

Impact of the COVID-19 pandemic on business-to-business relationships in digital ecosystems: an African perspective

COVID-19's
impact on B2B
relationships

69

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Abstract

Purpose – In the African context, the threat of the disruption of traditional business value-creation processes, currently facilitated by the growing information technology (IT) ecosystem, came with the coronavirus disease 2019 (COVID-19) pandemic. Thus, this paper aims to investigate the impacts of the COVID-19 pandemic on interfirm relationships within the context of the digital ecosystem in Africa.

Design/methodology/approach – This study employs an explanatory–exploratory qualitative approach from an interpretivist stance to investigate the impacts of the COVID-19 pandemic on interfirm relationships. The authors conducted seven in-depth interviews with top management executives in a Nigerian technology company, together with the company's archival data that provided the pre, during and post pandemic (2018–2021) business-to-business (B2B) relationship structures, to determine how these relationships have been affected.

Findings – The results suggest that the pandemic had a minimal effect on partnership relationships in the B2B ecosystems of the case company but affected only non-partnership relationships.

Research limitations/implications – The authors' qualitative study is interpretive and the sample size is limited. Hence, there is a need for caution in generalizing the findings. The framework can be further validated across a wider population.

Practical implications – Partnerships can help organizations weather business crises. Consequently, organizations should maintain a healthy number of partnership relations to deal with periods in which challenges emerge in the business landscape. In other words, with tight contracts and a strategic focus on goals and objectives, partnership relations can help organizations weather business crises.

Originality/value – This study builds upon the burgeoning body of literature on digital ecosystems within the African context, which is a relevant contextual contribution.

Keywords COVID-19, Digital ecosystem, Business relationships, Business-to-business (B2B), Digitization, Relationship model

Paper type Case study

1. Introduction

The development and expansion of communication technologies enabled by the spread of internet-based services have been instrumental to the number of emerging start-ups (Kende, 2015; Weiss and Ndemo, 2017). In Africa, the services and products powered by the Internet have accelerated economic growth, created entry opportunities for firms and increased productivity (Hjort and Poulsen, 2019). Much of this growth has occurred in Africa's service sector (e.g. Azubike and Onukwube, 2019), negating the typical trajectory



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of a directional transformation from a product-oriented approach toward a service-centered one (e.g. [Brax, 2005](#); [Baines et al., 2009](#); [Smith et al., 2014](#); [Reim et al., 2016](#)). [Vargo and Lusch's \(2008\)](#) service-dominant logic underscores this idea at the transactional level, where customers, rather than purchasing standard products, opt for services that consider only the value of the use of such products. However, the directional transformation sequence argues that the product sector needs to be mature for modular and integrative digitalization to emerge – leading to transformed offerings in the product or service market ([Ramaswamy, 2011](#)).

Although the digital business-to-business (B2B) ecosystem is thriving in Africa, the COVID-19 pandemic is testing the burgeoning digital ecosystem's resilience. Consequently, the rapid development and uptake of digital technologies imply that the traditional transformation trajectory may occur in the reverse direction. The product sector's projected growth will happen only after the digital service sector matures ([Siripitakchai et al., 2015](#)). Rather than following the traditional incremental path toward integrated product services, it is expected that the continuous development of modular integrated services via a well-structured and mature digital service sector will have a more significant impact on product development and the service sector over the next couple of decades. Consequently, small digital firms and ecosystems are implicitly being set up to lead this transformation in Africa, such as the growth in mobile data usage, the introduction and uptake of new apps and the growth in mobile money transaction data (e.g. [Ndemo and Weiss, 2017](#)).

A digital ecosystem is a system of related entities that depend on one another while remaining independent and interacting in a way that enables the flow of information and transactions between different stakeholders (e.g. [Jacobides et al., 2018](#)). Digital ecosystems are essential for the African growth context in two main ways. First, digital ecosystems are vital for information sharing within the information technology (IT) network ([European Commission, 2007](#); [Iyawa et al., 2017](#)), which goes beyond this digital space. Second, the survival of the growing digital ecosystem landscape is crucial to Africa's economies (see, e.g. [Abor and Quartey, 2010](#); [Gbandi and Amissah, 2014](#)). As digital B2B entities interact, they build relationships that create networks; these networks constitute the basis upon which firms' future competitiveness depends via effective participation in and use of the digital ecosystem. As such, Africa presents a rich and diverse cultural context within which new kinds of relationships spanning digital and non-digital ecosystems may be assessed, given its religious, ethnic and political compositions. This broadly varying cultural context can create institutional voids unique to Africa, influencing business norms, practices and hence business relationships ([Ashiru et al., 2022](#)).

Despite its significance, Africa's digital structure is nascent ([Moussa and Schware, 1992](#); [Odedra et al., 1993](#); [Ogunsade et al., 2022](#)). Moreover, although emerging ecosystems have become used to infrastructure failures (e.g. power outages) that affect their ability to support and assure uptime for digital services (e.g. [Myovellaa et al. \(2020\)](#)), the risks posed by threats such as the COVID-19 are novel and bring new challenges to Africa's digital sector. Given the unprecedented scale of the COVID-19 pandemic and its impact on business interactions and relationships, a detailed exploration of how digital ecosystems, particularly the relationship structures that support such ecosystems, have been affected by the COVID-19 crisis is apt. The current article aims to fill this gap by investigating how the COVID-19 pandemic has impacted business relationships in Africa.

The authors collected interview and archival data (2018–2021) from a case technology company based in Lagos, Nigeria, to investigate the research question. By adopting a simple yet powerful framework – [Lambert et al.'s \(1996\)](#) partnership model – authors identified and analyzed the strategic shifts in the case company's business relationships by examining the

many relationships that the company maintains in its B2B ecosystems. The findings reveal that the resilience of the partnership structures functioned as the case company's supporting framework. Therefore, the authors posit that for African B2B firms, relationship and network development capability constitute one way of weathering extreme events, such as the COVID-19 pandemic.

This paper contributes to relationship network literature in several ways. First, we identify the range of relationships that make up the B2B network ecosystem. Extant studies have rarely considered the details of how relationships within digital ecosystems play out in times of crisis. Second, siding with [Cankurtaran and Beverland \(2020\)](#), this study shows that digital service firms can leverage the digital ecosystem to develop and maintain relationships and strategies in a digital market environment. Finally, we provide a deeper understanding of digital ecosystems' role in the resilience of business relationships in the African B2B context.

[Section 2](#) reviews the literature on digitalization, relationships, ecosystems, and some impacts of the COVID-19 pandemic. [Section 3](#) discusses the case company and the research approach. [Section 4](#) undertakes the analyses of the empirical data collected, and [Section 5](#) presents the findings. [Section 6](#) discusses the results and limitations and points out avenues for further research. Finally, [Section 7](#) concludes the article.

2. Literature overview

2.1 Digitalization, ecosystems and business relationships

In an environment with limited resources, rapid digitalization often leads to the formation of long-term partnerships among actors and stakeholders along the supply chain (e.g. [Krasnyuk et al., 2021](#)). From an African perspective, partnership formation usually involves African enterprises updating and modifying their unique local business models. Simple technologies that support economic activity and exchange before automation and digitization are currently giving way to pragmatic solutions, such as developing B2B ecosystems.

