The impact of coronavirus on business: developing service research agenda for a post-coronavirus world

Cristina Mele and Tiziana Russo-Spena
*Department of Economics, Management and Institution,
University of Naples "Federico II", Naples, Italy, and*
Valtteri Kaartemo
Turku School of Economics, University of Turku, Turku, Finland

Abstract

Purpose – The coronavirus (COVID-19) has had a tremendous impact on companies worldwide. However, researchers have no clear idea of the key issues requiring their attention. This paper aims to close this gap by analysing all business-related posts on a coronavirus subreddit ("r/coronavirus") and identifying the main research streams that are guiding the research agenda for a post-coronavirus world.

Design/methodology/approach – We use data from reddit, particularly the subreddit "r/coronavirus" to identify posts that reveal the impact of coronavirus on business. Our dataset has more than 200,000 posts. We used an artificial intelligence–based algorithm to scrape the data with business-related search terms, clean it and analyse the discussion topics.

Findings – We show the key topics that address the impact of coronavirus on business, combining them into four themes: essential service provision, bricolage service innovation, responsible shopping practices and market shaping amid crisis. We discuss these themes and use them to develop a service research agenda. The results are reported against the backdrop of service research priorities.

Originality/value – The study identifies four key themes that have emerged from the impact of coronavirus on business and that require scholarly attention. Our findings can guide service research with unique insights provided immediately after the coronavirus outbreak to conduct research that matters to business and helps people in vulnerable positions in a post-coronavirus world.

Keywords COVID-19, Reddit, Essential service, Bricolage innovation, Responsible shopping practices, Market shaping

Paper type Research paper

1. Introduction

In the past 20 years, identifying research priorities has become a critical aim for service scholars (Fisk *et al.*, 2000; Ostrom *et al.*, 2015; Furrer *et al.*, 2020). A discipline's maturity comes by recognizing its knowledge gaps and challenging topics, the investigation of which can inform research policy and funding in the field (Gummesson and Mele, 2010). Although disciplines tend to follow certain research trends and priorities, crises often introduce changing conditions that challenge companies and encourage scholars to rethink the type of research required. For example, the refugee influx (Finsterwalder, 2017; Nasr and Fisk, 2019) and the ServColla project (Fisk *et al.*, 2000) have caused scholars to question some of the basic assumptions made in service contexts and conditions, which in turn illuminated a need to redesign service ecosystems.

The COVID-19 pandemic has spread at an extraordinary rate. Close on the heels of the health emergency, the world is facing the severest economic shock since Second World War (Brown and Arnholz, 2020), and the recession is likely to trigger wider systemic changes (International Monetary Fund, 2020) that will transform how companies, consumers and public actors behave. Restaurants have been forced to close their doors, and tourists have been banned from crossing borders. The COVID-19 crisis has accelerated the shift to digital, and entrepreneurs in various sectors have had to create new business models to survive. Similarly, the coronavirus pandemic has radically changed demand patterns for products and services across sectors and national boundaries, exposing points of fragility in global supply chains of various industries (e.g. information and communication technology, automotive supplies) and service networks (e.g. financial products).

When weathering a crisis, companies must deal with uncertainty and need new perspectives, methods and practical steps to stay ahead of the next stage of the current crisis and be better prepared for future crises. During this current crisis and change, scholars have recognized the need to identify research directions as crucial (Furrer et al., 2020). As the COVID-19 pandemic represents a dramatic turn of events (Ostrom et al., 2015; Hult et al., 2020), it has spurred service researchers to question previous and well-established research priorities and conduct responsible research to bridge theory and practice "by building knowledge that is useful to businesses, individuals, communities, institutions, society and the bio-environment" (Bolton, 2020, p. 279).

This paper aims to unpack the business implications of the coronavirus and develop a service research agenda for the post-coronavirus world. We do so by analysing all business-related posts on a coronavirus subreddit ("r/coronavirus"). Because this dataset contains more than 200,000 posts, we employ an artificial intelligence–(AI-) based algorithm to scrape the data with business-related search terms, clean it and analyse the discussion topics. We illuminate four main research streams that require the attention of service scholars in the post-coronavirus world: (1) essential service provision, (2) bricolage innovation, (3) responsible shopping practices and (4) market shaping amid crisis.

Our study introduces a novel way to identify service research priorities that enable broader thinking on key aspects and scenarios from which we can glean insights in this rapidly changing context. We place the most frequently mentioned research themes against the backdrop of service research priorities developed before the pandemic (Ostrom et al., 2015; Aksoy et al., 2019).

The rest of this paper proceeds as follows: first, we review studies on service research priorities before the pandemic. Second, we outline our method and then we present the research streams guiding the research agenda for the post-coronavirus world. We conclude with a discussion of limitations and suggestions for further research.

2. Service research priorities before the pandemic
With the emergence of what Gummesson (2012) calls "paradigm 3" in the 2000s, research progress in the service discipline increased its pace considerably (Polese et al., 2015). Service scholars began gathering insights from leading experts, who provided reflections on the research field (Fisk et al., 2000; Grove et al., 2003).

