facilitate and enhance SES. Previous research also indicates that SCA enables organisations to communicate with external parties and obtain additional information about the external environment (Fang *et al.*, 2016). Thus, we propose the following hypotheses:

H3. Organisational capital positively impacts on SES.

H4. Social capital positively impacts on SES.

SES is also a significant factor in achieving customer satisfaction (Heinonen and Strandvik, 2020). In highly volatile environments, such as the current pandemic, organisations cannot simply engage in explorative and exploitative activities (Tang, 2014). Instead, they must focus on predicting future customer demands, exploring additional potential markets and attaining information that leads to competitive advantages (Nenonen and Storbacka, 2020). SES can support these goals by uncovering market opportunities before their rivals do, thus allowing organisations to mitigate potential threats (Sund, 2013). As noted earlier, organisations can also improve performance by integrating ordinary and dynamic capabilities to respond to the changing demands of customers (Teece, 2018a, b). By drawing on dynamic capability theory, therefore, the impact of SES on SIC is predicted to be positive. Thus, we propose the following hypothesis:

H5. Strategic environmental scanning positively impacts on SIC.

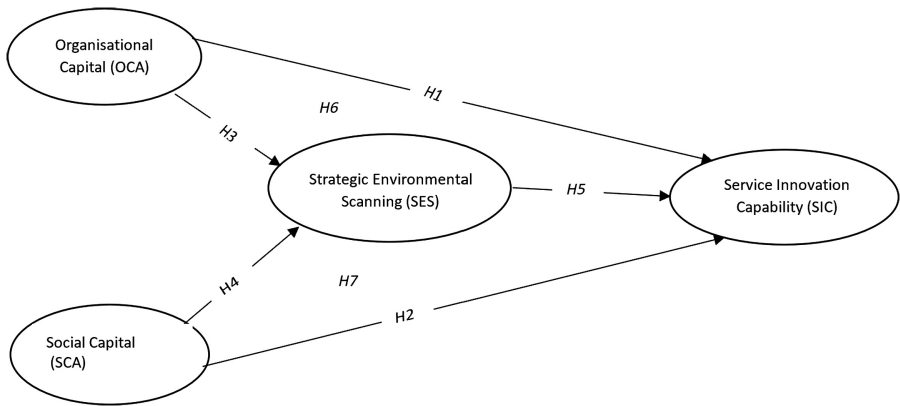
Dynamic environments can render existing services obsolete due to changing customer needs, alterations in technology or variations in demand (Chen *et al.*, 2018). To reduce the impact of COVID-19 on services, businesses need to update and build on existing knowledge to improve existing services or create new services that add value based on the results of environmental scanning (Birkinshaw and Ansari, 2015). Consequently, organisations that engage in frequent environmental scanning will have a deeper understanding of the external operating environment which increases their opportunities to acquire the best resources and information to respond appropriately to changes in market demand (Liao, 2018). The SCA of the organisation facilitates access to beneficial resources that may not be found in other organisations due to the widespread network of connections. OCA also acts as an internal source of information that facilitates effective environmental scanning.

As discussed earlier, dynamic capability theory contains three main activities, one of which is reconfiguring organisational capabilities (see Figure 1). One of the main misjudgements of some otherwise successful organisations is complacency or introducing minor changes instead of implementing major reforms (Helfat *et al.*, 2007). When firms frequently scan the environment, they are most likely to acquire knowledge about service innovation needs. Therefore, we infer the following hypothesis:

H6. Strategic environmental scanning mediates the relationship between OCA and SIC.

H7. Strategic environmental scanning mediates the relationship between SCA and SIC.

Figure 1.
Research model



3. Method

The purpose of this study is to understand the impact of SCA and OCA on SIC and the mediating role of SES. To test the proposed research model, data were collected during the COVID-19 pandemic using a cross-sectional questionnaire-based online survey. Using an online survey questionnaire is an economical and convenient way of gathering information since software is available for collecting, modifying and coding data (Bhattacharjee, 2012). Moreover, it is convenient for managers because the data collection tools provide an option for respondents to save an incomplete survey and continue it later. Hence it helps to decrease incomplete responses (Mikalef and Krogstie, 2020). This method was especially useful during the COVID-19 pandemic because it provided safe, easy access to data without the need for physical contact.

