



Business continuity in the COVID-19 emergency: A framework of actions undertaken by world-leading companies



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Abstract The COVID-19 emergency has urged companies to operate in new ways to face supply chain interruptions, shifts in customer demand, and risks to workforce health. The organizational ability to respond to critical contingencies is crucial for business leaders in the perspective of continuing business. In our research, we investigate the actions undertaken by 50 world-leading corporations to respond to the pandemic. Applying content analysis to web pages and social network posts, we extract 77 actions related to 13 sub-areas and integrate these into a five-level framework that encompasses operations, customer, workforce, leadership, and community-related responses. We also describe six illustrative company examples of how the emergency can generate opportunities for creating new value. The study advances the scholarly discussion on the impact of emergencies on business continuity and can help leaders define response strategies and actions in the current challenge.

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1. Responding to COVID-19

Since the first months of 2020, the world has experienced an unprecedented health emergency generated by the global diffusion of a novel coronavirus (COVID-19). On March 11, 2020, the World

Health Organization (WHO) declared COVID-19 a pandemic and on November 30, 2020, the WHO reported about 62 million confirmed cases and 1.5 million confirmed deaths affecting 220 countries, areas, or territories.

Besides representing extraordinary health and social emergency, the pandemic is also a major threat to companies and the continuity of their business processes. Whereas business continuity represents a strategic organizational capability

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(Wong, 2009) also associated with resilience (Parker & Ameen, 2018; Sabatino, 2016; Sahebjamnia et al., 2015; Schätter et al., 2019), the literature has specifically discussed the relevance of crisis management for the survival of organizations (Laufer, 2015). A classification effort was also conducted to identify key research themes and trends in crisis management (Coombs & Laufer, 2018) along the different pre-crisis (prevention and preparation), crisis (response), and post-crisis (learning and revision) activities (Coombs, 2015).

The interest in investigating business continuity and a company's ability to respond to a critical scenario is significantly relevant in the most recent pandemic. The difficult contingency caused by COVID-19 represents an important context to investigate company reactions. The main positioning and research goal of this article is to analyze world-leading organizations and to build a framework of responses realized by those firms to ensure business continuity in the pandemic scenario. Besides analyzing responses aimed to ensure the preservation of current value, we have a secondary focus to discuss how the emergency can generate opportunities for organizations to create new stakeholder value.

After a review of extant approaches on business continuity and organizational resilience in emergency scenarios, we present an in-depth analysis of the responses of the first 50 *Fortune* Global 500 companies to the COVID-19 emergency as well as a content analysis of web pages and LinkedIn posts of companies dedicated to the pandemic. Then, we discuss how we isolated 77 actions aggregated into a five-level framework that encompasses operations, customers, workforce, leadership, and community-related responses. Finally, we describe six company cases as illustrative examples of organizations attempting to create new business value in the critical scenario.

2. Background

In recent years, there has been fervent academic interest in organizational responses to critical situations. Today, organizations are forced to build resilience against numerous events that threaten the continuity of their business processes (Sahebjamnia et al., 2018). These include natural events (e.g., earthquakes, hurricanes) and man-made factors such as cyberattacks, geopolitical crises and terrorism (e.g., Castillo, 2005; Sheffi, 2001), corporate crisis (e.g., Yang & Jiang, 2015), and market and supply chain crises (e.g.,

Chopra & Sodhi, 2014; Kleindorfer & Germaine, 2005; Sáenz et al., 2018; Strandvik et al., 2018). A significant stream of literature has studied the problem of planning and foresight for emergency preparedness and management (Turoff et al., 2013).

Organizations strive to cope with emergencies and critical events to keep their reputation, be more resilient, and ensure continuity (Parker & Ameen, 2018; Rezaei Soufi et al., 2019). The management of business continuity has evolved since the 1970s as a form of crisis management in response to the different risks that threaten an organization. It is a holistic management process that provides a framework for effective response (Herbane, 2010), and business continuity plans have been developed primarily to minimize the effects of unanticipated events on the firm's ability to meet customer requirements (Zsidisin et al., 2005).