Such articles have recently proliferated as scholars have aimed to develop research priorities for both academia and practice (Ostrom et al., 2010; Aksoy et al., 2019). In the first eight months of 2020, several published studies have already analysed the discipline's research streams to evaluate its maturity and set up its future (Bolton, 2020; Furrer et al., 2020; Hult et al., 2020). The overarching goal of their efforts is to guide decisions of academia, businesspeople and policymakers and spur research to advance the field of service globally. Table 1 offers synoptic research priorities and key studies. The analysed articles differ in terms of not only the identified research topics but also the methods employed.

Authors	Research priorities		Topic		Method	Perspective
Grove *et al.* (2003)	(1)	Interface between services and manufacturing	(1)	The nature of services	Expert-based survey	Theoretical
	(2)	Impact of information technology and e-commerce	(2)	The scope of services		
	(3)	Global service issues	(3)	Services and value creation		
	(4)	Scope, boundaries and conceptualization of service marketing				
Ostrom *et al.* (2010)	(1)	Fostering service infusion and growth	(1)	Service strategy	Expert-based survey	Academic and practitioners
	(2)	Improving well-being through transformative service	(2)	Service development		
	(3)	Creating and maintaining a service culture	(3)	Service execution		
	(4)	Stimulating service innovation				
	(5)	Enhancing service design				
	(6)	Optimizing service networks and value chains				
	(7)	Effectively branding and selling services				
	(8)	Enhancing the service experience through co-creation				
	(9)	Measuring and optimizing the value of service				
	(10)	Leveraging technology to advance service				
Kunz and Hogreve (2011)	(1)	Online service and technology infusion	(1)	Business-to-business services and service infusion	Citation-based approach	Theoretical
	(2)	The new dominant logic and cocreation of value	(2)	Complaint handling and service recovery		
	(3)	Coproduction to enhance service processes	(3)	Service value chain		
	(4)	Managing business-to-business services and service infusion				
	(5)	Enhancing and managing the service value chain				
	(6)	Return on service marketing decisions				
	(7)	Managing dynamic customer relations and assets				
	(8)	Analysing customer retention and churn				
	(9)	Complaint handling and service recovery				

(continued)

Table 1.
The research priorities and key studies

Authors	Research priorities	Topic	Method	Perspective
Ostrom et al. (2015)	(1) Stimulating service innovation (2) Facilitating servitization, service infusion and solutions (3) Understanding organization and employee issues relevant to successful service (4) Developing service networks and systems (5) Leveraging service design (6) Using big data to advance service (7) Understanding value creation (8) Enhancing the service experience (9) Improving well-being through transformative service (10) Measuring and optimizing service performance and impact (11) Understanding service in a global context (12) Leveraging technology to advance service	(1) Transformative service (2) Measuring and optimizing service performance (3) (4) Big data	Expert-based survey	Academic and practitioner
Furrer et al. (2020)	(1) Human resource management (2) Organizational behaviour and strategy (3) Technology and operations (4) Customer behaviour and marketing	(1) Technology/e-service (2) S-D logic (3) Emotions (4) Innovation (5) Environmental context	Content analysis Multiple correspondence analysis	Theoretical
Bolton (2020)	(1) Service to society (2) Stakeholder involvement (3) Impact on stakeholders (4) Valuing both basic and applied contributions (5) Valuing plurality and multidisciplinary collaboration (6) Sound methodology (7) Broad dissemination	(1) Sustainability in service ecosystems (2) Automation and the nature of service work (3) Inclusion, equality and well-being of service workers (4) New technology and big data	Personal development	Theoretical
Hult et al. (2020)	(1) Frontline employees (2) Self-service technologies (3) Co-creation of value	(1) Interdisciplinary research on frontline employees (2) Self-service technologies	Personal development	Theoretical

Table 1.

A first group proposes expert surveys and roundtable discussions involving academics, executives and research centres (Ostrom *et al.*, 2010, 2015). Ostrom *et al.*'s (2010) ground-breaking article identifies 10 research priorities to advance service science and service innovation, articulated in strategy (service infusion and growth, well-being and service culture), development (service innovation, service design, service networks and value chains), execution (branding and selling services, service experience through co-creation and measuring the value of service) and the leveraging of technology to advance service as a pervasive force enveloping the other priorities. More recently, Ostrom *et al.* (2015) addressed the changing context of service, presenting four main categories—strategy, design/delivery, value creation and outcome—and two overarching priorities—service in a global context and the role of technology—to cover 12 priorities and 80 subtopics.