To ensure the validity of the latent variables, the study constructs corresponding questionnaire items based on previous peer-reviewed studies. Before launching, the adapted survey was pretested by presenting it for comment to eight service sector experts who were asked to identify any items that were vague or confusing. Comments from these experts were then incorporated to improve the survey items. Respondents were assured of confidentiality to eliminate potential biases such as social desirability. Non-probability purposive sampling was used because the researchers had limited resources and time (Etikan *et al.*, 2016). The sample for this study was drawn from public and private sector service organisations in the UAE and included respondents representing small, medium and large organisations. Since our study focuses on the impact of SCA and OCA on SIC, we focused on managers because of their critical role in implementing the systems and processes that support innovation. Data were collected from managers at all organisational levels (please see Table 1). The names and titles of respondents were obtained from several sources, such as government websites, personal contacts and professional fora. A total of 625 links to the survey were sent by email to the contact list and through professional LinkedIn, with a cover letter explaining the purpose and conditions of the study. Reminder emails and messages were sent to those who did not return the survey within a week. Within two months a total of 188 completed and usable surveys had been returned, yielding a final response rate of 30%.

Table 1 summarises the respondents' key characteristics. Most were male (65.4%) and aged from 20 to above 61 years. A large proportion of the results were from the public sector (49.5%), followed by the private sector (32.4%) and then semi-government entities (18.1%), which are businesses owned by the government such as the Abu Dhabi National Oil Company. Around 70% of respondents were from large enterprises.

Factors	Sample (<i>n</i> = 188)	Percentage (%)	Social and organisational capital on SIC
<i>Gender</i>			
Female	65	34.6	
Male	123	65.4	
<i>Age</i>			
20–25 years	13	6.9	
26–31 years	27	14.4	
32–37 years	40	21.3	
38–43 years	44	23.4	
44–49 years	31	16.5	
50–55 years	25	13.3	
56–61 years	5	2.7	
Above 61 years	3	1.6	
<i>Education level</i>			
Diploma	2	1.1	
College	2	1.1	
Bachelor	84	44.7	
Master	84	44.7	
Doctoral	16	8.5	
<i>Job level</i>			
Executives	10	5.3	
Senior managers	53	28.2	
Middle managers	44	23.4	
Junior managers	20	10.6	
Supervisors	44	23.4	
<i>Years of experience</i>			
0–5	35	18.6	
6–11	42	22.3	
12–17	41	21.8	
18–23	32	17.0	
Above 23	38	20.2	
<i>Sector</i>			
Private sector	61	32.4	
Public sector	93	49.5	
Semi-government sector	34	18.1	
<i>Job level</i>			
Executive	10	5.3	
Intermediate	44	23.4	
Junior	20	10.6	
Senior management	53	28.2	
Supervisory	61	32.4	
<i>Organisation size</i>			
Between 50–250 employees (medium enterprise)	37	19.7	
Less than 50 employees (small enterprise)	20	10.6	
More than 250 employees (large enterprise)	131	69.7	

Table 1.
Descriptive statistics of
the sample and
respondents

We adopted this method because it is common in organisational studies and strategy research (Jantunen, 2005). Moreover, data were collected during the COVID-19 pandemic and an online survey with email reminders was more likely to attract managers to complete it. Thus, the rationale included both safety and convenience.

However, since the data were collected from single respondents using one questionnaire survey, there was a possibility that common method variance (CMV) would occur (Podsakoff *et al.*, 2003). However, following Podsakoff *et al.*'s (study) we took some steps to rule out the risk of CMV. First, to reduce evaluation anxiety, we assured our respondents about their anonymity and the confidentiality of their data. Next, we pretested the questionnaire to remove any item ambiguities. Finally, we conducted a Harman one-factor test on the study variables (Fuller *et al.*, 2016; Podsakoff *et al.*, 2003). The results did not show a unifactor solution and the maximum variance shown by any one factor was 41.5%, enabling us to conclude that CMV was not a concern for this study.

3.1 Measurement of constructs

The scale to measure SIC was adopted from Jansen *et al.* (2006). The construct is conceptualised as a reflective construct comprising 12 items. Six items measure exploratory innovation such as "Our unit accepts demands that go beyond existing products and services" and "We invent new products and services". The remaining items measure exploitative innovation and include items such as "We frequently refine the provision of existing products and services" and "We regularly implement small adaptations to existing products and services". The SES of a firm was measured via six items adopted from Barringer and Bluedorn (1999). Respondents were asked to evaluate the extent to which scanning devices were used by their firms to gather information about its business environment during the COVID-19 pandemic. The SCA and OCA items were adapted from Subramaniam and Youndt (2005). A total of five items measured SCA, while four items captured the respondents' perceptions about OCA such as "Our organisation uses patents and licenses as a way to store knowledge". The wording of all the items in each construct was modified to reflect the pandemic context.