Scholars and practitioners have introduced several methods to assist organizations in improving business continuity (e.g., Botha & von Solms, 2004; British Standards Institution, 2006; Gibb & Buchanan, 2006; ISO, 2012; Lindström et al., 2010; López & Ishizaka, 2019). Activities include risk and impact evaluation, continuity plan/process design, implementation and measurement, testing, and continuous update of measures (Cerullo & Cerullo, 2004; Pitt & Goyal, 2004; Speight, 2011). The literature emphasizes compliance with continuity standards (Freestone & Lee, 2008; Tammineedi, 2010), risk management (Nosworthy, 2000; Schätter et al., 2019), and organizational culture (Alesi, 2008; Rapaport & Kirschenbaum, 2008). Typically, the focus has been on ensuring the continuity of a specific business domain such as IT infrastructure (Bajgoric, 2006), supply chain (Benyoucef & Forzley, 2007), or outsourcing (De Luzuriaga, 2009).

With a particular focus on supply chain and business continuity, Zsidisin et al. (2005) highlighted the importance of developing business continuity plans by addressing key concepts such as risk, uncertainty, and exposure. The authors examined how and why firms create business continuity plans to manage this risk and highlighted how various isomorphic pressures left firms with similar risk management practices embedded in their supply management practices. Based on the study of companies operating in different environments, the authors found consistency in their approaches to continuity planning and four inter-related tasks (i.e., awareness, prevention, remediation, and knowledge management) that form a

framework for effective continuity planning (Zsidisin et al., 2005).

Whereas business continuity is generically aimed to preserve the value that an organization provides with current activities, with business model innovation the organization is deliberately altering the core elements of its model as a way to develop a new-to-business model (Bucherer et al., 2012; Heikkilä et al., 2018; Pohle & Chapman, 2006). The integration between business continuity and business model was recently advanced by Niemimaa et al. (2019), who pointed out that while business continuity focuses on preserving current operations, a crisis could also be a source of new value. Recent research also provided methods for companies to evaluate the components of their business model against future uncertainties (Bouwman et al., 2018; Haaker et al., 2017).

There has been an increase in scholarly interest in analyzing the strategic decisions and actions undertaken by companies to respond to a crisis is increasing. Whereas the COVID-19 outbreak has generated a large stream of research contributions focusing on different managerial dimensions, a comprehensive study of company responses along several organizational perspectives has not yet been introduced. We focus on these responses in the following sections.

3. Research process

Our study involves conceptual development work based on the analysis of available web-based information about the responses of leading corporations to the COVID-19 outbreak. Content analysis is a method of studying and analyzing communication in a systematic, objective, and quantitative manner to measure variables (Wimmer & Dominick, 2000). The method can be used in social science to examine patterns in communication systematically. One key advantage of using content analysis to analyze social phenomena is its noninvasive nature in contrast to simulating social experiences or collecting survey answers.

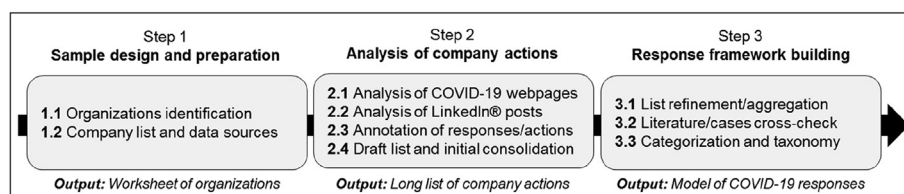
Practices of content analysis range from systematic observation of texts or artifacts to which assigned labels indicate the presence of interesting, meaningful content.

Different applications of web content analysis are described in the literature. Jose and Lee (2007) used content analysis based on website disclosures to study the environmental reporting of global corporations. Ting et al. (2013) performed an advanced website evaluation to assess the top 100 hotels. Maatota et al. (2019) used content analysis of storytelling elements and brand archetypes of LinkedIn ad campaigns. McCorkindale (2010) reported on the content analysis of the *Fortune* 50's Facebook social networking sites, and Parsons (2013) engaged in content analysis of official Facebook pages to assess how companies would use social media to reach consumers. The methods in these studies include a combination of sample design and preparation, source identification, analysis of content and cases, and synopsis of findings. Along with such macro research activities, our research process included three initial steps, illustrated in Figure 1.

Step 1, *Sample design and preparation*, is dedicated to identifying the population of companies to include in the study. We looked at big corporations since they are extensively affected by the COVID-19 emergency, and they face challenges at both the local level (e.g., progression of the disease in the local communities) and the global level (e.g., impact on international markets and global logistics). The study of response strategies undertaken by these types of companies is thus more able to address a comprehensive view of the multidimensional challenges generated by a pandemic scenario.