In a second group, studies come from the authors' conceptual development (Bolton, 2020; Hult *et al.*, 2020). By recognizing the gap between societal needs and scholarly knowledge about service and the urgency to perform responsible research—that is, research that is useful to society—Bolton (2020) adopts a societal problem-driven perspective and addresses three leading research responsible principles: (1) the development of knowledge that benefits society, (2) the involvement of multiple stakeholders in the scientific process and (3) making an impact on stakeholders. Such principles are discussed in terms of societal issues such as individual and societal needs for privacy, security and transparency; the ethical sourcing and treatment of service workers; and the impact of service actions on environmental outcomes. Hult *et al.* (2020) recognize the integration of interdisciplinary perspectives in service research. Their research agenda focuses mainly on two areas—frontline employees and self-service technologies—highlighting the importance of collaboration between services marketing and other disciplines (e.g. management, computer science) for scholarly advancement.

The third group of scholars identifies promising research themes by investigating the evolution of service discipline with quantitative methods such as a citation-based approach or multiple correspondence analysis (Kunz and Hogreve, 2011; Furrer *et al.*, 2020). Kunz and Hogreve (2011) inspect the intellectual pillars of service marketing in 1992–2009 using a citation-based approach. They derive insights for nine research topics (see Table 1) highlighting two main areas: motivating customers to use service technologies to enhance service productivity and implementing service technologies such as remote services. By contrast, Furrer *et al.* (2020) analyse 27 years of publications in service research and depict four research clusters: human resource management, organizational behaviour and strategy, technology and operations and customer behaviour and marketing. Then, adopting a share-growth matrix they discuss the three themes identified in the "stars" category (technology/e-service, service-dominant [S-D] logic and emotions) and two "question marks" (innovation and environmental context). Pohlmann and Kaartemo (2017) specifically focus on the research trajectories of S-D logic, combining bibliometric analysis with qualitative study to identify the main concepts and themes that guide S-D logic research.

In summary, as scholars have investigated published articles on service priorities, a multifaceted picture has emerged. Notwithstanding the specific differences, we summarize three main points: key concepts, adopted methods and chosen perspective. First, service research is fragmented on key concepts. However, the complexity of research questions prioritized by researchers and practitioners requires a broader and integrated view of the service domain (Ostrom *et al.*, 2010, 2015; Hult *et al.*, 2020). Among the list of priorities, two main topics seem to repeatedly arise. The first is transformative service research (TSR) to better understand the well-being of service workers and customers (Anderson *et al.*, 2013; Bolton, 2020). Societal needs drive what is labelled "responsible research" (Bolton, 2020). The aim is to develop knowledge that benefits society and makes a positive impact on stakeholders, by rethinking the service provision (Anderson *et al.*, 2013) and understanding the intended and unintended consequences of actions on well-being (Finsterwalder and Kuppelwieser, 2020).

The second topic is the impact of new technology (Ostrom *et al.*, 2015) on advancing service across digital, physical and social contexts (Bolton *et al.*, 2018). Other studies on research priorities address the potential role of AI and robotics in the service experience and value co-creation (Kaartemo and Helkkula, 2018; Mele and Russo Spena, 2019).

Second, the adopted methods range from qualitative methods (e.g. expert surveys), to conceptual development and to quantitative methods (e.g. co-citation analysis). Qualitative methods involve using academics or business executives as subjects, and conceptual development has a core limitation in its potential subjectivity (Kunz and Hogreve, 2011; Furrer *et al.*, 2020). Quantitative methods, in contrast, have strong roots in the past and may be limited in identifying new trends in a rapidly changing context.

Third, articles about service priorities tend to come from theoretical perspectives and provide limited insights into how to inform practice. Service research needs to refresh scholars' theorizing process and produce knowledge for use in the practitioners' service context (Brodie and Peters, 2020). To inform contextual research, the priorities should assist academics and practitioners by shaping the landscape of the discipline and business context.

In light of these three aspects, we analyse the potentially disruptive role of the COVID-19 and its effects on the context in which service is co-created and experienced. The purpose of this work is to put forth a research framework analysing a business-related source of information to inform scholars and practitioners and introduce a new methodology for identifying research priorities.

3. Methodology
To identify the discussion on the impact of coronavirus on business, we used data from reddit, particularly the subreddit "r/coronavirus". This online platform enables people to submit links, create content and discuss any topics, so it provides access to geographically unbounded, real-time debate on the topic of interest. Online forums have only recently become the interest of research in the service domain (Aragòn *et al.*, 2017). Researchers note that they provide rich environments in the sense that users can spontaneously post questions and comments about different topics. Understanding how people behave in online forums may shed light on the fundamental mechanisms by which collective thinking emerges in a group of individuals, with relevant practical applications. In addition, in contrast with other network platforms (e.g. Facebook, Twitter), reddit users follow a subject and not a person and can choose subreddits within different created communities united by a certain topic.

