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The Future of Service Post-COVID-19 Pandemic, Volume 1

Rapid Adoption of Digital Service Technology

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Preface

This volume captures the experiences and lessons of service transformation experienced or observed during the COVID pandemic by forward-thinkers and strong leaders who acknowledge the digital technology as a potential stimulus for service transformation and a lever for the metamorphosis of services. Their insights shed some light on the service management after the pandemic in 2020. In this regard, cases in this volume bring together the work of experts from various research institutes around the world, describing the immediate transformation of services and service work and longer term metamorphosis of service businesses.

The chapters in this volume are largely grouped into three: a theory, cases, and policy analyses. The first chapter presents a theory of three-order effects with in-depth analyzes of the cases presented in this volume. Six chapters from 2 to 7 contain business cases in different service industries: education, health care, professional advisory, and people processing services. Last three chapters from 8 to 10 cover policy analyzes in startups, transportation services, and service policy recommendations for the poverty.

Third-Order Effects of Technology Adoption: Chapter 1

Chapter 1, titled "Preparing for Accelerated Third Order Impacts of Digital Technology in Post Pandemic Service Industry: Steep Transformation and Metamorphosis," presents a theory of three orders of effects in adopting digital technologies. Using this theory, cases in the chapters of this volume have been analyzed. Based on these analyzes, the three order of effects are extended into the service sector. For services, the first-order effects are defined as the convergent services, the second-order as the re-engineered services, and the third-order as the dynamic services.

Cases of Digital Technology Adoption in Services: Chapters 2–7

Chapter 2, titled "How the COVID-19 Pandemic Is Reshaping the Education Service," presents a case of quickly emerging distance education services in detail. This chapter points out that a digital transformation is the most immediate outcome of COVID-19 in education services in Japan. Details are described as to how distance education services have been implemented rapidly in terms of recorded online courses and interactive online courses. These two different but interrelated delivery techniques are compared and contrasted with each other. The recent sudden development of accompanying educational technologies is presented. New EdTech is discussed from three aspects: a learning management system, the use of artificial intelligence, and an OODA loop closure. Finally, discussions are given with some reflections on prior studies questioning the impact of digital transformation on education in relation to the effects and concerns (Kang 2020).

Chapter 3, titled "Rethinking Higher Education Post COVID-19," reports on findings from interviews of 19 high-level officials of universities across nine countries in Asia. This chapter discusses the pandemic effects on the higher education sector in the eastern hemisphere. Email interviews were conducted with 20 senior academic leaders in Australia, Bangladesh, Hong Kong, India, Macau, New Zealand, Singapore, Sri Lanka, and Thailand. An analysis of the interview transcripts revealed two underlying themes: changes in education delivery and changes in university management. Regarding the changes in education delivery, three themes surfaced: a different form of online delivery, emerging challenges in online education, and new ways of managing students. Regarding the changes in university management, three other themes also surfaced: new financial challenges, changing priorities, and new ways of managing resources. Discussions are provided for each theme (Ewing 2020).

Chapter 4, titled "Transformative Value Co-creation in Healthcare Services in the COVID-19 Era: The Case of Centro Cardiologico Monzino," investigates how digital health technologies impact the evolution of the Italian healthcare service ecosystem in a transformative way by studying the case of Centro Cardiologico Monzino in facing the pandemic. The study adopted a qualitative approach based on in-depth interviews with patients of Centro Cardiologico Monzino with cardiovascular pathologies who use digital health devices, as well as with doctors, caregivers, and other key informants who are experts in the Italian healthcare service ecosystem. With regard to the newly implemented service ecosystem, the following three main themes emerged through these interviews as transformative ways for developing digital technologies: engagement in newfangled actors, digitally mediated resource integration, and newly emerging barriers and tensions. The findings illustrate how digital health contributes to value co-creation and enhancement of individual and collective well-being, considering the renewed interaction between different actors in the service ecosystem (Sebastiani & Anzivino, 2020).

Chapter 5, titled, "Technology Perception and Productivity Among Physicians in the New Norm Post-pandemic: A Dynamic Capabilities Perspective," investigates

the antecedents (perceived usefulness, perceived ease of use, and habit) for intention to use, and its impact on dynamic capabilities and physician productivity pre- and post-pandemic. The research subjects are physicians who are at the frontline of intensive care units (ICUs) in Malaysia. This study shows two significant findings: First, before the pandemic, under normal conditions of EMR use, technology perception had a significant but indirect impact on physician productivity through the key role of dynamic capabilities. Second, however, after the pandemic under abnormal conditions, technology perception no longer has any significant impact on physician productivity. Their intention to use EMR may have a weak but direct impact on productivity. A key significant change post-pandemic is that dynamic capabilities no longer mediate but strongly and directly impact physician productivity. This directly positive effect is much stronger than that before the pandemic. This study integrates perspectives from information systems and dynamic capabilities to examine the impact of EMR usage on dynamic capabilities for knowledge acquisition and deployment to enhance their productivity. The findings offer insight into how a pandemic can accelerate technology perception and can contribute to the effective use of technology to aid physicians (Liew, Koh, Andrei, Poh, & French 2020).

Chapter 6, titled "How COVID-19 Has Changed the Digital Trajectory for Professional Advisory Firms," investigates the impact of COVID-19 on professional services. The author conducted semi-structured interviews with 10 senior legal advisers, 10 senior management consultants, two judges, and two professors concerning their expected digital trajectories. The findings show that COVID-19 had rapidly broken down several previous barriers to digital transformation and had caused a rapid increase in the adoption of digital technology among professional advisory firms. Although there might be a rapid digital implementation from a Corona bump, it seems that a new normal has already been established with changes in the operational context. The rate of digital trajectory seems to be steeper than anticipated, and the pace will be accelerated. Professional advisers will become better suited to advise on the increasingly complex digital context of their clients (Kronblad 2020).

In Chapter 7, titled "The Lotus in the Mud: A Conceptual Model of Livestream Yoga Service Experience," a novel structure of e-experience is proposed for a Yoga processing service. People processing services are those in which customers are present in a physical environment for the service exchange to receive service benefits. These services are experiencing business hardships as authorities around the world have ordered these businesses to shut down face-to-face operations in an attempt to curb the contagion of the Coronavirus. People processing services such as yoga studios have found an alternative way to deliver their service during this challenging time through digital technology: the provisioning of livestream yoga classes. This chapter explores this service offering and posits a conceptual model of a livestream yoga service experience. It discusses key learning, identifies managerial opportunities, and proposes an agenda for future research (Ng-Fitzgerald 2020).

Policy Implications for Digital Technology Adoption in Services: Chapters 8–10

Chapters from 8 to 10 deal with policy issues concerning technologies in service sectors. Chapter 8 discusses how to support startups, and Chapter 9 deals policy issues faced by transportation services in the pandemic situation. Chapter 10 is unique in the sense that it deals with supporting policies for financially marginalized population in this era of the COVID pandemic.

Chapter 8, titled "Technology and Innovation to Weather the Storm?—A Case Study of the Role of Technology and Innovation for Startup Survival in Shanghai, China," examines the challenges faced by start-up companies in China during the great lockdown caused by the COVID-19 pandemic during the first quarter of 2020. This study covers six startup companies in Shanghai with a focus on the nature of the challenges that they have faced, their responses to these challenges, and the post-pandemic prospects in their respective areas of business. Particular attention is paid to the roles of technology and entrepreneurship ecosystems involving various stakeholders, including venture capitalists, incubators, and governments. The conclusions are presented with cautions regarding online technology adoption, and highlights of the importance of entrepreneurship ecosystem for startup survival during the pandemic (Ro, Zhang, Dayaneni, & Chen 2020).

Chapter 9, titled "Enhancing Transportation Service Experience in Developing Countries: A Post Pandemic Perspective," focuses explicitly on the anticipated changing nature of the post-pandemic services and service industries with particular reference to the Nigeria transport industry and its post-pandemic outlook. With an understanding of the economic challenges around the world and the need to adopt transformative service research, coping measures were developed and presented within three main areas: the protection of commuters (users of transportation services), particularly related to the public transportation; an infrastructural redesign of the physical transportation to accommodate novel changes induced by the pandemic; and redesign of transportation services in response to the pandemic. These action plans are discussed against the short and long terms prospects, respectively. The challenges of transportation services in developing countries are discussed in detail (Mogaji 2020).

Chapter 10, titled "Post-pandemic Penury of the Financially Marginalized in India: Coping with the New Normal," investigates the impacts of COVID-19 on financially marginalized groups in India. The consequences and required actions are categorized based on levels of influence: high, medium, and low. Suggestions were made, including significant structural changes such as extensive use of information and communication technology, the development of online platforms for education, strengthening of rural infrastructure, development of health infrastructure, creation of employment opportunities in both rural and urban areas, and provisioning of credit

and capital, followed by suggestions for improving credit flow and launching temporary social security systems for the poor (Singh, Ambarkhane, & Venkataramani 2020).

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Contents

Chapter 1
Preparing for Accelerated Third Order Impacts of Digital Technology in Post Pandemic Service Industry: Steep Transformation and Metamorphosis

Jungwoo Lee and Spring H. Han

Abstract COVID-19 has expedited digital technology adoption in the service sector ever under severe constraints. However, if not suitably appropriated, this haste adoption of digital technology might have unintended adverse effects in the longer term. In this introductory chapter, a theory of third-order impacts of digital technology is introduced to explore the effects of digital technology adoption in the service sector organizations. The third-order changes will have more profound implications for future services beyond the simple digitalization of service routines. Although third-order changes may occur much later, preparation is critical because the first-order adoption and the second-order adaptation may form a basis for the third-order metamorphosis. We hope that this theoretical lens is useful in providing foresight for the changes in the nature of services in the post-pandemic. As an exemplary analysis, the first-, second-, and third-order changes are extracted from the six cases of service transformation presented in this volume, and contrasted with each other. Finally, a refined theory of third-order changes in the service sectors is proposed in relation to the evolution of digital technology, and its implications are discussed.

Keywords Third-order changes · Organizational transformation · COVID 19 · Post-pandemic · Organizational development · Information systems · Digital technology · Service industry · Metamorphosis

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1.1 Introduction

A novel coronavirus, first discovered in China in December 2019, led to a global pandemic in March 2020. The disease, called Corona Virus Disease (COVID), spreads among people through direct, indirect, or close contact with infected people through mouth and nose secretions (Kabadayi et al. 2020). Thus, strict measures such as border lockdowns, stay-at-home orders, travel restrictions, massive quarantines, enforced social distancing, contact tracing, and self-quarantines are enforced worldwide (Tian et al. 2020). These measures have been extremely harsh on business operations, especially the service sector, in which human contact is critical, has been hit the hardest. The situation is particularly dire in the hospitality sector. The global travel industry is facing reductions of more than 90% (Fernandes 2020). The impact seems to be vast and not yet predictable for the near and longer-term future of the service industries. All service operations are experiencing severely destructive effects on the nature of their businesses (Guzman et al. 2020).

In response to these challenges, service sector organizations have delved into a rapid adoption of technology-driven practices under severe time constraints (Carroll and Conboy 2020). In addition, this digital transformation is expected to escalate post-pandemic. People fear contact, and contactless services may become the new norm in all service aspects. Many potential changes may occur in the deep structure of services when using digital technology and applying severe alterations to service practices. In a certain sense, COVID-19 is bringing in an era of new normal digitalized services across industries, much earlier than anticipated.

The World Economic Forum identified 10 technology trends that are eminent in dealing with the COVID-19 pandemic, as listed below (Xiao and Fan 2020). Each of these technology trends contains digital and automation components. Moreover, most of these technologies aim to transform contact-based services into technology-mediated services. Human contact must be minimized (Fig. 1.1).

Digital technologies are opening up a whole new world of possibilities for services with deeper insights into customers, improving the service processes, optimizing the operations, and much more. However, the adoption of digital technology is complicated and usually meets with resistance and time-consuming adjustments. In the

Fig. 1.1 The ten technology trends (Xiao and Fan 2020)

(1) Online shopping and robot deliveries
(2) Digital and contactless payments
(3) Remote work
(4) Distance learning
(5) Telehealth
(6) Online entertainment
(7) Supply chain 4.0
(8) 3D printing
(9) Robotics and drones
(10) 5G and ICT.

literature, it has been warned that an immature implementation of digital technology may trigger 'digital sclerosis' (Andersen et al. 2020). Such digital sclerosis might be characterized by a stiffening of the service processes, failing to respond to changes in demand, and lowering innovation possibilities once rigid digitalized systems freeze the service routines. To prevent long-term digital sclerosis, close observations and measurements of the impacts and evolution post-adoption, as well as a careful design, development, and implementation, are necessary in advance.

Despite the unplanned rapidness and abruptness of digital technology adoption in services during the pandemic, it is vital to observe and measure the changes incurred by these digital technologies on the nature of services. As an analytical framework for measuring the impacts of technology integration with services, a theory of three orders of effects of digital technology is presented here.

1.2 Digital Technology Adoption: Three Orders of Effects

Business re-engineering has become very popular in 90s when digital technology had been rapidly advanced and adopted by businesses (Hammer 1990). However, this strategy of radical re-engineering is criticized as too radically dehumanizing the workplace, and contradicted by slow but incremental changes of organization using digital technology. This dichotomy of strategic thinking has been popular in 90's : radical re-engineering versus incremental improvement (Pereira and Aspinwall 1997). Since the advent of business re-engineering during the 1990s, both incremental and radical changes have contrasted within studies on organizational change and innovation as contrasting strategies for organizational change (Hill 1999). It can be traced back to studies on strategy in which they were described as gradual versus dramatic, or small-scale versus large-scale (Fox-Wolfgramm et al. 1998; Newman 2000; de la Sablonnière 2017; Berente et al. 2019; Lewis 2019; Watad 2019). These arguments are summarized in Table 1.1.

In general, these two approaches are considered as a choice of method, exclusive to one another. This dichotomy is used to compare and contrast two extreme approaches for organizational development and changes, and also used by many consultants. In most cases, they are presented as exclusive to each other. In some cases, these are portrayed as first- and second-order changes, though this naming implies sequence.

In another stream of organizational development studies, organizational changes incurred by interventions such as the adoption of new digital technologies are described as sequential stages: first-, second-, and subsequent third-order effects of changes induced by digital technology implementations (Bartunek and Michael 1994; Riasanow et al. 2018). This view is process-oriented in that it presents organizational development as moving from the first-, through the second-, and into the third-orders of changes, whenever organizations modify and develop themselves in response to environmental pressures and/or strategic needs. Links between this

Table 1.1 Two types of organizational transformation presented and contrasted in prior consulting literature

	Berente et al. (2019)	Lewis (2019)	Watad (2019)	de la Sablonnière (2017)	Newman (2000)	Fox-Wolfgramm et al. (1998)
Incremental changes	Initial responses to an enterprise system implementation (first-order responses)	Incremental change that supports and strengthens the existing structures and competencies	Change that occurs within a system that remains unchanged	Incremental, beta, decline, gradual, small-scale change	Incremental and convergent changes helping firms maintain internal reliability	Changes that occur within the system itself
Radical changes	Responses over time to ongoing activity with enterprise system implementation (second-order responses)	Discontinuous change that poses a threat to the structures and capabilities	Change that alters the total system	Dramatic, gamma, abrupt, collapse, large-scale change	Transformational and radical changes at its core with strategic reorientation leading to an organizational metamorphosis	Changes in which the system itself changes
Context	Systems implementation	Technology change	Technology adoption	Social change	Institutional change	Institutional change

processual view of organizational development and digital technology implementations, however, have rarely been drawn, except in a few studies on work transformation with digital technology (Baptista et al. 2020) and digital system implementations (Riasanow et al. 2018).

In this stream, organizational development can be described as first-, second-, and third-order changes occurring in sequence using the concept of schemata developed in cognitive sciences (Bartunek and Moch 1987; Bartunek and Michael 1994) rather than two competing approaches of radical changes and incremental improvements. This theory can be found across various research disciplines, such as in the configuration of work (Baptista et al. 2020), family therapy (McDowell et al. 2019), classroom computing adoption (Makki et al. 2018), and digital transformation (Riasanow et al. 2018), among others. Representative research and theories regarding this three-orders of effects in different domains are selectively screened, summarized, and contrasted in Table 1.2.

In the context of digital technology adoption, the first-order of change occurs when the digital systems are designed and simply implemented. In most cases, digital systems are developed reflecting current business processes. The virtual processes are designed as replicas of the physical processes. Calculative routines in these processes are handled by numerical machines, thus the business operations can be much faster with new digital systems (Riasanow et al. 2018). In this regard, the first-order changes includes routinization of calculative and numerical procedures such as comparison of receipts and bill of lading. In this regard, first-order changes effect selective parts of an organization, such as certain localized business processes (Bartunek and Jones 2017).

The second-order changes occur when users realize that digital systems can go beyond a simple digital routinization of tasks. Patterns of work change and evolve, reflecting the characteristics of digital technology. Unnecessary steps and procedures are removed or modified, thus affecting the entire organization with potential to change the core concepts of the business (Young et al. 2016; Riasanow et al. 2018). For example, after comparison of receipts and bill of lading are delegated to the machines, humans may take more responsibilities for different processes which was not handled by him/her. As digital technologies are more malleable and operate in real-time compared to technologies based on physics, the routines are more easily changeable. Thus, work processes are transformed, reflecting these characteristics that might or might not have been anticipated in the initial design digital systems.

The third-order changes occur when the potential and deep capabilities of these digital technologies are realized in practice beyond the current organizational schemata and structural constraints. The third-order changes involve developing capacities for changing schemata and structure (Bartunek and Moch 1987; Riasanow et al. 2018). With capabilities provided by advanced digital technology, the organizational schemata are modified rather freely on the fly as events occur and environmental conditions change. The digital technologies and the impact of changes go beyond the organizational and industrial boundaries, taking advantage of the synergistic aspect of the information. New business models may emerge with these third-order changes.

Table 1.2 Studies used the theory of three-order effects in various fields

	Baptista et al. (2020)	McDowell et al. (2019)	Makki et al. (2018)	Riasanow et al. (2018)	Bartunek and Michael (1994)	Bartunek and Moch (1987)
1st order	(Convergent change) reinforce, enhance, and evolve existing practices and understandings of work in organizations	(First-order thinking) changes or solutions to problems that fit within existing relational frameworks	(First-order barrier) willingness to incorporate technological tools with limited computing resources	Incremental or convergent change	Incremental change involving behavioral adjustments within established beliefs set	Incremental changes occurring within particular schemata shared by members
2nd order	(Transforming work) shift organizational schemata and social dynamics, and modify patterns of work and interactions	(Second-order thinking) changes in the process level of relationships, for example, change in repetitive patterns and schemas	(Second-order barrier) attitudes and beliefs in predicting the effective integration of technology in classrooms	Transformational or radical change involving entire organization	Changes in the deep structure and shared schemata that generate meanings to activities	Modifications in the shared schemata themselves
3rd order	(Transforming the organization) emergence of entirely new schemata, reshaping views about the nature of work and the corresponding organizational structures	(Third-order thinking) take a meta perspective considering systems of systems, that is, sets of alternatives between schemas	(Third-order barrier) dynamic creation of knowledge and practice confronted with ICT and associated affordances	Change that exceeds organizational boundaries affecting business model and value network	Changes transcending and transforming schemata	Development of the capacity of the client system to change the schemata as events require
Context	Digital/human configurations of work	Family therapy and relationship building	Classroom computing integration	Digital transformation	Organizational development	Organizational development

Chapters from 2 to 7 in this volume deal with actual cases of service transformation and possible metamorphosis incurred with the adoption of new technologies. The theory of three orders of effects is used in analyzing these cases. The results are summarized in Table 1.3. It should be noted that some analyses are based on the 'author's imaginative abduction, while most analyses are based on facts. Abductive inferences are italicized in the table.

