Viability amid systemic crisis: the CORER framework

Tiziana Russo-Spena and Cristina Mele
Department of Economics, Management and Institutions, University of Naples Federico II, Naples, Italy
Valtteri Kaartemo
Turku School of Economics, University of Turku, Turku, Finland, and
Francesco Caputo and Marialuisa Marzullo
Department of Economics, Management and Institutions, University of Naples Federico II, Naples, Italy

Abstract

Purpose – The COVID-19 wave spread all over the global market, affecting all industries. This paper aims to develop the understanding of how service systems can enhance their viability when facing rapid systemic changes.

Design/methodology/approach – The authors use data from Reddit, and particularly the subreddit r/coronavirus, to identify posts that discuss the impact of coronavirus on business. The authors use an algorithm to scrape the data with business-related search terms and elaborate relevant posts.

Findings – The findings show key topics and related sentiments on the impact of COVID-19 on business. Service systems can enhance viability by identifying alternative paths for emerging opportunities (by being creative), seize opportunities offered by the changing environment (by being opportunistic), not compromise conditions for internal balance (by being resilient), focus attention on critical purposes (by being essential) and perform nonharmful actions (by being responsible).

Originality/value – This paper proposes a framework depicting five possible key enhancers of viability to face a systemic crisis. In brief, companies need to ensure that they are creative, opportunistic, resilient, essential and responsible.

Keywords COVID-19, Systemic crisis, Crisis management, Viability, Creativity, Opportunism, Resilience, Essential business, Responsibility

Paper type Research paper

1. Introduction

Various triggers, such as bushfires, wars or viruses, may cause crises. However, in 2020, companies faced one of the most severe threats to profitability and survival. A pandemic, known as coronavirus disease 2019 (COVID-19), spread all over the global market, affecting all industries, and, as of early 2022, is still in progress. Close on the heels of the health emergency, COVID-19 has presented one of the worst systemic shocks since Second World War (Brown and Arnholz, 2020), and is likely to trigger wider systemic changes that are expected to transform social-economic and political settings (Georgieva, 2020). As a result, many businesses have been compromised, and business actors are questioning how to face difficulties, what scenarios might arise and how they can maintain or increase viability.

Crises happen in business (e.g. Exxon, subprime mortgage crisis), and crisis management (CM) is not a new topic in business studies (Kouzmin, 2008; Taneja *et al.*, 2014). However, a pandemic crisis is not a simple standalone business risk but an amplifier of new emerging challenges: significant risks for an open and networked economy occur, and new social and economic trends emerge that companies need to make the most of (Sheth, 2020). The distress of many sectors manifests via contagion between businesses and interlinkages in economic systems.

Corporate decision makers plan for ordinary business risk (Brown *et al.*, 2009). However, they also need to prepare for upheaval with a broader systemic impact. A pandemic is a systemic challenge arising from underlying interdependencies that can create havoc at an industry level and are often too formidable for any single firm to manage (Donaldson and Schoemaker, 2013). An increasing number of studies have considered COVID-19 as an accelerator of opposing challenges. Innovative organizational solutions have been arranged to rebalance resources and investments between businesses suffering declining demand and those experiencing a spike in demand (Alameeri *et al.*, 2021). However, as Dahlke *et al.* (2021, p. 1) noted, "the Covid-19 pandemic exhibits increasingly transboundary dynamics, causing interconnected problems across multiple societal systems" (In such a situation, scholars have argued that disruptive events represent harmful problems that require managers to break out of established patterns of thinking (Cankurtaran and Beverland, 2020). Hence, there has been a call for research on "how industrial

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firms can navigate through disruptive crises [...] can recover faster [and] can become more resilient" (Rapaccini *et al.*, 2020, p. 225). Despite this, few studies have taken a systemic perspective to consider the COVID-19 crisis (Iandolo *et al.*, 2021; Fehrer and Bove, 2022).

The business and industrial marketing literature has highlighted the importance of context and the viability of service systems within larger service ecosystems (Barile *et al.*, 2012; Lusch *et al.*, 2016). Some scholars have used the metaphors of complex adaptive systems (CAS) to describe forms of organizing that are evolving due to the increased demand for efficacy, flexibility and innovation (Barile and Polese, 2010a, 2010b). Part of the explanatory power of the system view is that it accounts for pluralism and dynamism within business and society (Akaka *et al.*, 2013; Siltaloppi *et al.*, 2016).