While we could have also analysed business-related subreddits and limited the search to the pandemic era, these subreddits feature a great deal of discussion unrelated to the impact of coronavirus, such as promotional content or other business news. "r/coronavirus" is also the most generic of the largest COVID-19 subreddits, as alternatives, such as "r/COVID19", aim "to facilitate scientific discussion of this global public health threat". As there were more than 200,000 posts and four million comments on the subreddit "r/coronavirus" at the time of data collection, it was impossible for a human being to analyse the data in a timely manner. Therefore, we employed an AI-based algorithm to help with the analysis in three steps. First, we scraped the data with business-related search terms on reddit posts. The search function was built on a custom business thesaurus, which returned 9,698 unique reddits posted on January 1–April 26, 2020. Second, we eliminated nonsense posts with a cleaning software, leaving 9,661 reddits in total. These two steps left us with sufficient reddit posts to analyse, so we advanced to the third step, in which we conducted the topic analysis using a custom-built thesaurus specifically built for this analysis. The Cao metric (Cao *et al.*, 2009) guided us in selecting the number of topics to extract. The ideal balance between parsimony and goodness-of-fit appeared to be offered by seven topics. We extracted these topics via a latent Dirichlet allocation employing Gibbs sampling (Griffiths, 2002). The posts were distributed to topics by the algorithm and did not involve manual coding. The difference between all the topics is statistically significant ($p < 0.01$).

It is important to note that though a computer can distinguish between themes of any discussion, the labelling of the results is subject to human interpretation. One author carefully read the research transcripts and started to categorize units of data. Then, all authors discussed the seven topics together and generated the following initial titles: (1) essential service provision, (2) creative medical service, (3) combatting virus, (4) responsible shopping and international service, (5) guided retail, (6) distrust in the stock market and (7) wild market of supplies. With these themes, we moved to the next stage to decrease the number of topics for further analysis. We used inductive reasoning to generate ideas from the collected data and to develop explanations and interpretations about them. All researchers were involved in developing comprehension, synthesis, theorizing and recontextualizing (Morse, 1994). While interpreting the results, we found thematic similarities between the topics from a service research perspective and combined some of the issues. While these topics were thematically different to a machine, we perceived combining them as more efficient for developing a service research agenda. This process flowed as a selective-coding, by which a new label is attached to some themes (Corbin and Strauss, 2008). More precisely, we combined themes 2 and 3, which both discuss the "bricolage innovation"; themes 4 and 5, which both focus on "responsible shopping practices"; and themes 6 and 7, which relate to "market shaping amid crisis". We developed an understanding of the phenomenon under investigation by further discussing what accounts for relationships between related concepts, how explaining why new knowledge occurs and then relating the concept back to previously developed knowledge (Gummesson, 2000).

4. A service research agenda for the post-coronavirus world
Building on the results from the large-scale analysis of the impact of coronavirus on business and placing these findings against the backdrop of previous findings on service research priorities, we categorized four main topics. We did so with the aim to develop a research agenda on the most critical issues for the post-coronavirus world. In the following sections, we (1) discuss the themes by presenting findings, (2) highlight promising avenues in exploring novel areas in the service domain and (3) address the contribution to research priority to broaden the scope of service discipline in the post-pandemic era. Table 2 provides a synthesis of the service priorities arising from the COVID-19 seismic wave.

4.1 The themes
Based on reddit analysis we address four themes: (1) essential service provision, (2) bricolage innovation, (3) responsible shopping practices and (4) market-shaping amid crisis.

4.1.1 Essential service provision. The first theme is on service and its conceptualization. Against the first service definition (Hill, 1977), service scholars no longer conceptualise services as non-goods. Rather, services now increasingly represent an integral part of the product and of society's needs, and the interconnectedness of goods and services is well represented by service infusion or servitization (Kowalkowski *et al.*, 2012). Moving beyond the outcome, in the S-D logic the term "service" captures the shift of attention to the process and the application of knowledge for the benefit of others (Lusch and Vargo, 2014). However, for many companies and policymakers this shift is still far from being realized, and the old separation logic is still dominant, especially in times of crises, when the decision on what business activities are necessary must be made quickly.

Amid coronavirus, governments have made decisions on whether essential and non-essential services are allowed to remain open. Thus, it has become crucial for companies that want to remain open to be labelled essential. This distinction was not always clear-cut, which introduced 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 is not an essential service? (Reddit #7989).

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

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).

Service research has extensively discussed what is and is not an essential service (Sharam, 2007). In general terms, utilities, telecommunications, banking, medical care, education and transportation are viewed as essential services. The International Labour Organisation (2019) defines essential services as vital to the health and welfare of a population and, therefore, essential to maintain even in a disaster. Governments provided lists of non-essential services that were forced to close for several weeks to control the spread of the coronavirus. However, they made many amendments to these lists, as it was challenging to define what is essential (e.g. professional and technological services supporting essential service providers). The crisis has also introduced the question of services that are interpreted as non-essential but have an impact on mitigating people's social constraints due to isolation or loneliness. In the case of social support services (i.e. care or educational services), it could be useful to evaluate what kind of essential benefits they can support and for whom they benefit (e.g. health systems, family).