Table 1.3 Three orders of effects of digital technology adoption manifested in chapter cases

Changes	1st order	2nd order	3rd order
Chapter 2 (Reshaping the education services)	Convert to recorded online courses and interactive online course	Adopt a new learning management system and artificial intelligence	Implement observe, orient, decide, and apply *novel* loop for teaching and services
Chapter 3 (Rethinking higher education post-COVID)	Convert to a different form of online delivery	Respond to emerging challenges in online education and devise new ways of managing students	Deal with new financial challenges, changing priorities, and new ways of managing resources
Chapter 4 (Value co-creation in health care services)	Adopting a digitally mediated healthcare service ecosystem	Deal with newfangled actor engagement and integrate digitally mediated resources	Deal with newly emerging tensions such as structural changes and power shifts
Chapter 5 (Technology perception changes in health care services)	Adopt an electronic medical record system in an intensive care unit	Use the dynamic capability to mediate technology perceptions leading to productivity	Invigorate the dynamic capability leading to the productivity irrespective of technology perceptions
Chapter 6 (The digital trajectory of professional advisors)	Accelerate digital advisory system change wherein many intertwined processes are involved	Effectively break down barriers to change, such as culture, competencies, and sense of urgency	Rethink business models and service delivery to become more aligned with the new normal.
Chapter 7 (Livestream yoga experience)	Adopt a live stream experience of yoga where the instructor play their own livestream yoga	Change the fixed place, one-on-one business model, into online business *models enabling the widened search of yoga instructors*	Advance into the 'yoga practice of the future'

1.3   Three Orders of Effects of Digital Technology in Services: Cases in Chapters 2 Through 7

1.3.1   Discussions: Three-Orders of Effects of Digital Technology on Services

Services and services industries are undergoing tremendous changes. These changes are happening in the ultimate deep structure of services. Not only routines of services but also the meanings and goals of services are changing. In some cases, services may be aided by multiple layers of digital technologies, combining algorithmic as well as routinizing features (Lee and Moon 2018). In other cases, technologies may digitally automate tasks eliminating human intervention.

It can be even called the metamorphosis of services. New breed of services that could not be imagined are burgeoning flourishly, such as Uber and AirBnB. Uber is transforming the nature of rental car services and taxi services. Uber is shaking the ground of hotel businesses. Services based on the concept of sharing may prevail over services based on concentrated capital. Beyond simpler transformation of service routines by digitalization and digital augmentation, the services seems to be metamorphing themselves into new ones with the aid of digital technology.

It is the digital technologies that are fundamentally changing the way many services are being operated and delivered (Beirão et al. 2017; Subramony et al. 2018). The nature of services are indeed changing faster with maturing of digital technologies. These changes incurred and induced by digital technology are being exacerbated with fast advance of technologies themselves.

Today's digital technology such as cloud computing, Internet of Things, social media, mobile computing, and bigdata analytics were not available at least a decade ago (Lee 2015). The platforms of data and information that anybody can access and use were not available at all a decade ago. This continentalization of information makes it easy for people to build digital services by integrating and linking data and information from different sources (Lee 2016). Digital services can be conceptualized and implemented in a matter of hours and days rather than of months and years.

Now, with forced rapid adoption of digital technology in services, this trend is accelerating even more (Ryu and Lee 2018; Buhalis et al. 2019). As digital technologies are hastily adopted, the service organizations did not have sufficient time to think about and digest the possible second- and third-order impacts of digital technology in their services (ISS Group 2020).

Thus, service organizations have to think seriously about the third-order effects of their current actions and, if necessary, change the course of actions as the nature of services may change beyond the initially imagined (Lewis 2019). These changes might be critically important in sustaining the competitive edge of their businesses (Morais-Storz et al. 2018). These complex effects need to be interrogated in order to gain a deeper and clearer understanding of how digital technologies are changing the services, whose work is being changed and metamorphed. These third-order
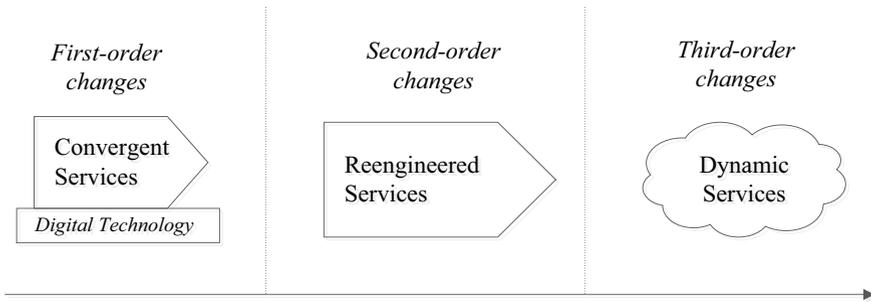
Fig. 1.2 Convergent, re-engineered and dynamic services as three-order of effects

metamorphoses might be the source of enhanced competitive advantages in the future (Aimé et al. 2019). We need to go beyond the first-order effects of digital technology, and consider the second-, and the third-order effects to remain competitive.

Here, reflecting upon the cases analyses results applying the theory of three-order effects (Bartunek and Moch 1987; Baptista et al. 2020) to the service industry, the three-order of effects with digital technology adoption in services are presented as: convergent services (first-order), re-engineered services (second-order) and dynamic services (third-order). Details are presented in the text below along with the Fig. 1.2.

1.3.2 First-Order Effect: Convergent Services

The first-order effect is the direct application of digital technology designed to support existing service routines. Or even for newly developed services, the initial design of digital technology for supporting this new service would be designed as following imaginary operational processes which will usually redesigned later reflecting the actual behavior of users and operators. Thus, it is most likely the replication of physical service processes into virtual ones. As the digital technology here converges with the target service routines, it is named convergent services.

A case of food delivery service will be used in exemplifying these three-order effects. The first-order effects of digital technology on food delivery service would be developing an App for customers to order from the menu along with an App for restaurant owners to receive and confirm the orders. This should be platform-based on which restaurant owners and customers are exchanging their order related information. This is the first-order change incurred in restaurant businesses when food delivery services are being implemented: installation of order-delivery apps on mobile phones of restaurant owners as well as of customers.

1.3.3   *Second-Order Effect:* Re-engineered Services

The second-order change is the modification of current service processes reflecting the characteristics of digital technology. As digital technology is instantaneous and information, by definition, are synergistic, the service processes are re-engineered taking advantage of the digital technology. However, the organizational schemata is still being maintained. Changes are occurring the current organizational schemata.

The second-order effects occurred in the running example was the integration of order-delivery App with the point of sale (POS) terminal in the restaurant. Once the standalone Apps were installed on the restaurant owners' personal computers and/or cell-phones, owners begun to find that they have to re-input order details to the POS terminal transferring all the order-related information from the App. As food orders increase, these tasks are becoming cumbersome and unmanageable. Thus, they have re-engineered the food ordering process by integrating the App orders with POS terminal. The food ordering process of a restaurant is reengineered around new breed of POS terminals to which ordering Apps are connected. The POS terminal automatically rings in the orders from the Apps. It is the second-order effects of adopting the food-delivery Apps on restaurant businesses.

1.3.4   *Third-Order Effect:* Dynamic Services

The third-order changes incurred by digital technology in services involve developing the capability that the services can dynamically reconfigure themselves. With the intelligence capability provided by digital technology, the advantage of speedy information flow, and the synergistic nature of information, existing services are re-conceptualized from the bottom giving birth to new types of services.

The third-order effect of our running example would be the development of the shared kitchen services. As food-delivery demands grow, restaurants may begin to realize that they need to have localized kitchens that deliver warm foods to neighbors on time. Thus, several restaurants with high delivery demands may develop a shared kitchen in densely populated area where their chefs can cook and deliver warm food on time. Shared kitchens may come up with different business models such as sharing supply chains or customer bases. This may become a new business model with dynamic reconfiguration capability.

The third-order effects are most significant changes in the nature of services, henceforth the term, metamorphosis. As these third-order changes are beyond the current organizational schemata, it is not easy to imagine the actual shape of the third-order changes, but new services invented and evolved recently may provide some insights on what is going to happen. Sharing economy type services seem to be examples of these third-order changes of services using digital technology.

1.4 Conclusion

This chapter presents a theory of three orders of effects in adopting digital technologies. Using this theory, cases in the chapters of this volume have been analyzed. Based on these analyses, the three order of effects are extended into the service sector. For services, the first-order effects are defined as the convergent services, the second-order as the re-engineered services and the third-order as the dynamic services.

This theory makes greater sense at this time of advanced digital technology applied forcefully in pandemic situation. We may begin to see the extensive emergence of the third-order metamorphosis of services very soon, exacerbating the trend started earlier. Unless services are adapting to these third-order changes, their service businesses may soon lose the competitive edge.

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Chapter 2
How the COVID-19 Pandemic Is Reshaping the Education Service

Byeongwoo Kang

Abstract History teaches us that crises reshape society. While it is still uncertain how COVID-19 will reshape our society, the global pandemic is encouraging and accelerating innovation and advancement, especially in the digital sphere. This chapter focuses on the impact of the COVID-19 pandemic on the education service, which is typically classified as a service industry in industrial classifications. Digital transformation in the education sector has attracted significant attention recently. The current education system in Japan is based on a structure that was institutionalized in the industrial age. Although education has seen innovation since then, it is one of the sectors wherein innovation occurs at a slow pace, and therefore, it does not meet the sector's expectations and demands. The COVID-19 pandemic is, however, accelerating digital transformation in education: Not only in Japan, but globally too, educators, students, policymakers, and other role players are now actively undertaking efforts to bring about digital transformation in this sector. This chapter reviews the rapid expansion of digital transformation in the education service and explores, in detail, the two main trends in digital transformation in the education service in Japan. These trends are the expanding of distance education and increasing innovation in educational technologies. The discussion further reflects on prior studies questioning the impact of digital transformation on education; it also anticipates and explores the effects of and concerns about the digital transformation in the education

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[1]The education service is classified as a service industry (e.g. Standard Industrial Classification (SIC) code: 8200 "Services-Educational Services" and North American Industry Classification System (NAICS) code: 61 "Educational Services").

In the Japan Standard Industrial Classification (JSIC), the education service was originally classified under "Division L –Services." Since the scale of the education service was expanding along with the increase in learning opportunities, lifelong learning and leisure time, a new division of "Division O – EDUCATION, LEARNING SUPPORT" was established by separating these fields from "Division L – SERVICES" in 2002. For more information, please see "Summary of Development of the Japan Standard Industrial Classification (JSIC) and Its Thirteenth Revision" by the Ministry of Internal Affairs and Communications (available at https://www.soumu.go.jp/main_content/000316295.pdf).

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service. Finally, the chapter includes a discussion on how to address these concerns and maximize the digital impact. It indicates three concerns of the digital transformation in the education service: (1) poor motivation management, (2) negative effect of IT devices usage in education, (3) educational inequality by digital divide. They can be overcome by changing roles of instructors and further investment in ICT infrastructure in the education service. The discussions in this chapter give insight into how the education service might evolve after the COVID-19 pandemic. The distance education is becoming a new normal in the education service. However, the education community in general is not ready to maximize the merits of distance learning. We need to change the role of instructors from a knowledge teacher to a learning motivator and progress manager. In addition, we need more investment in ICT infrastructure in the education service to enhance educational effects.

Keywords Covid-19 · Digital transformation · Distance learning · Education service · Education technologies

2.1 Introduction

Although crises tend to reshape society, it is still uncertain how the global COVID-19 pandemic will transform our lives. Currently, numerous discussions are taking place across the globe about whether we should prioritize the treatment of the COVID-19 pandemic over the economy. In a short period, many actions and policies have materialized and been implemented across industries in reaction to the pandemic, despite these demanding social adjustments.

This chapter focuses on the impact of the COVID-19 pandemic on the education service in Japan. The education industry is a typical example of a service industry.[1] In Japan, many actions have been set in motion to address the impact of the COVID-19 pandemic.

In an attempt to contain the spread of COVID-19, most governments across the globe decided to temporarily close educational institutions.[2] When Japan closed all its schools in March 2020, many discussions about how the education service should be managed (during and after the pandemic) have taken place. Traditionally, Japan's academic year starts in April (many other countries' academic year starts in September). It has been suggested that Japan's academic year should now start in September too as a measure to manage education. In addition, the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) implemented a financial support system for higher education in April 2020, which includes a reduction in tuition fees, waivers, and scholarship provision.[3] Furthermore, students are requesting their schools—in particular private institutions—to lower their tuition fees, because they are not using any school facilities (such as dorms, classrooms,

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[2]Visit UNESCO at https://en.unesco.org/covid19/educationresponse.

[3]MEXT website on the new financial support system (Japanese), available at https://www.mext.go.jp/a_menu/koutou/hutankeigen/index.htm.

and libraries) while they are in isolation at home. Moreover, many students are now facing financial hardship because they lost their part-time jobs or their families' income has decreased.[4] Many students are considering terminating their studies. None of the universities in Japan lowered its tuition fees to accommodate students; instead, some institutions have decided to offer scholarships or grants to give students financial support.

However, these measures and actions will not fundamentally change the education industry in Japan. Ultimately, the acceleration of digital transformation, prompted by the COVID-19 pandemic, will reshape the education service in Japan. In fact, some measures and actions taken during the pandemic might become everyday practice once the spread of the virus has decreased.

The rest of this chapter reviews the digital transformation in the education service, and against the background of prior studies, it includes discussions on the impact and concerns that pertain to these technological changes. Then, this chapter introduces the situation in Japan and anticipates how the education service will be after the COVID-19. Lastly, this chapter concludes with the future of the education service and the author's insight.

2.2 Recent Trends in Education Services: Digital Transformation

The two recent trends in digital transformation in the education industry during the COVID-19 pandemic are the expansion of distance education and the increasing innovations in educational technologies. These trends, accelerated by the educational demands during the pandemic, are discussed below.

2.2.1 Expansion of Distance Education

The COVID-19 pandemic compels educators to explore and implement methods of distance learning on a larger scale than ever before. Although distance education practices were in place before the COVID-19 pandemic, it was uncommon, and most learning activities happened in the classroom. Initially, when Japanese schools were closed in March 2020, most schools postponed their classes for a certain period.

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[4]Free (https://www.free20180913.com/), a student group advocating tuition-free higher education, conducted an online survey (between April 9 and April 27, 2020) on the impact of the COVID-19 pandemic on university students. A total of 1200 university students from 319 universities and colleges responded. Approximately 70% of the respondents indicated that they lost their part-time income, and more than 40% of the respondents' financial supporters had lost their income. Approximately 20% of the respondents are considering terminating their studies due to the COVID-19 pandemic.

When this period was prolonged, these schools initiated distance learning practices that, at that point, were quickly becoming the new standard.

Distance education has a long history (Sumnar 2000); the first attempts at distance learning were made during the nineteenth century[5] when print-based course materials were sent to learners through the postal service. More recently, the second generation of distance education involved a combination of multimedia (such as radio, television, cassette tapes, and CD-ROMs) and print materials. The third generation of distance learning is Internet-based.

The emergence of Internet-based distance learning is attributed to the information revolution. In addition to print materials, course materials are now available in digital format. Today, students can even conduct virtual experiments and simulations with educational software applications. Aside from these differences, third generation distance learning is unlike the first two generations in a fundamental way. The main objective of the first and second generations was to produce and distribute teaching and learning materials to learners. The learning activities were predominantly one-way, and interactivity was supported marginally. Internet-based learning, on the other hand, enables interaction between instructors and students.

Internet-based distance learning can be categorized into two models: recorded online courses and online interactive sessions. The following section reviews these models and their merits in detail.

2.2.1.1 Recorded Online Courses

The use of recorded online courses is primarily made possible by the expansion of the Massive Open Online Course (MOOC). The MOOC is an online educational platform that offers most of its content for free. The MOOC, which is a result of the Kahn Academy on YouTube, offers various courses for, among others, universities, skills and job training institutions, and preschools. Students can select their own courses.

MOOC has many advantages. First, the platform improves learning efficiency by enabling people to learn at their own pace and anywhere. The MOOC even allows learners to customize their learning speed. The traditional education services design curricula to be completed within a certain timeframe (i.e., per semester) and in a classroom. For example, a semester at a Japanese university consists of 15 weeks of classwork. For a standard course, learners and teachers meet once a week for 90 min. In other words, a student must spend 15 weeks to complete a subject and receive the due credits or certificates. MOOC, on the other hand, allows students some flexibility: Students can attend lectures when it suits them and learn at their own pace. A capable student can therefore study intensively and complete a course within a few days.

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[5]According to (Verduin and Clark 1991), Isaac Pitman offered the first recognised correspondence courses in shorthand in 1840 in England.

In addition, the MOOC provides global access, enabling students to choose their course levels and instructors. Traditionally, students must enroll at a specific institution, follow its curricula, and receive instruction from employed teachers; their options are, in other words, limited. At primary and secondary level education, students have almost no alternative options in terms of curricula and instructors. In higher education, the options in terms of curricula and instructors increase: students can enroll at one institution and learn from other institutions too, or use exchange programs and credit transfer systems. Nonetheless, these options are limited to partnered institutions. Aside from this, the preparations and relocation to other regions or countries are costly. The MOOC, however, enables a student to select a course at a suitable level and an instructor who teaches in a way that the student wants to be taught. In short, the MOOC makes customized learning possible for individuals.

Aside from these benefits, the MOOC provides open access and pursues an equal educational opportunity for everyone. However, based on the living conditions of some students, this ideal is not always achieved in the traditional education system. Students whose living conditions are poor find it difficult to commit to learning. Less-educated students are disadvantaged in terms of job seeking and promotion. In addition, unequal learning opportunities in one generation increase the next generation's disadvantage. In this regard, the MOOC content is mostly free and accessible from anywhere if one has access to the Internet. Currently, parents tend to relocate to other regions so that their children can attend renowned schools. But MOOC, which is free and accessible from anywhere, might decrease such movement between areas. Unlike traditional education, MOOC may provide students with an equal opportunity for learning.

Fourth, the MOOC has the potential overcome the language barrier in the education industry. While most of the courses on the MOOC platform are taught in English—which might be problematic for Japanese students—some recent courses provide Japanese subtitles. Such learning support and aid expand students' opportunities by enabling them to find suitable online courses taught by excellent instructors across the globe.

Finally, the MOOC meets social demands and addresses needs. Innovations in the high-tech industries occur at such a rapid pace that it is difficult to predict what new technologies will become available and how they will change society. What is clear, however, is that we need to be adaptable to our ever-changing environments. For example, Frey (2017) predicts that it will be common for us to change occupations several times throughout our lives. Enrolling at higher education institutions and committing to several years of study requires effort and sacrifices. In the future, people would need to learn new skills while they continue to work, and the MOOC would offer them the opportunity to do so. For this reason, online learning in the form offered by the MOOC will become standard.

2.2.1.2 Live, Interactive Online Courses

Interactive online learning has also become a trend in the education sector. Despite the many merits of the MOOC platform, most lectures are pre-recorded, making it similar to earlier generations of distance learning.

The MOOC relies on asynchronous education as opposed to synchronous education. Asynchronous models allow students to complete courses at their own pace; in other words, students can complete pre-recorded courses when it suits them. While that is one of the main advantages of asynchronous teaching, such a model has its disadvantages too. In asynchronous courses, students cannot ask questions or receive immediate feedback. Moreover, asynchronous teaching does not allow instructors to take immediate and flexible action based on the students' motivation and attitudes. Additionally, students cannot actively participate in class activities. Because the MOOC is a one-way method of instruction, the platform does not maximize the merits of the third generation of distance learning.

Live and interactive online courses can overcome such challenges by encouraging two-way communication and allowing students to attend a lecture in real-time, ask questions, and discuss work with instructors and classmates from anywhere in the world.

2.2.2 Development and Expansion of Educational Technologies

Most governments around the world have temporarily closed schools in an attempt to contain the spread of COVID-19. Homeschooling is now the obvious option for parents because learning content is accessible remotely and educational technologies (or EdTechs) are developed and shared to assist learning. The COVID-19 pandemic presents the education system with a renewed opportunity to embrace new EdTechs.

In recent years, there has been rapid innovation in EdTechs. Current EdTechs are mainly a utilization of new IT devices and the digitization of textbooks and teaching materials. Although such EdTechs improve the efficiency of education, they do not increase the effect of education and, therefore, do not fundamentally transform the education service.