3.2 Analysis

Partial least square-based structural equation modelling (PLS-SEM) was used to examine the validity and reliability of the research model and to test the research hypothesis. Analysis was conducted using the software package SmartPLS-3 (Ringle *et al.*, 2015). PLS-SEM was considered appropriate for this study because it allows the simultaneous estimation of model relationships (Hair *et al.*, 2011). It is a variance-based technique that offers flexibility with respect to small sample sizes, makes no abnormality assumptions and offers high predictive power (Gefen and Straub, 2005; Kock and Hadaya, 2018; Hair *et al.*, 2017). Owing to its flexibility and robust analysis capabilities, PLS-SEM is widely used in business and management research and several other research areas (Ahammad *et al.*, 2017). Hair *et al.* (2017) recommend that the sample size for the study should be 10 times the maximum number of inner or outer model links pointing to any latent variable in the model. Our sample size of 188 responses exceeded this requirement and hence was appropriate for PLS-SEM analysis.

3.3 Measurement model

The assessment criteria suggested by Hair *et al.* (2017) were used to evaluate the reliability, convergent validity and discriminant validity of the constructs. First, we examined the composite reliability and Cronbach alpha values. Values for both tests were found to exceed the threshold of 0.7 (Nunnally, 1978). All item loadings were above the recommended threshold of 0.7 (Hair *et al.*, 2017), except for SES1 and SIC1 which had loadings below 0.6, and hence these two items were dropped from the SES and the SIC constructs, respectively. Table 2 summarises these results.

Next, the convergent validity was established by examining the Average Variance Expected (AVE). As shown in Table 3, all the values exceeded the required limit of 0.5, indicating that this convergent validity criterion was satisfied.

Item description	OCA	SCA	SES	SIC
<i>During the pandemic your organisation</i>				
Uses patents and licenses as a way to store knowledge	OCA1	0.831		
Contains its knowledge in manuals, databases, etc.	OCA2	0.790		
Uses culture (stories, rituals) contains valuable ideas, ways of doing business, etc.	OCA3	0.816		
Embeds much of its knowledge and information in structures, systems, and processes	OCA4	0.812		
Skilled at collaborating to diagnose and solve problems	SCA1	0.902		
Being able to share information and learn from one another	SCA2	0.880		
Being able to interact and exchange ideas with people from different areas of the company	SCA3	0.835		
Being able to partner with customers, suppliers, alliance partners, etc., to develop solutions	SCA4	0.888		
Being able to apply knowledge from one area of the company to problems and opportunities that arise in another	SCA5	0.879		
<i>During the COVID-19 pandemic your organisation</i>				
Has an explicit tracking of the policies and tactics of competitors	SES2		0.813	
Forecasts sales, customer preferences, technology	SES3		0.849	
Does special marketing research studies	SES4		0.794	
Utilises social media, government publications, and news media	SES5		0.848	
Gathers information from suppliers and other channel members	SES6		0.836	
<i>Comparing to normal working days, in COVID-19 your organisation</i>				
Invents new products and services	SIC2			0.762
Experiments with new products and services in the local market	SIC3			0.743
Commercialises products and services that are completely new to the unit	SIC4			0.703
Utilises new opportunities in new markets	SIC5			0.747
Uses new distribution channels	SIC6			0.703
Refines the provision of existing products and services	SIC7			0.799
Implements small adaptations to existing products and services	SIC8			0.715
Introduces improved, but existing products and services for our local market	SIC9			0.763
Improves our provision's efficiency of products and services	SIC10			0.814
Increases economies of scales in existing markets	SIC11			0.819
Expands services for existing clients	SIC12			0.733

Table 2.
Item loading table for
indicators reliability

	OCA	SCA	SES	SIC
OCA	0.812			
SCA	0.697	0.877		
SES	0.691	0.677	0.828	
SIC	0.630	0.604	0.746	0.756
Average variance extracted (AVE)	0.660	0.769	0.686	0.571
Cronbach's alpha	0.829	0.925	0.885	0.925
Composite reliability	0.886	0.943	0.916	0.936