We used the 2019 *Fortune* Global 500 ranking, an annual ranking of the top 500 corporations worldwide as measured by the level of their revenues. We considered the first 50 companies, which represent a well-diversified group of organizations operating in different continents and countries (e.g., China, France, Germany, Russia, Saudi Arabia, the U.K., the U.S.) and in different

Figure 1. Steps of the research process



industries (e.g., automotive, bank and insurance, energy, food distribution, oil, telecommunication, and utilities). Companies include world-leading players such as Allianz, Amazon, Apple, AT&T, Bank of China, Berkshire Hathaway, BP, Daimler, Gazprom, General Electric, Royal Dutch Shell, Saudi Aramco, Samsung Electronics, Toyota, Verizon, and Walmart. The sources used to collect data are twofold. First, we looked at the corporate websites of companies and particularly the pages dedicated to COVID-19 and the actions undertaken by the organizations to face the pandemic. Second, we analyzed the LinkedIn pages of those organizations with a specific focus on the posts providing information on how organizations are responding to the emergency. The output of the first phase was a worksheet with the list of organizations, along with key demographic data (i.e., home country, industry, and revenues) and the web addresses of COVID-related web pages and the LinkedIn page (main profile) of the company.

Step 2, *Analysis of responses and actions*, focuses on capturing information on the identified companies in terms of responses to the coronavirus emergency. We studied corporate websites and LinkedIn pages to identify messages, statements, and reports on COVID-19 and on how the companies are responding along multiple perspectives. Overall, we analyzed about 300 web pages and 400 LinkedIn posts, and we annotated relevant information for further analysis and classification.

The content search was aided by the fact that practically all the analyzed organizations have set up web pages specifically dedicated to COVID-19. Concerning the LinkedIn pages, the identification of relevant content was more complex as we needed to go through all the posts from February 2020 to the time of the study (mid-April 2020) to identify information related to the outbreak and the vision and responses of the company. The content analysis process was thus not characterized by a bounded or limited sample of key concepts to be searched. More than using a priori coding schema, we conducted a systematic reading of the corporate web sources and social network messages dedicated to the emergency, and we identified three general categories of information.

First, we coded with “scenario” the general information provided by the company about the pandemic and its impact on the industry and market. The extracted content is mostly derived from the reports of the companies of what is happening in the external environment, and this was used to enhance our understanding of the business-related aspects of the coronavirus

outbreak. An illustrative (adapted and anonymized) company statement is: “The COVID-19 is rapidly diffusing in most European countries, and it is creating the conditions for a limitation of flows of people and products. This could strongly impact the logistic and dynamics of our industry.”

Second, we extracted the “strategies”: general policies or approaches defined by companies to react to the outbreak. Here, the strategy refers to how the company sees the crisis and what is its position in responding to the crisis, thus providing a relevant interpretation of where the organization stands and what is the vision ahead. An illustrative statement is: “Our company intends to react firmly to the emergency by following all the indications provided by health authorities and keeping to ensure first of all the health of our workers and customers.”

Finally, we identified “initiatives” (i.e., practical activities assumed by the companies along different areas). This content was the most relevant for our study since it is explicitly related to the actions realized by the organization in response to an emergency. Naturally, the information on scenarios and strategies was relevant to better interpret the purpose and scope of those actions, as one organization illustrated with this statement: “We are extending the service period for most of our products and enhancing our contact center to provide the best service possible to our customers.”

We triangulated content gathered from the websites and social network pages by looking at corporate videos and interviews (mostly delivered by top managers), broadcasts, and other sources available on the web. We collected all relevant information into a spreadsheet for further analysis and generated a long list of initiatives (actions) realized by the 50 companies by doing a high-level consolidation of similar items.

Step 3, “Response framework building,” was aimed to obtain an integrative inventory of organizational responses. After careful analysis of extracted data, we aggregated companies’ actions by deriving a taxonomy of common macro-areas that could group similar items: operations management, customer relationship management, human resource management, leadership and change management, and community management. Most of the initiatives were clearly about one of those groups; only in a few cases were initiatives potentially relevant for two or more categories, and in those cases, we selected the most relevant dimension. We also realized a cross-check of the taxonomy with business continuity methods, approaches, and cases found in the literature. We

Table 1. Sub-areas and actions related to operations and value system

Sub-areas	Company actions (alphabetical order)
1.1. Supply chain status and scenarios	1. Assess the overall impact of the emergency on company operations 2. Define micro-scenarios of evolution for demand and sales 3. Leverage analytics to monitor operations and supply chain status 4. Share risk scenarios with key partners and suppliers
1.2. Inbound and outbound logistic flows	5. Enhance digital connectivity across the supply chain 6. Ensure business-critical processes and services 7. Identify core physical resources needed to maintain continuity 8. Revise inventory/warehousing and order management processes 9. Revise logistics and route optimization to reduce risks
1.3. Manufacturing continuity and conversion	10. Convert to or increase production of protective materials/products 11. Optimize production capacity and redefine production plans 12. Update or reengineer production to enhance workforce security

thus obtained a COVID-19 response model, which is described in the next section.