2.2.2.1 Learning Management System

Some EdTechs, such as the learning management systems (LMS), will change the traditional education industry dramatically. An LMS is a software application that assists with the administration, documentation, tracking, reporting, and delivery of educational courses and training, learning, and development programs. Companies often use LMS for online training courses for employees. Now, the LMS is used in

the education service more widely. Despite its merits, an LMS used to be costly, but lately, the development of cloud-based LMSs has reduced the initial and operational cost of these systems.

There are several reasons to introduce an LMS in the education service. First, it improves the efficiency of teaching preparation and communication between instructors and students. For example, students can submit their assignments online. Accordingly, instructors do not need to print out documents and assignments, thus saving costs and acquiring additional time to prepare for teaching. In addition, some LMSs have a social networking service (SNS) function with which instructors, students, and parents can communicate.

Importantly, an LMS informs instructors of education performances immediately because it allows students and instructors to confirm attendance, submit assignments, and complete tests and simple surveys online. An instructor can gain insight into a subject or a student's performance and provide relevant feedback by analyzing the data on the system. Such efforts will eventually improve teaching materials and methodologies in the education service. (Smartphone applications offer similar services.) As Nakane (2005) points out, Japanese students tend to be silent in classrooms—even when an instructor encourages them to talk. It has been reported, however, that the use of educational applications, such as the above, improves interactions between instructors and students in the class.

2.2.2.2   Artificial Intelligence-Based Education Tools

Artificial intelligence-based education tools are regarded as the most innovative among newly developed education tools. Artificial intelligence (AI) tools collect data on a student's level of understanding, analyze it, and then determine how to improve comprehension.

The two leading EdTech companies in Japan, ATAMA and COMPASS, develop their own AI-assisted education tools, namely, Atama Plus and Qubena. These tools allow students to answer questions and solve problems using a tablet. The AI tool then collects and analyzes the log and other data (such as response times and answers) to determine a student's level of comprehension, strengths and weaknesses. The AI tool then challenges students with supplementary problems to help them improve their level of understanding. It is widely understood that an ideal education is a customized education, and AI offers the opportunity to offer tailor-made instruction to students. Ultimately, this should increase the effects of education, and for this reason, several cram schools in Japan are introducing similar educational tools. Despite these advantages, customized instruction remains expensive.

The impact of AI tools on education effects was unforeseen, as the case of COMPASS's Qubena illustrates (Jinno and Sato 2019). In July 2018, the Ministry of Economy, Trade and Industry (METI), selected Qubena as one of its demonstration projects in math classes for 1st, 2nd, and 3rd graders in a middle school in Tokyo between September 2018 and February 2019. While the course's standard learning time is 62 hours, students who used Qubena completed the course in

34 hours. Moreover, these students demonstrated a better understanding and higher scores compared to a comparison group. In addition, not only did the students who used Qubena expressed positive attitudes toward relevant subjects; they also had increased interaction with their instructors and classmates, asked more questions, and exchanged feedback with classmates.

2.2.2.3 Creating an OODA Loop

One aim of digital transformation in the education service is to generate and utilize relevant data to improve learning by applying the OODA loop (Boyd 1987). The OODA loop consists of four steps (observe, orient, decide, and action) and a feedback loop (see Fig. 2.1). The first step in the OODA loop is to collect and observe relevant data. This step is followed by analyses and a decision. A comparable concept with the OODA loop is the PDCA cycle (plan, do, check, and action). The PDCA cycle is a method used in business for the control and continuous improvement of processes and products (Moen and Norman 2009). The PDCA cycle (plan, do, check, and action) starts at the planning stage, where stakeholders formulate assumptions and develop hypotheses. Sometimes the PDCA cycle reveals disparity between assumptions and the reality/practice and does not cover the reality beyond its hypothesis. On the other hand, the OODA loop does not reveal such weaknesses.

Current EdTechs provide infrastructure that will enable the creation of an OODA loop for learning. For example, IT devices that provide educational content generate data that can be used as a new input for the development and improvement of the content. By repeating the loop, innovations in the education service will accelerate. In this sense, the dissemination of EdTechs establishes a crucial infrastructure for learning in the education industry.

Since the outbreak of COVID-19, private sector companies in Japan have been offering temporary and free online educational content to children.[6] As a result, a large number of students and their parents are testing online courses and newly
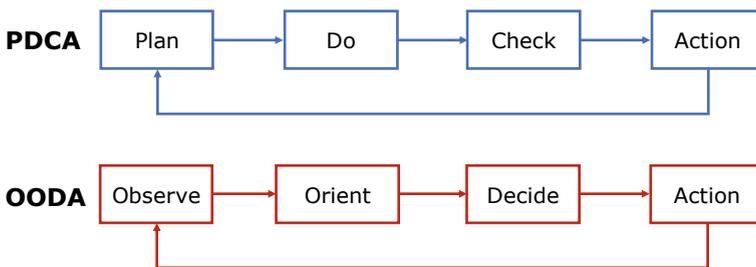
Fig. 2.1 The PDCA cycle and OODA loop

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[6]The METI published on the Ministry's website the private sector companies that provide online teaching materials for free: https://www.learning-innovation.go.jp/covid_19/.

developed EdTechs. The author conjectures that these developments will further enable the dissemination of EdTechs and the construction of OODA loops.

2.3 Concerns and Limitations in Digital Transformation in the Education Services

The COVID-19 pandemic caused some concerns in the education services including class postponement. Students are concerned that their education would be left behind. However, such concerns are temporary. Schools can arrange supplementary classes. However, there are more fundamental concerns and limitations caused by the digital transformation in the education services. This section aims to introduce them.

As discussed above, the major trends in the education industry give the impression that the sudden and rapid changes in educational technologies will result in an ideal system, which is not necessarily the case. Based on findings from earlier studies, the next section considers the concerns and limitations of these trends: (1) poor motivation management, (2) negative effect of IT devices usage in education, (3) educational inequality by digital divide.

The concerns and limitations in this section is not necessarily caused by the COVID-19 pandemic.

2.3.1 Poor Motivation Management

Distance learning's popularity is increasing, and some experts believe that this form of learning will replace traditional education eventually. However, it is still uncertain whether distance learning improves the effect of education or even guarantees successful learning. Live, interactive online sessions are reasonably new, and, yet, there is no research available on their educational effects. There are, however, many insightful studies on the educational effects of the MOOC.

In this regard, Chuang and Ho (2016) describe the case of edX, an MOOC created by the Massachusetts Institute of Technology and Harvard University. With edX, students receive a certificate when they complete a course. Chuang and Ho researched edX's initial four-year progress—from its establishment in 2012 to 2016. The researchers also analyzed the enrollment patterns and the issuing of certificates and found that enrollments on edX increased steadily since its establishment. The system had 2.4 million unique enrollments during these four years, or 1523 days (an average of 1554 enrollments per day). However, only 159,000 of these enrollments resulted in a certificate being issued. About 250 thousand certificates were issued for 4.45 million course registrations. These numbers indicate that the course completion rate is about 5.5%.

Reich and Ruipérez-Valiente (2019) conducted a follow-up study in 2018, and their findings were the same as Chuang and Ho's (2016). In total, 52% of all enrollments had never started the courses. They found that although the number of new enrollments had increased since the establishment of the MOOC, the number of new enrollments started decreasing in 2016. Other studies also indicate that the MOOC has low completion rates. For example, one study analyzed 39 MOOC courses and found that the completion rates were between 2.3 and 19.5%, with a median average of 6.5% (Jordan 2014).

The findings of Chuang and Ho (2016) and Reich and Ruipérez-Valiente (2019) suggest that distance learning models and tools do not guarantee the proper use of online educational content. Furthermore, EdTechs do not increase learning motivation. Ito et al. (2019), for example, examined the causal effect of computer-aided instruction (CAI) on children's cognitive and non-cognitive skills. The researchers used a CAI application, called Think!Think!, to support learning among approximately 1,500 students from G1 to G4 in Cambodia. Although their findings show that the use of the application raised students' expectations in terms of future studies, the use of CAI had no significant effect on their motivation and self-esteem. Their findings suggest that even when students are provided with good educational content in proper education environments, few of them sustain their original motivation.

2.3.2 Negative Effects of IT Devices in Education

IT devices are social infrastructures essential in our daily lives. However, there is a concern over the usage of IT devices among children. Pioneers and leaders of the information revolution are strict about their children's technology use. Furthermore, even though students admit that IT devices are a distraction, they continue using them, thinking that the benefits outweigh the costs (Kay and Lauricella 2011).

Several studies and reports have investigated the effect of the use of IT devices among children. The Programme for International Student Assessment (PISA) of the Organization for Economic Cooperation and Development (OECD), for example, regularly evaluate educational systems by measuring 15-year-old school pupils' scholastic performance on reading, mathematics, and science. In 2015, PISA conducted a comparative analysis of the digital skills that students have acquired and the learning environments designed to develop these skills (OECD 2015). A finding from the report indicates that there is no difference in reading, mathematics, or science skills between students in the countries that had invested heavily in information and communications technology (ICT) for education and those in other countries. The report suggests that building deep, conceptual understanding and higher-order thinking requires intensive teacher-student interactions, and technology distracts from this valuable human engagement, although the report presumes other reasons for the result.

Others have studied the use of IT devices among lower-performing students. For example, Mueller and Oppenheimer (2014) investigated whether taking notes on

a laptop versus writing longhand affected academic performance. They conducted comparative experiments among students at Princeton University and the University of California in the United States and found that students with laptops took more notes than those who used longhand. Furthermore, the laptop notes had more verbatim overlap with the lecture than the longhand note. Despite this, students who took notes longhand performed better on tests, especially on conceptual questions. The authors argue that longhand note-taking requires students to select important information and engage with the content, which, in turn, enables them to study more efficiently. In short, although laptops allow students to take notes easily and speedily, the students do so indiscriminately and mindlessly, which has a negative impact on their learning.

2.3.3 Educational Inequality by Digital Divide

Finally, the impact of the digital divide on the education industry should be addressed. The digital divide is a new concept, and it refers to the inequalities in society in terms of knowledge, that is, the gap between people who have access to ICT and those who do not. The digital divide exists not only between more advanced and less advanced countries but also between regions within the same country (Wong 2002; Nishida et al. 2014).

As mentioned earlier, usage and familiarity of ICT devices in the education industry do not necessarily result in academic performance. The ICT infrastructure is necessary to build an OODA loop in the education service. Schools with good ICT infrastructure will improve their education services faster than those with poor ICT infrastructure. The wider the digital divide, the wider the educational opportunity gaps.

2.4 Japanese Education Services During the COVID-19 Pandemic

This section introduces how Japanese education services corresponded during the first few weeks of the COVID-19 pandemic. To achieve this objective, a few systematic surveys by MEXT are reviewed. Additional literature was unavailable because this chapter was drafted soon after the start of the COVID-19 pandemic in Japan.

2.4.1 On the Introduction of the Distance Education

MEXT conducted surveys on how universities and colleges in Japan corresponded during the COVID-19 pandemic. The first survey was performed three times: twice

in April and May 2020, and once on May 12, 2020 (Tables 2.1 and 2.2). Japan's academic year starts in April; thus, the data were from the first two months of the academic year. Of the 1070 schools that received a survey, 1046 schools responded; thus, the response rate was 97.8%.

Table 2.1 indicates that nearly 90% of all schools in higher education in Japan postponed their classes. Schools that did not postpone their classes started distance education.

Table 2.2 indicates that 96.6% of universities and technical colleges had started or were discussing starting distance education. Variations between types of schools were observed.

A follow-up survey was conducted on May 20 to assess the types of correspondence used by the surveyed schools to communicate the start dates of their classes. Of the 1075 schools that received a survey, 890 schools responded; the response rate was 82.8%. As of May 20, 185 schools had not replied.

Table 2.3 indicates that 80% of the universities and colleges had started their classes as of May 20. Most schools could start their classes one month later than usual.

Table 2.1 Whether the class started as usual (On April 1st) or was postponed

	Class postponement	No class postponement	
		Distance education	Other infection prevention
National university	78 (90.7%)	8 (9.3%)	0
Prefectural and other public university	87 (82.9%)	14 (13.3%)	0
Private university	715 (87.0%)	86 (10.5%)	1 (0.1%)
Technical college	50 (87.7%)	7 (12.3%)	0
Total	930 (86.9%)	115 (10.7%)	1 (0.1%)

Source MEXT report "On Correspondence of universities and colleges to the COVID-19 pandemic." Available at https://www.mext.go.jp/content/202000513-mxt_kouhou01-000004520_3.pdf

Table 2.2 Implementation of distance education

	Distance education started	Distance education under discussion	No distance education
National university	71 (82.6%)	15 (17.4%)	0
Prefectural and other public university	58 (55.2%)	43 (41.0%)	0
Private university	536 (65.2%)	254 (30.9%)	12 (1.5%)
Technical college	43 (75.4%)	14 (24.6%)	0
Total	708 (66.2%)	326 (30.5%)	12 (1.1%)

Source MEXT report "On Correspondence of universities and colleges to the COVID-19 pandemic." Available at https://www.mext.go.jp/content/202000513-mxt_kouhou01-000004520_3.pdf

Table 2.3 Whether the class started or was postponed further as of May 20

	Class started	Class postponed
National university	86 (100%)	0
Prefectural and other public university	83 (79.8%)	2 (1.9%)
Private university	638 (77.1%)	24 (2.9%)
Technical college	57 (100%)	0
Total	864 (80.4%)	26 (2.4%)

Source MEXT report "Implementation status of university and college class during to the COVID-19 pandemic." Available at https://www.mext.go.jp/content/20200527-mxt_kouhou01-000004520_3.pdf

Table 2.4 indicates that 90% of universities and colleges started distance education only. A few universities and colleges started distance education and face to face lectures. Some private universities started face to face classes only and started distance education after one to two months of preparation.

Table 2.5 presents the data on the start date of classes for the 26 schools that postponed their classes in Table 2.3. Most schools started classes before June 15.

Table 2.4 Class method

	Distance education	Distance education and face to face	Face to face
National university	78 (90.7%)	8 (9.3%)	0
Prefectural and other public university	76 (91.6%)	7 (8.4%)	0
Private university	568 (89.0%)	44 (6.9%)	26 (4.1%)
Technical college	56 (98.2%)	0	1 (1.7%)
Total	778 (90.0%)	59 (6.8%)	27 (3.1%)

Source MEXT report "Implementation status of university and college class during the COVID-19 pandemic." Available at https://www.mext.go.jp/content/20200527-mxt_kouhou01-000004520_3.pdf

Table 2.5 Start of class

	In May	June 1–15	June 16–30	In July or later
National university	–			
Prefectural and other public university	0	2 (100%)	0	0
Private university	13 (54.1%)	8 (33.3%)	1 (4.2%)	0
Technical college	–			
Total	13 (50.0%)	10 (38.5%)	1 (3.8%)	0

Source MEXT report "Implementation status of university and college class during to the COVID-19 pandemic." Available at https://www.mext.go.jp/content/20200527-mxt_kouhou01-000004520_3.pdf

Table 2.6 Homeschooling policy during the temporal closure of schools (multiple answers)

	Responses	Share (%)
Homeschooling using textbooks and paper teaching materials	1,213	100
Homeschooling using television	288	24
Homeschooling using class movies taken by Board of Education	118	10
Homeschooling using digital textbooks and digital materials	353	29
Homeschooling using live, interactive online courses	60	5
Others	145	12

Source MEXT report "Status of teaching in public schools relevant to school disclosure to prevent the COVID-19." Available at https://www.mext.go.jp/content/20200421-mxt_kouhou01-000006590_1.pdf

The elementary, middle, and high schools had not started distance education. On April 16, 2020, MEXT published a survey of public school superintendents[7] who provided information on their schools' status of teaching; 1,213 establishers responded, and they temporarily closed 25,223 schools.

Table 2.6 presents the homeschooling policy during the temporary closure of schools: all the establishers started homeschooling using textbooks and paper teaching materials, 5% started homeschooling using live, interactive online courses; 29% started homeschooling using digital textbooks and digital materials.

In summary, higher education in Japan quickly started to provide online classes. By contrast, the elementary, middle, and high schools continued to rely on traditional paper-based teaching during the COVID-19 pandemic but gradually introduced online classes and utilization of digital teaching materials. Thus, in Japan, in higher education and in elementary, middle, and high schools, distance education expanded, and educational technologies are under development to complement the distance learning.

2.4.2 Reactions to the Distance Learning

No systematic surveys or reports were available; therefore, reactions to distance learning remain unknown. The available surveys and reports were based on voluntary self-reports done by schools on their employed teachers, or students, and were conducted by using mass media and tens to up to two hundreds of samples. The surveys and reports differed in their questions and other survey elements; thus, a review would neither represent the whole situation in Japan nor allow for comparisons of schools. Accordingly, instead of relying on the data of those surveys and

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[7]The central government, local governments, and corporations, as specified by law, can establish schools in Japan. National schools, prefectural and other municipal public schools, and private schools are founded by the central government, local governments, and corporations, respectively.

reports, this subsection is based on the author's knowledge and perceptions after reviewing as many of the available surveys and reports as possible.

In Japan, during the pandemic, distance learning became a new normal in higher education. Notably, the few private universities that were delayed or did not start distance learning had the lowest budgets and were located in suburbs where there are fewer students (Tables 2.1–2.5). Except for those few exceptions, most higher education institutes managed distance learning well. A few concerns from students were observed, for example, unstable internet connections at home increased the difficulty of accessing distance education. However, such concerns are solvable by providing improved internet accesses. Additionally, before the COVID-19 pandemic, professors taught students remotely to some extent; thus, best practices and sample teaching models of distance education were available from experience in the past. Accordingly, the introduction of distance education in universities and colleges was smoother than expected.

Additionally, distance learning in elementary, middle, and high schools has expanded slower than that in higher education, and most of the schools, save a few exceptions, relied on textbooks and paper teaching materials. Regarding the perceptions of distance learning of students and their parents, many concerns were observed. The most major concerns were as follows: whether students could manage self-education well; whether parents could teach their children, elementary school students, at home while working; whether insufficient homeschooling would result in low educational development; whether (and how) the children should socialize with classmates while homeschooling; and whether students had sufficient internet environments to support distance learning. Additionally, although most teachers were unfamiliar with distance education, there were a few exceptions, for example, all Kumamoto city public schools started the academic year (April 15, 2020) with live, online, interactive classes.[8]

Recognizing such difficulties of homeschooling children, many EdTechs have been developed in Japan. Those EdTechs are provided for free for a certain period of time. Students use laptops and tablets to access digital educational materials and EdTechs. This situation is a good opportunity for young students, their parents, and teachers to try EdTechs, and for teachers to apply them their curriculums. EdTech providers have successfully constructed OODA loops and collect data logs from free trials to improve these EdTechs, for example, enhance the educational effects. This phenomenon will promote EdTechs' further development and use beyond the COVID-19 pandemic.

Notably, the concerns and limitations indicated in Sect. 2.3 remain and will be revealed as more schools employ the distance learning and EdTechs. Accordingly, follow-up studies are necessary to investigate the weaknesses and externalities of distance education.

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[8]Kumamoto city prepared the distance education before the COVID-19 pandemic. When a series of earthquakes including a magnitude 7.0, known as the 2016 Kumamoto earthquakes, struck beneath Kumamoto city in 2016, schools in Kumamoto prefecture closed for a while. As a lesson, Kumamoto City Board of Education had been preparing the distance education such as distributing iPads to schools and training teachers for the distance education.

2.5   The Education Service After COVID-19

This section reflects on the future of the education industry when the COVID-19 pandemic has subsided. Furthermore, the section considers ways to overcome the concerns and limitations that pertain to the two main trends in the education service by introducing practices in Japan.

2.5.1   Further Acceleration of Digital Transformation in the Education Service

Although the trends discussed above have been taking place since the information revolution, COVID-19 has accelerated digital transformation in the education sector. Prior to the pandemic, digital transformation in the education service happened at a modest pace, and, although the MOOC was increasing its footprint, many educational institutions had not adopted these systems or the array of new EdTechs. Moreover, institutions and students used live, interactive online courses on a voluntary basis. Overall, only a few higher educational institutions adopted these trends.

The MOOC launched in Japan in 2013 when the University of Tokyo and Kyoto University joined Coursera and edX. The Japan Massive Open Online Courses Promotion Council (JMOOC) also launched in 2013. The MOOC, however, has a higher number of available online courses than the JMOOC. As of May 2020, 36 universities in Japan offer approximately 340 courses, and in response to the COVID-19 pandemic, most universities now offer live and interactive online courses.