Table 3.
Assessment of
reliability, convergent,
and discriminant
validity

To assess discriminant validity, we conducted three types of test. First, we examined the outer loadings of each indicator which should be greater than their cross-loadings with other constructs (Farrell, 2010), and found that this condition was met (see Table 2). Next, we checked for the Fornell–Larcker criterion, which suggests that each construct's AVE square root

value should be greater than its highest correlation with any other construct, and found the values to be satisfactory (see Table 3). Finally, the Heterotrait–Monotrait ratio (HTMT) was applied, which is the most stringent discriminant validity test of all three (Henseler *et al.*, 2015). In this test, the HTMT ratio is calculated from the average of the indicators' correlations across constructs, relative to the average of the indicators' correlations of indicators in the same construct. All values below 0.85 with a confidence interval that does not contain a 0 value can be accepted as indications of sufficient discriminant validity. Our results (Table 4) show that our data met these requirements.

The results presented in this section suggest that the measurement model was valid and reliable and could be used for structural model analysis.

3.4 Structural model

The structural model from the PLS analysis summarising the explained variance of the endogenous variables (R^2) and the standardised path coefficients (β) is presented in Figure 2.

For our structural model analysis, we examined the coefficient of determination (R^2) values, predictive relevance (Stone–Geisser Q^2) and the effect size of path coefficients (Hair *et al.*, 2017). A bootstrap analysis with 3,000 resamples was run to obtain the significance of the estimates. The structural model results are presented in Table 5.

As hypothesised, a firm's OCA is found to have a positive impact on the SES (H3) ($\beta = 0.425$, $t = 4.495$, $p < 0.05$) and on a firm's Strategic Innovation Capabilities (SIC) (H1) ($\beta = 0.170$, $t = 1.983$, $p < 0.05$). Similarly, a firm's SCA is found to have a positive impact on SES (H4) ($\beta = 0.381$, $t = 3.695$, $p < 0.05$). However, the relationship between SCA and a firm's SIC (H2) was not found to be significant ($\beta = 0.110$, $t = 1.437$, $p > 0.05$). Additionally, a positive direct relationship was supported between the SES and SIC (H5) ($\beta = 0.555$, $t = 7.185$, $p < 0.05$). The structural model explains 55.1% of the variance for SES ($R^2 = 0.551$), and 58.7% for SIC ($R^2 = 0.587$). These coefficients of determination represent moderate to

Table 4.
HTMT table

	OCA	SCA	SES
SCA	0.788 [0.671–0.882]		
SES	0.799 [0.691–0.883]	0.744 [0.628–0.836]	
SIC	0.711 [0.569–0.826]	0.648 [0.514–0.762]	0.820 [0.726–0.895]

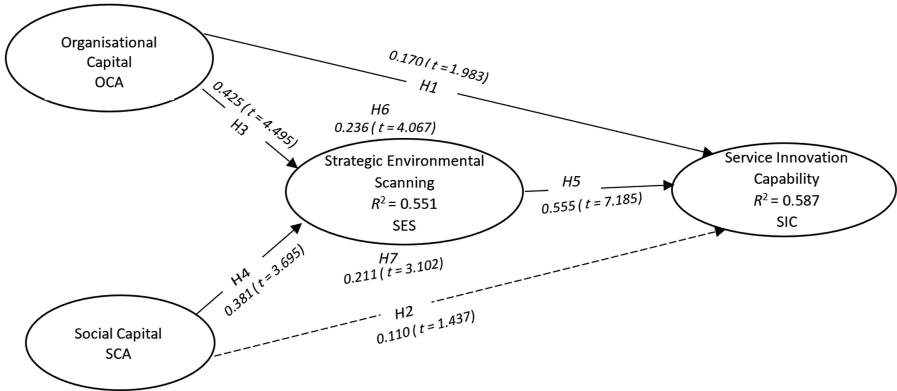


Figure 2.
Structural model

Structural path	Effect	t^a value	f^2	Ratio to total effect (%)	Bias corrected 95% confidence interval	Conclusion
OCA → SIC	0.170	1.983*	0.030	42%	[0.001–0.347]	H1 Supported
SCA → SIC	0.110	1.437	0.013	34%	[–0.03–0.266]	H2 Not supported
OCA → SES	0.425	4.495***	0.207		[0.233–0.6]	H3 Supported
SCA → SES	0.381	3.695***	0.166		[0.18–0.578]	H4 Supported
SES → SIC	0.555	7.185***	0.334		[0.392–0.692]	H5 Supported
OCA → SIC via SES	0.236	4.067***		58%	[0.132–0.363]	H6 Supported (partial mediation)
Total effect	0.406	4.032***		100%	[0.199–0.592]	
OCA → SIC						
SCA → SIC	0.211	3.102**		66%	[0.092–0.361]	H7 Supported (full mediation)
via SES						
Total effect	0.321	3.287**		100%	[0.132–0.509]	
SCA → SIC						