4. Framework of response actions

This study focuses on two key concepts: business continuity (in crisis and emergency scenarios) and value creation (through business model innovation). We looked at how companies attempted to address the critical challenges caused by the pandemic event through minor or significant process changes while also looking at how business models have been adapted to create new value by leveraging the difficult contingencies.

All the 50 organizations analyzed took coordinated actions to face the COVID-19 emergency. We isolated 77 responses related to 13 sub-areas and five areas of organizational activities: (1) operations and value system; (2) customer experience and support; (3) workforce and human capital; (4) leadership and change management; and (5) community and social engagement. The classification was obtained by aggregating the single

responses into homogeneous categories (sub-areas) and then identifying more high-level areas able to include those categories. Figure 2 provides a snapshot of the five areas and the 13 sub-areas of actions undertaken by companies in response to the COVID-19 emergency. All the areas are detailed through the description of the sub-areas and the illustration of the specific actions.

4.1. Actions related to operations and value system

The first area of responses is related to the effects of COVID-19 on the management of the companies' operations and value system (Table 1). In particular, responses can be associated with three sub-areas according to their focus. Some actions are addressed to face the shifts in customer demand and the impact on the supply chain, which has brought companies to identify and measure risks, and to envision a possible future. Most companies analyzed were engaged in assessing the overall impact of the crisis on operations, as well as in defining scenarios of demand and sales evolution, also based on the use of advanced analytics and business intelligence systems. Different companies, such as AmerisourceBergen, have monitored inventory levels and customer purchasing behavior to assess any potential impact on the product supply chain.

The second sub-area of actions is related to logistic flows, both inflows of resources and materials and outflows of products and services to customers. In this case, company responses are addressed to enhance digital connectivity across the supply chain while ensuring business-critical resources, processes, and services. Also, the inventory/warehousing and order management processes are being re-engineered to optimize routes

Figure 2. A framework of response actions for COVID-19

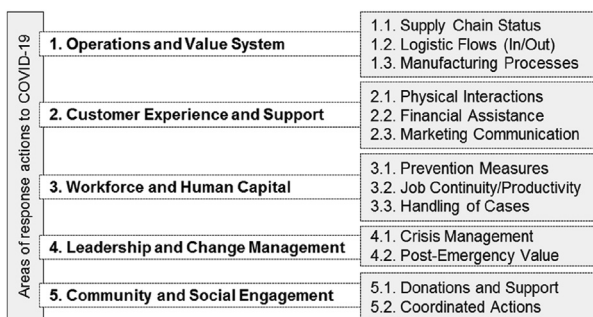


Table 2. Sub-areas and actions related to customer experience and support

Sub-areas	Company actions (alphabetical order)
2.1. Physical interaction and mobility	<ol style="list-style-type: none"> 1. Adopt prevention measures across all customer touchpoints 2. Change shop/facility access and buying/payment (contactless) process 3. Track customer mobility and build fact-based customer reports
2.2. Financial and emotional assistance	<ol style="list-style-type: none"> 4. Extend warranty and service recall, online and telephone support 5. Provide digital parenting to customers and their families 6. Provide digital resources and emotional support or telehealth services 7. Relief payments, provide delays and financial support to customers 8. Support customer communities and facilitate peer-to-peer interactions
2.3. Marketing and customer communication	<ol style="list-style-type: none"> 9. Develop training for customer teams and emergency communication 10. Improve digital channels and strengthen customer contact centers 11. Redefine brand strategy, pay-offs, logos, and marketing messages

and to reduce risks. As an illustrative example, Amazon has reported realizing more than 150 process updates to ensure the reduction of risks and enhance the ability to satisfy prioritized needs.