Although the distance learning in Japan is currently merely duplicating the classroom content and offering it online, distance learning models will evolve to overcome such concerns and limitations as our experience and knowledge accrue and new EdTechs become available.

2.5.2   Changing Roles of Instructors

Section 2.3.1 indicated that only few of students sustain their original motivation over the distance learning and most of them do not finish online courses. New models of distance learning may change the role of instructors too. Aside from teaching, instructors, in the future, might be required to manage students' learning motivations and progress. The following case study in Japan illustrates this scenario.

The N High School,[9] a Japanese school financed by the Kadokawa Dwango Corporation, was founded in April 2016. Since then, the number of students has increased

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[9]Visit the N High School's webpage at https://nnn.ed.jp/.

rapidly from 1,482 to 12,414 in January 2020. All the school's students begin their distance learning experience with a virtual reality ceremony.

The school's curriculum includes the regular subjects taught at high schools across Japan. In addition, it offers an advanced program, which includes subjects such as programming, web designing, and novel writing. Each student has an assigned homeroom teacher advising them about their learning progress and future education. The school's program is designed to overcome the concerns and limitations of digital transformation in the education service to some extent.

Despite its short history,[10] the N High School has a good reputation and outperforms other high schools in several areas. First, the N High School has fewer students who terminate their studies. Furthermore, the school reports that 81.8% of its graduates started entered into careers,[11] as opposed to 61.5% from other distance learning high schools in Japan who started careers or studies at higher education institutions in 2018.[12] Surprisingly, 77.1% of the students who dropped out of other high schools and finished their studies at the N High School started careers after graduation. Moreover, graduates from the N High School are accepted to top universities. In the class of 2019, one graduate enrolled at the University of Tokyo and three at Kyoto University. In the Japanese educational context, this is an impressive achievement for a school with such a short history.

The N High School's achievements mean that the school's educational model can be referenced when we consider distance learning in other contexts. Admittedly, its model and approach might not be transferable to distance learning at the university level, but it provides insight into how we can improve distance learning.

To sum up, when the distance learning becomes a new normal, teachers might be required to manage students' learning motivations and progress.

2.5.3 Further Investment in ICT Infrastructure in the Education Service

Section 2.3.3 indicates that the digital divide in the education service leads to educational inequality. The availability of 5G and AI technologies will further stimulate the transformation and development of distance education and EdTechs. These technologies will support teachers in terms of preparation, innovation, and lesson design to improve online courses.

In addition to these technologies, infrastructures that will allow educators to collect data are also being built. In Japan, for example, the MEXT announced in December 2019 the Global and Innovation Gateway for All (GIGA) school program

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[10]The first group of the N High School's students graduated in 2018.

[11]The N High School's presentation on March 27, 2019.

[12]MEXT: School Basic Survey 2018. Available at https://www.mext.go.jp/b_menu/toukei/chousa01/kihon/1267995.htm.

to prepare children for life in Society 5.0.[13] The GIGA program aims to supply an educational IT device to every student and to establish high-speed, high-capacity communication networks in schools across the nation. With an IT device, a student can search for information on the Internet, complete their homework digitally, or even learn to program (a critical skill in the current era). GIGA is similar to the One Laptop Per Child (OLPC) project.[14]

Although the educational effects of GIGA and OLPC are still uncertain,[15] these programs would require an OODA loop in the education service, which will improve the educational effects. Determining the effects of educational policy is a costly process as it involves the collection and analyses of data on educational behaviors and performances. For example, to evaluate a new educational policy, researchers might experiment with a small sample size (e.g., a few classes). All the information they receive, however, is recorded in handwritten documents that need to be manually inputted to produce digital data. Since the data have not been standardized, it is difficult to combine or compare sets of data from different experiments.

An IT device can simplify this process. If every child has a device, it will be easy to produce and collect relevant data. Furthermore, it will allow researchers to easily analyze data, observe educational behaviors and effects, and compare data sets to gain detailed insight into a specific group of students. New findings and insights from one analysis can be applied and tested effortlessly. This process results in an OODA loop. It is not yet clear whether GIGA aims to create an OODA loop, but other private educational institutions are making haste to build their own OODA loops to improve their services. Infrastructure such as an OODA loop will facilitate faster and more dynamic innovations in the education service.

To sum up, investment in ICT infrastructure in the education service is necessary to minimize the digital divide in the education service.

2.6   Conclusions

This chapter reflected on the impact of the COVID-19 pandemic on the education service, in particular in Japan. Despite its severe impact on the traditional education system, it offers the education industry the opportunity to transform its service. To

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[13]See https://www.mext.go.jp/a_menu/other/index_00001.htm.

[14]The OLPC was initially proposed by Professor Nicholas Negroponte, the founder of the Massachusetts Institute of Technology's Media Lab, at the World Economic Forum in Davos in 2005. His vision was to provide a $100 laptop to give all children access to education. Visit http://one.laptop.org/ for more information.

[15]Some studies analyzed the educational effects of the OLPC in several countries (Kraemer et al. 2009; Warschauer et al. 2012; Beuermann et al. 2015). These studies compared, for example, learning prior to and after receiving a laptop and learning with and without a laptop. The majority of these studies reported that there was no observable improvement in learning with a laptop. In fact, some researchers have noticed that those students with laptops performed worse in mathematics and linguistics than those who did not receive a laptop.

address the challenges of the isolation policies during COVID-19, many institutions have now started to utilize distance learning supported by newly developed EdTechs. This suggests that the pandemic is accelerating digital transformation in the education industry.

However, digitalization is not a simple process, and the education community is not ready to maximize the merits of distance learning. Currently, distance education entails the duplication of the classroom content on an online platform. Moreover, many teachers and parents are uncomfortable or unfamiliar with technology. Parents also struggle to supervise the distance learning or homeschooling of young children. A full transition to distance learning, therefore, requires not only solid ICT infrastructure, but also support for teachers, students, and parents. Throughout trials and errors in the transition, we can expect improvements such as enhanced online-teaching tools, digital fluency, and attractive and engaging lessons.

It is still uncertain how long COVID-19 will impact our lives, and there might be a second and even third surge of the virus. This uncertainty will only further fuel rapid digital transformation in the education service. The creation of OODA loops will also facilitate innovations in the education industry; Various kinds of educational data will be collected through IT devices adopted in the classroom. Analysis on such data will be used to enhance individual and overall educational performance. This process will be repeated.

Currently, a large number of universities experience challenges with distance learning and EdTechs, particularly because it had to be introduced within a short timeframe. For example, some online lectures have been interrupted by uninvited guests, resulting in offensive and harassing situations. Universities' servers also went down due to the sudden surge in online access. These issues, however, are minor and should be solved in the future. Meanwhile, they will not hinder digital transformation in the industry.

Digital education and traditional education have their strengths and weaknesses. In the future, distance learning will offer students more opportunities and options than traditional education. Educational technologies will enable students to take ownership of their learning. Students' taking ownership of their learning is the new normal of the education service that is shaping gradually.

Author's Insight

This chapter might trigger questions such as the probability of the digital education services replacing the traditional education services after the COVID-19 pandemic. Harvard University, the wealthiest university in the world, offered its staff early retirement[16] and instituted a salary freeze on all exempt employees[17] to reduce expenses.

[16]https://www.bloomberg.com/news/articles/2020-06-09/harvard-offers-staff-early-retirement-in-move-to-cut-expenses.

[17]https://www.harvard.edu/president/news/2020/economic-impact-covid-19.

Furthermore, schools have started providing online tuition, and various EdTechs have been released by education startups and tech firms. These incidents can be regarded as initial signals of disruption in the traditional education service.

If education is the sole focus, finding a post-pandemic replacement is, to a great extent, possible. Educational institutions that cannot offer distance learning and competitive educational contents may not survive during and after the COVID-19 pandemic. They will be replaced by attractive MOOC content that allows self-motivated students to continue their education without enrollment into formal educational institutions.

However, education is not the only thing that students get from traditional education service providers. They acquire other assets such as lifelong friends (some of which may become business partners in the future), access to a scholarly network, skills, opportunities, (Galloway 2017), and, in case of students in top schools, brands. Although these assets do not always bring rewards, they are still valuable tools for success in future endeavors. Although digital innovators such as Bill Gates, Steve Jobs, and Mark Zuckerberg did not complete formal higher education, it was on the campus that they found their passion, business partners, and business opportunities. There is no certainty as to how much of these assets a digital education system can provide.

According to the knowledge management theory, interactions in the same space, which Nonaka and Takeuchi called "Ba" (Nonaka and Takeuchi 1998), between people with different knowledge and perspectives encourage knowledge flow between them (Nonaka and Takeuchi 1995). "Ba" is a shared space that serves a foundation for knowledge creation. Schools play a similar role as students from different backgrounds interact with each other during curricular and co-curricular activities. Although one may argue that virtual spaces such as social media and online communities can play the same role, users are less likely to be exposed to users with different perspectives (Himelboim et al. 2013). As the popular saying goes, "birds of the same feather flock together."

Therefore, it is unlikely that the digital education services will replace the traditional education services completely. Additionally, education startups and tech firms may not be able to replace traditional education institutions.

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Chapter 3
Rethinking Higher Education Post COVID-19

Check for updates

Lee-Ann Ewing

Abstract Higher education's economic footprint is significant (fourth largest export sector in the US, third largest in Australia). Accordingly, this chapter will address the higher education sector—particularly how COVID-19 has impacted and will continue to impact the future of higher education. It will begin by briefly discussing higher education as a service, before reviewing recent managerial literature on COVID-19's impact on higher education. The focus and indeed bulk of the chapter will then shift to considering the myriad possible post-pandemic effects on the higher education sector in the eastern hemisphere. Email interviews are conducted with twenty senior academic leaders (including seven Vice Chancellors) in Australia, Bangladesh, Hong Kong, India, Macau, New Zealand, Singapore, Sri Lanka and Thailand. Two broad themes emerge, encompassing actual and anticipated changes to the delivery of education; and to the management of universities—with three sub-themes under each. Findings are then discussed and conclusions drawn.

> *I think higher education is just on the edge of the crevasse. Generally, universities are doing very well financially, so they don't feel from the data that their world is going to collapse. But I think even five years from now these enterprises are going to be in real trouble.*

Clayton Christensen (2013)

3.1 Introduction

Universities are amongst the oldest continuously operating institutions in the world. The University of Karueein (al-Qarawinyyin), founded in 859 A.D. in Fez, Morocco is arguably the oldest, followed by the University of Bologna in Italy (established in 1088). The value of the higher education market globally was US\$4.9 trillion in 2015 (Verger 2016). Universities are also among the least understood service systems

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(Lella et al. 2012). Hence, the sector is deep-rooted, valuable and under-researched from a services perspective.

Historically, pandemics have forced humans to break with the past and imagine their world anew (Roy 2020). Will COVID-19 herald the disruptive change and structural reforms that many within and outside the sector have been calling for? Or will it go down in the annals of history as a mere bump in the well-worn higher education road? Or, to para-phrase Bill Gates, will the transformative effects of the pandemic be felt unevenly across the sector? To explore these and other questions, the remainder of the chapter is structured as follows. Higher education as a service is first discussed, before reviewing recent managerial literature on COVID-19's impact on the sector. The focus then shifts to consider the myriad possible post-pandemic lasting effects on the sector—particularly in Asia/Australasia. Specifically, email interviews are conducted with twenty senior academic leaders (including seven sitting Vice Chancellors) in Australia, Bangladesh, Hong Kong, India, Macau, New Zealand, Singapore, Sri Lanka and Thailand. Two broad themes emerge, encompassing actual and anticipated changes to the delivery of education and to the management of universities—with three sub-themes for each. These are presented and discussed in detail, after which conclusions are drawn and author's insights offered.

3.2   Universities as Services

A number of parallels have been identified between services and education (Ng and Forbes 2009; Ledden et al. 2011; Guilbault 2016). Indeed, the foundational premises of the services domain extend to universities and higher education. The introduction of service dominant logic (Vargo and Lusch 2004a, b) represented a significant conceptual development and paradigmatic shift (Svensson and Grönroos 2008; Grönroos 2011; Vargo and Lusch 2017). Within a university context, the 'application of specialised skills and knowledge is the fundamental unit of exchange', forming the basis for their differentiation and competitive advantage (Lusch et al. 2007, p. 7). Moreover, students and teachers are central to the production of the education experience (Naidoo et al. 2011; Guilbault 2016). Indeed, 'there is no value until an offering is used' and in the context of higher education value is always co-produced (Elsharnouby 2015). Educational institutions 'exist to integrate and transform micro-specialised competencies into complex services that are demanded in the marketplace' (Lusch et al. 2007, p. 7). Notwithstanding, product centric logic prevails in the domain of higher education, as is evidenced by the continuing debate surrounding whether students are products or customers (Guilbault 2018; Emery et al. 2001). However, rather than a dyadic exchange, the higher education research domain needs to embrace the networks of interactions which are at the heart of services and the value they offer (Barile et al. 2016).

3.3 COVID-19's Impact on Higher Education

The coronavirus pandemic is causing a 'tidal wave of disruption to the higher educa-
tion sector' (MacIntosh 2020), resulting in the global higher education landscape
'changing dramatically' due to spread of the virus (Quacquarelli Symonds 2020).
More than 1.6 billion students have been affected, representing 91% of all students
worldwide (DeVaney et al. 2020). The pandemic has forced global experimentation
with remote teaching. Indeed, demand for online learning has skyrocketed—with
Coursera posting a 644% year-on-year increase in March 2020 (DeVaney et al. 2020).
Unable to deliver on campus learning, universities scrambled to provide academic
(and revenue) continuity through "emergency remote teaching". Indeed, universities,
alongside many other organisations, are facing multiple difficult decisions and doing
their digital "growing up" in real time (MacIntosh 2020) and in full view.

More radical thinking brings into question time and competency. The 'credit hour',
and the rigid and complicated rules around academic years, terms and attendance.
LeBlanc (2020) calls for competency-based degree pathways untethered to time—
and for the sector to 'break from the tyranny of time' in order to unleash a wave of
innovation and reinvent itself. Govindarajan and Srivastava (2020) also question the
four-year residential program—and what aspects can be digitized and/or commodi-
tized. In a sense, they argue for more 'flipped classrooms' and a 'horses for courses'
bespoke approach to online delivery. They go on to note how the increasing cost of
tuition further ripens the education market's case for disruption.

In response, this chapter seeks to tap into senior university leaders' early
thinking about the pandemic (and their immediate and ongoing response). Accord-
ingly, a convenience sample of twenty senior university leaders across nine
Asian/Australasian countries participated (see Table 3.1).

3.4 Research Approach

Spradley (1979) distinguishes between 'grand tour' questions and 'mini tour' ques-
tions. Mini tour questions focus on more specific details or smaller units of experi-
ence. Given the seniority of the participants, grand tour questions where employed
in this study. Specifically, participants were asked what the *new higher education
world* might look like once the post pandemic dust settles? What their "New Normal"
is and how they are coping with it? What key lessons they have learned during the
pandemic (lessons that could assist future academic leaders deal with similar crises)?
What aspects of their institution and operation will not go back to the way 'things
were' pre COVID? In other words, what permanent changes do they anticipate?

An interview protocol (see Appendix A) promoted consistency of insight and
served the purpose of steering the interviews. The protocol encouraged respondents
to draw upon 'their own linguistic frameworks' in their responses (Stern et al. 1998,
p. 197), thus eliciting descriptions about their lived experiences during the pandemic.

Table 3.1 Study participants

Australia	Vice Chancellor	India	Vice Chancellor
Australia	Vice Chancellor	India	Vice Chancellor
Australia	Pro Vice Chancellor	India	Vice Chancellor
Australia	Pro Vice Chancellor	India	Deputy Dean
Australia	Dean	Macau	Dean
Australia	Dean	New Zealand	Pro Vice Chancellor
Bangladesh	Vice Chancellor	New Zealand	Dean
Hong Kong	Pro Vice Chancellor	Singapore	Dean
Hong Kong	Associate Dean	Sri Lanka	Vice Chancellor
Hong Kong	Dean	Thailand	Dean

Interviews, albeit a tool for eliciting rich data (Tamminen and Bennett 2017), are susceptible to the common problems of bias, poor recall or inaccurate articulation (Shankar and Goulding 2001; Smith and McGannon 2017). To protect the quality of evidence all participants responded in writing (by email), providing a more accurate rendition of each individual's accounts. As already eluded to, this approach had the added benefits of respecting the participants' seniority and time scarcity, while also enabling the expeditious completion of the fieldwork *during* the first wave of the pandemic.

3.4.1 Data Analysis

Data recorded in the email transcripts were inductively coded within a grounded theory framework (Glaser and Strauss 2017). Specifically, each email response was read repeatedly to gain a holistic understanding of the issues being discussed by respondents, and key concepts identified through this process were inductively coded to form categories. Iterative readings of the emails involved moving back and forth between the parts of the whole, searching for meaning, analytic patterns and emerging themes (Braun and Clarke 2006). These provided a basis for data immersion and analysis (Gadamer 2008). Following grounded theory's constant comparative method (Glaser and Strauss 2017), categories were then compared both within transcripts and across multiple transcripts in an iterative fashion to refine the definition and interpretation of each category and to ensure that the refined categories accurately reflected the original transcript data. Interesting features of the emails were manually

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                    │ Delivery of Education │                   │ Management of Universities │
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              ┌───────┬───────┼───────┐                      ┌────────┬────────┼────────┐
     ┌──────────┐ ┌──────────┐ ┌──────────┐         ┌──────────┐ ┌──────────┐ ┌──────────┐
     │ Changes in│ │Challenges in│ │ Student │         │ Financial │ │ Changing │ │ Resource │
     │  delivery │ │  online   │ │management│         │challenges │ │priorities│ │management │
     │          │ │ delivery  │ │          │         │          │ │          │ │          │
     └──────────┘ └──────────┘ └──────────┘         └──────────┘ └──────────┘ └──────────┘
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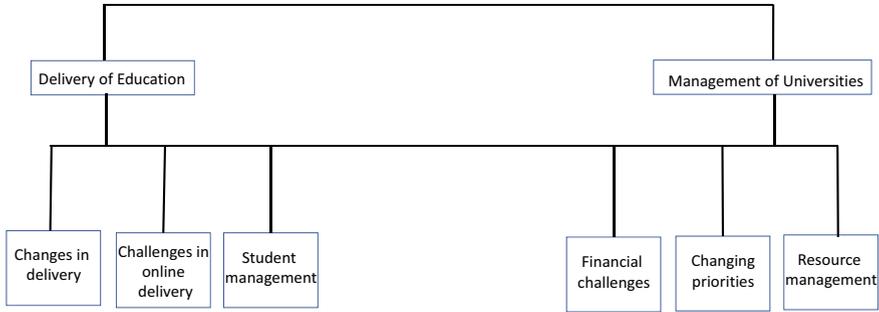
Fig. 3.1 Findings

coded in a 'systematic fashion across the data set' (Braun and Clarke 2006, p. 87). Moreover, given the possibility for country-specific practices to emerge, memos were prepared alongside the inductively coded categories to describe whether the experiences outlined by respondents were specific to their country or reflected broader sector practices. Software (such as NVivo) was not used. Multiple participants at different (but all senior) ranks in different countries enabled the capturing of diverse perspectives, which is an important means of building a ´dependable understanding' of the topic (Hirschman 1986, p. 246; Patton 2002). The research established credibility through a systematic approach to data collection and analysis. Documentation of the 'inquiry process' through memoing established a clear chain of evidence (Creswell and Miller 2000, p. 128; Silverman 2015). I reflexively probed presumptions and underlying perspectives in producing a new conception of the phenomena of interest. The chapter incorporates relevant illustrative quotations from interviewees. Each quote is coded with respect to the interviewees' position and country (Fig. 3.1).