Survival is at the core of system dynamics (Barile and Saviano, 2013; Vargo and Lusch, 2016); therein, viability is "the expression of the will to survive in a complex environment and naturally exists within each actor who is engaging in integrating his resources within the [relevant] ecosystems" (Polese *et al.*, 2017, p. 927). Viability seems to be the fundamental concept for defining the processes through which companies can face and manage the multiple challenges imposed by crisis dynamics. Amid the pandemic crisis, companies are dealing with uncertainty. They need new perspectives, methods and practical steps to stay ahead of the emerging stage of the pandemic crisis and better prepare for future emergencies. The system view offers the possibility for uncovering the role of CM in turbulent, unpredictable and complex scenarios supporting viability. To address a systemic crisis, companies need to determine how they can position themselves for better viability (Saviano and Caputo, 2013; Polese *et al.*, 2018).

This paper aims to shed light on how companies as CAS can face systemic crises such as COVID-19. The following research question is posed:

Q1. How can service systems enhance viability to face a systemic crisis?

To answer the question, we used Reddit data, particularly the subreddit r/coronavirus, to identify posts discussing COVID-19's impact on businesses addressing this systemic crisis. At the time of data collection (April 2020), there were more than 200,000 posts on the subreddit. We used an algorithm to elaborate these posts by scraping the data with business-related search terms.

Our main contribution lies in our proposal of a framework for depicting five possible key enhancers of viability to face a systemic crisis. In brief, companies need to ensure that they are creative, opportunistic, resilient, essential and responsible (CORER).

The remainder of the paper is structured as follows: Section 2 summarizes the theoretical framework that develops the reflections herein; Section 3 reports primary information about the research path and method used; Section 4 describes the main results of the research; Section 5 introduces the CORER framework as a conceptual tool for explaining the ways in which viable systems can face rapid systemic crises; and Section 6 provides implications and directions for future research.

2. Literature review

2.1 Crisis management and systemic crisis

Studies on CM in managerial literature share a strategic dimension that considers CM's impacts on organizations' structure and dynamics (Wang and Belardo, 2005; Kouzmin, 2008; Taneja *et al.*, 2014). Sahin *et al.* (2015) clarified that:

> The aim of crisis management is not to try to prevent crises absolutely, but to minimize negative results, to have quick and high-quality responses, and to make preparations against all types of crises as much as possible (p. 2299).

The literature has depicted CM as a process through which organizations can face the challenges imposed by unpredictable events by modifying their structure and processes (Smith, 1990; Pedersen *et al.*, 2020). The fields of economics, finance and political science have widely addressed the systemic nature of crisis and its broader effects (Pauchant *et al.*, 1991; Pearson and Clair, 1998; Mascareño *et al.*, 2016). Management and business studies have particularly investigated the economic context (Elsinger *et al.*, 2006; Aldohni, 2018). A central issue is organizational resilience, described as the "ability of organizations to anticipate, avoid, and adjust to shocks in their environment" (Ortiz-de-Mandojana and Bansal, 2016, p. 1615). In the marketing discipline, increasing attention has been paid to the systemic nature of crisis following the outbreak of the COVID-19 pandemic. Sheth (2020) underlined how "Covid-19 has also pointed out the interdependence between the government, the business, and the local community" (p. 263), provoking a collapse of a consolidated view of crisis that is strongly limited to individual actors. In the same direction, Rapaccini *et al.* (2020) argued that:

> When facing a crisis with high levels of environmental complexity and turbulence, firms may need organizational structures and strategies that facilitate high levels of both incremental, exploitative changes and radical, exploratory changes (p. 227).

Similarly, Ardito *et al.* (2021) indicated that different ways to address COVID-19 have typically been improvised rather than following a planned strategy. COVID-19 can be considered "different" from previous crises due to its systemic and cross-dimensional nature which necessitates new frameworks and interpretative models (Nenonen and Storbacka, 2020; Mele *et al.*, 2021). The systems perspective can support management studies in addressing how companies can become sensitive to specific changes in times of systemic crisis and effectively react to a wide range of systemic changes, making them more resilient (Rapaccini *et al.*, 2021).

2.2 System approach, complex adaptive systems and viability

In business studies, scholars have recognized that using a system approach is crucial to consider the integrated and interacting phenomena as a whole (Spohrer *et al.*, 2007; Mele *et al.*, 2010; Jackson, 2016). The system view brings together aspects of interactions in marketing that form more than the characteristics of a system's parts. Interactions between the parts of a system (including people, firms, resources and

activities) produce, reproduce or change the parts, firms and other organizations involved in business markets and the way they are interconnected (Wilkinson, 2006; Golinelli *et al.*, 2012; Barile *et al.*, 2012).