The third sub-area includes actions related to the continuity of manufacturing processes and/or the conversion of the same to address new market needs or to contribute to the community's fight against the pandemic. Actions included the conversion of production to deliver protective materials and products, the optimization of production capacity, and the reconfiguration of plants to enhance workforce security. In such a view, companies like General Motors have engaged in the production of protection devices (like face masks) and collaborated with partners to provide pulmonary ventilators. Whereas supply chain management generally includes logistics and manufacturing, we separated the three concepts in our framework. Based on the analyzed responses, we needed to isolate actions generically addressed to assess the supply chain impact of the crisis (thus including an ecosystem view) from more specific actions targeted at redesigning logistic and transformation activities, which are mostly related to an internal view of the organization.

4.2. Actions related to customer experience and support

A large number of response actions found in the study address the impact of COVID-19 on the customer experience and the management of the customer life cycle (Table 2). The first sub-area of actions concerns the customers' buying experience, including the buying process, with a specific focus on touchpoints and physical interaction with the company. Most organizations have

reengineered access to shops and facilities and adopted several prevention measures across all customer touchpoints. Digital channels and contact centers have been enhanced, and customer mobility was assessed and reported. Companies like Walmart have taken actions aimed to limit customer access and flows in shops (e.g., one-door entry), implement sanitation and social distancing, and provide sneeze guards in all stores. Companies have also provided payment relief and financial assistance to customers along with other kinds of support services.

Response actions have included the development of new training for customer teams, new forms of customer outreach and communication, and emotional support to customers. For example, AT&T has provided digital parenting solutions for families. The company's ScreenReady site shares digital parenting tips and resources to help families stay connected, learning, and entertained at home during the coronavirus. Finally, several actions are addressed to respond to the marketing impact of COVID-19. Responses included the redefinition of brand strategies and the design of new purposeful payoffs, logos, and marketing messages. In this regard, Volkswagen and Audi have temporarily modified their well-known logos to communicate the importance of practicing social distancing.

4.3. Actions related to workforce and human capital

The third response area ensures the well-being of the workforce and to reducing the negative effects of the outbreak while creating the conditions for enhancing the human capital of the organization (Table 3). First, actions aim to ensure the safety of workplaces (e.g., offices, shops, facilities) by activating infection prevention measures.

Table 3. Sub-areas and actions related to workforce and human capital

Sub-areas	Company actions (alphabetical order)
3.1. Employee safety and disease prevention	1. Define policies for evacuation and return from infected areas 2. Define procedures for workplace hygiene and sanitization 3. Ensure availability of medical consultation in emergencies 4. Establish travel restrictions and mobility guidelines 5. Evaluate facility closure and layout redesign 6. Launch an employee-dedicated COVID-19 information portal 7. Provide infection control supplies in all business locations 8. Provide information about at-home care and prevention 9. Provide Personal Protective Equipment (PPE) to workforce 10. Regulate norms for workplace physical interaction 11. Track employees through infrared scanning, RFID, and QR codes
3.2. Work continuity and job productivity	12. Anticipate or face anxiety due to infodemic and disinformation 13. Create training opportunities to upskill employees during a pandemic 14. Define criteria for workplace rotation, flexible and smart working 15. Define shifts to new patterns of work and the "new" normal 16. Define the overall workforce impact of pandemic 17. Develop platforms for intra- and extra-organization communications 18. Enhance network capacity to support remote access/collaboration 19. Implement special compensation and payment policies 20. Launch competence development and informative webinars 21. Provide official information to enhance employee awareness 22. Share response plans and organizational actions with employees 23. Train and prepare ancillary workforce (contractors, retirees)
3.3. Leave and infection handling	24. Define return to work policies after infection or quarantine 25. Define sick-leave and quarantine policies 26. Develop status reporting for exposed and infected employees 27. Identify special needs and incorporate them in the emergency plan 28. Manage work impact of employee infection and quarantine 29. Provide physical and psychological support/assistance services

Responses include the definition of procedures for workplace hygiene and sanitization, rules for office layout and usage, the launch of employee-dedicated COVID-19 information portals, and the sharing of norms for physical interaction and employee tracking. For example, Hon Hai Precision Industry has used infrared scanning, severe social distancing measures in the workplace, and QR codes for employee tracking.

Second, responses seek to support employee productivity, although in a smart and remote configuration. Organizations have taken actions to cope with employee *infodemic* (i.e., an overload of information, both online and offline) and disinformation, and they have defined criteria for workplace rotation, remote access, and competence development. As is the case with many other organizations, Trafigura Group has activated a social-spacing policy, including for office-based employees working from home. Finally, some actions focus on monitoring and managing cases of exposed and infected employees, defining leave and return-to-work procedures, and ensuring health assistance

and psychological support. For example, Costco Wholesale has activated premium pay and paid time off for higher-risk employees and ensured the availability of protective masks and symptom screenings for employees and managers.