3.5 The Delivery of Higher Education During and After the Pandemic

3.5.1 Changes in Delivery

The complex COVID situation provided considerable delivery challenges: the continued health risks of the pandemic made the pivot to fully online learning attractive and important, however an ongoing tension for some participants was that too high a level of online delivery would signal a permanent transition which for many was *not* the desired strategy of the university. It is also not seen as financially viable to run duplicate classes for online and face-to-face instruction. Therefore, if the experimental model were to run, it would require thorough evaluation. Student feedback is an important element in the constructing and evaluation of any new program.

Other participants were less dogmatic. The demand for *how* higher education is delivered will change dramatically. "*The majority of our offerings will shift from being face-to-face to being online or blended-a combination of face-to-face and online delivery*" (New Zealand PVC). These shifts will also create opportunities to educate students who previously may not have accessed higher education as the accessible online tools will have further reach in society.

Many universities are instituting what one Hong Kong Dean refers to as "1st generation" online programs. Lectures are pre-recorded (in small 15–20 min segments) and then delivered "live" or "synchronous" tutorials using a platform like Zoom or Webex. It is a reaction to the crisis, but "*hardly what we should be aspiring to for our online programs.*" The concern with online programs is that they are still largely based on the old lecture and tutorial model of university education. "*This in my opinion, is a mistake. The very same technology can be used to radically change the learning environment for students (and academic staff)*" (Australian Dean).

A Dean in Macau suggests that university education will become 'blended' including both degree programs and short courses. This will include research collaboration. According to another Australian Dean, the focus should be on moving away from lecture/tutorial format once and for all. "*Lectures are a bad, one-way mass medium. Like watching free-to-air television with a bad signal.*" Tutorials are still an option but with adaptations. The lecturer becomes a 'learning facilitator' who coordinates a team of five students working on a live brief from an actual external client who interacts with these teams. Teams could meet once a week for a period of 30-minute consultations (depending on the team's needs). The team will prepare a research report for the 'client' and present it to the client's executive team. The entire process can take place online. This approach encompasses many important personal growth, mentoring and 'real-life' business practices. An Australian PVC concurs with this strategy by stating that in the future, "*we will have to do much better than simply providing an online recording or a traditional lecture or PowerPoint slides with voice-over. Academics will need to spend time developing more engaging online programs with the assistance of learning designers. This is also true for assessment*". He argues that "*for the majority of discipline areas in business this is a great opportunity to switch to more 'authentic' assessment practices – a trend which was already strongly encouraged by the university.*"

Some leaders suggest that the pandemic has legitimized the online learning platform. "*In our case, the pandemic has made online learning more 'respectable' and brought it more into focus for faculty*" (Thailand Dean). It has highlighted the benefits of online learning and ensures that higher education will increase the digital component in the future. Learning will become more oriented to "stackable segments" whereby participants can receive "education which is primarily just-in-time not just-in-case." Others agree with this view, "*we will see greater integration of online and face to face delivery channels.*" (Singaporean Dean). One Australian VC does foresee some more permanent post-pandemic changes:

Large face to face lectures will be no more. The classroom will truly flip to replace the traditional lecture with online content and context, augmented through face to face seminars, tutorials, workshops and labs. The timetable will become freer and students will have more choice.

3.5.2 Challenges in Online Learning

Predictably, differences emerged between developing and developed countries. In Sri Lanka, like elsewhere, the pandemic has forced the adoption of online education. Where traditional teaching methods have been the most accepted and "comfortable" form of delivery and learning, the pandemic has challenged the system and 'forced' them to adapt. "*Our administrative functions too are in the process of digitalization. A once thorny discussion has now become readily accepted*" (Sri Lankan VC). Arguably, the challenge is heightened as the country does not have the necessary infrastructure to function smoothly online owing to student disparity and electrical shortages.

A VC in Bangladesh made note of similar circumstances and challenges. Switching from in person to online learning has not yet been adopted as a permanent method due to "*it's long-held socio-cultural perspectives and traditions of viewing face to face teaching methods as easily affordable and manageable.*" The uninterrupted availability of electricity is a concern. However, many students in the country were able to complete the semester with smart phone and mobile data. In light of the use of technology, the VC sees future generations adopting online methods as part of their education journey. "*The electronic device is going to be not just something nice-to-have but a must-have tool for their academic journey. In time, it will allow a wider range of the population to access education, particularly the multi-taskers,* "*mom-students and mom-teachers, which was a rarity prior to the pandemic.*"

An Indian VC notes how the 'new learning' has highlighted the importance of technology. "*Democratization of technology is now an important issue, comprising internet connectivity, telecom infrastructure, affordability of online system, availability of laptop/desktop, software, educational tools, online assessment tools* etc.*, hence going ahead, the government will have to ensure last-mile connectivity to each of the 6,500 villages to ensure access to online teaching and e-resources.*"

At the other end of the 'digital divide', an Australian VC suggetsed that espousing 'online capabilities' and delivering online education are two entirely different realities—such that "*…the need for digital literacy retraining for established academics – and to be inculcated in the training of emerging academics is paramount*".

So online is challenging regardless of geography, but the challenges may vary between and within countries. Although online learning has been embraced to varying degrees by most/all institutions, and its benefits have been highlighted, there was also a renewed appreciation for classroom learning as expressed by the two highest-ranked schools in the study. "*Both faculty and students have a renewed appreciation for classroom learning*" (Deputy Dean, India). This argument is supported by a prestigious Singaporean school, whose Dean suggests that they are less likely to see

a surge of fully online delivery, "*because local employment factors might still favour some traditional learning models. But we will see universities complement their F2F with online and blended degree models.*" There will also need to be a rethink about how to do internships and short-term placements. "*This will require us to innovate on the principle of experiential and problem-based learning*" (Singaporean Dean).

3.5.3   Student Management

To address the rapid transition to an online teaching/learning mode, university leadership and IT teams adapted the academic semester to the new circumstances. However, most university leaders made note of the principal responsibility of ensuring the welfare of their students. This also included challenges for those universities with diverse student bodies. Ways had to be found for domestic and international students who could not return to their home countries. Graduating students also expressed their concern for future careers and internship opportunities. "*In such circumstances, it becomes imperative for university leaders to communicate in a manner that is reassuring and supportive*" (VC, India). As higher ed rankings agency Quacquarelli Symonds (2020) note, students have been dramatically impacted by the spread of the coronavirus, from travel restrictions to social distancing, isolation measures, quarantine, campus closures and border closures. And that doesn't even acknowledge financial hardship and insecurity.

Students have been challenged to adopt online learning as the health crisis has halted face-to-face learning and social gatherings. As a result, the learning environment is very different and challenging. Academic leaders recognize the disruption and challenge faced by students and note that student welfare is of paramount importance in navigating the 'new' learning landscape. Students need to become more *adaptable* and *resilient* and the university environment can assist them. As a VC (Bangladesh) notes, "*we rarely understand that young students' adaptability and resilience are being damaged globally mainly because of the attack of 'virtual virus', which has opened up the window of free access to social media, wasting valuable time view and sharing materials that have not use at all…the availability of appropriate online teaching methods during this kind of crisis situation can be one of the great ways to draw them to study, and help them reduce their vulnerability.*"

An Indian VC concurs with this sentiment, "*one of the most important and critical changes I see is to the way in which we prepare our students to adequately cope with the living and working environments they will go on to inhabit. In many ways, this crisis exemplifies the kind of challenges that our students are likely to encounter in their careers.*" Globalisation and higher levels of economic activity will present challenges for which there may not be predetermined responses. Graduates will be expected to adapt and respond to situations whilst encompassing diverse expectations of a community. "*In such environments, uncertainty, ambiguity, and complexity would be framing aspects…it now becomes (pro-COVID) imperative for higher education leaders to make these concepts foundational pillars for teaching and learning.*"

Learning to think creatively and develop broader perspectives about the dynamic nature of the contexts they are likely to live and work in.

Another student management challenge, particularly in the northern hemisphere, was managing the changing calendar. "*The biggest change for us to date is that we have moved our entry date for the 2020 cohort from our traditional April start (SE Asian New Year) to August start. Then we had to streamline the program to ensure 2021 graduation dates could be met. This will become the new normal for our programs.*" (Singaporean Dean). An Indian Deputy Dean pointed to the same process for their school. "*Our term normally starts in mid-April, but this year we extended it to start on June 1st, and that too only online for the first 10 weeks.*" As a result, the staff had to quickly upskill in teaching online. This had further implications, as staff adopted a 'flipped classroom' approach, "*using this as an opportunity to move the more mechanical learning online and use class time for those things that cannot be done well online, such as discussion.*"

3.6 Management of Universities

3.6.1 Financial Challenges

The health crisis has exposed the high dependence of universities, particularly in Australia, on international students. An Australian PVC argues that when international student revenues once again start to flow, they must be managed in a different way, "*used less for bolstering current expenditure and more for building endowment funds for the future…government funding will need to increase…a slimmer, more efficient sector is likely to emerge. After all, if much teaching can be done online, geographical factors lose their relevance.*" As a consequence, universities that offer high quality online programs will successfully compete against their less effective counterparts in other states and countries and profit accordingly. He further argues that "*it is highly likely that a period of extraordinary stability in the structure of Australian higher education, which has persisted since the late-1980s, is now at an end.*"

One Australian VC argues that, "*the key lesson is no debt and always have something saved for the rainy day.*" Diversification of revenue is of paramount importance going forward, while another expects a number of (Australian) institutions to face significant financial pressure, which will:

> …see workforce adjustments over the next two to three years. I also expect to see tighter governmental regulation and self-imposed risk management and risk exposure assessments. I think it will be some time before we return to global mobility – if nothing else this event has demonstrated that conference calls are cheaper than air fares and hotel bills. I also expect to see deeper connection between established research collaborators – I believe that the disruption has brought more focus to inter-institutional research interactions. On the teaching front, we will see new models of international education, and increased embracing

of e-learning and online content. This was the push the higher education world needed to fully step into the digital domain.

Education may become more local as students choose to stay local rather than travel abroad, particularly "*when the local universities are world class*" (Singapore Dean). He argues that university finances that have a high dependence on international student intake will come under scrutiny if students choose to stay local. This will also lead to changes in the hiring of faculty and tenure. Foreign students may also be denied visa issuance under the Covid-19 rules. As a result, this could reverse the trend of globalization in higher education. There will be rapid downsizing of the scale of operations for those universities that are highly dependent on the tuition of foreign students. A Hong Kong Dean argues that "*a big challenge for the universities is to justify the pre-pandemic tuition cost, if a lot of learning is conducted online*".

A NZ Dean warns that the university sector cannot afford to underestimate "*the threat of actual as well as potential competition from outside the* "*traditional*" *higher education sector, where organisations with mastery in exponential technologies, such as Google and Amazon, can make the global higher education market more contestable by delivering programs at a scale.*"

3.6.2   Changing Priorities

An Australian Dean is observing and experiencing financial pressure and trade-offs between teaching and research; not seeking perfect solutions at all costs and allowing for mistakes. Making incremental improvements, responding to feedback promptly and making corrections. Dealing with operational issues in the short-run and revisiting goals for the medium to long term.

Key lessons learnt from managing in the COVID-19 crisis also include, the flexibility of managing and leading under uncertain conditions, and the ability to pick vulnerable signals and take pro-active/pre-emptive actions. Furthermore, there should be periodic "*strategic audits*" to delete non-value adding activities, processes and programs. The emphasis should be on output and impact, rather than inputs. More attention should be paid to scenario planning. This will involve a greater empowerment of academic and professional staff which requires leadership to focus on staff well-being and professional development, whilst maintaining honest and clear communication. Leaders need to recognize the importance of connectedness and work with a "can do" mindset. It will be necessary to manage without "micro-monitoring." Management must guide the attitudes of students, staff and stakeholders towards remote delivery, the digitalization of operations and working from home. This could include on-line assessment.

A Hong Kong Associate Dean referenced the importance of having a broadly representative task force with many stakeholders and student representatives, to steer a university through a crisis that is constantly evolving. The importance of effective

leader communication is again emphasized, "*the importance of unifying commu-nication to university stakeholders. Clear, non-conflicting and timely messages are important.*"

Indeed, an Australian VC views the new normal as being one *of* "*…almost constant scenario planning and strategizing – trying to predict markets and behaviours without a precedent for behaviours – and planning for worst case scenarios in terms of impact while trying to remain optimistic for some semblance of a return to 'business less unusual'. It's manifest in working-from-home and zoom meetings. The biggest change is the lack of physical connection to the university community and to the wider world*".

3.6.3   Resource Management

The pandemic has placed a spotlight on the university sector's primary resource—students (and staff). Higher education employees will have to upskill to meet the demands of a 'new-look' system. As the New Zealand PVC states, "*this will require a substantial investment in staff development.*" An Associate Dean (Hong Kong) suggests that monitoring mental health and wellbeing of faculty and students has become a part of the university's daily dialogue. "*I expect to see universities having health and wellness KPI's alongside the more conventional KPIs.*"

An Australian PVC has commented on the effectiveness of working at home, listing time -saved commuting and few distractions at home during meetings, as a personal benefit. However, he has also noted that for many of his female colleagues (with children requiring temporary home-schooling) the situation did prove chal-lenging. However, platforms such as MS Teams have proved effective and virtual meetings will continue to be routine for the longer term. "*Previously, my university prided itself on being family friendly and offering flexible working conditions. The crisis has greatly accelerated those trends which are now entrenched.*" However, the PVC notes that not being in an office environment does reduce informal interactions which are very necessary to team cohesion and wellbeing. Whilst, "*a greater propor-tion of the working week spent at home will be the 'new normal,*" a balance must be struck, as working entirely online would not be ideal.

An Australian Dean notes that the online, working from home platform will result in the reduction of building programs. Fewer new office spaces will be required and universities can reduce building maintenance, cleaning and security costs. The investment in buildings will shift to investments in IT (New Zealand PVC). The need for travel will reduce—"*smarter ways of engagement will emerge resulting in less flying and in doing so contribute to reducing emissions.*" This argument could extend to less use of printing materials and more online resources having a positive impact on the environment. The concept of the "*Green University*" could be accelerated (VC, Bangladesh).

A NZ PVC concurs with this opinion on the role of the campus, highlighting the significant amount of money tied up in physical campuses. In non-semester times,

a campus is relatively under-utilised. "*Campuses will need to become vibrant and attractive destinations in their own right where people wish to live and play, as well as study, if they are to retain their relevance in the post-COVID world.*" A VC (Bangladesh) notes that online tasks will include organizing events such as orientation and festivals, encouraging the campus environment to maintain its vibrancy. He does recognize that it is difficult to tell "*whether the actors in such online gatherings will fully enjoy their virtual happy hours.*"

3.7 Discussion

The ability to pivot to online learning during the pandemic was largely appreciated by the university leaders, but it uncovered a wide and diverse range of views with regard the post pandemic ongoing role of online. Indeed, a full spectrum exists. At one end, the converts and zealots, who feel that how higher education is delivered will change dramatically (and permanently) and that the majority of all offerings will shift from face-to-face to online or 'blended' (i.e. a combination of face-to-face and online delivery). These shifts will also create opportunities to educate students who previously may not have accessed higher education as the accessible online platforms will have increased reach in society. Some leaders were even more aspirational, looking beyond emergency online teaching to 'radically change the learning environment for students (and academic staff)'. Indeed, to move the focus away from traditional lecture/tutorial format 'once and for all'.

Most/all leaders acknowledged that the pandemic has legitimized online learning and made it 'more 'respectable'. It has highlighted the benefits of online learning and ensured that higher education will become increasingly digital in the future. Learning will become more oriented to 'stackable segments' and education which is 'primarily just-in-time not just-in-case.' Indeed, there was much support for university education becoming more 'blended' including both degree programs and short courses. In the middle of the spectrum where those who worried that too high a level of online delivery will signal a permanent transition which for many was *not* the desired strategy of the university. While others worried about costs and duplication of online and offline.

At the other extreme were those who longed for a return to the classroom and away from online. Indeed, some reported a 'renewed appreciation for classroom learning'. It seems higher ranked schools are less likely to make a hard transition to fully online delivery. Indeed, their models are predicated on low volume, high margin, high touch and non-scalable delivery. They seek to provide a premium experience for the privileged (and talented) few and price accordingly.

In some of the developing (sub-continent) markets, the pandemic 'forced the adoption of online education'. Where traditional teaching methods have been the most accepted and "comfortable" form of delivery and learning, the pandemic has challenged the system and 'forced' them to adapt. This led to other challenges, such

as the lack of necessary infrastructure and a digital divide owing to 'student disparity and electrical shortages.'

Indeed, '*democratization of technology*' (internet connectivity, telecom infrastructure, affordability of online system, availability of laptop/desktop, software, educational tools, online assessment tools) remains a hurdle, as does 'last-mile connectivity' to thousands of villages to ensure access to online teaching.

On the upside, many rural students in the country were able to complete the semester with smart phone and mobile data. Indeed, mobile devices could become 'must-have' (as opposed to nice-to-have), which could increase access to and participation in education for many.

From a students' perspective, the pandemic learning environment is very different and challenging, calling for adaptability and resilience. However, in crisis lies opportunity, in this case, preparing students to cope with the living and working environments they will go on to inhabit.

The pandemic has exposed the high dependence of universities, particularly in Australia/NZ, on international students, leading many to call for reform and lasting change. More prestigious institutions in Asia suggest (hope?) higher education will become more local as students choose to stay local rather than travel abroad, particularly 'when the local universities are world class'. University finances that have a high dependence on international student intakes will come under increased scrutiny if students choose to stay local—almost a globalization paradox in higher education. There will be rapid downsizing of the scale of operations for those universities that are highly dependent on foreign student tuition, which for some will make it difficult to justify their pre-pandemic tuition cost.

Australian schools are experiencing severe short-medium term financial pressure and are having to make trade-offs to deal with operational issues in the short-run and revisiting goals for the medium to long term.

The pandemic has placed a spotlight on the university sector's primary resource—students and staff. Higher education employees will have to upskill to meet the demands of a 'new-look' system. This will require significant investment in staff development.

The online, working from home platform will result in a reduction of campus building programs. Fewer new offices will be required and universities can begin to reduce building maintenance, cleaning and security costs. The investment in buildings will shift to investments in IT. The need for travel will reduce, resulting in reduced emissions, accelerating environmental sustainability and reform.

3.8 Conclusion

Disruption is coming for higher education. Even the best universities are going to have to change rapidly. Otherwise, they're going to be overtaken rapidly (Christensen 2013). Previously, when higher education institutions thought of digital transformation it was to achieve greater access, global reach, personalised instruction and

rapid improvements in pedagogical practices. Now, with no on campus students for extended periods, risk mitigation will become an equally important driver of digital transformation—both now and into the future (DeVaney et al. 2020).

COVID-19 represents a once-in-a-generation opportunity for the sector. Turning the crisis into an opportunity will require a degree of change at the institutional level—breakups, mergers and closures of faculties—that few will want to embark on until it is too late. And it will require a significant change in what are considered the "job requirements" for university leadership (Devinney and Dowling 2020).

> *I was torn between stating what I thought would happen versus what I hoped would happen post Covid-19. Alas, I fear the two will not be the same.* (Australian Dean)

Arguably, COVID-19 should/could be a catalyst for change, but that does not guarantee it will happen. As one PVC states, "*needless to add, none of this rapid development or large-scale experimentation would have occurred but for COVID-19.*" The pandemic has awakened and enabled opportunities for exploration and change around teaching/learning innovation. But is it enough? Will the sector reinvent itself, or wait for the dust to settle and then revert back to the ways of the past? Certainly, there is still something of a disconnect between how the study participants view the future compared with external experts, consultants and commentators—with the former being far more circumspect and conservative; and the latter more doomsday-like.

For example, the VC of one of the Australian universities most affected by the collapse of international students (and hence of on the most over-dependent) is not only unrepentant, saying that they had "not been irresponsible in depending on Chinese students", but also highly confident that "*..the market for international education, post-pandemic, would* "*continue to grow exponentially this century and Australia has a real edge competitively compared to any other country in the world*" (Hunter 2020). Time will tell.

Appendix A

Interview Protocol
Dear XXX

How are you travelling—in these strange times?
Can I ask you a favour? I teach in the education faculty at XXX and am preparing a book chapter on COVID-19 and the Future of the Service Industry Post-Pandemic. My chapter focuses on **the future of higher education/universities post COVID-19.**

- As a senior academic leader, in your opinion, what will the *new higher education world* look like once the proverbial dust settles?
- What is *your* "New Normal" and how are you coping with it?
- What key lessons have *you* learned during this pandemic (that could assist future academic leaders deal with similar crises)?