A system has been defined as a "dynamic value co-creation configuration of people, technologies, shared information (language, value, measures) and other resources that interact with other service systems to create mutual value" (Maglio and Spohrer, 2008, p. 18). Service systems are CAS: complex in that they are diverse and made up of multiple interconnected elements, and adaptive in that they have the capacity to change and learn from experience (Gell-Mann, 1995; Holland, 2012). CAS interact with each other, mutually affect each other, and generate novel, emergent behaviour for the system as a whole (Holbrook, 2003; Barile *et al.*, 2016). They constantly adapt to the conditions around them as they scan their environment and develop schema representing interpretive and action rules. These schemas are subject to change and evolution (Simone *et al.*, 2021).

The system approach (Barile *et al.*, 2012; Barile, 2013) highlights the key role of viability in business management and the significance of resource sharing and collaboration in ensuring organizations' survival over time (Gummesson *et al.*, 2018). Viability is a function to balance stability and adaptation (Beer, 1995), and value can be perceived as anything else that assists a system's goal of remaining viable (Ma *et al.*, 2010). Viability is a feature of a system that is also adaptive, in that it has the capacity to change, learn and transform (Gummesson *et al.*, 2019). A viable service system has been defined as one that aims to achieve a final goal by transforming static structural relationships into dynamic interactions with other entities (Barile and Polese, 2010a). According to Espejo and Reyes (2011, p. 92), viable systems have problem-solving capacities:

> They can respond to unexpected events, to the emergence of new social behaviours and even to painful catastrophes. The latter capacity is the hallmark of viable systems; it gives them the capacity to evolve and adapt to changing environments. While a catastrophic event may at a particular instant throw the viable system off balance, the fundamental characteristic of viability lessens its vulnerability to the unexpected, making it more adaptive to change.

Several conditions are needed for a business to be considered a viable system (Barile and Polese, 2010b). As stated by Drăgoicea *et al.* (2018, p. 351), "a viable service system evolves as a triple loop learning system, aimed to improve (i) efficiency (plans), (ii) effectiveness (goals) and sustainability (relationships and resources)". Viability also relates to the concept of resilience, which is the ability of a system "to transform itself by absorbing recurrent perturbations, dealing with uncertainty and risk and still sustaining its essential properties" (Barile *et al.*, 2019, p. 97). In such a view, system viability can require keeping the state of some variables of the system stable while precipitating changes in the state of others (Simone *et al.*, 2021).

Scholars (Devine, 2005; Hartley *et al.*, 2013; Caputo *et al.*, 2019) have also stressed that the survival of any system comprises its ability to identify "alternative paths" through which it is possible to increase internal and external efficiency using the same resources in innovative ways. By catching and using environmental turbulence, a system can enforce its position in the market and survive (Davis *et al.*, 2014; Mele *et al.*, 2020). From a long-term perspective, viability stems from focusing more precisely on broader instances by overcoming the strictly firm-focused perspectives. A viable system should have in place strategies for individual and collective aims (Lusch and Spohrer, 2012; Barile *et al.*, 2019). Barile and Saviano (2018) stated that a viable system is one that is interested in creating conditions for harmonic relationships with all actors involved in its environment to ensure conditions for long-term collaboration and resource sharing. This means that a viable system must focus on essential purposes, avoiding being attracted by aims that are not strictly useful for ensuring socioeconomic balances inside the system's environments and, thus, its survival (Calabrese *et al.*, 2018).

More than ever, the COVID-19 pandemic is affecting business contexts, and companies will survive only if they can constantly adapt and evolve by adopting a systemic approach to face this systemic crisis. For example, Nenonen and Storbacka (2020 noted that firms need to be resilient, adaptive and "utilize shocks such as Covid-19 to generate new business opportunities". By adopting an ecosystem perspective, Fehrer and Bove (2022) explicated how organizations can apply stabilizing and destabilizing tactics to increase their resilience in times of crisis and beyond. Furthermore, they addressed how stability and changes need to be balanced, enhancing organizations' ability "to bounce back for survival in the short run and also bounce forward to thrive over time and reach a new state of order" (p. 8).

As knowledge of how companies face a systemic crisis to improve their viability is still scant, empirical research is needed to address these issues.

3. Methodology

We chose to follow an abductive approach (Dubois and Gadde, 2002) to address our aim, where framework, data collection and analysis evolve simultaneously. Strauss and Corbin (1990) illustrated the researcher's role as comprising systematic combining of constant back-and-forth movement between existing theories and empirical analysis to develop new theoretical insights. In the present case, recognizing research as a nonlinear process that started with observing a novel and disrupted phenomenon that is unaccounted for by existing theories had consequences for data collection.