Note(s): ^a *significant at $p < 0.05$; **significant at $p < 0.01$; ***significant at $p < 0.001$ (two-tailed test)

Table 5.
Structural model
results

substantial predictive power (Chin, 1998). Next, we examined the effect size f^2 to determine the contribution of the exogenous construct to the endogenous latent variable (Cohen, 1988). Table 5 shows that the effect size values of our model were above the threshold of either 0.02 or 0.15, i.e. showing small- to medium-sized effects.

3.5 Tests for mediation

To test our mediation hypotheses H6 and H7, we employed the bootstrapping approach (Hair *et al.*, 2017). First, we examined the significance of the mediated paths (OCA → SES → SIC) and (SCA → SES → SIC). Both the indirect effects were found significant. Next, we examined the direct relationships (OCA → SIC and SCA → SIC) in the model. We found that the latter was nonsignificant ($\beta = 0.110$, $t = 1.437$, $p > 0.05$), while the former retained its significance ($\beta = 0.170$, $t = 1.983$, $p < 0.05$). Table 5 presents the summarised results of the mediation analysis showing that both H6 and H7 are supported. Since the direct effect of SCA on SIC was found to be nonsignificant and the mediating path was found to be significant, we can conclude that SES fully mediates the effect of SCA on SIC. But, because the direct effect of OCA on SIC is still significant and the mediating path is also significant, we conclude that SES partially mediates the effect of OCA on SIC.

3.6 Predictive validity

To establish the predictive relevance of the exogenous variables, the Q^2 values were examined (Woodside, 2013). Using the blindfold procedure, the Q^2 value shows how well the path model can predict the originally observed data values (Hair *et al.*, 2017). Q^2 predictive relevance values that are greater than 0 imply the predictive relevance of the structural model (Henseler *et al.*, 2015). From the analysis of results, we found that both SIC ($Q^2 = 0.325$) and Strategic Environment Scanning (SES) ($Q^2 = 0.367$) had satisfactory predictive relevance. OCA and SCA do not have a Q^2 predictive relevance scores because these are exogenous constructs.

Next, predictive validity was further analysed using the PLS predict approach (Shmueli *et al.*, 2019). In this procedure, two samples, one training and one holdout are used respectively to estimate a model's parameters and evaluate its predictive power (Hair *et al.*, 2017). The first condition of the test is that the Q^2_{predict} values should be greater than zero. This condition was

met since all indicators showed a Q^2_{predict} value higher than zero. Next, our comparison of the root mean squared error RMSE (or the mean absolute error MAE) values with the linear regression (LM) benchmark showed that approximately half of the indicators had PLS-SEM values that were less than LM. Hence, we concluded that the model has a low to medium predictive power.

Finally, to examine model fit, a test of composite-based standardised root mean square residual (SRMR) was performed. Our model yielded an SRMR value of 0.075, which is below the threshold of 0.08, thus confirming the overall fit of the PLS path model (Henseler *et al.*, 2016).

4. Conclusion and discussion

Set in the context of the COVID-19 pandemic, this study examined the impact of OCA and SCA on SIC mediated by SES. The study is based on dynamic capability theory, and previous models that have clarified the relationship between either intellectual capital or SES and innovation (e.g. Leitner, 2011; Pizarro-Moreno *et al.*, 2011; Subramaniam and Youndt, 2005; Bigley, 2018; Nylén and Holmström, 2015). The findings have revealed that, in the kind of dynamic environmental conditions caused by COVID-19, which are expected to continue in the medium to long term, OCA has a significant impact on SIC and SES and the mediating path are also significant. This explains why SES partially mediates the effect of OCA on SIC. SCA was found to only have a positive impact on SES and had no impact on the development of SIC. This explains why SES fully mediates the effect of SCA on SIC. The empirical research findings of this study make considerable contributions to the following fields.