- What aspects of your institution and operation will **<u>not</u>** go back to the way things were pre COVID? In other words, what permanent changes do you anticipate?

The study is **completely anonymous and deidentified**. At no point will you be named or your identity revealed—other than a very broad descriptor like "Australian vice chancellor' or 'Singaporean Dean' (no mention of discipline).
The book editors are keen to publish this year—so deadlines are tight. Hence, if it is not too much trouble, could you reply within a week?
Enjoy your weekend!

XXXX

Author's Insight

The pandemic has facilitated an expedited learning curve in terms of online delivery, in both developed and emerging economies. Many schools seemed to make up 5 years' worth of ground in 5 weeks—albeit often out of necessity rather than choice. Some universities with significant prior online expertise were adapting, whereas others faced far more significant challenges. The online environment does provide opportunities for more engaging practice. For example, a more problem-based curriculum, with students being involved in 'real-life', mentored projects. This develops student creativity, adaptability and very importantly, resilience. Assessment formats and protocols also required creative re-thinking. The pandemic did expose some (Australasian) schools' financial over-dependence on international student fee income. That said, when all is said and done, the twenty participants interviewed in this study did not point to any radical or particularly enduring structural reforms. For example, no changes to degree duration or credit hours emerged in the responses. No real competitve threats (or opportunities) were identified either. Even the most prestigious schools did not speak of being free of the bonds of geography and using online capabilities to attract the brightest students from around the world. Rather, they seemed more content to return to their pre-COVID status quo. While COVID-19 might theoretically represent a 'once-in-a-generation' opportunity for the higher education sector, turning the crisis into an opportunity will require a degree of change at the institutional level that most of the leaders in *this* study seem somewhat reluctant to embrace. Hence, based on the findings of the present study, one might conclude that changes will likely be evolutionary not revolutionary; and innovation incremental rather than disruptive. It could well be that this sector does 'waste a good crisis'. The only caveat to this is that the fieldwork for this study was conducted in April 2020, early in the pandemic. Hence, many of the participants would have been more focused on survival and short-term 'fire-fighting' rather than seeking out longer-term opportunities. That said, higher education is one of the oldest continuously operating sectors in the world and has survived many pandemics and crises far more calamitous than virus strain SARS-CoV-2 (named 2019-nCoV or COVID-19). Contrary to the cliché, perhaps change is *not* the only constant?

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Chapter 4
Transformative Value Co-creation in Healthcare Services in the COVID-19 Era: The Case of Centro Cardiologico Monzino

Roberta Sebastiani and Alessia Anzivino

Abstract The outbreak of COVID-19 has presented great challenges for health services targeted at patients with chronic diseases, such as cardiovascular disorders. Hospitals and medical clinics must find new and effective solutions to address the impacts on individual and collective well-being due to the increased diffusion of these types of diseases, especially during a pandemic. This implies the evolution of the service ecosystem through enhanced coordination and resource integration between different actors (patients, doctors, service providers, relatives, caregivers, etc.). The coordination process might be leveraged by technological devices aimed at integrating resources and co-creating transformative value (Anderson et al. 2013; Danaher and Gallan 2016; Anderson et al. 2018). This chapter, in particular, investigates how digital health technologies impact the evolution of the Italian healthcare service ecosystem in a transformative way through the study of the case of Centro Cardiologico Monzino. The study adopted a qualitative approach based on in-depth interviews with patients of Centro Cardiologico Monzino with cardiovascular pathologies who use digital health devices and doctors, caregivers, and other key informants who are experts in the Italian healthcare service ecosystem. Our findings illustrate how digital health contributes to value co-creation and to the enhancement of individual and collective well-being, considering the renewed interaction between different actors in the service ecosystem.

Keywords Transformative value co-creation · Service ecosystem · Digital health · Individual and collective well-being

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4.1 Introduction

COVID-19 seems to have projected us all into that social and temporal dimension that anthropologists call "liminality" (Horvath et al. 2015). The pandemic has suspended all ordinary activities and identities. We no longer act from a project perspective but only in the contingency of the very short term. For example, in this period, attention has been focused on COVID-19 patients, while patients with other diffuse and chronic pathologies, such as cardiac disease and diabetes, were neglected. Instead, non-COVID-19 patients seem to have disappeared from social communication, as if their illnesses were also suspended. Unfortunately, however, they are not, though in many cases clinics have been closed and appointments postponed. Even though activity in hospitals resumed, patients have been afraid of going there. This phenomenon has not only occurred in Italy but in the rest of the world.

According to a survey conducted between March and April 2020 by Carenity, a social platform that brings together more than 400,000 chronic patients and caregivers from around the world, and Alira Health (Carenity and Alira Health 2020), 42% of patients have had a consultation or surgery cancelled or rescheduled, 40% report consulting their doctor less often than usual, 9% have stopped and/or interrupted their background treatment, and 10% reported that they have had difficulty finding their prescription in a pharmacy. These figures show a substantial risk of therapeutic discontinuation for patients requiring regular care and treatment.

Among chronic diseases, cardiovascular diseases (CVDs) are the leading cause of death globally, according to World Health Organization (WHO) data (Health Organization 2020), claiming an estimated 17.9 million lives each year and accounting for approximately 31% of all deaths worldwide. CVDs are a group of disorders of the heart and blood vessels and include coronary heart disease, cerebrovascular disease, rheumatic heart disease, and other conditions. Four out of five CVD deaths occur in people under 70 years of age due to heart attacks and strokes. One-third of these deaths occur prematurely. In Italy, there are 240,000 victims of heart disease per year; cardiovascular diseases are responsible for 44% of all deaths, and those who survive a heart attack become chronic patients.

Imagine, for a moment, a typical chronic patient with a cardiovascular disease who needs to go to the hospital. Usually, the patient would call for an ambulance or otherwise go to the hospital, and after the usual triage, they would receive specific care.

But what happens during the COVID-19 era?

During the lockdown, the scenario in Italy changed because of the rapid reorganization of hospitals and the increased burden on the emergency system due to the pandemic. People with cardiovascular diseases preferred to stay home, even in severe cases. Based on the numbers of the first Italian multicenter study (De Rosa et al. 2020) conducted in 54 hospitals, the Italian Cardiology Society stated that during the COVID-19 emergency, mortality from heart attacks tripled and, in most cases, were linked to non-treatment or delayed treatment. About 7.5 million Italians suffer from cardiovascular diseases, and during this pandemic, a reduction of more

than 50% in hospitalizations for heart attacks has been registered. Hospitalizations for heart failure, heart rhythm abnormalities, and dysfunction of pacemakers and defibrillators are down by about a third.

Given this scenario, it is necessary to re-consider the service ecosystem in healthcare and how digital health could represent, in this process, a long-term strategy for the healthcare system. Since the pandemic has boosted the use of digital technologies to address the need for social distancing, actors involved in the healthcare service ecosystem are moving toward transforming the crisis into a great moment of rethinking the organizational and relational models of care based on these types of technologies.

In the United States, during the COVID-19 pandemic, the majority of patient consultations are happening virtually, and healthcare planners are shifting toward systems of virtual care based on China's experiences where patients were advised to seek medical help online in order to avoid problems related to contagion in hospitals and delays in treatment (Webster 2020). As of 2018, in Italy, each of the 20 regions implemented national telemedicine according to specific guidelines, but we can say that it was only in its primary stage and involved very few patients (Infection Control Today 2020). The changes to the traditional structures and consequently to service ecosystems due to the use of digital technologies, were consolidated and strengthened, thus introducing new ways to integrate resources to co-create transformative value. In cardiology, remote monitoring of electronic cardiovascular devices, such as defibrillators and cardiac resynchronization systems implanted in patients with severe arrhythmias or heart failure, already existed, but during the COVID-19 pandemic, this was implemented in a more effective way. Information concerning both the state of the device and the patient's clinical condition moves periodically through a secure and protected system from the patient's home to computer platforms that are reviewed by cardiology technicians and cardiologists in the hospital (Lakkireddy et al. 2020).

Vargo and Lusch (2016) have defined the service ecosystem concept as "relatively self-contained, self-adjusting systems of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange" (p. 11). But which is the value in this particular case, that is, what is the object of the service ecosystem change? The purpose of the healthcare service system targeted to patients of chronic diseases, is to co-create a specific form of value, the transformative value, that encompasses the "social dimension of value creation which illuminates uplifting changes among individuals and collectives" (Blocker and Barrios 2015, p. 2).

This chapter investigates how digital health impacts the evolution of the Centro Cardiologico Monzino service ecosystem in a transformative way, in particular, during and after this pandemic, how transformative value is co-created, who the actors are, and how the resource integration mechanisms and logics are changing.

The study adopted a qualitative approach based on thirty two in-depth interviews: ten patients with cardiovascular pathologies using digital health devices useful for their own body and its vital functions, four caregivers, seven clinicians, two technology providers, six nurses, and three experts in the Italian healthcare service

ecosystem. The data were triangulated with those derived from participatory observation and from the analysis of secondary data. The data were collected in parallel, and the various sets of results were interpreted concurrently to draw valid conclusions regarding the research problem.

This chapter is structured as follows. The next section is dedicated to the research setting. Then the Centro Cardiologico Monzino service ecosystem is described and pillars of transformative value co-creation are discussed. We end with conclusions and managerial implications.

4.2 Research Setting: Centro Cardiologico Monzino

Centro Cardiologico Monzino was established in 1981, and it was the first hospital in Europe exclusively dedicated to the treatment of cardiovascular diseases. Today, the center is part of IEO-Monzino group, which includes two centers of excellence in the management of the major pathologies of the Western world that reinvest all their profits in research and innovation. Monzino is accredited and affiliated with the Lombardy Region and offers admissions and outpatient services under the National Health Service. In 1992, it became the first clinical research hospital in Italy dedicated exclusively to cardiovascular diseases. As a research hospital, Monzino pursues research, mainly clinical and translational, in the biomedical field as well as in the organization and management of health services, together with admissions and highly specialized treatment of cardiovascular diseases. The activities of Monzino are inspired by values such of specialization, research, interdisciplinary care, and continuity of services aimed at keeping the individual at the center of attention.

Centro Cardiologico Monzino was set up as the main seat of the Università Statale of Milan for the study of Cardiovascular disease: thus, it contributes to training, producing clinical excellence in all specific roles, in order to offer the best care.

At Monzino, scientists, physicians, technicians and nurses work together sharing highly specialised individual knowledge, to provide the best patient care and to establish a trusting relationship in a collaborative and confidential environment. This approach to work is our key to carrying out innovative research, prevention and care projects.

The Monzino Centre is a patient-oriented institute that accompanies patients throughout the course of their therapy.

A total of 12 Research Units, with 75 researchers are active at Centro Cardiologico Monzino, that led to 212 publications in scientific magazines (1.423 Impact Factor in 2016) with an excellent scientific productivity rate per researcher, directly integrated with hospital areas to transform results achieved into new approaches for prevention, diagnosis and patient care as quickly as possible.

Constantly improving knowledge of the heart's "language" and that of its cells, the centre's laboratories search for new markers that would allow better prevention of cardiovascular disease and prompter, more personalized and effective care.

A further field of research concerns the use of innovative equipment for diagnostic and surgery procedure imaging, to make the detection and treatment, for instance, of coronary disease, more effective and less invasive.

A few years ago, Monzino Digital was born; like all centers of excellence, the Monzino Cardiology Center had already integrated a large amount of cutting-edge digital technologies for its clinical-scientific activity, for example, the most advanced cardiovascular imaging equipment or research equipment. But it is to the strengthening of center relationship with the patient and the citizen that the "Digital" is contributing in an unexpected and very rapid way during this COVID-19 period.

During the COVID-19 period, digital health technologies have played a leading role and is expected to play a more important role in the future management of heart disease and especially, in reducing cardiovascular risk after the pandemic. In fact, the European Society of Cardiology (ESC) has launched its own commission, the "Digital Health and Cardiology Commission."

4.3 Service Ecosystems and Transformative Value Co-creation in Centro Cardiologico Monzino

The value creation process, as depicted in service-dominant logic (Vargo and Lusch 2011, 2016), is an interactive and collaborative process occurring in the context of a unique set of multiple exchange relationships among various actors in a service ecosystem.

Service ecosystems represent spatial and temporal structures of loosely coupled, value-proposing social and economic actors engaging in mutual service provision and value co-creation (Vargo et al. 2015). They reconfigure themselves when necessary; they are dynamic and potentially self-adjusting. Service provision and value creation through resource integration impact the nature of the system. These dynamics, in turn, determine a change in the context for future value creation processes (Chandler and Vargo 2011). Resource integration, service provision, and value creation change the system's nature to some degree and, thus, the context for the next interaction and determination of value creation.

Multiple levels of sub-ecosystems that intersect and overlap at the micro, meso, and macro levels of social interaction compose service ecosystems (Alexander et al. 2018). The macro-level structure is derived from interactions at the meso level, which in turn, is determined by interactions at the micro level (Lusch and Vargo 2014). Consequently, the macro-level system exerts an influence on the lower levels—that is, meso and micro—over time, varying according to the context (Alexander et al. 2018). At each level, actors interact with co-creating value and shaping the social context. Thus, value co-creation in service ecosystems is a complex process involving the integration of resources from numerous sources in unique ways, which in turn, provide the possibility of new types of service provision that require coordination.

The extant literature focuses primarily on how value co-creation occurs at a micro level, within the dyad, while the mechanisms that govern value co-creation at the different levels of a service ecosystem are much less investigated. Scholars increasingly recognize the importance of the social and collective dimensions of value creation that influence well-being both at the individual and at the societal level. This effort gave rise to a specific research stream called "Transformative Service Research" (TSR) (Anderson et al. 2013; Anderson and Ostrom 2015) that "centres on creating uplifting changes and improvements in the well-being of individuals (consumers and employees), communities, and ecosystems" (Anderson et al. 2013, p. 1). Individual well-being refers to the "reflective cognitive evaluations of life" and "affective reactions to life events" that happen to an individuals' "bodies and minds, and the circumstances in which they live" (Diener 2006, p. 153). Collective well-being refers to a positive state of affairs in which the collective needs and aspirations of individuals and communities are fulfilled (Evans and Prilleltensky 2007).

Individual as well as collective well-being represent the forms of transformative value that encompass the "social dimension of value creation which illuminates uplifting changes among individuals and collectives" (Blocker and Barrios 2015, p. 2) within service ecosystems.

To explore the co-creation of transformative value in health services, TSR suggests a contextual analysis that detaches itself from the more traditional analyses of loyalty and consumer satisfaction; the aim is to investigate the effects that services can have in terms of uplifting individual and collective well-being based on the assumption that healthcare organizations focus their activities on improving patients' lives.

In the current epidemic context, a digitally mediated healthcare service ecosystem emerges as a disruptive reality useful to provide new solutions and manage new links and actors' and resources' integration to co-create transformative value.

Until now, digital technologies have been used as an alternative method of interacting with patients in the healthcare sector, and these innovative technologies have been useful in improving education, preventative care, and the relationship between patients and health professionals with regard to treating cardiovascular diseases.

Even if the use of technologies in the healthcare industry faces challenges, such as the lack of financial resources (Saborowski and Kollak 2015), during this pandemic, the systematic availability of health-related information, gathered by wearables, sensors, and smartphone technologies has further enhanced patient performance in co-creating transformative value with the provider and for themselves (Aceto et al. 2018; Osei-Frimpong et al. 2018).

The intervention of technological advancements in a service ecosystem defines a new systemic network and the development of new social practices, such as continuous remote monitoring of patients' symptoms, sharing clinical data, and patient empowerment (Caridà et al. 2014; Osei-Frimpong et al. 2018).

Using data derived from our interviews, we found three different macro themes at the base of the recent evolution of the Centro Cardiologico Monzino service ecosystem in a transformative way thanks to digital technologies:

- newfangled actors engagement,
- digitally mediated resource integration,
- newly emerging barriers and tensions.

4.3.1 Newfangled Actors Engagement

The improvement of the use of digital technologies in healthcare systems and the reshaping of the Centro Cardiologico Monzino service ecosystem is connected to a novel way of actor engagement. At the micro level, the correct management of digital devices by patients with heart disease from home helps cardiologists and technicians analyze data transmitted to computer platforms in a better way. The role of the patient in this new healthcare ecosystem is transformed into a co-creator of value more than ever before; the correct use of digital devices by patients is fundamental to provide continuous treatment and to guarantee patient autonomy.

> Psychologically, it was very important for me to know that I am constantly monitored and that I can continue to be treated even from a distance. *(Patient)*

> During the lockdown period, it was very important for me to know how to best use these technological devices. At first, I did not know how to relate to this new type of "remote treatment," then I understood the added value and also how much it saved us and her from going to the hospital. But at the beginning, I had to study this new device. *(Husband of a patient)*

During the pandemic, every patient can be a potential user of digital health devices, and it is necessary to consider both sides of the coin. On one side, patients, caregivers, families, and providers need to be aware of the use of these digital devices in order to optimize the prescribed therapy. The new adaptive interactions among actors also include more in-depth relationships between specialists; the work of the cardiologist is highly related to that of technicians, the family doctor, the psychologist, and so on. On the other side, the relationship between the patient and doctor changes radically because of the mediation of digital devices and the differences present in this new type of visit.

In this new digitally mediated ecosystem, it is also important to consider the engagement of private companies, such as Zucchetti SpA, which has made available to Monzino and to all Italian hospitals an advanced telemedicine software to monitor the parameters necessary to assess patient health outside hospital structures. The central role of the patient in this ecosystem also requires the development of new services based on subjectivity, culture, values, and preferences. The role of some health tech start-ups becomes important, as they permit the patient to virtually interact with clinicians, nutritionists, psychologists, and other members of the so-called care teams.

> The pandemic significantly boosted new opportunities for my start-up to develop more humanized technological solutions to the healthcare system. In this situation, the continuous interaction with the cardiologists of Centro Cardiologico Monzino and their patients has represented a unique source of inspiration. *(Health tech startup manager)*

Furthermore, many non-profit associations, at the meso level, have implemented new forms of caring; some of them are experiencing the so-called "volunteering via Internet," while some other non-profits and voluntary associations have expanded their mission in order to continue their core activities in a new way, which is useful in caring for chronic patients remotely. "We will have to introject the oxymoron that social distancing could be overcome through virtual social interaction via telephone or computer. Contact is relevant for the patient to decrease loneliness and fear of the disease" *(President of a voluntary association).*

Our analysis shows the importance of actor engagement, not only at the micro and meso levels as expected, but also at a macro level, such as the Ministry of Health and other institutional actors. The evolution of the Centro Cardiologico Monzino service ecosystem has also impacted, at the macro level, institutional actors, such as the Italian National Institute of Health, which foresaw and encouraged the use of telemedicine to allow hospitals located in the areas most affected by the pandemic, to use teleconsultation. After this notice, similar initiatives multiplied.

The Ministry of Health has set new guidelines for telemedicine in Italy. The document "Telemedicine – National Guidelines" (Rapporti ISS COVID-19 n. 12/2020) states:

> Technological innovation can contribute to a reorganization of healthcare, in particular by supporting the shift of the focus of healthcare from the hospital to the territory, through innovative citizen-cantered care models and by facilitating access to services in the national territory. The modalities for the provision of health and socio-health services enabled by telemedicine are fundamental in this sense, contributing to ensure equity in access to care in remote territories, a support for the management of chronic conditions, a channel for access to high specialization, better continuity of care through multidisciplinary comparison and a fundamental aid for emergency-urgency services. (Rapporti ISS COVID-19 n. 12/2020)

Given the importance of telemedicine during this specific pandemic, institutional actors' coordination is necessary. To facilitate patient monitoring from home, the Ministry for Technological Innovation, together with the Ministry of Health and the WHO Higher Institute of Health, promoted a call to find telemedicine applications for patients who were at home either because they were affected by COVID-19 or other diseases, including chronic ones.

Specifically, in terms of heart diseases, the Digital Health Committee of the European Society of Cardiology (ESC) is working to move strategies in a digital direction; all the educational activities of ESC, its associations, and its working groups are becoming increasingly based on remote access and digital interactions (ESC 2020).