4.4. Actions related to leadership and change management

The fourth area of responses to face the COVID-19 emergency concerns actions focused on managing the current emergency while preparing the organization for the future (Table 4). First, analyzed actions include the definition of a response plan and a dedicated management team, the creation of an emergency coordination task force, and the undertaking of stress tests to assess the working capital and resource preparedness of the organization. Verizon Communications has gathered purposeful senior crisis leadership and response teams able to face the emergency by identifying proper strategies and actions. Second, responses include the alignment of business leaders in terms

Table 4. Sub-areas and actions related to leadership and change management

Sub-areas	Company actions (alphabetical order)
4.1. Emergency and continuity management	<ol style="list-style-type: none"> 1. Access lines of government/bank credit to support continuity plan 2. Acquire authoritative epidemiological and economic outlook/data 3. Articulate a detailed company response plan 4. Build leadership and response teams who can proactively manage risks 5. Define issue map and handling/management mechanisms 6. Define, activate and test business continuity and recovery programs 7. Freeze capital expenditure and reallocate funds to where most needed 8. Identify a pandemic and emergency coordinator or team 9. Perform stress tests on key resources and working capital requirements
4.2. Post-emergency vision and value creation	<ol style="list-style-type: none"> 10. Align business leaders and conduct roundtable exercises 11. Define a portfolio of post-emergency actions 12. Develop positive scenarios and maintain the trust of people in the future 13. Establish robust emergency communication plans 14. Identify opportunities for new value creation beyond the crisis 15. Share CEO talks to ensure stakeholders about company preparedness

of the organization's strategy against the emergency, the definition of a portfolio of post-emergency actions and value-creation opportunities, and efforts to maintain the trust of people. For example, companies such as Honda Motors have put extra effort into their marketing and social media presence to enhance positive communication and encouragement for customers and the larger community.

4.5. Actions related to community and social engagement

The response area is related to the interaction of the organization with external stakeholders, both to contribute tangibly to fight the pandemic and by sharing knowledge useful to support first responders and the whole community (Table 5). The first sub-area relates to money donations, financial support, and the provision of resources and products (e.g., protection masks, ventilators) to fight the pandemic. Actions include the provision of special discounts and gift programs to responders/helpers, contributions to open innovation initiatives by disclosing knowledge and intellectual property, and support to research entities. For example, BP has provided donations, free fuel, free delivery of food, and convenience goods to customers and partners.

Second, actions are addressed to ensure coordination with agencies and institutions and to share best practices and organizational experience, which can be useful for the community. Initiatives include the sharing of critical information and response tactics with responders, as well as the strengthening of public and private collaborations to define more effective response

strategies. For example, Alphabet (the holding company including Google) is strongly engaged in assisting educational institutions with content, tools, and distance learning, and it has planned to launch a national platform to educate the community on coronavirus.

In this section, we have presented a comprehensive inventory of 77 response actions undertaken by 50 big corporations to the COVID-19 emergency, and we have aggregated the actions into a five-level business continuity framework. The next section discusses how the current emergency can also generate opportunities for creating new value.

5. Creating value beyond the crisis

5.1. Drivers of value creation

The literature on company behavior during recessions shows how companies can survive and even profit by modifying their marketing strategy (Köksal & Özgül, 2007), increasing the R&D budget (Laperche et al., 2011), investing in innovation (Archibugi et al., 2013; Paunov, 2012), and enhancing their corporate governance (Villanueva-Villar et al., 2016). The business crisis generated by the COVID-19 outbreak has also generated opportunities for organizations to go beyond simple business continuity and the preservation of current value.