The results extend the literature on SIC during the pandemic by introducing a conceptual framework to capture the mediating role of SES on SIC in a disruptive context. Our results are aligned with recent studies conducted during COVID-19 which suggest that innovation capability is a catalyst for imposed service innovation (Heinonen and Strandvik, 2020). Our results are also aligned with Mendoza-Silva's (2020) comprehensive study of the determinants of organisational innovation capability. The study categorised the dimensions into external and internal organisational factors. The external ones can be defined as a reaction to events that occur outside the firm, in our case COVID-19, while the internal ones refer to factors that result from activities inside the firm that are related to the organisation's innovativeness, in our case organisational and SCA. Our study also responds to the call from Figueiredo *et al.* (2020) and Botelho (2020) to explore the impact of a broader range of constructs on innovation capability – especially in the service sector. Moreover, we extend the importance of the types of innovation capability (exploitative or explorative) as one of the approaches to cope with the crisis. Exploitative innovation, where the service organisation seeks to improve current value-creating activities focuses on the continuous improvement of the current service (Jansen *et al.*, 2006).

Lee and Trimi (2021), however, recognise that organisations need to rely on their innovation capabilities to survive and grow in times of crisis. This aligns with our results showing that the pandemic triggers a reframing of SIC in general. Different resources must be used to support a company's capabilities during crises, like technical support, financial support and the capacity for developing human resources. From this point of view, the competence of each member of the organisation is a critical factor. Many scholars argue that employees (leadership/managers) are more critical than any other factor to reinforce innovative capability (Al-Omoush *et al.*, 2020; Bornay-Barrachina, 2017).

OCA is considered a significant component of intellectual capital because it supports the development of institutionalised knowledge and organised experiences preserved in the corporate image, culture, routines, procedures, information systems and patents (Gilbert *et al.*, 2017). In comparison, SCA encompasses the organisation's background, stock of

relationships, interpersonal trust and the norms that promote certain behaviours and lead to sustainable relationships between employees, together with developed knowledge exchanges. It is widely accepted in the literature that an organisation's capacity to innovate is closely tied to its intellectual capital (Cabrito and Dahms, 2018; Carmona-Lavado *et al.*, 2010; Jantunen, 2005; Li *et al.*, 2019) and the interrelationships between the different categories of intellectual capital influence its incremental and radical innovative capabilities (Subramaniam and Youndt, 2005). Surprisingly, our hypotheses testing reflected the findings in the literature that OCA positively impacts SIC (H1); but SCA had no impact on SIC during the COVID-19 pandemic (H2).

OCA has three dimensions (Gilbert *et al.*, 2017). First, the structural dimension refers to the formal procedures and processes of the organisation, human resource policies and guidelines. Second, the cultural dimension accounts for processes that serve the organisational strategy, including its plan, mission, values and vision. Finally, the knowledge dimension accounts for the processes through which knowledge and information are created, used, exchanged and preserved. This includes investment in research and patents (Youndt *et al.*, 2004). The result of testing H1 indicates that internal business processes, procedures, policies and guidelines in which knowledge is used, exchanged, created and stored represent a strategic asset that supports SIC during crises. This definition would suggest that organisations which have continually developed their internal organisational capabilities are better placed to develop the SIC required to adapt and respond to the pandemic (Mendoza-Silva, 2020).

The difference in the impact between the organisational and SCA on SIC can be explained by the definition and nature of each category. OCA is considered the only category of intellectual capital owned by the organisation and the least flexible of the three categories (Gilbert *et al.*, 2017). In comparison, the lack of impact of SCA in SIC contrasts with previous studies that found that SCA positively impacts SIC (Ramadan *et al.*, 2017; Gonzalez-Loureiro *et al.*, 2017; Subramaniam and Youndt, 2005). There are several possible explanations for this. During the pandemic, significant changes were swiftly introduced in most countries, including lockdowns, social distancing and remote working (Berry *et al.*, 2020).

Given that these changes were regulated, it is likely that service organisations addressed these demands as a priority. At the same time, lockdowns and working remotely do not lend themselves to engaging in the external social relationships that might benefit organisations (Nahapiet and Ghoshal, 1998). This can be explained by conceptualising the internal SCA as an impeded resource in the network and the resource facilitating action among the employees for productive purposes (Nhon *et al.*, 2018). This has been dramatically changed in the service sector since the pandemic began. There may also be contextual differences in that the study was conducted in the UAE and, as noted by Feng *et al.* (2020), socio-cultural differences can have an impact on service innovation, especially in relation to attitude to risk.

SES is the organisation's ability to anticipate and consider external change when designing its strategy (Zhang *et al.*, 2011). The purpose of environmental scanning is to detect and track current and potential trends that recognise business opportunities and challenges to maintain competitive advantages. The literature groups SES into two categories: the "general environment", which refers to forces that affect organisations indirectly, such as those that are political, economic, social or technological (COVID-19, in our case), while the "task or specific environment" category involves direct transactions with the organisation, for example, competitors, suppliers and customers (Zhang *et al.*, 2011).