Ecosystem studies in business research tend to be broad and encompass the following three areas: business, innovation and platform ecosystems ([Jacobides et al., 2018](#)). These areas can create opportunities for service and interaction expansion in the African context via development and participation in digital ecosystems. According to [Jacobides et al. \(2018\)](#), a business ecosystem consists of an organization and its business support systems and involves stakeholders, organizations and countries that participate in exchange, production, trading, cooperation and competition (e.g. [Hult et al., 2020](#)). Innovation ecosystems drive focal innovations and studies dealing with such systems emphasize the components and complements that support innovations. Components support upstream structures in the innovation process, while complements support downstream structures. Lastly, platform ecosystems involve technologies whose primary purpose is to provide opportunities for interactions between customers and service providers ([Xu et al., 2021](#)).

More specifically, digital platforms explore the interdependence between a platform's sponsors and its complementors ([Jacobides et al., 2018](#)), whose role is to make the platform more valuable to the customers using it ([Ceccagnoli et al., 2012](#)). The business ecosystem allows the entities participating in the ecosystem to discover new ways of delivering services ([Yeon et al., 2020](#)), fostering business organization structures that drive new forms of cooperation between enterprises, such as new ways of value creation, even along the reverse transformational path from a service-oriented approach to a product-centered one. However, business ecosystems depend on digital relationship structures. Therefore, more research is needed on digital ecosystems and their functioning to investigate relationships not just within potentially disruptive situations but also across the range of business relationships.

2.2 Digital ecosystems

The definition of digital ecosystems has yet to be fully established and currently includes diverse elements, such as networking infrastructure (e.g. [Wu and Chang, 2007](#)) and services for co-value creation (e.g. [Karhu et al., 2011](#)) and to support business ecosystems (e.g. [Razavi et al., 2009](#)). Digital ecosystems act as peer-to-peer distributors of the technology infrastructure that enables connecting, servicing and disseminating information over the Internet ([Senyo et al., 2019](#)). Digital ecosystems are interacting organizations (e.g. suppliers, customers, third-party service providers and partners) that are digitally connected and enabled by modularity and are not managed by a hierarchical authority ([Jacobides et al., 2019](#)). [Senyo et al. \(2019\)](#) described digital ecosystems as sociotechnical networks of entities, firms and technologies that jointly co-create value. The value co-created by stakeholders in such ecosystems is presumed to be superior to that created by a single organization ([Adner, 2006](#); [Vargo et al., 2008](#)). [Darking and Whitley \(2007\)](#) described an ecosystem as a concept, a technology, or a project, thus underscoring digital ecosystems' ability to facilitate value co-creation from the conceptual premise to realization.

According to [Valdez-De-Leon \(2019\)](#), the three essential building blocks of a successful ecosystem are (1) the digital platform, (2) the network effect concept and (3) market expectations. [Wortmann et al. \(2020\)](#) defined a digital platform as a fundamental digital market structure that simplifies, coordinates and centralizes tasks and transactions. The centralizing function of a digital platform allows the platform to act as a facilitator between actors or groups of entities (e.g. [Drewel and Gausemeier, 2018](#); [Wei et al., 2019](#); [Xu et al., 2021](#)).

The networking role is vital to the concept of a platform for both business and operational reasons ([Valdez-De-Leon, 2019](#)). These business and operational components ensure that the platform can support the creation of appropriate incentives (social, financial, environmental, etc.) and systems for supporting value creation and allocation among participants. The operational component focuses on the platform's capacity to develop specific abilities to support the rapid expansion of the digital ecosystem, such as providing a technical foundation for the development of smart services ([Anttiroiko et al., 2014](#)).

Market expectations refer to how potential future platform participants perceive the platform's attractiveness in terms of meeting challenges in the long run. Operationally, market expectations refer to the number of users expected to interact with a platform ([Eisenmann et al., 2007](#)).

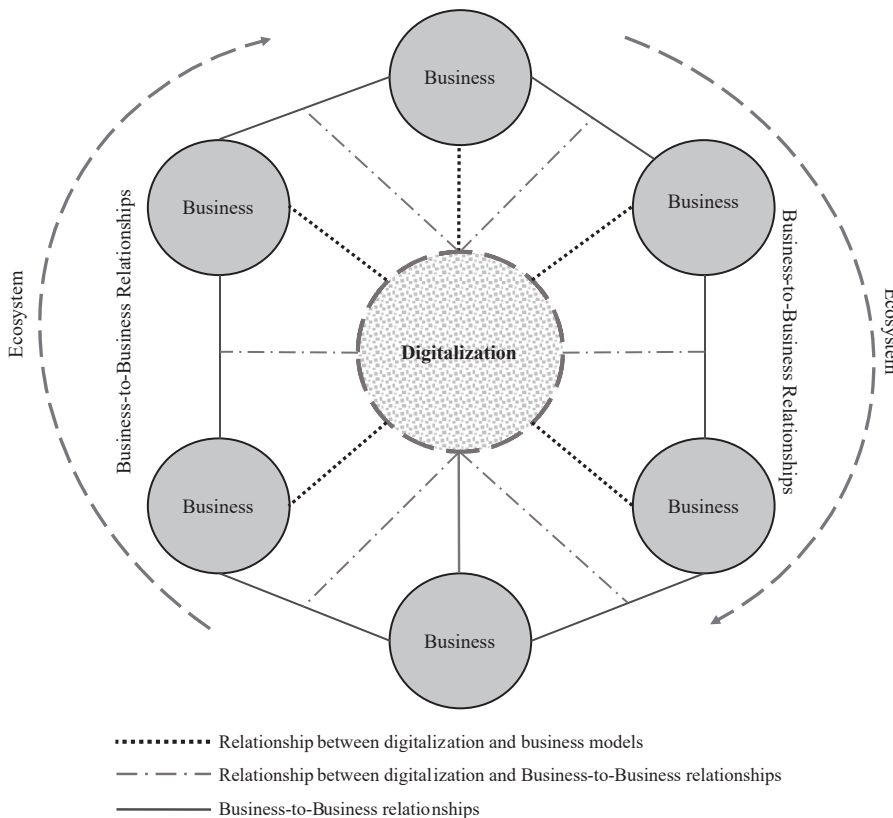
Consequently, partnerships (or business relationships) in digital ecosystems are inevitable and provide reliable and affordable services in complex socioeconomic structures that include many private and business users ([Krasnyuk et al., 2021](#)).