A combination of transforming customer and supply chain trends and the necessary redesign of corporate processes has indeed stimulated the redefinition of strategies and actions able to generate new business value. Whereas some of the

Table 5. Sub-areas and actions related to community and social engagement

Sub-areas	Company actions (alphabetical order)
5.1. Community donations and support	<ol style="list-style-type: none"> 1. Invest in local government debt to reduce the social impact of the crisis 2. Offer special discounts and gift programs to responders/helpers 3. Participate in open innovation initiatives by disclosing knowledge/IP 4. Produce/donate individual protection devices and sanitization products 5. Provide money donations to institutions, agencies, and first responders 6. Support scientists and researchers through research grants and funds
5.2. Communication and coordinated actions	<ol style="list-style-type: none"> 7. Communicate assets/services available to the community 8. Share best practices with the public to improve community responses 9. Share the response plan with public agencies, healthcare, and responders 10. Strengthen public and private collaborations for emergency responses

responses provided by organizations to the COVID-19 are mostly reactions critical for survival (e.g., protection of employee safety), others can be considered more transformational actions. These are aimed at developing new capabilities to respond to the current challenges while looking at the challenges as opportunities for future growth (e.g., digital health assistance and smart working).

We proceeded with a more in-depth analysis of our research data to identify interesting examples of initiatives, processes, or projects where the organizations are creating new value from a medium- and long-term perspective. Whereas new value can be generated by leveraging each element in the response framework (Figure 2), the innovation potential seems to be related especially to three elements: (1) new products/services to address new customer needs; (2) improvement of virtual interaction and integration with customers; and (3) an enhanced image of the corporation as a socially responsible and community-oriented organization. Next, we illustrate these three value-creation avenues by providing six company examples.

Toyota started to face the COVID-19 emergency soon after its president announced the transformation of the company's business model for the CASE era (Connected, Autonomous, Shared, Electric) and the evolution of the organization toward a mobility company that provides resources and services for a connected city. Whereas the company has decreased its production due to COVID-19, Toyota has maintained employment and increased investment in the R&D of electric cars. It was able to create new customer-related value by introducing new car models to the market and by improving virtual interaction with customers who can explore and make purchases in virtual showrooms via WhatsApp video, Facebook Live, web chat, or phone. The company has adopted a

product- and customer-centric view, which looks at the after-emergency in terms of new societal and market needs. Toyota has provided value to the community by full-scale production of medical devices and by offering Japan Taxi models to transport patients with mild symptoms. Also, the company has cooperated in the production of equipment such as makeshift beds for hospitals, disinfectant containers, and simple partition walls for use at medical facilities.

BP has robust business continuity plans in place to make sure that the company can supply energy, fuel, and vital petrochemical feedstocks uninterrupted. In retail sites, BP has increased cleaning procedures and encouraged customers to practice social distancing while also taking precautionary measures such as removing the sale of open food products. BP has also undertaken socially responsible initiatives by supporting governments and partners with donations and free fuel to emergency services vehicles, such as ambulances and helicopters. Working with the U.S. government, leading universities, and high-tech companies, BP's Center for High-Performance Computing has been used for research on COVID-19. These new collaborations have provided the basis for strategic renewal and a new paradigm of extended collaboration (with countries, cities, and industries) aimed at creating new value.

Amazon has updated 150 processes, from social distancing measures to new efforts like disinfectant spraying and temperature checks. It established a \$25 million relief fund for its partners (e.g., delivery drivers) facing financial hardship or quarantine. To address increased customer demand, the company has focused on fast delivery of high-priority items, such as household staples and medical supplies. Amazon has provided the option of unattended delivery and defined a system to prevent price gouging. The company has also

addressed the needs of customers and looked at the current situation as an opportunity to create value with new services. To help communities around the world, Amazon has made donations and provided work to 175,000 additional people. Finally, it launched a global initiative with participation from 35 global research institutions, startups, and businesses to accelerate COVID-19 diagnostics, research, and testing.

The change in insurance firm AXA's business profile due to the pandemic has been notable. The company started providing its customers with apps for video medical consulting and new processes for online incident communication. It has also reached new customer segments. For example, AXA collaborated with the Accor hotel chain, which offered its customers free access to AXA's medical teleconsultations from hotel rooms. Moreover, AXA has invested heavily in R&D. It provided €5 million for research to develop responses to infectious diseases, and notably to COVID-19, including the building of post-crisis solutions. The company has also supported the COVID-19 task force launched by the Institut Pasteur to develop new diagnostic tools and treatments. AXA supported an open research initiative in which a digital platform brings together engineers, practitioners, and researchers collaborating to design, test, and provide efficient emergency solutions.

The drug wholesale company AmerisourceBergen has increased inventory on items related to COVID-19 treatment and supportive care. The company has business continuity plans that include monitoring inventory levels and customer purchasing behavior for any potential impact on the product supply chain. General Electric, and in particular GE Healthcare, developed a new product, the Venue Go ultrasound system, which includes an artificial intelligence feature, the auto B-lines tool, that highlights and counts B-lines, which may signal COVID-19. The tool provides a lung diagram and generates a lung ultrasound score that helps clinicians to follow the progression of the lung condition in patients as they fight the virus.