4.1.2 Bricolage service innovation. The second theme discusses bricolage innovation (Witell *et al.*, 2017; Alkire *et al.*, 2019) and how new kinds of solutions and innovative processes can emerge during the crisis. Solving problems has always been at the heart of

Themes	Sample posts on reddit	Future research ideas		Contributions to research streams
Essential service provision	New definition of essential service to question the rational and basic set of issues in a crisis time that can be implemented in a phased manner	(1) (2) (3)	Essential service conceptualization according to different perspectives (micro, meso and macro) Models and metrics to configure an essential service Smart technologies to foster essential service provision	Service infusion Service culture well-being Service technology
Bricolage innovation	Innovative solutions to reduce constraints based on new ways of integrating existing resources	(1) (2) (3)	Bricolage innovation processes Well-being innovation outcomes Practicing innovation in complex adaptive systems	Service innovation Service well-being Social implications of technology
Responsible shopping practices	New experience and value cocreation processes in times of crises focused on what constitutes "responsible" and how market actors behave for their own benefit and the benefit of others	(1) (2) (3)	Emergence of new service practices Responsibility as a value logic Responsible behaviour and measures	Transformative service research Social marketing
Market shaping amid crisis	New insights on market-shaping mechanisms and dynamic capabilities that are suitable for a crisis situation	(1) (2) (3)	External shocks triggering market changes Public actors in market shaping Nation-states as institutions	Market shaping Market dynamics Service System viability

Table 2.
Themes, research ideas and contributions to the research streams

service innovation (Droege *et al.*, 2009). However, innovation driven by the desire to help, connect with other people and be part of the solution when things get difficult is a less familiar topic for service scholars. Crises often present unique conditions that allow companies to think and move more freely to create rapid, influential changes. These aspects are linked with the transformative role of services (Ostrom *et al.*, 2015; Alkire *et al.*, 2019; Finsterwalder and Kuppelwieser, 2020), in which studies have examined the intersection of service and well-being but focused less on service innovation to address important individual and collective well-being-related issues.

> 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).

> 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 do not have enough kits or protective gear to meet demand. (Reddit #8141).

During the COVID-19 emergency, new creative medical solutions such as temporary hospitals, drive-in services and crowdfunding have emerged as an opportunity to solve business problems. In addition, many companies have turned their operations into life-saving products (e.g. masks, ventilators, hand sanitizers) during the crisis:

> 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).

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

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

During the coronavirus pandemic, organizations have been forced to quickly create solutions to reduce people's constraints and support their well-being by searching for more collaborations and exploiting their knowledge. In addition, the need for innovative organizational solutions has caused organizations to rebalance resources and investments between companies suffering declining demand and those experiencing a spike in demand. The bricolage perspective in service research is in its infancy (Witell *et al.*, 2017), but it could explain service innovation in resource-constrained contexts and situations. Rather than searching for new resources, companies overcome scarcity resources by using resources at hand and improvise to face the crisis (Shen, 2018). The focus moves from the formal and programmed mode of innovation to the processes of learning by doing, using and interacting to produce interactive and incremental frugal innovations (Rajala *et al.*, 2016).

4.1.3 Responsible shopping practices. The third topic refers to new service practices that have emerged during the pandemic. Two of these phenomena are "responsible shopping" and "responsible business", which illuminate new norms on how customers and other market actors should behave in service encounters. Similarly, shops have introduced new practices to support responsible shopping driven by both retailers and governments:

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

> Walmart to limit number of customers, creates in-store social distancing measures. (Reddit #101).

> NYC Mayor De Blasio: appointment shopping, senior hours for grocery stores during coronavirus, pledging NYPD to enforce social distancing. (Reddit #2184).

In addition, during the pandemic several institutions at local, regional and national organizational levels have developed actionable, timely and credible communication to prompt people towards responsible behaviour. In this sense, both institutional and commercial actors have encouraged consumers to need a really good reason to go to the mall and to fulfil the shopping experience and meet social connections more responsibly:

> 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).

> Bavaria introduces mandatory masks in shops and local transport. (Reddit #2035).

While service research scholars have expressed some interest in responsibility in the past (Rendtorff, 2009; Bolton, 2020), the coronavirus pandemic raises questions about how new responsible shopping practices emerge. These practices are initiated by market actors (e.g. retailers) willing to serve vulnerable clientele and governments regulating providers and market actors (e.g. retailers, media). New practices are considered a response to serve people better during the pandemic and to slow the spread of the virus. However, the question is whether the new responsible practices will retain their form in the post-coronavirus world. Prior evidence shows that responsible shopping has become the primary value proposition of some service providers (e.g. Body Shop; Edvardsson and Tronvoll, 2013) and drivers of new customer practices (Ostrom *et al.*, 2015).

4.1.4 Market shaping amid crisis. The fourth theme discusses the market changes that the external shock has initiated. Some people and companies have reacted quickly to the pandemic by buying and selling masks and other medical supplies. A market that had not attracted a general interest before the pandemic pulled new market actors that bent the rules of the game. In other words, they shaped the market amid the crisis. As a response, some public actors have reacted to the changes to maintain the status quo:

> 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).

At the same time, public organizations have changed their rules to be better positioned to access critical medical resources by limiting exports and encouraging imports. Similarly, to ease the financial market pressure, governments have taken measures to pump new money into the market. The empirical evidence shows quick manoeuvres to restrict exports and lift tariffs when the need for critical resources becomes more important than generic trade policies.