2.3 Business relationships and digital ecosystems

Business relationships in the digital age involve diverse players from various locations, which mean that collaboration often occurs in remote settings across geographic, language and cultural boundaries. As digital B2B businesses interact, they build relationships with their customers, clients and service providers. Eventually, digital B2B businesses find partners and, ultimately, create networks in which products and services can be integrally servitized and integrated to provide innovative offerings that emphasize the complementarity of relationships (e.g. [Hart and Moore, 1990](#)). Each industry tends to have its own unique mix of relationship types ([Valdez-De-Leon, 2019](#)) and understanding these mixes can help managers find the best possible configurations for their specific situations. As organizations benefit from close business relationships through cost reduction and/or increased revenues, for small- and medium-sized enterprises (SMEs) and their stakeholders, relationships are vital and should be considered further. Relationship management aims to nurture strong ties and maintain loyalty to external stakeholders (e.g. [Smith, 1998](#)). Therefore, business relationships are said to be long-term and

stable but not static (Alajoutsijärvi *et al.*, 2001). Over time, business relationships need to be changed and adjusted (or adapted) to make them continually successful as well as steady and predictable (e.g. Claycomb and Frankwick, 2010; Polonsky *et al.*, 2010). During periods of change and uncertainty, firms tailor their resources to accommodate the products or processes of the parties with whom they are in relationships (Dalsace and Jap, 2017); in other words, firms adjust to the needs of their partners.

Firms can actively anticipate changes in relationships at the following four levels (Ritter and Gemünden, 2003): individual, group, organizational and IT ecosystem levels. Adjustments to periods of economic difficulty, crisis, or uncertainty may be formal, informal, technological, or process related and most often require investments by one or more involved parties. Such investments are critical to business relationships because they generate trust and familiarity between interacting parties. Willingness to implement adjustments or adaptations indicates a party's level of commitment. Thus, firms within an ecosystem become mutually dependent and develop value-adding relationships as they work together to manage the flow of goods and services along the value-adding chain (Anderson *et al.*, 1994), enabling SMEs to compete against larger firms. This complex interaction between firms in the digital ecosystem is a continuous flow of action and feedback interactions that we represent in Figure 1, with digitalization at the core and business relationships within their broader digital ecosystem, which are of interest in this paper.



Source(s): Authors' conceptualization

Figure 1.
Inter-relationships
between digitalization,
digital ecosystems, and
business relationships

2.4 Impact of COVID-19 on business to business

The COVID-19 pandemic came with a lot of uncertainty at various levels across the globe. Individuals, organizations, countries and the world faced the challenge of figuring out how to maneuver the challenges that come with it (Abhari *et al.*, 2022; Mitchell, 2021; Rodrigues *et al.*, 2022).

On the organizational level, more specifically, B2B organizations faced the immediate loss of customers (Cankurtaran and Beverland, 2020). Therefore, organizations began to take actions that would enable them to weather the storms of these uncertain times. For instance, an organization's use of disruptive thinking brings innovative solutions, such as using its production line to produce medical supplies, such as sanitizers and masks, thereby making the organization more resilient (Cankurtaran and Beverland, 2020). Other organizations use cooperation, simultaneous cooperation and competition among themselves, which entails information sharing and collaboration to cope with the global crisis (Crick and Crick, 2020; Crick *et al.*, 2021). Greco *et al.* (2022) suggested that knowledge sharing as part of interfirm collaboration is a performance-enhancing strategy.

Regarding collaborations between organizations for innovative solutions in coping with the pandemic, some scholars have argued that not all COVID-related innovations are profitable. For instance, after studying 18 COVID-19-related innovations, Greco *et al.* (2022) argued that institutional motivations have driven the most radical and incremental innovation projects. These innovations were achieved through collaboration between either research and development institutions or a supplier–customer, exploring new business opportunities while benefiting from favorable contingent marketing effects. However, others had to redefine the purpose of the business by focusing not only on the investor but also on all stakeholders, even at the expense of short-term losses (Sheth, 2020).

In the less developed markets with significant institutional inefficiencies and perennial resource scarcity, SMEs depended on the micro-foundations of relational exchanges to enable them to develop a B2B crisis management relational exchange framework (Ashiru *et al.*, 2022). COVID-19 also affected micro and small enterprises (MSEs), especially in developing countries, regarding digital money payments because of their limited use of digital technologies (Bai *et al.*, 2021). Further, van Klyton *et al.* (2021) argued for the presence of simultaneous value co-creation and value co-destruction in rural communities in Columbia with digital and financial deficits due to cultural norms. Eze *et al.* (2014) suggested that SMEs constantly interact with various actors to keep up with new IT development and benefit from emerging opportunities. This research investigates a B2B SME with more developed access to technology to determine how the COVID-19 pandemic impacts business relationships.

3. Methodology

3.1 Case company description

SMEs account for up to 90% of businesses in Africa (see, e.g. Abor and Quartey, 2010; Gbandi and Amisshah, 2014). The digital ecosystem offers small- and medium-sized entrepreneurs an interactive means of monitoring their performance over time (Nachira *et al.*, 2007). Our study investigated an SME in Africa. Although an SME is typically a private sector workplace with 250 employees or less (e.g. Muriithi, 2017), organizations with up to 500 employees may be considered SMEs (e.g. Kinnie *et al.*, 1999; Short, 2019).

The case company was created in 2008 to provide first-class, unique and premium solutions geared toward meeting clients' business objectives through the use of appropriate and cost-effective technologies. Over the years, the company has developed robust competencies and a competitive edge in providing critical services in fintech, software engineering, enterprise security and infrastructure, communication technology, e-business development, government transformations, systems integration, IT consulting, process

re-engineering and more. The case company has become a force to be reckoned with in and beyond Europe, the Middle East and Africa. By the end of 2020, it had cumulatively and successfully executed 1,065 projects and had an active staff of 338 full-time employees; 7 branches across Lagos, Enugu, Abuja, Dubai, Ghana, Ethiopia and Kenya; 121 established customers; 16 subsidiaries and 69 technology partners. The case was selected because the company represented the typical burgeoning IT services firm within Nigerian and African contexts. In what follows, we introduce our research methods.

3.2 Methods

Given that one objective was to develop a typology of the relationships that exist in the digital B2B ecosystem in Africa, the study followed a single-case explanatory–exploratory methodology (Levy, 1988). In other words, we adopted Stake's (1995) stance of case study research, which is underpinned by interpretivism, whose purpose is to understand the uniqueness of the case in its entirety, favoring particularization over generalization and enabling us to inductively extend extant theory. Case studies offer researchers the opportunity to explore a phenomenon deeply from a site with rich, detailed and evocative data, thus enhancing the case study's explanatory power and potential for contextualization (Welch *et al.*, 2011).

This study explores an SME of Nigerian origin that has been in B2B relationships for over a decade. Nigeria may be considered representative of Africa (particularly sub-Saharan Africa), given its population of over 211.4 million (World Bank, 2021). Thus, one in five Africans is a Nigerian. Further, the population of Nigeria provides a cause of concern for the possible impact of COVID-19 at the individual, organizational and county levels. Second, the country's economic situation —low development, resource scarcity, government inefficiencies and institutional deficiencies (Eze *et al.*, 2021) – make it highly dependent on imported products and services, such as IT. Thus, partnerships with foreign companies are prevalent in Nigeria. Therefore, the selected case provides an ideal avenue for investigating how the COVID-19 pandemic impacted business relationships in Africa.

Finally, with secondary data constraints in such a context, there are difficulties in systematically conducting empirical research (Smallbone and Welter, 2006). Therefore, we resorted to primary data via interviews because we were interested in the specificities of the context and because our case provided a strong empirical site for answering our research question (Crick, 2021). Given that our study adopts a single-case study, it is a typical case and thus representative of the everyday business and relationship circumstances of SMEs within the digital ecosystem in Africa; thus, multiple sources of qualitative data from the case company are critical (Crick, 2021; Stake, 1995).