6. Discussion

6.1. Highlights and contribution

This study has contributed to the extant business continuity literature by introducing an empirically derived inventory of response actions taken by leading companies during the COVID-19 crisis. The framework includes five dimensions, which are

divided further into sub-areas and actions that address operational aspects affected by the outbreak. The dimensions range from internal operations to supply chain management, from human resources and leadership to relations with customers and stakeholders. We also include a community and social engagement perspective, which is not typically considered in the business model literature (e.g., [Osterwalder & Pigneur, 2010](#)). This finding shows that, at least in exceptional circumstances, the relations between a company and its local community are an important part of the company's activities and value-creation potential.

Although many articles have depicted company responses to critical emergencies (e.g., [Alesi, 2008](#); [Castillo, 2005](#)), we contributed with a comprehensive and evidence-based analysis of actual responses by large organizations to face the pandemic. Additionally, whereas emergency and business continuity studies have focused on general and crisis-independent activities such as risks and impact evaluation, continuity plan/process design, implementation, and measurement (e.g., [Cerullo & Cerullo, 2004](#); [Pitt & Goyal, 2004](#); [Speight, 2011](#)), we identified specific fine-grained actions aimed to ensure the continuity of business operations over a large spectrum of management dimensions.

Finally, the contribution of our study may be found in the integration between business continuity and business model innovation for value creation ([Bouwman et al., 2018](#); [Foster & Dye, 2005](#); [Haaker et al., 2017](#); [Nieminmaa et al., 2019](#)). All large corporations have acted to ensure the continuity of their current business operations. However, as our illustrative cases show, some companies are also able to create new value by reaching current and new customers via digital channels, redirecting more resources from current operations to R&D activities, or increasing the companies' social responsibility and involvement with their local communities.

6.2. Managerial insights

Some insights can be derived that could be useful for application in other companies dealing with the consequences of COVID-19 or thinking about improving their response strategies for future (likely although undesired) events. In the area of emergency management and crisis response, key success factors have been discussed in the literature, including adaptability, agility, communication, coordination, leadership, and technology application (e.g., [Harrald, 2006](#); [Zhou et al., 2017](#)). We found these aspects in the investigated companies and

their responses to the crisis and used them to formulate four main recommendations.

1. Companies have been urged to develop an immediate reaction to the operational breakdown and the risks of infection within and outside the organization. Successful answers have been based on the implementation of agile business processes (which has involved redesign or adaptation of existing activities) and the use of digital technologies as key enablers.
2. Most organizations have been forced to rely on available crisis management capabilities and financial and technical assets useful to face and overcome the emergency. Successful responses thus have also been based on the existence of technical reserves useful to ensure the sustainability of operations in the transition phase and to support smooth adaptation of the organization to the changing business situation.
3. Organizations have developed a real-time awareness of the impact of the pandemic through advanced data gathering and monitoring capabilities. Successful responses have been based on the adoption of effective business analytics methods and tools that support information-rich communication and leadership.
4. Organizations have been challenged with risks of declining sales due to switching customer needs and demand. Successful responses have included the creation of diversified and modular product/service portfolios and adaptable business models that can support a faster recovery.

7. Concluding remarks

In this study, we investigated the responses of 50 world-leading companies to the COVID-19 emergency, and we integrated the responses into a descriptive framework. To the best of our knowledge, this study is the most extended attempt to build an inventory of real actions undertaken by large companies to deal with a common global emergency.

The research is not without limitations. First, business continuity has been historically associated with medium and large corporations, and our research also focused on big organizations. However, the concepts of business continuity and resilience against emergencies should be extended to small organizations, which face the crisis generated by the pandemic along different and equally significant dimensions. Second, we used data available online (web pages and social

network posts), which is the information shared by organizations about their responses to COVID-19. However, such public information is not necessarily able to describe the policies defined and actions undertaken by the companies comprehensively. At the same time, corporate communications messages conveyed through public outlets like websites and social network posts may be biased as possibly self-serving statements, which might not represent the situation with either accuracy or comprehensiveness. Access to real company knowledge and objective analytical reports, where possible, would thus allow researchers to strengthen the model by adding more fine-grained actions implemented by managers.

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