In this new digital service ecosystem approach, the engagement and the contributions of all actors at the micro, meso, and macro levels are important. They contribute in new-fangled ways to transformative value co-creation in order to give the right assistance to patients with chronic heart disease.

4.3.2   Resource Integration for Transformative Value

The revolutionary switch to telemedicine and video consultation in order to prevent the spread of COVID-19 is not as straightforward as installing a new service; rather, it involves introducing and sustaining major changes to an already complex system. The use of telemedicine has to be considered an integration and not a simple substitution of traditional healthcare systems, and nowadays, it is a valid support tool on the path of treatment of heart disease. It must be adapted flexibly, with personalized logic, to the needs of the individual patient. The evolution of the traditional service ecosystem emphasizes the role of the different actors as value co-creators in a new transformative way due to the integration of different resources. For example, there is resource integration between nurses and caregivers. In the management of patients through telemedicine, nurses transmit their skills to caregivers and family members more effectively and have feedback about the patients' daily life issues for imagining possible solutions. The connection between technicians, cardiologists, and patients is also relevant. Thinking about the meso level, integrating resources leads to overcoming the boundaries and creating new networks. Dealing with resource integration, we have also to consider data integration: the digital environment is very complicated, and the integration of different and individual applications with core hospital systems is useful for communicating with other systems. Resource integration also involves team integration, concepts, skills, and technologies to create virtual infrastructures. At Centro Cardiologico Monzino, telemonitoring is carried out using an application that can be downloaded to a phone; every day, the patient records a series of fundamental data to understand the evolution of his or her clinical situation. The data are constantly analyzed at the control center, which in turn, contacts the patients at least twice a day to evaluate their clinical progress, indicating or integrating the existing therapy, organizing a series of targeted diagnostic tests and with constant "virtual human contact," which keeps the patient and their family from feeling abandoned and alone.

During this COVID-19 period, Centro Cardiologico Monzino activated a new service to remotely monitor the cardiorespiratory health of patients discharged from the hospital with COVID-19 pneumonia. It is a cutting-edge technology that allows patients to control their main vital parameters through special sensors built into the fabric of a t-shirt that the patient wears at home. The initiative is part of the Monzino model for Phase 2 of the COVID-19 emergency, which aims to strengthen surveillance and home care. The service provided by the t-shirt was originally developed for decompensation and clinical cardiology patients of Monzino.

The shirts are given to patients at discharge and configured to allow reading and transmission of data. A portable router is also given to the patient, which allows the patient to transmit the registration data even without using a telephone connection or a home data network. The kit also contains a series of practical instructions and a contact number to provide constant assistance and respond to any technical problems. The high-tech t-shirt records a twelve-lead electrocardiogram, the same that is performed in surgeries, and measures heart rate, arterial saturation, mechanics, and

respiratory rate (including apneas). The device can be worn for any number of hours per day that the patient desires, though for a minimum of two hours, in which he must alternate, at set intervals, rest and standardized exercise, such as a walking around the home at a pace that anyone can sustain. In this way, it is possible to compare the parameters in the two situations and to get information if the patient performs the amount of physical movement in the house that is functional to healing.

> The ability to monitor the patient remotely without the need to access the hospital unless worrying parameters have been observed; greater safety on the part of the subject, who feels monitored by advanced technology in the physically and psychologically delicate phase of post-discharge; greater self-monitoring by the patient, who is made aware of the need to gradually resume his daily life, at least within the home; and greater safety in the slightly earlier discharge of stable patients. *(Clinician)*

Telemedicine in this period is very important for patients with cardiac disease because, through different instruments, patients can stay in contact with their doctors, constantly monitor vital parameters through the use of wearable devices, and manage their emotional state through online support communities, mindfulness programs, and so on. Furthermore, in this way, the quality of care is enhanced and patient self-confidence is improved.

The adoption of remote patient monitoring (RPM) has exploded during the COVID-19 pandemic; these innovative and disruptive systems help care teams monitor, manage, and engage patients in the comfort of their homes, which contributes to reducing costs and mitigating risks. These systems continuously stratify patient risk via artificial intelligence (AI)-driven algorithms and alert and empower care teams with optimal windows of opportunity to intervene when needed. Automated visual/audio reminders and phone calls enable higher patient engagement and medication adherence. Integration with telehealth and virtual video conferencing and visits enables rapid patient health assessment, optimized for various chronic diseases.

Integration of different resources creates new resources in which the different actors act on different levels of engagement and co-create value to ensure the well-being of patients and society. One caregiver said:

> It was not easy to manage his anxiety at the beginning and also the lack of trust in the health system. "If I'm sick what happens?" was the most frequently asked question. The support of a diverse community has been fundamental, and even in this period, I have had to learn to be a caregiver in a different way. To no longer deal only with therapy, but also with the use of devices and dealing with doctors and nurses by phone or via the Internet. *(Caregiver)*

In Phase 2 of the pandemic, the objective is to protect and monitor fragile patients and to do it is important the collaboration between family doctors, territorial health services, and service health centers in order to schedule proactive telephone surveillance interventions and control some vital parameters with simple monitoring tools to be delivered at home.

4.3.3   Newly Emerging Barriers and Tensions

The new path defined by the evolution of the service ecosystem in a transformative direction is not without drawbacks. On one hand, there are some normative and technological barriers; on the other hand, there are tensions and resistance between the different actors in the process of resource integration.

The integration of digital health and health services could open the door to new, important, but complex, issues. The creation of a large amount of data generated by users is indeed useful for the health system, but at the same time, it generates questions regarding patient privacy, highlighting the need to establish privacy policies.

Protection of personal data, however, is a fundamental right of each individual. The high predictive analysis capacity allowed by the latest technologies represents a precious resource in emergency situations; the impacts, even in the long run, on the rights and freedoms of individuals cannot be underestimated. Where digital health is concerned, therefore, a reflection on the balance between health protection and privacy protection will be very important in order to build a post-emergency health system that is more democratic in accessibility and equally democratic in the defense of citizen individuality.

Today, even if there are limited high-quality and randomized data supporting telehealth, there is evidence suggesting the benefit to patients given by health systems. Telehealth interventions in cardiology to date have largely focused on ambulatory management of hypertension and heart failure. Analyses of randomized trials of telehealth in heart failure have shown improved clinical outcomes.

In general, during this period, digital reservations and prejudices have fallen, but methodological scruples and an orientation to critically rethink the ordinary methods of taking care of patients have remained in order to avoid transferring poorly suited organizational practices to digital.

> Not all my colleagues appreciate telemedicine. Having fewer patients in the office for some doctors is implicitly related to the loss of power … *(Cardiologist)*

For remote assistance, it is necessary to have safe technological tools that preserve the confidentiality of health data, but it is not enough for them to simply function and be used. It is essential to be able to co-construct diversified and customizable organizational and relational settings. In a very short time, virtual meetings were organized with the teams of each service to understand the needs and to build digital clinics capable of enhancing a personalized approach for the individual team. Technologies must not impose rigid and standardized organizational models and paths; on the contrary, they must help reinvent them.

The National Italian Health System today does not reimburse telemedicine services, and the adoption of new digital healthcare solutions by national systems must take this issue into consideration along with issues related to the integration with current information systems as well as the legal framework in data processing.

Another critical point is the lack of the presence of clinical and non-clinical staff and their appropriate training. This issue reflects the importance of the presence

of trained staff because the greater the change of behavior needed (by physicians, nurses, providers, payers, and policy makers) to deliver new products or services, the greater the barriers to patients, despite the promises of value delivered by the new product or technology.

Summing up barriers and tensions could be summarized as follow:

- Normative and technological barriers
- Patient privacy
- Data protection
- Telemedicine reimbursement
- Clinical and non-clinical staff training.

4.4   Transformative Value Co-creation Framework with New-Fangled Actors

Considering the results of our analysis and our research setting, Fig. 4.1 represents Transformative Value Co-Creation in Monzino Service Ecosystem.

In the scheme, we have considered three different levels: micro, meso and macro with the patients at the center. The coordination process leveraged by technological devices integrates resources and co-creates transformative value at individual and collective levels.

The impact of technological devices requires and implies new relations and the creation of networks to better suit new practices required by this type of innovation (Geels and Schot 2007; Edvardsson et al. 2014).

The creation of new type of relationships and overcoming barriers and difficulties typical of creating new networks, between micro, meso and macro levels, is needed to develop this service ecosystem, but to act these new relations is important to create convergent logics among different actors (Öberg et al. 2016; Aarikka-Stenroos et al. 2017; Jaakkola et al. 2018). The co-existence of different layers and different actors at different involved in different ways, necessitates the engagement of actors in new practices (Edvardsson and Tronvoll 2013; Jaakkola et al. 2018).

Various actors, institutions and stakeholders such as clinicians, family doctors, nurses, caregivers, but also health tech start-ups, associations and so on at meso level, and Ministry of health, National health institutes and others at macro level, can impact transformative value co-creation and influence the institutionalization of new practices in society (Geels 2002).

At micro level patients, caregivers, family doctors, cardiologists and so on impact the success of the use of these new devices and influence also their institutionalization and usage in the society (Biemans 1991; Geels 2002; Aarikka-Stenroos et al. 2017). Intermediaries, such as technology providers and tech consultants, make the products available to users (Woodside and Biemans 2005).
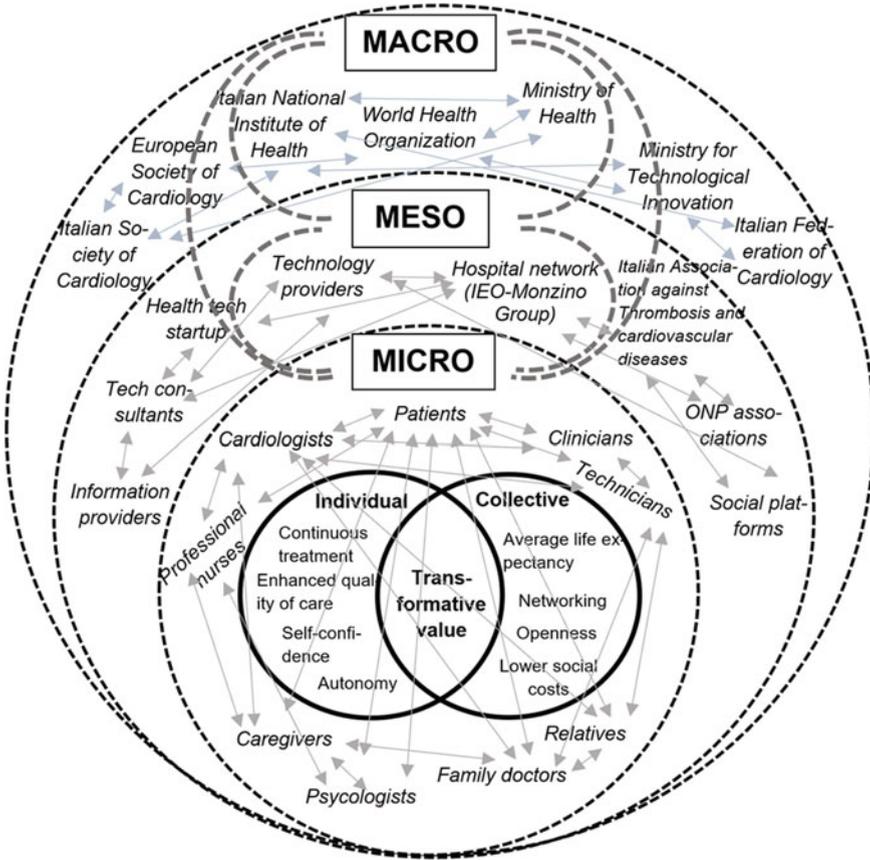
Fig. 4.1 Transformative value co-creation in Monzino service ecosystem

Public organizations and other institutions, at macro level, may support the diffusion by articulating positive visions of the use of the innovation in society (Troshani and Doolin 2007) also trying to limit barriers and tensions.

The case of Centro Cardiologico Monzino shows that the use of digital devices has potential to provide benefits for many stakeholders, but it also requires the presence of long term vision and sometimes a change driven from the macro level could force actions also at meso and micro levels in order to provide global benefits.

The digitally mediated healthcare service ecosystem nowadays emerges as a disruptive reality useful to provide new solutions and manage new links and actors' and resources' integration to co-create transformative value taking into account at the individual level, the continuity of treatment, the enhancement of quality of care, and patient autonomy and self-confidence. At the collective level, some variables to be considered in this framework are the increase in life expectancy, the variety and

breadth of interaction in networks, the augmented openness towards innovation, and the decrease of social costs.

4.5   Conclusions and Managerial Implications

The use of digital technologies in healthcare systems brings about a new service ecosystem based on new adaptive interactions among actors that transforms the patient–provider relationship and on new social practices. In this new ecosystem, based on technology-mediated healthcare, new social practices grow and integration among actors' changes.

The use of telehealth has been growing in the past few years, though more slowly than expected. One major reason has been the lack of a reimbursement model for telemedicine that puts it on par with in-person visits. We may be seeing a tipping point that takes telehealth to the mainstream in one stroke, transforming the way we experience healthcare in the future. Most importantly, the public at large will become accustomed to telehealth visits as an acceptable way of obtaining healthcare.

A large body of scientific literature demonstrates the effectiveness of this system (Ganatra et al. 2020; De Rosa et al. 2020), which improves the management of these patients in terms of prognosis and quality of life while avoiding periodic visits to the hospital. Even if it is very difficult to not have a patient in front of the doctor, digital health and telemedicine is now a necessity, not only in Italy but worldwide.

Telemedicine and digital health technologies have proven to be very useful to allow cardiologists virtual visits and, when possible, electrocardiogram (ECG) reading and in general, continuous patient monitoring and immediate interventions. Furthermore, the use of digital technologies mitigates issues related to this emergency period, such as the fact that local doctors are exhausted from this situation and Italian laboratories have reduced non-urgent activities, especially in regions with a high number of COVID-19 patients.

The creation of these new "virtual clinics" is useful to the reduction of physical crowding in clinics and hospitals, and the use of digital technologies for patients with cardiovascular diseases has helped the tracking of patients and prevented them from a delay in treatments and unnecessary hospital consultations. Some studies suggest the importance of substituting in-person visits with telehealth visits (Ganatra et al. 2020) in order to reduce COVID-19 transmission among patients with cardiovascular disease and underline the importance of activating telehealth protocols as soon as possible.

Digital health proposes new ways to produce and provide services that differ from models based on the hospital structure. These are considered limiting, since the COVID-19 pandemic has highlighted the need for better use of healthcare resources with a view to achieving greater efficiency. Increasing the quality means having a huge amount of detailed data of all kinds of patients, pathologies, and/or lifestyles,

thus being able to support medical figures in the delivery of personalized therapies without wasting resources and without incurring unnecessary expenses. Therefore, anyone could be a potential user of digital health devices, and this challenging context requires the development of people-centered services, which considers one's subjectivity, living environment, culture, values, constraints, and preferences.

In such emerging healthcare ecosystems, smart devices effectively connect the emotional, social, and physical needs of the actors (patients and their families, physicians, other service providers, etc.) to transform the patient into an active actor who integrates resources and co-creates value (Anderson et al. 2013; Danaher and Gallan 2016; Anderson et al. 2018).

This epidemic period represents a unique occasion to understand the real potential of digital transformation in the healthcare sector; never before has the speed of adopting a large-scale digital healthcare tool been so impactful. In this period in Italy, virtual experiences have multiplied, including the use of chatbots to detect COVID-19 from the first symptoms and free specialized nursing tele-assistance services that provide support to patients, caregivers, and families and that create a new virtual network between partners.

Long after this pandemic has run its course, we will be left with enhanced structural changes in the way we work and communicate. These were happening already, but in a rather slow and piecemeal fashion. COVID-19 will accelerate this process and leave us transformed forever. Looking to the future, remote imaging assisted by artificial intelligence for image collection and interpretation may also reduce the need for patients to attend distant healthcare facilities—but we are a long way from this at the present time. Centro Cardiologico Monzino is working in this direction; simpler solutions than t-shirt are under study, these new solutions will be less invasive and will transmit data faster. Soon there will also be the possibility of measuring body temperature remotely, a particularly significant figure, as is known, for patients who have contracted COVID-19.

Many Italian hospitals, however, lack the necessary and technical resources; the use of digital health requires that services looking to use video consultations must ensure they are using appropriate software that properly aligns with clinical workflows. Platforms designed for video conferencing do not provide the appropriate workflow and may require software downloads that breach local information governance policies. Bandwidth, audio quality, and video quality must also be considered when implementing a system.

The future is digital—and likely more virtual than has traditionally been the case. Healthcare is no exception. Cardiology has already dipped a toe into these waters, and the COVID-19 pandemic will no doubt, continue to speed up the process of transformation.

Authors' Insight

Roberta Sebastiani, Alessia Anzivino

Sometimes things happen and confront all of us with some hidden realities. Chronic illnesses, although diffused, have been somehow swept under the rug during the pandemic. In the last months, we have experienced new forms of vulnerability and have reflected on the different nuances that this term assumes, thinking about how to cope with it.

Nevertheless, surprisingly, it is around someone vulnerable, chronic patients, that old walls have begun to crumble, and a new conformation of the ecosystem has begun to define itself and strengthen. This implied the breaking of old patterns and the overcoming of consolidated boundaries.

Patients began to become more aware of their therapeutic paths, doctors approached different worlds, such as that of technologies, starting to acquire their logics and languages, ancillary figures such as nurses found themselves at the center of a process of retraining from which were left out for a long time.

The perfect storm, that we did not expect, confronts us with the need to finally become aware of the interrelationships between the health sector and other sectors.

Digital innovation—continuous care—patient—covid—attention—new network—new skills.

These are in our opinion the keywords that summarize what the present and the future in the management of the health sector will be.

Rather than creating a new service ecosystem, we think we should review the existing one and understand how everything that already exists could be re-read in the light of the disruptive changes brought by Covid.

The pandemic has led us to reflect in a new way on the organization of health services, on the need to put more attention to the prevention of similar events, but also and above all on the need to rethink the role of local medicine and focusing on the model proposed in this chapter on the connection between micro and meso levels.

A patient-centered health strategy must be accompanied by an equally decisive strategy centered on the community and the territory and it should be driven at macro level. The overcoming of barriers and the easing of tensions is possible only through new ways of integrations between actors and also to the reshape of some services. Patient associations or voluntary associations, for example, could reshape their mission in order to be as close as possible to patients and continue to offer their support in response to citizens' needs.

The problem is therefore mainly to look to the future with foresight, to confront different disciplines and their studies and results and to continue to support the creation and the development of new innovative project, such as the one by Philips and Pfizer called "Vicini di Salute".

Specifically based on the sharing of information and data between doctor and patient through a digital device, the Philips-Pfizer remote assistance program allows patients to be constantly connected with the doctor and receive alerts and reminders

regarding adherence to therapy and follow-up, requests for monitoring vital signs, as well as motivational messages. The doctor is thus able to have the patient's condition under control and can intervene if necessary. And this is precisely the dual soul at the center of the project: on the one hand the continuous training of the staff of the healthcare facility, which can constantly monitor the patient, on the other the empowerment of the patient who, thanks to the use of innovative technologies and integrated, improves their care experience thanks to constant proximity to the doctor and greater involvement in their path of disease management.

Philips and Pfizer confirm their commitment to innovation in the service of health, combining their expertise respectively in terms of technological innovation in the health sector and know-how on pathologies, to activate the Vicini di Salute project for the second consecutive two years.

"The future is digital—and likely more virtual than has traditionally been the case", as we said at the end of chapter, but the future is also interconnection of different disciplines, the acquisition of new skills, the application of existing skills in a new way.

This renewal process hides many questions and challenges, despite the pandemic providing a boost that will spread its energy over time and space like a wave. We hope that with the contribution of all this energy should not be wasted but intelligently directed precisely where it is needed most.