3.3 Data collection

The case company is an integral part of the digital B2B ecosystem – the company had to interact with the physical value-creation ecosystems through support and rendering to create and secure value (Pattinson and Johnston, 2015). The interviewees were selected based on their involvement in conceptualizing, developing and implementing digital solutions for their company, customers and partners. Due to their managerial positions, it was crucial for the participants to possess extensive and varied knowledge of the organization and its relationships with stakeholders, customers, suppliers and the like; thus, our informants are the most knowledgeable persons in the company (Crick, 2021).

We conducted semi-structured, in-depth individual interviews with seven top management executives, including the CEO, in 2020 (see Table 1), focusing on the COVID-19 pandemic's impact on the firm's operations and relationship structures. Each interview lasted between 45

Table 1.
List of respondents

No.	Code	Respondent's role	Role		Level code
			1 = Management 2 = Finance 3 = IT	4 = PR 5 = R&D	1 = Strategic 2 = Tactical 3 = Operational
1	A1	MD/CEO	1		1
2	A2	Head of finance	2		1, 2
3	A3	DVP, solutions engineering	3		3
4	A4	DVP, business development and sales	5		1
5	A5	DVP, security solution	3		2
6	A6	SVP business services and operations	3		2
7	A7	SVP, public sector	4		2

Note(s): MD/CEO – Managing Director/Chief Executive Officer; DVP – Deputy Vice President; SVP – Senior Vice President

and 60 min. First, we established rapport by asking the participants about themselves and their roles in the company. We then asked the participants questions regarding their business relationships, the impacts of the pandemic and the status of the firm's business relationships, with a focus on how the participants bridged relationship gaps at the height of the pandemic. Given the circumstances surrounding the pandemic at the time, we conducted telephone and video (Zoom) interviews.

In addition, we obtained empirical data from the company's chief finance officer (CFO) regarding the company accounts of existing customers and service providers. This means that after our interviews with top management in 2020, we received relationship status data via emails from the company CFO that covered the previous years (2018 and 2019), interview year (2020) and post-interview year (2021). Hence, we collected data for ongoing relationships over four consecutive years, from 2018 to 2021, as shown in [Table 2](#).

Furthermore, we collected data from the company's websites and reviewed company reports, agreements and project documents to contextualize the interviewees' responses. By doing so, we triangulated the various aspects of the case using different data sources ([Jick, 1979](#)), thus generating richness with small samples in qualitative research ([Crick, 2021](#); [Stake, 1995](#); [Welch et al., 2011](#)).

3.4 Guiding framework and data handling protocol

We used [Lambert et al.'s \(1996\)](#) partnership model as our theoretical model for developing relationship types. The model defines six business interaction levels and three partnership-level relationships ([Lambert et al., 1996](#)). We chose a model with a supply chain perspective because in the contemporary business environment, it is impractical for one firm to own more than a small slice of the entire value-creation or demand-fulfillment process, as argued by

Table 2.
Overview of interactive relationships during the studied period

	2018	2019	2020	2021
Customers	87	90	121	153
Vendors (OEM)	22	22	24	26
Vendors (Local)	26	26	25	36
Bankers	17	19	19	20
Related Parties	18	17	19	20
Total	170	174	208	255

Vargo *et al.* (2008) and Adner (2006). Therefore, we explored the data to determine the different types of relationship structures that the organization has built up over the years as part of the developing B2B digital ecosystem. The data provided insights into the case company's relationships. We also investigated the data for possible evocative outcomes related to the different relationship types.

Our protocol for handling the data was as follows: First, using a list of B2B interactions received from the case organization, we organized them via classification groups commonly used in day-to-day organizational management (e.g. customers, vendors and bankers) to denote the relationships between the case company and other companies. We further divided customers into financial institutions, academic institutions, the public sector or parastatal organization, oil and gas and others. The "others" category of interactions included power distribution and telecommunications companies, health management institutions and diplomatic corps (embassies). Second, we determined and classified the three non-partnership relationship types using popular business definitions, such as arm's-length relationship, joint venture and vertical integration. Third, we applied cognitive operations to the recorded data to gain further insight into the representations, processes and strategies underlying the transactions and activities (Timpe *et al.*, 2004) and distinguished Types I, II and III relationships based on Lambert *et al.*'s (1996) partnership components. The analysis included the level of coordination between interacting parties and integration (i.e. the number of activities jointly carried out by the case company and its partners, spanning multiple divisions and functions across both companies). Usually, these integration activities ensure an uninterrupted flow of information to support the competitiveness of the interacting parties across the digital ecosystem. Finally, we analyzed time-planning horizons, which refer to the case company's relationships across short-, medium- and long-term planning horizons.

4. Empirical data and analysis

We conducted all our data analyses manually, using applications such as Microsoft Excel to organize our data. Moreover, because we collected the data ourselves and knew the intricate details of our data, we could code themes based on our knowledge of the events in our study (e.g. Crick, 2018). Manually coding empirical data is a credible and effective technique for analyzing qualitative data (Crick, 2021). In the next sections, we explain how we analyzed our archival and interview data.

4.1 Archival data

Our archival data refer to the data we collected for the case company's relationship structure over four years (2018–2021). From these data, we identified 255 B2B relationships maintained by the case company, relationship types and the length and level of the relationships between stakeholders and the case company. We based the relationship classifications on Lambert *et al.*'s (1996) partnership model, which consists of three stages, as shown in Figure 2.

Stage 1 categorization reflected standard business definitions and day-to-day operational monikers of interaction types in the case company. The day-to-day monikers used for B2B digital relationships in the case company revealed the following five broad categories of relationships: *subsidiaries*, *customers*, *international vendors* (Original Equipment Manufacturers - OEMs), *local vendors* and *financiers* or banks.

Stage 2 identified two of the model's three non-partnership relationship types: *arm's-length relationship* and *vertical integration*. We also identified a new category to Lambert *et al.*'s (1996) model not previously named, *horizontal integration* and represented

the case company's ability to manage a specific activity or a set of operations at the same production stage across several subsidiaries. The case company performed sensitive and specialized tasks for its subsidiaries and associated firms as part of its management practices.

Stage 3 involved Lambert *et al.*'s (1996) criteria for Type I, II and III relationships. Therefore, we identified three relationship types, as specified by Lambert *et al.*'s (1996) model. Types I, II and III accounted for an average of 14%, 3% and 4% of the case company's total interactions, respectively across the study period, as evidenced by the collected data and records.

Although some entries in the case company's records showed up as interactions, the company had not had any transactional relationships with these organizations in the last three years. Therefore, we could neither classify nor discard these relationships. As depicted in Table 3, we described such B2B relationships as "Not classified," which averaged 6% in the first three years, and 20% in the final study year 2021.

Regarding the types and mobility of relationships, we found increasing difficulty in the components required to initiate and maintain relationships. This suggests that in moving from Type I to III, there was a progressive decline in the number of relationships during the studied period, as shown in the characterization results in Table 3.