While we could have brainstormed ideas for companies simply from what we were seeing around us, we did not consider this to provide sufficient evidence. We did not want our study to be limited to local communities. As the pandemic spread rapidly and forced companies to focus on survival, managers did not have time to participate in academic studies. Therefore, we needed novel research methods to develop ideas on ensuring viability in such a context. We decided first to analyze the global business news related to the COVID-19 outbreak and then to derive ideas from these findings on how organizations could better prepare for such changes in the future.

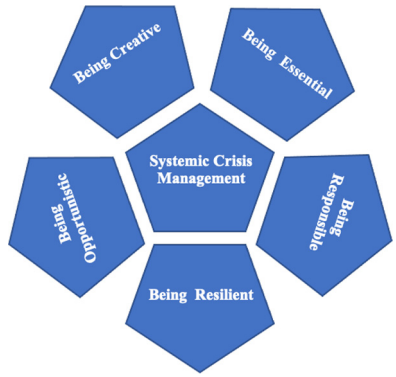
We collected data from Reddit (www.reddit.com/). On this publicly available social media platform, users can post, comment or vote within various forums, called subreddits, including thematic categories such as politics and entertainment (Amaya *et al.*, 2019). To date, few studies have used Reddit, although research examining media content is becoming more

popular in social science. Social media provides timely data representing the real world, as it is generated through word-of-mouth and peer-to-peer interactions (Choi *et al.*, 2016). Our study used special-interest groups represented by the subreddit r/coronavirus, as it provided us direct access to global business news during the early days of the pandemic. There were already more than 200,000 posts and 4 million comments on the subreddit r/coronavirus at the time of the analysis on April 26, 2020. The pre-vaccination scenario differed from the post-vaccination era: new business streams without pre-pandemic history suddenly emerged. This foreshadowed a world where the virus seemed to take longer to contain, and restrictions were critical and expected to past several months. We used an artificial intelligence-based algorithm to help with analysis of the discussion. We chose a commercially available text analytics tool that enabled us to perform topic modelling (Blei *et al.*, 2003) – i.e. identifying themes and structures of discourses based on unsupervised machine learning (Shalev-Shwartz and Ben-David, 2014). Of note, the collected posts were published relatively soon after the outbreak of the pandemic, and they do not necessarily represent the discussion that followed later in the pre-vaccination or post-vaccination era thereof. Nevertheless, the posts provide insights into the global discussion at the outbreak of the pandemic – the most shocking time of the systemic crisis.

We advanced in two stages. The first stage of data analysis followed four steps needed for analyzing the big data to reveal topics in the discourse. Firstly, we scraped the data with business-related search terms on Reddit posts. The search function was built on a thesaurus specifically designed for this project. The search results revealed 9,698 unique posts (i.e. reddits discussing the business implications of the virus. Secondly, we used cleaning software to remove nonsensical posts, which left us with a total of 9,661 reddits. Thirdly, we determined the best number of topics for extraction by using the Cao metric (Cao and Zhang, 2009). We noticed that seven topics offered the best balance between parsimony and goodness-of-fit. Fourthly, we extracted these topics using latent Dirichlet allocation and Gibbs sampling (Blei *et al.*, 2003). As a result, we distributed the posts to seven topics. Finally, we gave each of the topics an initial working title, namely, essential business, creative solutions, virus-combatting companies, responsible shopping, guided retail, distrust in the stock market and wild markets. The difference between all topics was statistically significant (<0.01).

In the second analysis stage, we conceptually elaborated on the seven topics. A deeper review of identified themes follows. We started to question how to combine or refine initial themes individually. Data within themes should cohere meaningfully, while there should be a clear and identifiable distinction between themes. By interpreting and re-contextualizing observed topics, we moved from some observations to theoretical explanations of those observations (Asvoll, 2014). We discussed data, themes and theory together, moving back from the surface phenomenon captured at the data domain through interpreting and re-contextualizing particular events to identify the essential characteristics and mechanisms defining the observed phenomenon. These discussions helped generate a thematic map (Figure 1). The map accounts for relationships between related concepts, explaining why these relationships occur and then relating this new knowledge back to previously developed knowledge.

Figure 1 The CORER framework



In the following, we discuss the results of our analysis. As a part of the discussion, we provide some quotes that the algorithm had categorized in each topic. These quotes had a relatively high confidence score, indicating that they were exemplary to that particular topic. We then present the CORER framework, addressing how service systems can enhance viability to face systemic crisis. Of note, the same data set was used previously for understanding the requirements for service research (XXX – hidden for anonymity). The present study provides a novel, unpublished approach to the data.

4. Findings

The findings show seven key topics and related sentiments on the impact of COVID-19 on business: essential business, creative solutions, virus-combatting companies, responsible shopping, guided retail, distrust in the stock market and wild markets.