> CZECH REPUBLIC—Government bans export of respirators and regulates their sale in order to have stock for medical staff. (Reddit #4277).

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

> White House is drafting a financial assistance package for airlines that is expected to include direct assistance, loans and tax relief. (Reddit #1175)

The topic resembles the recent surge of interest in market shaping. Prior literature emphasizes the dynamic capabilities in "visioning" changes (Nenonen *et al.*, 2018) and the agency of focal actors (Mele *et al.*, 2018) that trigger and facilitate changes in market characteristics (Nenonen *et al.*, 2019). This study suggests that crisis as an external shock requires different kinds of dynamic capabilities from market actors that shape markets reactively. As the crisis emphasises the role of public actors, it is important to know how various public actors can shape markets and understand their motives for market shaping. During the crisis, markets have been opened for diplomacy and foreign trade and closed to

ensure that there are enough supplies for citizens within national boundaries. To understand the rationale, it is important to consider how politicians and other authorities determine value and how they oscillate between value created for themselves, the nation and society at large.

4.2 Future research ideas
Building on our analysis, we created a research agenda to steer each topic in a certain direction for further service research. The following subsections elaborate.

4.2.1 Essential services. The essential services theme focuses on how a new definition of "essential service" during a time of crisis can better support research questioning a rational and basic set of issues and supports managers' and policymakers' agendas. The nature of these services is complex to identify, and it is difficult to show ties and interdependencies among service ecosystems; as a result, their interruption in the crisis period has spread out their effects, directly affecting wider economies and social life as a whole. This research stream needs a systems perspective to explore the dynamic role of essential services in the nested business and social networks (Lusch *et al.*, 2010). Service-dominant logic (Vargo and Lusch, 2016), service logic (Grönroos and Ravald, 2011) and service science (Maglio and Spohrer, 2008) could offer theoretical lenses to further investigate the nature of service and to bridge theory and practice. Essential services for consumers, companies and societies are one of the priorities for further research in terms of the following key aspects:

(1) *Essential service conceptualization according to different perspectives (micro, meso and macro).* Treating the essential services as the service provisions that are absolutely necessary, even during a pandemic, means focusing on the beneficiaries. To a given person, musicals or wrestling shows can feel essential. Scholars can address the needs of consumers and citizens as well as key organizations. Zooming out, they can address the importance of service providers to the society as a whole and redefine what is essential. Thus, further research can offer a contribution to the concept of service provision in line with S-D logic (Vargo and Lusch, 2017).

(2) *Models and metrics to configure an essential service.* Future research could develop methods and tools to help decision-makers determine essential services during a crisis. If these metrics were transparent, companies would know in advance whether their business is essential and could design their service accordingly. Recent work on metrics in S-D logic could offer a preliminary understanding of how to promote service provision and mutual value co-creating processes (Grönroos and Helle, 2010).

(3) *Smart technologies to foster essential service provision.* Traditionally, specific industries such as food, housing, medical care and education have been deemed essential. However, technology is changing how these services are delivered from autonomous food delivery vans to online education. Scholars could focus on how cognitive and distributed ledger technologies (e.g. AI, machine learning, blockchain) could affect the essential service provision. Service science could be a ground to foster conversation on the social waves of new technologies Maglio (2017); Mele and Russo Spena (2019).

4.2.2 Bricolage innovation
The bricolage theme highlights the need for innovative solutions in light of co-creation and well-being assumptions that can support managers in searching for new ways of collaborating and integrating existing resources. It also includes the ability to boost resource becoming (Lusch and Vargo, 2014). In times of crises, innovation is more about discovering emergent opportunities for new service provision (Russo Spena *et al.*, 2017) and

integrated open and collaborative expansive learning (Mele and Russo Spena, 2018). Service research can zoom out from micro-issues (as single new artefacts) to consider new ways of innovating and further contribute to existing studies on service innovation (Helkkula *et al.*, 2018):

(1) *Bricolage innovation processes.* Viewing innovation as the result of linear and deliberate activities that introduce discontinuities is not suitable in times of crises. Further research can address innovation as an emergent and dynamic phenomenon by combining and recombining available resources and actors that were previously unconnected in new ways. In such a view, resource (i.e. knowledge, relational or financial) scarcity becomes a trigger of innovation. The bricolage perspective is in its infancy in service research and could be extended to determine the most effective ways to innovate in resource-constrained environments (Witell *et al.*, 2017).

(2) *Well-being innovation outcomes.* During the coronavirus crisis, innovation does not need to be limited to benefitting a few identified targets (e.g. consumers, business segment) but could address the broader nested social and economic goals. Creating "uplifting changes" aimed at individuals' lives (both consumers and employees), families, communities and society is one of the foci of TSR (Rosenbaum, 2015). Future studies can investigate in more depth the link between TSR and service innovation and identify conditions that encourage creative solutions for transformative changes in times of crisis.