Our analysis of the data on interactive relationships with the customer segment showed that Types I and III were relatively consistent over the studied period, with minimal migration from arm's-length relationships to Type I, II and III relationships across the years. A significant turnover in the non-partnership arm's-length customer segment occurred over the years, with a substantial number of one-off transactions with customers resulting in no repeat business.

The findings revealed a slight increase in customer relationships in the public sector during the period studied. Even though relationships across the board fluctuated over the studied period, relationships with financial institutions remained central to the case company's economic productivity and sustainability. The downturn in economic activities brought about by the COVID-19 pandemic had little impact on partnership relationships; however, this was not the case with non-partnership relationships.

The "Other" category segment, while experiencing high turnover in clients, had little or no impact on the organization due to the arm's-length relationships between the case company and its customers. The vendor (OEM) segment represented the international and national partners that the case company worked with to provide services and value for customers and clients; no significant changes in the interactive relationships between the case company and its vendor (OEM) segment were observed.

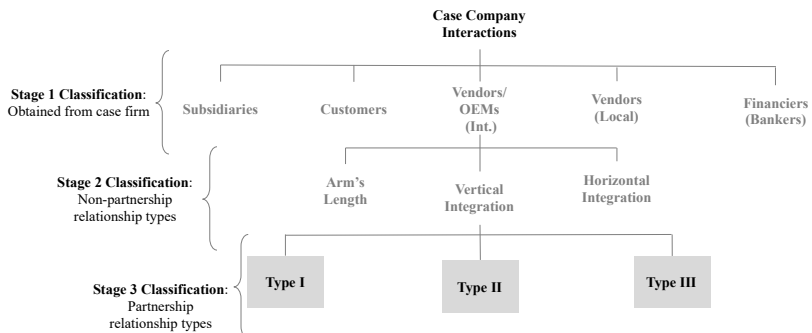


Figure 2. Classification (typology) process by stage

	Non-partnership interactions			Partnership interactions			Not classified	Total
	Arm's length	Vertical integration	Horizontal integration	Type I	Type II	Type III		
<i>2018</i>								
Customers	71	–	–	10	3	3	–	87
International vendors (OEMs)	15	–	–	4	–	3	–	22
Local vendors	12	–	–	12	2	–	–	26
Bankers	14	–	–	2	–	1	–	17
Related parties	–	3	4	–	1	–	10	18
Total	112	3	4	28	6	7	10	170
<i>2019</i>								
Customers	71	–	–	10	6	3	–	90
International vendors (OEMs)	14	–	–	4	1	3	–	22
Local vendors	12	–	–	12	2	–	–	26
Bankers	16	–	–	2	–	1	–	19
Related parties	–	2	4	–	1	–	10	17
Total	113	2	4	28	10	7	10	174
<i>2020</i>								
Customers	95	–	–	14	5	3	4	121
International vendors (OEMs)	16	–	–	4	–	4	–	24
Local vendors	12	–	–	10	3	–	–	25
Bankers	17	–	–	2	–	–	–	19
Related parties	–	3	5	–	1	–	10	19
Total	140	3	5	30	9	7	14	208
<i>2021</i>								
Customers	98	–	–	15	4	7	29	153
International vendors (OEMs)	9	–	–	4	–	4	9	26
Local vendors	21	–	–	12	2	–	1	36
Bankers	16	–	–	2	–	–	2	20
Related parties	–	3	5	–	1	–	11	20
Total	144	3	5	33	7	11	52	255

Table 3.
Business relationship
characterization
2018–2021

4.2 Interview data analysis and results

The interviews involved open-ended questions to investigate how the case company had been affected by the COVID-19 pandemic, especially regarding its partners and service clients. We formulated the interview questions to allow for the emergence of supplementary topics (Charmaz, 2006; Seidel and Urquhart, 2013) and queried interview data to allow for possible new insights and to identify the similarities and differences between the interviewees (Urquhart, 2013). An interpretive approach can make it possible to access reality through the participants' experiences of the studied phenomena (Clark *et al.*, 2010). Additionally, findings from an interpretivist stance are inductive and support theory extension (Stake, 1995). In order to address the impacts of the pandemic on the case company and its partners, we employed a thematic coding process in which we identified patterns in our qualitative data and effectively highlighted links between analytical themes (Braun and Clarke, 2006). Thus, we coded by identifying and iteratively assessing our raw data for themes, higher-level

themes and overarching dimensions – that is, we relied on a three-level process similar to that described by Gioia *et al.* (2013).

We generated *first-order themes* by reading the responses and identifying the terms, words and phrases that emerged repeatedly throughout the interviews, for example, “*service delivery was affected due to inability to interact.*” The second stage of the analysis consisted of developing higher-order themes by identifying theme patterns among the first-order concepts, such as “*Experiences*” and “*Revenues.*” Comparing the interview transcripts enabled us to refine the data structure for the most pertinent questions and responses and generate aggregate dimensions. To enhance the credibility of our data analysis and the trustworthiness of our findings, both authors coded our data independently; we compared the outcome of our second-order theme and got a match of about 81%. An 81% match surpasses the 70% benchmark suggested by Miles and Huberman (1994), and we reached mutual agreements in areas that did not match. In the third stage, we further refined and aggregated the themes identified in the second stage into broader constructs based on insights from the literature (e.g. Kumar *et al.*, 1993). As such, we achieved a higher level of abstraction to a third-level aggregate dimension by further analyzing and validating the codes from the previous level. Figure 3 is an illustrative example of our data coding structure overview.

Finally, we considered the logic of and the relationships among the aggregate dimensions and generated our model by building on the various themes that emerged from the results of the data analysis at the aggregation dimension stage. Overall, three themes emerged from our data coding process – relationship management, IT ecosystems and change management – regarding the direct and indirect impacts of the COVID-19 pandemic.

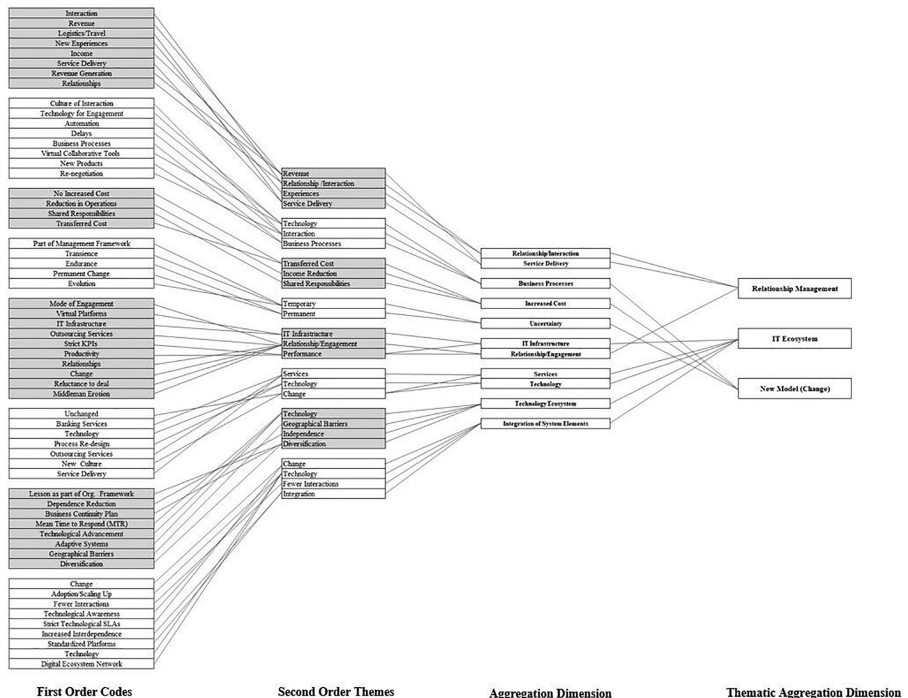


Figure 3.
Data coding structure

5. Findings

To explain the impacts of the COVID-19 pandemic on partnership structures in the technology and IT sectors in Africa, [Figure 4](#) presents the model that emerged from our data analysis. In the next sections, we explain these constructs – relationship management, IT ecosystems and change management – and their inter-relationships.