4.1 Topic 1: Essential business

Amid COVID-19, governments decided whether essential and nonessential services should remain open. Thus, it became crucial for businesses that wanted to remain open to be labelled as essential. However, this line was not always clear-cut, introducing interesting debates on what is essential for society.

"Victoria, Australia, to enter lockdown as of Tuesday the 24th. Only essential services will remain open. But what is an essential service, and what isn't an essential service?" (Reddit #7989)

"WWE deemed an essential service, returns to live televised shows". (Reddit #134)

To control the spread of COVID-19, governments in many countries provided a list of nonessential services, and they ordered businesses offering such services to close for several weeks. However, many services initially included in the nonessential list were later reassessed and permitted to operate. This was the case, for example, for services that could be seen as nonessential but that had an impact on mitigating people's social constraints due to isolation or loneliness.

"The UK is ready for the pandemic, but essential industries such as dumb musicals with hundreds of people in a small space remain in operation". (Reddit #774)

4.2 Topic 2: Creative solutions

This topic relates to hospitals and medical services, including limited hospital capacity and solutions such as temporary hospitals, drive-in services and crowdfunding.

> Andrew Cuomo: The temporary hospital in the Javits Center will fully open on MONDAY. I congratulate FEMA and the Army Corps of Engineers for their work at Javits. I thank the Javits staff. I thank the National Guard. You built a hospital in a week. You are the best of us. (Reddit #3507)

In times of crisis, innovation is driven by the desire to help, connect with other people and be part of the solution when matters become complicated. New creative solutions, such as temporary hospitals and crowdfunding, were spurred by exploiting services' combinative and generative nature. They were more devoted to solving problems related to users' real needs than carried out as part of a business plan. Crises often present unique conditions that allow businesses to think and move to create rapid and impactful changes freely.

> Cars lined up for more than a mile outside a Houston hospital Thursday as the nation's fourth-largest city began drive-thru testing for the coronavirus, but officials warned they don't have enough kits or protective gear to meet demand. (Reddit #8141)

"More than 3 million euros to enhance Italian San Raffaele Hospital's ICU were raised in a Crowdfunding promoted by Fedez and Chiara Ferragni". (Reddit #5073)

4.3 Topic 3: Virus-combatting companies

This topic includes messages on companies that redirected their production to creating life-saving products (i.e. ventilators, hand sanitizers, etc.) during the crisis. This topic scores not only highest in overall positive sentiment and trust, anticipation and joy but also highest on fear, indicating high emotional charge.

COVID-19 has accelerated several trends related to the future of the industries. It highlights the need for innovative organizational solutions to enable, for example, a rebalancing of resources and investment between businesses suffering from declining demand and those experiencing a spike in demand.

"Ford converts Michigan auto plant into ventilator factory, promising 50,000 devices by July 4". (Reddit #3090)

Organizations have been forced to experiment. They have focused more on the here and now, and the new mantra has been to test different thinking, learn quickly and move forward.

"'Italy - Su Misura Lodi-Sartoriale italiano', a textile factory from Cornegliano Laudense, Italy, switch their production and starts producing masks". (Reddit #3163)

4.4 Topic 4: Responsible shopping

This topic refers to new shopping practices that emerged during the pandemic. This topic scores the lowest in overall negative sentiment. It encompasses issues related to retail innovation, changing commercial practices and shopping geographies.

The pandemic made it necessary to define measures that help people behave responsibly in-store and restrict and open exports for the common good of nation and international peoples. These new practices served people better during the pandemic and helped prevent the spread of the virus.

Shops introduced new practices to support responsible shopping. These were driven by retailers as well as governments.

"Target, Whole Foods, and many grocers designate special shopping time for seniors and vulnerable amid coronavirus". (Reddit #2141)

A general lockdown of all activities generated feelings of anxiety and fear – due, for example, to the lack of primary foods – that translated into apprehensive and irrational attitudes. The COVID-19 pandemic has raised questions about how companies can serve customers while upholding safety, as well as how governments regulate commerce and affairs. Institutions and national companies have issued reassuring messages, favouring national affairs and commerce over international demand.

"Croatian Prime Minister Sends Appeal to Croats: 'We need to stop any panic, big shopping trips, supplies, we are not in this situation or at this stage'". (Reddit #2218)

> Pasta producers in Turkey: Our annual production capacity is 2.9 million tons. We temporarily stopped exporting. We don't need chaos. If necessary, we will stop exporting for more than 15 days; every house in Turkey will be drowned in pasta. (Reddit #6269)

4.5 Topic 5: Guided retail

COVID-19 has had a significant impact on shops around the world. Nevertheless, some shops were not allowed to decide for themselves whether they remained open or closed.