Our findings clearly indicate that organisational and SCA positively impact SES (H3 and H4). This could be explained by the fact that SES is an approach to gathering relevant information and turning it into knowledge to manage a business (Karami and Chen, 2010). This result is consistent with the role of SCA. That is, when a member's network is expanded and trust is extended, the other members are more willing to share intellectual resources which motivates knowledge exchange (Gilbert *et al.*, 2017). The role of OCA when knowledge is used, exchanged,

created and stored in internal business processes, procedures, policies and guidelines should, therefore, also be considered. Additionally, the findings of H3 support the literature that includes the cultural dimension of OCA where internal processes serve the firm's long-term strategy, including its strategic plan, mission, values and vision.

By drawing on dynamic capability theory, the impact of SES on SIC is predicted to be positive. Yet the findings of (H5) support the literature, which indicates that SES is a critical factor in understanding customers' needs and requirements to enhance their satisfaction (Heinonen and Strandvik, 2020). This could be explained by the fact that organisations cannot simply develop existing services or develop new ones in a vacuum (Tang, 2014). They must first focus on predicting future customer needs (Nenonen and Storbacka, 2020). Thus, SES can allow organisations to gain a deeper understanding of the innovations required to drive customer value and allow them to employ organisational resources to respond appropriately to emerging market conditions.

Previous studies have neglected to incorporate environmental scanning into the analysis of innovation capability. Hitherto SES has helped firms access and use relevant event, trend and relationship information found in the external environment. In order to close the gap left by previous studies, our study examines the mediating role of SES between OCA, SCA and SIC. Thus, we extend the work of Tang (2016) and Liao (2018) during the COVID-19 pandemic.

The findings of this study indicated that the relationship between SCA and SIC was fully mediated by SES (H7). However, SES partially mediated the relationship between OCA and SIC (H6). This could be explained by the fact that the managers in our sample paid more attention to environmental scanning in order to understand what was required to adapt to the COVID-19 environment. This suggests that, during crises, SES becomes more critical for organisations to ascertain where to direct their resources to deal with emerging challenges.

Thus, frequency and extensive SES during the crisis through their networks (SCA) can allow organisations to gain a deeper understanding of the innovations required to drive customer value and also allow them to employ OCA to respond appropriately to emerging market conditions, enhance their confidence innovating's and thus improve success.

In addition, the study offers new insights into the development of dynamic capabilities theory. The majority of past studies have focused on the early developing stages of the theory (Helfat and Peteraf, 2009), indicating that the dynamic capabilities domain still needs expansion and testing (Easterby-Smith *et al.*, 2009; Singh and Rao, 2016; Teece, 2018b). Our study addresses this gap by offering an understanding of the impact of SES as a mediator between aspects of intellectual capital and SIC. Specifically, the results of this study contribute to the theory of dynamic capabilities on the three main process elements: sensing, seizing and retaining (Davies *et al.*, 2016; Baden-Fuller and Teece, 2020). This study makes an additional contribution to theory by providing empirical evidence on how an organisation can use its capabilities to dynamically enhance its service innovation (Prieto and Easterby-Smith, 2006). Finally, the study attempts to test the versatility of the theory in a new cultural and geographical context thus, addressing calls for suggested research by many scholars (McKelvie and Davidsson, 2009; Bitencourt *et al.*, 2020).

5. Managerial implications

Most service organisations that enhanced their innovation capability did so because they understood its importance. This changed during the COVID-19 pandemic, when all service organisations were pushed to do so by a sense of urgency (imposed service). The outbreak of COVID-19 reveals that service industries faced a new situation that they were generally unprepared for. Nevertheless, the COVID-19 pandemic represents opportunities for rapid

business development because dramatic disruption can force managers to rethink and redesign their business models beyond their existing strategies (Kabadayi *et al.*, 2020).

Our study reveals that service organisations can use their internal SCA most effectively, to quickly develop new services during the pandemic. The internal SCA can provide diverse and valuable information and resources to design new services or redevelop existing ones to meet variations in customers' needs during a crisis. Service firms could also broaden and deepen their social networks by using digital platforms to strengthen relationships between their employees. These platforms can enhance innovative behaviour, serve as a source of dynamic capabilities and allow knowledge to flow between employees to develop the new services needed during a crisis. External relationships could also assist in developing partnerships with organisations that have complementary capability.