5.1 Relationship management: the shrinking role of the middleman

Business relations may develop in a variety of ways. As the case company dealt with different types of entities, from education to financial to innovation-focused companies, the relationships maintained by the organization spanned the entire relationship continuum. The case company played different roles for different entities represented by the various relationships. Regarding these roles, the data suggested that relationship interactions formed the basis of business exchanges, at least in the B2B context. Relationships play a key role in business and the absence of such relationships puts pressure on an organization.

This disruption in the business relationship trajectory brought the evolving relationship between business relations and IT infrastructure to light more clearly, as “activities progressed more via the digital platform as opposed to physical engagement.” The lack of physical engagement “severely hampered service delivery,” which affected many key performance indicators (KPIs). For example, due to the rapid switch to working from home, managers had to develop new and, in some cases, stricter KPIs that reflected the reality of the business climate. In the relationship marketing literature, such adjustments are addressed as adaptations aimed at preserving close relationships during economically uncertain periods using several means, including cost reduction or alternative services.

Similarly, a senior vice president (SVP) spoke about the difficulty of getting customers to engage in operational processes. In his words, “because most businesses were uncertain about the situation, they were reluctant to do business as usual, [and] we had to engage in new partnership arrangements focused on non-monetary benefits” (A6). In a similar manner, the CEO spoke about adaptation to the ongoing crisis and how timing was critical in such situations: “If we had not adapted well, specifically with our sales and engineering teams, it would have surfaced in many services delivery gaps or failures” (A1). In addition, as discussed by an SVP, “the middleman business portfolio is being eroded. The customers now negotiate pricing directly with the OEMs. This is a problem because customers now demand

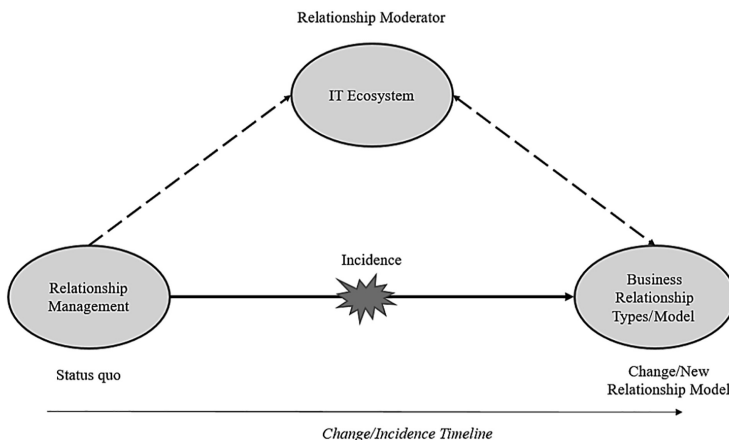


Figure 4.
Incidence
relationship model

a longer price validity period, which can only be achieved with more stable currencies, like the United States dollar” (A7). However, the Nigerian Naira became unstable, which placed capital burdens on SMEs to upgrade their technologies in-house or buy IT services from within the business ecosystem. These effects were prevalent among SMEs that worked in linking roles as intermediaries or brokers and focused on services connecting different members of the business ecosystem.

5.2 IT ecosystem: dependence on technology to maintain relationships

The IT ecosystem is an emerging environment in the African context. It typically includes stakeholders from the finance, governance, infrastructure, marketplace, regulation, culture and network structures and seeks to integrate all these individual entities into one coherent value-creating and profit-generating system. One way this ecosystem is beneficial for business resilience has to do with SMEs’ rapid development of digital technologies, which can support service delivery under challenging local conditions. Therefore, the technologies present (or absent) within the ecosystems themselves can affect the quality of the services provided, thus impacting business relationships between SMEs, as occurred with the case company and its collaborators.

In the context of our interviews, the IT ecosystem was related to the pandemic’s impacts on the technology system that supported the provision of services to and by the case company, as experienced by managers in relation to the many instances when existing systems were either not providing the desired results or were simply missing the (new) mark when put to the test during the early stages of the pandemic. The case company had to quickly develop, use and integrate new technologies to meet its partnership and service obligations within the ecosystem. This situation was acknowledged by the case company’s management, for example, when A1 emphasized the following:

The implication of the existing technology ecosystem will be such that it will encourage adoption and scaling up of various technologies that will encourage or support fewer interactions with people. Thus, managers had to quickly leverage the organisation’s skills, talents and innovativeness to provide something close to service-as-usual. Our product development team went into work and started looking at either existing products that we could rebrand around the pandemic realities or brand-new products that we could quickly take to the market because of the obvious values it could bring given the situation. In that regard, we were able to come up with a virtual classroom, which was an adjustment to an existing product that we already had for the distance learning program, and a virtual court solution, which was also an adjustment to the classroom, which we felt could also be used by the judiciary in our courts.

Few organizations in the business ecosystem could carry out such swift upscaling of service capabilities in such a short time (approximately three months). Such flexibility emphasizes the innovativeness that is possible when modern IT infrastructure is available to SMEs working in the IT and technology sectors. Swift upscaling of service capabilities also enabled the continued maintenance of relationships despite sudden global disruptive events, such as the COVID-19 pandemic. Regarding our case company, the organization’s business responsibility involved building and maintaining relationships, as emphasized by management: “We run a system that is largely built on social interactions and relationships with very inclusive mentorship” (A6). Therefore, the organization needed to ensure that relationships were closely managed and maintained. In other words, as usual, the ability to provide services depends on the appropriate management of relationships. The interview data showed that business relationships with a proper partnership structure were relatively unaffected by the pandemic. For example, (A1) stated the following:

In our organisation's DNA, we don't seem to be averse to change the way many people are. We are always quick to come to terms with the business environment's realities, even when the realities involve a major shift from the way things are done. I really do not think the changes we experienced due to the pandemic had any impact on our partnership structure.

However, this was not the case, as revealed by the data on active relationships. Over the studied period (2018–2021), partnership data remained relatively unchanged. Meanwhile, non-partnership relationships increased toward the end of the studied period, with the most significant increase occurring at the end of 2020. Overall, during the studied period, non-partnership relationships increased by almost 28%, while the change between 2019 and 2020 was about 24%. The category of business relationships designated as “Not classified” increased by more than 400% over the studied period.