> 110 million people were placed on partial lockdown in Pakistan's largest province, Punjab, for the next 14 days. Shopping malls, public transport, public places, and tourist spots to be closed. – Pakistan Today – 03/23 (Reddit #2176)

The state of emergency has led to a surge in excessive price increases on everyday items, generating feelings of rebellion among consumers. There have also been measures against price gouging, restricting retailers' freedom to set prices. Some discussions have centred on whether prices should always refer to anticipated value and availability of alternatives.

"Utah officials target sellers for price gouging masks, water, Nintendos, and more". (Reddit #1657)

Institutions must follow defined laws against price gouging, some of which were activated by emergency declarations issued by governors in response to the COVID-19 pandemic. Price gouging has generally affected goods that have become essential in the immediate post-disaster environment and the longer-term recovery stage.

Companies must act responsibly amid crises to gain support from regulators and customers.

4.6 Topic 6: Distrust in the stock market

This topic concerns the financial impact of COVID-19 on the stock market. Given the powerful negative impact of COVID-19 on public physical and psychological health, the economic and financial impacts may seem secondary. However, the financial impact of COVID-19 on the stock market is potentially of first-order importance. Trust and information exchange are two closely related elements that influence the market. The posts related to this topic indicate reduced trust in the stock market.

> I assume you all pulled out of the stock market last Friday. Monday is the crash day. SARS wiped out 40 Billion. CoronaVirus is expected to be 10x worse. Global Recession is coming. (Reddit #1066)

"Why does the stock market seem to be barely reacting at all to this [. . .] extremely serious virus". (Reddit #4268)

The pandemic wave has also revealed to effectively discount the most exposed companies: those who are more financially fragile, subject to the disruption of international value chains, vulnerable in terms of corporate social responsibility or less resilient in the face of social distancing mandates.

"Taiwan's hotel chain Landis was hit by Coronavirus. Hotel chain announces a trading halt of stock, said to be closing Taichung subsidiary". (Reddit # 4556)

4.7 Topic 7: Wild markets

This topic comprises the market changes that the external shock initiated. Firstly, some people and companies rapidly began buying and selling masks and other medical supplies. This market, which was not in the general interest, attracted new actors, some of whom bent the rules of the game – in other words, these actors shaped the market. As a response, public actors aimed to react to the changes to maintain the status quo. A wild market for masks and ventilators emerged during the pandemic. The messages on this topic were the least positive.

> The Japanese government has announced that the reselling of masks for profit will become a crime punishable by a one-year jail term or a 1m-yen fine (£7,320; $9,560) – or both. (Reddit #1710)

"Mossad officer describes the covert global battle to obtain ventilators at all costs". (Reddit #7063)

Secondly, there was turmoil in the financial market. At the same time, public organizations changed their rules to be better positioned to access critical medical resources by limiting exports and encouraging imports. Similarly, governments took measures to pump new money into the market to ease pressure on the financial market.

"US excludes Chinese face masks, medical gear from tariffs as coronavirus spreads". (Reddit #4594)

5. The CORER framework

The findings show the key topics and related sentiments on the impact of COVID-19 on business. When we interpreted the findings from a systems perspective based on an abductive process and compared them with the literature, we were able to identify five patterns related to the COVID-19 crisis. Specifically, the topics shared the underlying key message of organizations looking for ways to remain viable. To be precise, topics two and three both discussed the importance of being creative, four and five focused on being responsible and six and seven covered topics related to companies being resilient and seizing opportunities in the market. These five parts form the CORER framework, shown in Table 1 and Figure 1. The acronym represents a figurative toolbox identifying complex issues in the important areas.

5.1 Being creative

Organizations were forced to react quickly to the pandemic; they needed to outperform competitors by finding new pockets of growth and reshaping go-to-market approaches.

Amid rapid systemic crises, viable systems involve identifying innovative solutions for combining available resources efficiently. These systems rely on the capacity to mobilize resources (i.e. acquiring, sharing and rebalancing them), to solve problems and offer new solutions (Czarnitzki and Spielkamp, 2003; Polese *et al.*, 2018). Surviving companies are those that serve people using the most creative power. Companies can rethink their activities, relationships and resource integration processes to gain a better position in the challenging pandemic market situation. The following proposition can be derived:

P1. A service system enhances viability by being creative to reshape the go-to-market approach amid systemic crisis.