(3) *Practicing innovation in complex adaptive systems.* Adopting a complexity perspective can shed light on the co-evolutive and emergent properties of the service organization by accounting for pluralism and a dynamic view of business and society. Innovation emerges in a non-linear path and involves non-linear dynamics with multiple actors and new shared and co-constructive practices. Service research could provide a more robust conceptualization for understating how organizations in times of crises innovate as complex adaptive systems. They become sensitive to certain dramatic changes. Moreover, they become characterized by a dynamic state and exhibit emergent or self-organizing operations, effectively adapting to a wide range of environmental change, which increases their resilience. Recent studies on innovating in line with a practice-based approach (Russo Spena *et al.*, 2017; Mele and Russo Spena, 2019) could offer an understanding of "multiple sociomaterial connections across actions [that] arise at the cross-points of actors' interactions and resource integration, revealing a broader picture that can depict service innovation complexity more accurately" (Mele and Russo Spena, 2019, p. 519).

4.2.3 New responsible shopping practices. The responsible shopping theme refers to further questions of how customers make experiences and co-create value, spurring discussion on what is "responsible" and how market actors make decisions and behave to facilitate value creation for themselves and others. In a service context, the pandemic has triggered new practices, ranging from appointments, to a limited number of shoppers, to elderly shopping hours. By leveraging and merging recent studies on shopping practices (Fuentes *et al.*, 2019; Tran and Sirieix, 2020) and responsibility (Peloza and Shang, 2011; Fuentes, 2014), future research could focus on responsible value co-creation that encourages customers to change their shopping behaviour and nudge people to make better decisions for themselves and others. The following aspects could be addressed:

(1) *Emergence of new shopping practices.* The coronavirus pandemic has forced market actors (including public actors) to initiate changes to shopping practices. New shopping practices have been established, partly driven by rapidly developing discourse on a higher level of a service ecosystem and following the example of

retailers and governments in other countries. We encourage a vision of shopping practices as a combination of values, discourse, knowledge and any other relevant social and material elements in situated actions. Service research could explore how new shopping practices emerge in a social context and thus contribute to the "shopping as practice" approach (Fuentes *et al.*, 2019).

(2) *Responsibility as a value logic*. Our study does not address why responsible shopping practices have emerged. These changes may partly be driven by the sense of responsibility towards stakeholders, but they may also be triggered by profit maximization logic. It would be useful to learn more about responsibility as a complex and multi-layered value construct that drives decision making. Such research could benefit and further extend studies on how corporate social responsibility creates value for stakeholders (Peloza and Shang, 2011).

(3) *Responsible behaviour and measures*. The coronavirus crisis has resulted in pledges for responsible behaviour. However, responsibility is not well-defined in the service research, and it requires further conceptualization. To better understand its role in value co-creation, service scholars should develop metrics for measuring responsible behaviour. At best, responsibility should be treated as a systemic construct that can be measured at multiple levels of a service ecosystem. Marketing and management studies could offer insights into the metric fields for service scholars (Székely and Knirsch, 2005; Raghubir *et al.*, 2010).

4.2.4 Market shaping amid crisis. While scholars agree that markets are influenced by institutional arrangements, national boundaries have attracted only limited attention in international service research (Kaartemo, 2018). First, this research gap is due to S-D logic portraying nations as conceptually the same as domestic institutions, such as municipalities, on a higher level of abstraction. Second, the increasing trend towards global free trade has diminished the impact of nation-states in the past few decades. Nevertheless, the business implications of coronavirus encourage scholars to examine more closely the empirical importance of nations as institutions. Finally, the theme of market shaping amid crisis initiates discussion on the impact of an external shock on market changes and how research needs to develop insights into market-shaping mechanisms of different actors and dynamic capabilities suitable to a crisis. External shocks trigger market changes, and research that provides a better understanding of the role of external shocks in market dynamics is necessary. Market-shaping literature has focused mostly on agentic focal companies and, more recently, on collectives initiating changes in the market (Mele *et al.*, 2018; Baker *et al.*, 2019; Baker and Nenonen, 2020). Yet these studies rely on intentional and envisioned changes; the coronavirus crisis has shown that market turmoil can be caused by external shock. Further research would be worthwhile to learn more about the following topics:

(1) *Reactive market shaping*. Market shaping is typically portrayed as an intended action based on long-term strategizing by proactive market actors. However, COVID-19 has revealed that companies can be fast in their actions when their long-term strategies are disrupted and the consequences to the market may be unintended. By moving from studies on actors' agency to shape the market (Peters *et al.*, 2020), researchers could provide a better understanding of how market shaping as an intended and slow process differs from unintended and fast reactions in the future.

(2) *Public actors in market shaping*. The coronavirus crisis has shown that public actors are also active agents shaping markets. They regulate market actors and can guide demand and supply both within and across state borders. It would be useful to learn more about how and why public actors shape markets. Recent studies on institutional

work mechanisms that public actors employ in market shaping can offer a useful guide (Kaartemo *et al.*, 2020).