5.3 Change: triggers for the relationship paradigm shift

While firms can manage their business relations by observing and reacting to the predictable variables in their relationships, they can also actively anticipate changes by following current economic and other factors. As discussed in the marketing literature, change can happen in several ways; however, for our case company, the anticipation of changes was chiefly brought about by the following three main factors: increased costs, uncertainty and business processes.

The intensity of the cost escalation was quite significant, as the education sector accounted for roughly 35% of the company's clients in the customer category. As one manager noted, “One of the ways my organization has been affected was in terms of our revenue generation from schools, which account for about 30% of our revenue. Due to the lockdown, schools were closed, hence no revenue coming in from schools to which we provide services” (A4). However, there were some upsides to the cost issue:

On the flip side, I think that the pandemic also brought a few positives. One is in the way we manage logistics – travels, to be specific. In the past, our business managers spent several hundreds of millions of dollars as the cost of travel. As a result of the pandemic, travels decreased, so travel cost went down as well. (A1)

Uncertainty among managers and in the organization was evident in the changes that had to be made and the rapid pace at which they were implemented, without knowing how long the changes and adjustments would be needed. As a result, the organization's focal areas had to be reconsidered for economic and relationship purposes, as explained by the CEO: “Focus has been shifted to more economically resistant sectors in relation to the virus, such as IT infrastructure and outsourcing and professional services, which were immune to the effects of the virus” (A1).

The last factor that contributed to this overall change theme had to do with changes in organizational business processes that affected the relationship structure between the case company and its business stakeholders. According to the management, the reasons for undertaking and implementing these changes included the general belief that a new era was emerging. As aptly explained by the SVP for business services and operations, “The pandemic introduced new ways of doing things and required adjustments to our business model and service delivery”; “furthermore, because most businesses were reluctant to spend, we had to engage in new partnership arrangements focused on non-monetary benefits” (A6). The deputy vice president for security and solutions also made similar comments: “This means a lot of processes have to be redesigned to work with the new normal” (A5). These observations provided additional context to the findings from the data analysis, which uncovered management's belief that several of the changes undertaken and implemented during the pandemic would be permanent. Comments from the management team regarding their perceptions of how long-lasting some of the changes would be overwhelmingly predicted (approximately 85%) the permanence of the changes, which should eventually lead to new norms for managing business processes and relationships. For example, one management team

member stated the following: “The COVID-19 pandemic has ushered in a world of endless possibilities which will permanently change some ways of doing things” (A4).

6. Discussion

While significant studies have investigated the relationships in Africa’s SME context (e.g. [Amoako and Matlay, 2015](#); [Stoian et al., 2017](#)), the dynamics of business relationships in the fast-growing SME digital ecosystem in Africa have received scarce attention. Business relationships between collaborators, partners and commercial stakeholders are usually fraught with complexity, conflicts and uncertainty, primarily due to internal and external environmental changes in such alliances. By examining the experiences of a burgeoning company in the IT and related service sectors, this study sheds light on the COVID-19 pandemic’s impacts and organizational responses to the crisis.

The pandemic disrupted communications, interactions and engagements between businesses. In [Figure 4](#), our model shows that relationships were affected directly by the management level and indirectly by the level of the IT infrastructure and ecosystem. Business relationships are a constant work-in-progress because they are affected by multiple issues. Second, the model highlights the fact that IT and its ecosystem infrastructure moderate the evolving relationships in existing interactions in an uncertain and disruptive context. Third, although our results did not indicate any impact of the pandemic on contractual business relationships (e.g. partnerships), a new type of business relationship emerged from the data. This business relationship sought to carry on business as usual with partners, with the IT ecosystem forming the basis of the relationship and subsequent engagements. Lastly, our results indicate that partnership models, with the help of advanced IT infrastructure, can help African SMEs bridge the business relationship gap by maintaining, identifying, or adapting to new relationship models during periods of increased uncertainty and disruption. Hence, our findings agree with [Cankurtaran and Beverland \(2020\)](#) that careful disruptive thinking to understand problems within their context can give rise to innovative solutions that consequently make an organization more resilient.

6.1 Theoretical contributions

Our study contributes to the literature in the following ways. First, we identified all the relationship and association types suggested in [Lambert et al.’s \(1996\)](#) partnership model for interactive relationships. The results show that the most affected interactive relationship segment consists of the groups that comprise the customer segment and belong to the arm’s-length relationship type. A possible explanation for this is the lack of trust and the weak formal institutional framework for mediating between transacting actors. Although the partnership patterns identified matched those from [Lambert et al.’s \(1996\)](#) model, the interviews revealed that several issues, collectively termed cultural and environmental factors, may moderate the concept/model relationship, as revealed by the case company and the reality on the ground. Thus, this finding aligns with that of [van Klyton et al. \(2021\)](#) regarding the impact of cultural contexts. Cultural factors can affect how organizations identify, develop and maintain relationships with other business organizations in the digital ecosystem, possibly resulting in false classification types. Cultural factors represent behaviors and attitudes learned directly or indirectly, openly or covertly, usually through social relations inherited across generations ([Olatunji, 2009](#)). Moreover, cultural factors vary across societies and may include demographic forces, as well as political, legal and bureaucratic forces ([Onodugo and Onodugo, 2015](#)). Type I partnerships account for most of the identified partnership associations, namely 16%, 16%, 14% and 13% across the four studied periods. As the manufacturing sector in Nigeria

is still mostly informal, it is unsurprising that 56–68% of all interactive relationships maintained over time were arm's-length relationships.

Second, regarding trust and commitment, Type III partnerships are known to be the most stable of all three categories in Lambert *et al.*'s (1996) model. Consequently, we relabeled this category “strategic partnership” due to the strategic nature of its elements. International OEM partners and vendors belong to this partnership type. Usually, OEMs are reasonably well-developed institutional partners, which enables integrated and long-term relationships to persist. Partnerships at this level enable digital SMEs to offer more than just basic services, as basic services are centered on supporting the functioning of a product (Baines and Lightfoot, 2014). In contrast, advanced service delivery involves helping customers achieve their desired outcomes. This suggests that the fewer interactive relationships at Type III within digital ecosystems, the more basic the company's services will be.

Third, our study reveals that Type III partnerships are key to resilient digital ecosystems with value creation and support capabilities. However, most Type III partnerships involve international OEMs, which are not necessarily based locally or regionally. This is also the case for B2B SMEs in Nigeria. In addition, the new interaction relationship type identified in the data – horizontal integration – evolved from case companies' attempts at hedging risks across international borders and diversifying beyond the home market by spreading the business and cultural risks associated with being located at and doing business in a specific market or country.

Establishing a relationship requires that at least one of the parties involved make the first move; however, our analysis has shown that this expediency is also necessary during conditions of economic uncertainty. More specifically, the study has revealed three ways in which business relationships in the digital ecosystem in Africa were affected by the COVID-19 pandemic. The severity of the impacts depended mainly on the type and caliber of relationships that organizations maintained, the infrastructure upon which the local B2B ecosystem depended and the evolving uncertainty embedded in working and maintaining relationships with affiliates in different parts of the world, as well as locally. These three factors can be related to different types of relationships, as the outcomes of the factors were somewhat diminished when relationships were underpinned by formal partnership agreements. Hakansson and Snehota (1989, 1995) stated that the relationship context must be managed through interactive behavior, which is usually guided by the values and norms of the firms involved rather than formal prescriptions about patterns. Even as business relationships are likely to develop and eventually become institutionalized, this article shows that when business relationships are tested by the fact that physical contact becomes untenable during crisis events, institutionalization tendencies diminish. Furthermore, the results showed that IT systems served as conduits between the ability to manage relationships and the relationship structure during the period of noncontact.