5.2 Being opportunistic

Companies need to seize the opportunities that emerge amid systemic crises. When markets emerge too quickly, as in the case of the market for masks, public actors cannot shape them. It is essential to have specific rules in place that public actors

Table 1 CORER framework

Findings		Enhancers to viability	A system view to viability in crisis time	Main references
Creative solutions **Virus-combatting companies**	Innovative solutions Organizational solutions Experimentation Rebalancing of resources Problem-solving	Creativity	Finding alternative patterns to survive	Espejo and Reyes (2011) Hartley *et al.* (2013)
Wild markets	New rules of the game New markets	Opportunism	Seizing emerging opportunities to ensure survival	Devine (2005), Caputo *et al.* (2019); Nenonen and Storbacka (2020)
Distrust in the stock market	Trust Vulnerability Fragility	Resilience	Maintaining stability despite turbulence	Barile *et al.* (2019); Rapaccini *et al.* (2021)
Essential business	Reconfiguration of processes	Essential	Assuring continuity of activities	Schwaninger (2006)
Responsible shopping	Practices	Responsibility	Remaining responsive to those in need	Mulej (2007); Saviano *et al.* (2017)

can quickly implement to support value co-creation in society (Fyrberg Yngfalk, 2013). Companies need new mechanisms and metrics for rapid analysis and decision-making processes when a fast-emerging market becomes a threat to the community.

The endurance emerges as the result of the fusion of decision makers' ability to combine conditions for ensuring the balance in system-environment relations and decision makers' aptitude in understanding ongoing dynamics to seize the better opportunities for the system (De Carvalho *et al.*, 2016). Therefore, the systemic crisis needs to be seen as an opportunity and not a threat to survival. According to this perspective, a system's central role in understanding and using emerging opportunities shows its centrality to ensure its survival over time. Then, the following proposition can be formulated:

P2. A service system enhances viability by being opportunistic and exploiting environmental turbulence amid systemic crisis.

5.3 Being resilient

The stock markets have integrated public information about the COVID-19 pandemic and subsequent lockdowns. However, not all companies have been impacted in the same way, and they have not reacted alike. The "external conditions" can influence both a system's structure and its dynamics differently (Jackson, 2016). Therefore, it is essential that companies can cope with various shocks. For example, it is preferable for companies to have multiple revenue streams instead of relying solely on one source of income.

The system's survival depends on its reactions to the external dynamics and its ability to maintain its balance despite the environmental turbulence (Mele *et al.*, 2018; Caputo *et al.*, 2019). A viable system can dynamically adjust its structure and behaviour to achieve consonance with its context and thus preserve its stability (Barile and Saviano, 2013).

The focus is on how a system continuously perceives, understands and manages environmental dynamics to build (or rebuild) conditions for internal balance. A service system needs to be flexible enough to work in rapidly changing conditions and amid different systemic changes. Thus, the following proposition is stated:

P3. A service system enhances viability by being resilient to build conditions for flexibility and balance amid systemic crisis.

5.4 Being essential

Amid COVID-19, governments decided whether to allow essential and nonessential services to remain open. Thus, it became crucial for businesses that wanted to remain open to be labelled as essential. Viable systems could constantly question the conditions under which products and services should be provided to meet critical public needs. By incorporating new technologies, viable systems also have to evaluate how services can be provided in new ways. Ongoing reconfigurations of these systems' structure and processes (Russo-Spena *et al.*, 2017) allow them to be part of essential business operations, which could transform the systems into foundational partners for addressing human needs. Nevertheless, it is crucial to understand what "essential" stands for in the changing context, and realize that being essential may have a new meaning after the context changes.

As a consequence, the following proposition can be formulated:

P4. A service system enhances viability by being essential to assure the continuity of business activities amid a systemic crisis.

5.5 Being responsible

Companies must act responsibly amid crises to gain support from regulators and customers. This topic can entail a discussion on responsible customer behaviour in the service context.

In the same direction, the viability of a system is related to its ability to recognize and satisfy the multiple – and sometimes conflicting – needs of society, economy and environment (Saviano *et al.*, 2017). Sometimes, this may refer to responsibility towards the environment; at other times, it may mean acting responsibly towards vulnerable people or towards national authority. Finally, during a rapid change in context, a system needs to remain responsive to those in need of services. Thus, the following proposition can be formulated:

P5. A service system enhances viability by being responsible amid systemic crisis to gain support from various actors.