(3) *Nation-states as institutions*. As the preceding discussion notes, the role of nation-states has remained relatively overlooked in service research. While on a higher level of abstraction nation-states are similar to any other institution, empirical evidence shows that countries and their decision-making processes can have a tremendous impact on business when trade is not free. Thus, developing a conceptual understanding of nation-states as specific institutions and market actors enabling and limiting business activities is necessary.

4.3 Contribution to service research
By acknowledging research priorities previously identified by literature, this work provides themes and research avenues that should be addressed during the current pandemic but that could last over time and span different domains. Identifying these phenomena and corresponding assumptions is critical to understand how scholars could challenge prior assumptions of research priorities, which in turn gives rise to the emergence of unforeseen trends of changes. Thus, we contribute to service research by providing new insights immediately after the outbreak of COVID-19 and introduce a new method for identifying research priorities.

First, understanding of the essential services could be related to service infusion, service culture, well-being and service technology. The path to service infusion is growing (Ostrom *et al.*, 2015), and various forms of goods–services integration are surfacing. In this view, we posit the theme of essential services as critical and deserving of more attention in the service research literature stream. Going beyond the product versus service mindset, the aim is to contribute to creating a service culture informing business contexts. Essential service also has a key role in shedding light on how to improve the well-being of institutions by enabling and/or constraining actors (Lusch and Vargo, 2014; Vargo and Lusch, 2016). In such a view, service technology offers opportunities to facilitate the range of market actors' behaviour.

Second, the theme of bricolage innovation could prompt empirical explorations of value co-creation and service innovation. Indeed, this kind of innovation could better inform how the most-needed services can support individuals and society in making informed choices to ensure their safety, empower them and uphold their rights. Moreover, the theme may have a role in the service literature, especially for researchers who advance the open and practice approach to stimulate innovation (Russo-Spena *et al.*, 2017; Chesbrough, 2020). Bricolage innovation can provide a new way to address fast service innovation to solve unusual or complex problems. It advances a new role of non-conventional sources (e.g. users) and frugal processes and highlights the urgency of a renewed approach to sharing relevant scientific, technical and personal data (Bolton, 2020).

Third, the theme of responsible practices could relate to transformative well-being and service experience. Although interest has increased in transformative service research (Anderson *et al.*, 2013) with linkage to social marketing (Russell-Bennett *et al.*, 2019) and social entrepreneurship (Alkire *et al.*, 2019), the COVID-19 pandemic has revealed a greater need for research in this emerging theme. For example, some companies have responded to the crisis by introducing new service practices intended to serve vulnerable customers better, such as elderly shopping hours. It would be worthwhile to examine how these practices are maintained or disrupted after the immediate crisis to provide a better understanding of the emergence of transformative service practices. Furthermore, additional research is required for understanding what drives entrepreneurs and companies to undertake responsible business measures. Future research can help identify the extent to which governments must

force and incentivize companies to serve vulnerable customers and the extent to which firms run responsible businesses for profit or for other values.

Finally, market shaping amid a crisis contributes to emerging discussions on service networks and ecosystems, service culture and service performance and impact (Ostrom *et al.*, 2015). Evidence abounds on how service provision has become more fragile under increased global economic dependencies. Part of the explanatory power of market systems and service ecosystems concepts (Vargo and Lusch, 2017) is that they account for the complexity of business and the underlying dynamic view of a service-infused society. Addressing the role of how institutional processes work in times of crises could become a prerequisite to the viability of service systems (Peters *et al.*, 2020). As a complex adaptive system, the service economy is sensitive to specific changes in times of crises and must adapt to them.

5. Conclusion

Moving from a general notion that COVID-19 is transforming business society, this work provides a framework that captures these transformations' four main themes. Our themes are linked with prior service research priorities related to service infusion and servitization, well-being and TSR, service innovation, technology and the global context of service (Ostrom *et al.*, 2015). They also add to the recent themes of responsible research (Bolton, 2020).

This study adds to previous service researchers' agendas working from a theoretical orientation by contributing to their conceptual exploration of a practical domain. Focusing on essential service provision, bricolage service innovation, responsible practices and market shaping amid crises can help identify progress on crucial research topics. By clarifying, mapping and setting out a new agenda, we provide fresh ideas to the discussion, which can guide the service community dealing with the coronavirus outbreak to conduct research that matters to business and society. In addition, we introduce a research method that scholars can employ to identify research priorities in a rapidly changing context.

We acknowledge that relying solely on reddit as a source of data may have led us to overlook some of the business implications of the coronavirus crisis. For example, some issues related to language, nationality, Internet access and so on could have affected the results obtained, and other data sources (e.g. Instagram, LinkedIn), on which users speak mainly other languages, could provide a different perspective. However, given the wide scope of business discussion on subreddit "r/coronavirus", we trust that the results highlight the main business implications that require scholarly attention. To validate and extend our findings, we encourage other researchers to run similar studies with other data sources.

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Corresponding author
Cristina Mele can be contacted at: cristina.mele@unina.it