Although norms are crucial within the organizational context, they are developed in a culture of socialization over time, which allows entities engaged in relationships to reasonably predict responses to social circumstances common to a group of people (e.g. Hodgson, 2007). This embeddedness of norms can create situations that affect entities' capabilities to manage their different types of business relationships. With reduced uncertainty and prosperity, the norms and values of the related parties can become distorted to the point where they no longer relate well to the other party's needs. When such embeddedness practices, known as institutionalization (Nelson and Winter, 1982), occur in an organization, they may affect its relationships with other companies. Our study reveals that given the occurrence of uncertain economic and social events, relationship management activities focus on developing and establishing new and innovative ways of maintaining relational and business exchanges, as aptly argued by Morgan and Hunt (1994). An economy's transformation from a manufacturing to a service-based economy is

traditionally a long-term process (e.g. McKee, 2008). However, with the introduction and use of IT and information systems in manufacturing, marketing and commerce, the lessons learned from the pre-IT age can be applied to current systems to achieve servitization faster. Change management literature primarily suggests a three-phased process for a successful transition that consists of the present “state of affairs,” the transition phase and the desired or future state. Nevertheless, when handling change and transformation, the transition also works to disseminate innovations among industry professionals, service providers, contractors and employees (e.g. Kim and Min, 2015).

Finally, in the last several decades, economists have argued that large firms have the greatest advantages in innovation (Schumpeter, 1939, 1942; Galbraith, 1952). This perspective is mainly due to the claim that small firms cannot access resources that enable the acquisition of significant fixed assets for research and development and other specialized services in a concentrated market (Vossen, 1998). The same perception is also accurate for growth and innovation. Owner-managed firms and firms managed by professionals characteristically engage in different leadership, management and innovation behaviors, for example, in relation to ownership stakes and objectivity (Daily and Thompson, 1994; Jaouen and Lasch, 2015). However, for SMEs in the African context, our study agrees with Eze *et al.* (2014) that IT and its ecosystem are the means for remaining in business from IT development and even becoming competitive from emerging opportunities. The proliferation of digital B2B ecosystems is changing the way African enterprises interact with one another and with international partners via expanded communication technologies, as shown by the Incidence Relationship Model (IRM) in Figure 4. The IRM seeks to develop knowledge on interactions between business partners and how business relationships are supported and maintained during periods of uncertainty. As the need for products and services in and from Africa continues to grow, businesses need to understand, develop and maintain relationships and possibly make predictions, given certain conditions, about the trajectory of business relationships.

6.2 Practical contribution

Our study, especially from this less developed context, shows us that partnerships, especially with OEMs from the more developed context, can help organizations from such contexts weather the storms of business crises. Consequently, organizations should maintain a healthy number of partnership relations to deal with periods when challenges emerge in the business landscape. In other words, with tight contracts and a strategic focus on goals and objectives, partnership relations can help organizations weather business crises.

Furthermore, our study highlights the horizontal integration relationship among companies with shared services. In practical terms, this shared services model presents an opportunity to allocate resources and gain a scale economy across companies more effectively and efficiently by consolidating interfirm support services. These services range from the standard to the more complex. At a minimum, the affiliates must be treated like external clients or customers, with legitimate expectations of quality, service levels and internal economies, to justify consideration transferred for the services. However, the design of shared services requires careful navigation to avoid over-consolidating revenue in a single entity.

6.3 Limitations and future research

Our study was motivated by the need to increase our understanding of the resilience of B2B relationships' resilience in the African context, specifically in Nigeria, in relation to the COVID-19 pandemic. Understanding how the B2B digital ecosystem operates and how it develops over time in Africa's unique context is crucial to helping up-and-coming

manufacturing firms provide advanced services when faced with adversities such as the COVID-19 pandemic. We investigated the role that firm partnerships play in the digital space in Africa. Using Lambert *et al.*'s (1996) partnership model, we identified the different relationship types and developed a new category – horizontal integration – a kind of relationship into which companies enter due to their ability to manage a specific activity or set of operations at the same production stage across several subsidiaries.

However, our research involved certain limitations. First, the study was based on a single, longitudinal and albeit typical case, and the findings should be treated as early hypotheses that need further testing to be validated via confirmatory approaches. The study established a link between relationship attributes and IT infrastructure and developed a model for this setting. The model developed using our case study can be employed as input for a quantitative survey, which would also enable testing of not just the resilience of business relationships in the digital space but also the strength of the association between digital business relationships and IT infrastructure.

Future research on digital network relationships should investigate the evolution of relationship models during crises in digital ecosystems. Future research should emphasize the importance of network relationship resilience and the process of change, first from traditional to digital relationships and subsequently to higher forms of digital business relationship models. Therefore, due to the increase in partnership-based business relationships in Nigeria's digital B2B ecosystem, resilience to extreme events will be aggregate, incremental and path-dependent. Path dependency in this context can involve the systematic migration of arm's-length interactions in firm relations into mainstream partnership Type I or Type II, with a steady accumulation of partnership component levels, as suggested by Lambert *et al.*'s (1996) partnership model.

7. Conclusions

We have argued that the usual trajectory – the stepwise directional value-creation process from physical products to service-enabled products – is much shorter in the African context due to its rapid uptake of digital technologies. This accelerated development toward digital transformation in the technology sector is geared to occur between stakeholders in the digital B2B ecosystem because of the increasing development of information, communication and Internet technologies. Although the digital B2B ecosystems in Africa already face inherent challenges to their evolution, the COVID-19 pandemic is one type of challenge that can have devastating impacts on burgeoning B2B ecosystems, such as those of African SMEs. This article has investigated these challenges by identifying and estimating the pandemic's impact on a critical aspect of business continuity, namely business relationships.

Based on Lambert *et al.*'s (1996) partnership model and an in-depth case study of an IT-based organization in Nigeria's digital ecosystem, we investigated the impact of the COVID-19 pandemic on business relationships in the African context. The interview results revealed the pandemic's impact on business relationships. The following three consequential themes emerged from the study: relationship management, IT ecosystems and change management. Although the relationship analysis revealed that only certain types of relationships were affected, the interview results identified the major areas of business relationships that were impacted by the pandemic.

Our findings have important implications for digital network relationship research and practices by revealing how firms bypass traditional modes of business relationships to develop collaborative relationships via IT-enabled interfirm collaboration. Based on the study's results, we developed a theoretical model to depict how business relationships are impacted by sudden and unanticipated disruptions and uncertainties. The IRM can also

function as a means by which business relationship innovations can be modified during crises. Despite our focus on the services sector, the aspects of the digital ecosystem that affect business relationships are representative of general trends in the digital economy.

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