6. Discussion

A crisis can be defined as systemic when risks and problems spread across the whole industry and economy. COVID-19 can be considered the most significant systemic crisis society has experienced in the last 60 years. However, there has been little debate in the business and industrial literature on systemic crises. By acknowledging the interrelated dynamics of systems (Barile *et al.*, 2014), this paper extends existing knowledge by questioning how a service system can enhance viability to face systemic crisis. COVID-19 represents a systemic shock in the business world that has lowered systems' viability and forced them to address many different threats and changes by trying to contain the crisis's impacts. Based on extensive study of the perceptions of different actors about the consequences of COVID-19 for business dynamics, this paper provides a framework for understanding how companies can work and survive in the context of a pandemic. The CORER framework shows that viability can be enhanced only in the case in which service systems can identify alternative paths for emerging opportunities (by being creative), seize opportunities offered by the changing environment (by being opportunistic), not compromise conditions for internal balance (by being resilient), focus the attention on critical purposes (by being essential) and perform no harmful actions (by being responsible).

In this view, the CORER framework contributes to CM by making sense of how companies can respond to necessary changes. In line with recent studies, our research points to the need to investigate the multidimensional and indirectly linked

effects that systemic crisis can generate (Bottan *et al.*, 2021; Zattoni and Pugliese, 2021).

Systems scholars have pointed to resilience (Barile and Polese, 2010a) as the basis of system viability. The COVID-19 crisis has given significant prominence to resilience and its practical application (Rapaccini *et al.*, 2021); resilience encompasses various qualities, including resisting, adapting, transforming and innovating (Iandolo *et al.*, 2021). We add to resilience the presence of multilayered threats to system viability. As an implication of this contribution, we formulate a sixth proposition:

P6. Amid systemic crisis, a service system enhances viability by enabling the exploration of new possibilities, and the following of opportunistic paths without compromising internal and external balance by supporting multiple actors and offering essential benefits.

6.1 Implications and directions for further research

A key aspect of the CORER framework is that the survival of a system during times of crisis requires attention to several different responses. Literature on system viability (Barile *et al.*, 2012) has stated that such viability goes beyond the short-term response to sudden shocks. In our view, system viability in times of crisis includes the system's ability to address and balance multiple conditions. In such a direction, future research should aim to directly identify the conditions that can positively influence companies' ability to embody the CORER framework. This could be especially significant since the characteristics required for coping with one aspect may not be appropriate for others. Further research is also needed to explore how the different conditions can affect each other, and whether some can prevail over others or impact the different contexts of changes.

In this sense, research should move beyond some of the limitations of our exploratory study. We invite scholars to specifically investigate how the diverse set of elements of the CORER framework can work in different pandemic scenarios. For example, studies could analyze the different vaccination scenarios. During the two years of the pandemic (as of early 2022), these scenarios have produced different degrees of physical distancing, lockdowns and economic losses; consequently, the different levels of tension to be balanced on an economic and social scale could require several specific system responses.

We also welcome more in-depth research based on empirical analysis of a set of case studies to identify and collect indicators for evaluating the long-term survival of systems. New methodologies could be helpful to operationalize the viability features amid systemic crisis, and our framework identifies the possible building blocks on which to base future measurement. Each potential condition requires the definition of appropriate tools for measurement to provide real-time information to organizations interested in adopting strategies to ensure long-term survival. This could also allow scholars to identify trade-offs and synergies between system viability features and associated indicators and to provide a more robust set of characteristics of the system's ability to withstand significant disturbances and rebuild itself.

Finally, fruitful avenues of research may include more detailed field studies using interviews with and observation of actors. Understanding how people behave in online forums may shed light on the fundamental mechanisms of collective thinking. However, this approach also has essential shortcomings, represented by the fact that the research could sacrifice depth in exchange for breadth by using such a platform.

6.2 Managerial implications

The impact of crisis has never been more substantial than that caused by COVID-19. One lesson from COVID-19 is that threats and changes cannot be adequately predicted, nor can their effect be fully addressed with well-established logic. The CORER framework can offer practitioners a guide to facing systemic crises, such as pandemics. Each aspect of the framework can offer guidance by challenging the traditional way of doing business and adapting and replacing outdated practices and relationships.

Companies need to invest in viability proactively. When a systemic crisis happens, it may be too late to start developing a company's creativity of resilience. Therefore, managers need to ensure that companies develop the required capabilities so that they can act amid systemic crises. Therefore, before a systemic crisis arises, companies need to find new ways to embody the CORER characteristics.

By adopting a system view, being responsible and creative becomes more than simply an add-on to business strategies. Moreover, responsibility and creativity no longer represent a trade-off concerning opportunistic or essential business responses. For example, the organizational innovation of some firms driven by the desire to provide essential services or life-saving products can be considered an opportunistic intervention that generates new creativity and provides a new way for companies to help and be part of the solution in a complicated situation. Managers' ability to adapt and respond to multiple changes can constrain and mold their evolution and system viability. Systemic crises often present unique conditions that allow businesses to rethink and move more freely to create rapid and impactful changes.

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Corresponding author

Cristina Mele can be contacted at: crimele@unina.it