Indeed, the literature emphasises that many successful innovations (Hormiga *et al.*, 2011), especially within the digital environment, result from external and cross-industry collaborations. Consequently, external relationships can assist in developing partnerships with organisations that have complementary capability, for example, those that can increase online purchasing and delivery channels and provide additional value for customers. We, therefore, recommend that companies enhance and strengthen their communication channels and relationships with external parties such as suppliers and customers as one means to increase innovation capability. Since customers insights are of significant value to businesses, it is also critical to communicate the information gleaned from SES broadly within the organisation but specifically to all key managers who are responsible for implementing the results.

The findings of our research are consistent with previous studies (Cabrilo and Dahms, 2018; Wang *et al.*, 2016), which also indicate that SES mediates the relationships between organisational and SCA and SIC. Our study shows, however, that innovation capability is contingent on specific resources, namely OCA, SCA and strategic knowledge tools. As a result, we recommend that managers identify strategic knowledge gaps within their organisations and then work on closing these gaps with the necessary managerial initiatives that can advance aspects of intellectual capital. Managers are also advised to identify external knowledge gaps within the market and deploy their resources efficiently and dynamically to address these gaps. For service organisations to improve innovative capabilities, managers and strategic leaders must ensure that strategic knowledge initiatives are aligned with intellectual capital components. To achieve this, they need to understand the intellectual capabilities within their organisation then introduce strategies to enhance these capabilities based on market needs and customer requirements (Cabrilo and Dahms, 2018).

Correspondingly, the findings of this study suggest that service organisations, whether public or private, would benefit from environmental scanning activities. Hence, service organisations need to continually monitor shifts in the external environment to develop strategies that allow them to capitalise on strengths, mitigate weaknesses and ensure compliance with emerging regulations. Those that acquire, analyse and act upon the results of SES are likely to successfully adapt to emerging changes, enhance performance and gain competitive advantages. The greater the frequency of environmental scanning, the higher the level of understanding of the external environment, resulting in a greater opportunity for firms to obtain favourable resources and information from the external environment. At the same time, regular scanning of the external environment enables organisations to remain alert and sensitive to changes in consumer preferences, making it easier to identify and use opportunities for innovation. Finally, it is critical to broadly communicate the information gleaned from SES broadly within the organisation but specifically to transmit it to all key managers who are responsible for strategic decision-making.

OCA, unlike SCA, is retained in the organisation even after employees leave. Thus, the knowledge and resources that are institutionalised within the organisation can be harnessed

to improve existing or develop new services. OCA that is less hierarchical in nature can also allow for autonomy in decision making, supporting increased innovation and the integration of new knowledge. The strong direct relationship between OCA and SIC may indicate that, during crises, management priorities change and they become more reliant on internal processes to develop SIC. The impact of OCA on innovation capability is further supported by the internal processes employees utilise to achieve organisational objectives (Santos-Rodrigues and Figueroa-Dorrego, 2011; Van de Ven, 1986; Wang *et al.*, 2015). Consequently, further investment in the systems, processes and procedures that enhance OCA is justified.

5.1 Limitations and further research

Although this study seems to be the first to identify the factors affecting service innovation capabilities during the pandemic, it is not without certain limitations. First, the data were collected from managers in public, private and semi-private service organisations. Future research should examine the difference between private and public approaches in adapting to pandemic influences. Second, future studies could collect more data from a greater variety of firms to generalise the study results. Moreover, cross-sectional data were used in this study and therefore future studies could usefully employ a longitudinal design for exploring relationships during crises. Future studies could also compare the role of environmental scanning before the COVID-19 pandemic to investigate whether our findings are supported in non-crisis situations.

Data were collected in the UAE, which emphasises developing innovation capability at the national level. Hence, it is suggested that comparison studies should be done in Europe, the UK, China and North America. Lastly, data were collected using a single questionnaire survey where each respondent answered for all constructs. Hence there was the possibility of common method variance (CMV) (MacKenzie and Podsakoff, 2012; Tian *et al.*, 2020). We took various design steps to avoid this issue and then checked with the Harman factor test, which is a reasonably good detector of this effect (Fuller *et al.*, 2016). The results showed that CMV was not a serious problem in this study. Nevertheless, we acknowledge that the possibility of some effect cannot be ignored. Finally, to enrich our understanding in this area and address any concerns about the subjectivity of employee perceptions, future studies could consider using ethnographic approaches to explain the major patterns emerging from the quantitative analysis of this study.

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