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Chapter 5
Technology Perception and Productivity Among Physicians in the New Norm Post-pandemic: A Dynamic Capabilities Perspective

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Abstract Healthcare service is experiencing a paradigm shift due to the COVID-19 pandemic. The pandemic has caused unprecedented fatalities and taken a toll on medical resources globally. Researchers and healthcare professionals value how data accessibility and analytics can save lives. Developing countries are fast leveraging on the electronic medical record (EMR) system to enhance decision-making effectiveness and patient care. However, for many healthcare professionals, there remain unexplored possibilities of how the use of this 'normally' operational-centric EMR might change post-pandemic. We investigate the antecedents (perceived usefulness, perceived ease of use, habit) of the intention to use EMR, and its impact on dynamic capabilities and physician productivity pre- and post-pandemic, focusing on physicians who are at the frontline of Intensive Care Units (ICUs) in Malaysia. This study

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evidences two significant findings: (1) before the pandemic in the 'normal' condition of EMR use, technology perception has *significant indirect* impact on physician productivity via the key role of dynamic capabilities. However, (2) after the pandemic in the 'abnormal' condition, technology perception no longer has any significant impact on physician productivity though their intention to use EMR may have a *very weak direct* impact on their productivity. A key significant change in the new norm post-pandemic is that dynamic capabilities no longer mediate but *strongly and directly* impact physician productivity. This direct positive effect is much stronger than before the pandemic. Theoretically, the study is among the first few to integrate perspectives from information systems and dynamic capabilities to examine the impact of EMR use on physician dynamic capabilities for knowledge acquisition and deployment towards enhancing their productivity. The study also offers insights into how a pandemic could accelerate technology perception and contributes to the dynamic use of technology to aid physicians.

Keywords Electronic medical record · Intensive care unit · Information systems · Dynamic capabilities · Physician productivity · COVID-19 pandemic

5.1 Introduction

The novel coronavirus SARS-CoV-2 (COVID-19) outbreak has caused a sudden surge of patients that posed a new challenge to hospitals, especially the Intensive Care Unit (ICU) (Arabi et al. 2020). The overburdened healthcare service, in response to emergencies, has highlighted the indispensability of the electronic medical record[1] (EMR) system as a coping mechanism for physician productivity (Wang et al. 2020). Hence, this study sets out to examine how the rapidly changing healthcare environment due to the COVID-19 pandemic has challenged physicians' technology perception and readiness as physicians have to adapt to the EMR system to improve their productivity purposefully (Cohen et al. 2020).

Since healthcare service is highly dependent on physician openness to adapt to new work processes, the transition from manual to the EMR system is more of a managerial concern than a technological consideration due to human resistance to change and potential interruption or complexity to the existing workflow operation (Zandieh et al. 2008; Nguyen et al. 2014). Specifically, in developing countries, the implementation of EMR system is still costly to most public hospitals. Thus, little is known about physician belief on how COVID-19 can accelerate the use of the EMR to aid decision-making, and the drivers of IT use behavior in the context of healthcare delivery (Lu et al. 2020).

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[1]The EMR is a comprehensive patient record system which contain pertinent information on patients' past and present medical information. As such, in many instances the EMR system improves staff efficiency, accountability, and error reduction in hospitals as it systematically manages patients' clinical data.

The study integrates theoretical perspectives from the information systems (IS) and dynamic capabilities literature. We combine some key constructs from two widely used models in the literature namely the Technology Acceptance model (TAM) and Unified Theory of Acceptance (UTAUT) to analyze the physicians' intention to use and ensuing behavior. Furthermore, the current COVID-19 pandemic presents bigger challenges to the healthcare service in terms of effectively responding to the crisis. As such, the dynamic capabilities literature presents a potential response in this turbulent environment.

First, we set out to examine the impact of the EMR use on physician productivity, mediated by physician dynamic capabilities for knowledge acquisition and deployment, during the switch from manual to electronic workflow operation at the onset of the EMR deployment in the hospital pre-pandemic (before the outbreak of COVID-19). Next, we compare the impact of the EMR use on physician productivity post-pandemic (after the outbreak of COVID-19). The secondary examination is intended to determine how the pandemic has impacted physician perspective on the use of the EMR to reveal insights into the importance of EMR that contributes to the acceleration of the digitization of healthcare services post-pandemic. Our results will critically capture lessons learned on the EMR use to leverage physician dynamic capabilities and physician productivity from a developing country perspective.

5.2 Electronic Medical Record (EMR) System in Healthcare Service

The COVID-19 pandemic has catalysed digitization in healthcare by highlighting the importance and accelerating the use of the EMR (Mahmood et al. 2020). Often, the role of physicians and patient care is inseparable[2] within the healthcare service. For instance, a patient needs to explain the symptoms of the medical condition in order for a doctor to pronounce a correct diagnosis so the service is inseparable as the patient is physically present and involved in the service.

Additionally, quality healthcare service is associated with patient mortality and readmission rates, patient satisfaction with quality care or physical health, infrastructure, and availability of preventative care (Legatum Prosperity Index 2017). Although the EMR is gradually implemented in stages by hospitals in developing countries (Dornan et al. 2019; Fraser et al. 2005), the costs associated with healthcare technology investment has not been uniformly justified, often leading to slow adoption of the EMR (Terry et al. 2012).

As the EMR moves healthcare information and knowledge resources towards an integrated interface, effective use of the system would improve staff efficiency, accountability, and error reduction in hospitals as it systematically manages patient

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[2]In the literature, services are distinguished from products on the basis of intangibility, heterogeneity, inseparability and perishability or IHIP paradigm (Askedal and Skiftenes Flak 2017; Grove et al. 2003).

clinical data (Williams and Boren 2008; Jha 2010). The use of the EMR reduces human error and improves medical diagnostics as physicians do not work in silos and are able to make better patient care decisions based on available online information (Noraziani et al. 2013). In this age of rapid medical advancement, physicians have to rely on reliable systems to ensure real-time access to information and enable regular communication between teams of multidisciplinary specialists involved in the care of a patient (Evans 2016). The EMR minimizes occurrences of biasness when physicians decide on a treatment course after making a definitive diagnosis or the consequences of a wrong diagnosis since physicians will not have to second guess their decisions since all decisions will be made objectively based on the data provided by the EMR (Scott et al. 2018; Bornstein and Emler 2001).

Despite the potential benefits of using the EMR, certain challenges in using the EMR system have also been highlighted in the literature (Fraser et al. 2005; Thakkar and Davis 2006). Physicians have described requiring longer working time learning to use the EMR effectively as most systems have multiple screens and navigation options. With an already heavy workload, physicians would prefer spending their time by the patient's bedside and getting more involved in the practical aspects of patient care (Dewa et al. 2014). Thus, many physicians tend to use the EMR system as an electronic paper record system and were unable to fully utilize the advanced functions of the EMR (Price et al. 2013).

5.3 Theory and Hypotheses Development

5.3.1 Dynamic Capabilities Theory

Rapid technological development presents an excellent potential for healthcare service organizations. However, the actual use of these technologies may be resisted by physicians for fear of changing their work processes, consequently affecting their productivity and job performance (Kankanhalli et al. 2016). This resistance from physicians may further impair the allocation of knowledge resources that would impact not only patient care but also socioeconomic outcomes for the healthcare organization. Existing literature often view technological infrastructure as a trajectory to effective knowledge management, thereby having a positive impact on productivity and job performance (Easterby-Smith and Prieto 2008). As such, knowledge management literature often relies on the dynamic capabilities perspective to explain "*how best to manage organizations in dynamic and discontinuous environments*" (Kankanhalli et al. 2016).

In one of the earliest papers on utilizing dynamic capabilities to enhance competitiveness in the healthcare industry, Sher and Lee (2004) emphasized the "*importance of dynamic capabilities in a turbulent environment.*" Since the emergence of the COVID-19 pandemic, healthcare service organizations had to navigate the turbulent environment by frequently reconfigure their work processes to enhance performance.

Without the right technological capabilities, the disruptive effects of the pandemic can create a severe liability to the healthcare service organization.

Dynamic capabilities are the ability of an organization to manage its vast resources in a rapidly changing environment, allowing for improvisations where necessary. The concept, first defined by Teece and Pisano (1994), was built on a resource-based view (Barney 1991) dealing with the evolutionary nature of resources and capabilities in a rapidly evolving environment. However, having resources advantage is necessary but not sufficient for gaining competitive advantages. Therefore, the enhancement of distinctive capabilities is essential to make better use of organizational resources (Wang and Ahmed 2007).

The development of dynamic capabilities can be understood as an evolving process based on the interaction between daily operations and knowledge-creating activities. It is not a one-off ad hoc problem-solving mechanism (Zahra et al. 2006). The enhancement of dynamic capabilities is an ongoing process that would redefine the knowledge base of organizations or individuals, which eventually would lead to value creation (Barreto 2010). Especially at the individual level, Rothaermel and Hess (2007) postulate that individuals interact with organizational supporting assets and processes to achieve improved performance. The heterogeneity of cognitive capability such as medical diagnosis evidenced support of "dynamic managerial capabilities for sensing, seizing, and reconfiguring, and explained their potential impact on strategic change of organizations" (Helfat and Peteraf 2015).

5.3.2 A Unified Theory of Acceptance and Use of Technology (UTAUT2)

The UTAUT2 model is an extension to the original technology acceptance model (TAM) and UTAUT model but refined to include *consumer use context* (Venkatesh et al. 2012). 'Perceived usefulness' and 'perceived ease of use' from TAM remain as main predictors in the UTAUT and UTAUT2 for behavioral intention to use (Venkatesh et al. 2011). However, the subsequent UTAUT models use different terminologies 'performance expectancy' and 'effort expectancy' while maintaining the same conceptual underpinning of the TAM constructs. Habit is one of the new key constructs incorporated into the UTAUT2 model. In line with Limayem et al. (2007), the authors define habit "*as the extent to which people tend to perform behaviors automatically because of learning*" (Venkatesh et al. 2012). As such, the authors posit that habit can influence technology perception and the intention to use a system.

This study included perceived usefulness (PU) and perceived ease of use (PEU) from the common TAM and UTAUT frameworks but excluded social influence (SI) and facilitating conditions (FC) postulated in the UTAUT frameworks. It is because our study took a person-centric approach in examining individual physicians' perceptions and focused on two different stages of the EMR use from adoption to post-adoption. Furthermore, the sudden surge of patients, especially in the ICUs (Arabi

et al. 2020), might affect both new and experienced physicians in their EMR use behaviors. Hence, we investigate the change in physicians' perceptions of using the EMR system from pre-pandemic to post-pandemic (after the outbreak of COVID-19).

5.3.3 Conceptual Framework

Based on the information systems and dynamic capabilities literature discussed above, the conceptual model is illustrated in Fig. 5.1. Accordingly, the study examines whether technology perception (perceived usefulness and perceived ease of use) as antecedents of the intention to use EMR, would also impact dynamic capabilities and physician productivity. Following Venkatesh et al. (2012), we added habit into the model as a direct antecedent of intention to use and a control variable to moderate the relationship between intention to use and physician productivity.

5.3.3.1 Technology Perception on Intention to Use

The information systems research identifies two technology perception successfully used to explain actual technology acceptance and system use (Venkatesh et al. 2003). Perceived usefulness (PU) and perceived ease of use (PEU) are two core beliefs in Davis' (1989) Technology Acceptance Model (TAM), one of the most widely used models in studying individual-level system adoption and use. Moreover, the conceptual underpinning of PU and PEU also incorporates into the UTAUT and UTAUT2 models (Venkatesh et al. 2003, 2012). In this study, PU is defined as the degree to which an individual physician believes that using an EMR would be useful to enhance job performance (Davis 1989). PEU is defined as the degree to which an individual physician believes that using an EMR would be easy and free from effort (Davis 1989). PU has always been the primary determinant of system adoption and use.
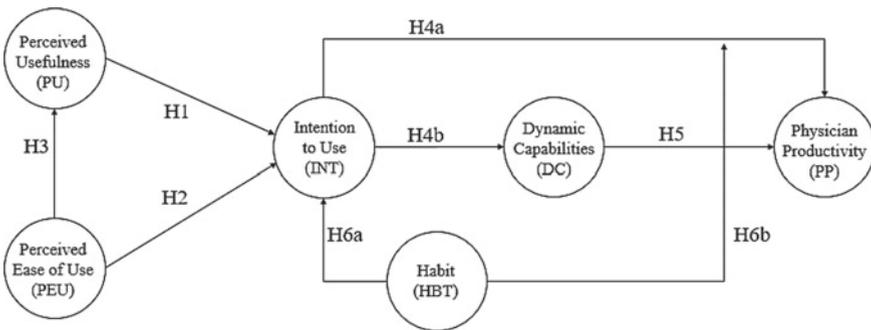

Fig. 5.1 Conceptual model

With an already busy workload, the implementation of the EMR may exacerbate the burden on physicians who show significant concerns over their responsibilities for medical decisions, clinical documentation, patient care, administration issues, and research especially in teaching hospitals (Bhargava and Mishra 2014; Sykes et al. 2011). The field survey by Ayanso et al. (2015) demonstrates that PU directly impacts the physicians' continuance intention. This study postulates that physicians who find the EMR useful for their operational routine and performance benefits will use the system regularly (Dobrzykowski and Tarafdar 2017). Thus, hypotheses 1 are as follows:

H1: Perceived usefulness (PU) has a direct positive effect on intention to use the EMR (INT).

The design of most EMRs could be cumbersome with multiple viewing screens and rigid navigation options that are not customized nor user-friendly for physicians. The initial learning time may put off physicians in transiting from their habitual use of the manual system to the new EMR. Furthermore, some physicians may perceive that learning to use and master a new EMR is a bad trade-off as they would rather spend their time being more involved in-patient care. Although Sykes et al. (2011) find that only PU is a key factor influencing physicians' use of the EMR, the study also points out the potential effect of PEU on the intention to use. Gagnon et al. (2014) evidence that PEU is positively associated with the physicians' intention to use the EMR. This study postulates that physicians who find it easy and comfortable to use the EMR would likely use it at least as regularly as they do now and for the foreseeable future (Price et al. 2013; Jha 2010). Thus, hypotheses 2 are as follows:

H2: Perceived ease of use (PEU) has a direct positive effect on intention to use the EMR (INT).

Davis (1989) and Venkatesh et al. (2003) discover that PEU can directly impact PU for technology adoption and use, but not otherwise. The positive correlation between PEU and PU is also observed for the intention to use EMR (Sykes et al. 2011). This study postulates that physicians who find it easy and comfortable to use the EMR would be likely to overcome the perceived difficulty in using it and willing to spend time learning to master any useful aspects of the system (Terry et al. 2012; Tierney et al. 2013). Hence, hypothesis 3 is as follows:

H3: Perceived ease of use (PEU) has a direct positive effect on perceived usefulness (PU) of using the EMR.

The intention to use EMR is measured by behavioral intention, which accounts for the internal behavioral determinants of physicians, as the degree to which conscious plan is formulated in the mind to use or not to use EMR in the future (Warshaw and Davis 1985). Given the integral role of EMR in the physicians' decision-making process, the intention to use EMR beyond adoption could directly affect physicians' dynamic capabilities and productivity. This study postulates that a positive intention to use the EMR would have a direct impact on physicians' abilities to acquire and

learn new knowledge from other physicians' inputs to the system, integrate and coordinate available information resources to improve decision quality on critical patients. Furthermore, a positive intention to use the EMR would also directly affect physicians' productivity as they synthesize information from multiple sources on the EMR and make patient treatment decisions efficiently, which can be helpful to other physicians (Nguyen et al. 2014; Furukawa 2011). Hence, hypothesis 4a and 4b are as follows:

H4a: The intention to use EMR (INT) has a direct positive effect on dynamic capabilities (DC).

H4b: The intention to use EMR (INT) has a direct positive effect on physician productivity (PP).

5.3.3.2   Dynamic Capabilities on Physician Productivity

In the healthcare industry, physicians should not only be able to perform their duties (operational capabilities) but comprehend changes in their external environment, seize the opportunity to utilize technology and knowledge resources or competencies to meet new challenges (Teece 2007). The quality of the job performed by physicians would directly ensure the quality of healthcare services provided, which may further impact patient care and socioeconomic outcomes at the macro-level.

Furthermore, as learning is central to developing dynamic capabilities, physicians often "learn by doing" and are called to provide accurate diagnosis involving life-and-death decisions (Cohen and Levinthal 1990). It is as they learn by accessing explicit patient data and assessing these data based on tacit medical knowledge that they can articulate sound diagnosis on patients. Trial and error, improvisation, and imitation (Zahra et al. 2006) may also be useful in the process of reconfiguring knowledge resources and competencies to address the medical conditions at hand better. Physicians are learning and consciously developing their dynamic capabilities for better productivity and job performance when they are engaging in such knowledge-creating activities (Easterby-Smith and Prieto 2008).

The EMR helps to facilitate patient information and consolidate multidisciplinary knowledge resources in the hospital. This study postulates that using the EMR would be likely to enhance physicians' dynamic capabilities for knowledge acquisition and deployment in practical aspects of patient care, and thus having a positive impact on physician productivity (Agwunobi and Osborne 2016). Hence, hypothesis 5 is as follows.

H5: Dynamic capabilities (DC) has a direct positive effect on physician productivity (PP).

5.3.3.3 Habit, Intention to Use and Physician Productivity

The UTAUT2 model incorporated habit as a perceptual construct that reflects prior experiences (Venkatesh et al. 2012). Physicians form different levels of habit depending on the extent of their interaction and familiarity when learning to use an EMR and receiving feedback from prior experiences (Limayem et al. 2007). Accordingly, habit is postulated as one of the "*key drivers of behavior*" (Venkatesh et al. 2012) that would directly impact intention to use as well as negatively moderating the effect of intention on actual use behaviors. Such operationalization of habit is consistent with the UTAUT2 model, which believes that habit influences behavioral intention and increasing habit would diminish the effect of intention on actual use (Limayem et al. 2007; Venkatesh et al. 2012). Thus, it is necessary to investigate not only the positive effect of habit on the intention to use EMR but also whether habit would weaken the intention to use EMR for physician's productivity. Hence, hypotheses 6a and 6b are as follows:

H6a: Habit (HBT) has a direct positive effect on the intention to use EMR (INT).

H6b: Habit (HBT) negatively moderates the relationship between intention to use EMR (INT) and physician productivity (PP).

5.4 Methodology

5.4.1 Data and Sampling Design

This study is a subset of more extensive research conducted in the Intensive Care Units (ICUs) of four leading tertiary referral hospitals in Malaysia. These hospitals are directly involved in the screening and intensive care management of COVID-19 positive patients, Patients Under Investigation (PUI), and those with Severe Acute Respiratory Infection (SARI). The Malaysian Society of Intensive Care Medicine strives to provide optimal medical expertise and excellent patient care in every hospital.

The data were collected in two waves. The pre-pandemic data (wave 1) was collected in 2018, representing the 'normal' use of EMR while the post-pandemic data was collected from April-May 2020 (wave 2), representing the 'abnormal' use of EMR during the spike of COVID-19 cases in Malaysia. The study focuses on individual physicians who are at the frontline of interactions with the EMR reviewing patients' information, making decisions, executing treatments, and entering patients' updates into the system (Bhargava and Mishra 2014).

Clustered random sampling method was employed to collect data pre- and post-pandemic, reaching out to all physicians (in the categories of specialists, medical officers, and house officers) who are directly involved with patient care in the ICUs of

the identified hospitals. The sampling frame contains a list of all physicians working in the ICUs during the period of our data collection. The physicians were given the option to complete either a paper-based or an online-based questionnaire during the pre-pandemic survey. During the post-pandemic survey, we reached out to physicians who had previously completed the first wave of the survey as well as other physicians who were newly added to the sampling frame. All respondents were given the only option of an online-based questionnaire during the post-pandemic survey. Our survey questions were part of a larger survey administrated in the hospitals.

A total of 67 valid responses and 55 valid responses were obtained from pre-pandemic and post-pandemic waves, respectively, representing a majority of the ICU physicians in the country. Results from the cross-tabulations and independent samples t-test (see Table 5.1) indicated no significant differences of the sample characteristics were found between pre-pandemic respondents (wave 1, $n = 67$) and post-pandemic respondents (wave 2, $n = 55$). The final sample consists of 122 physicians.

Table 5.1 Sample characteristics: pre-pandemic and post-pandemic comparison

Variables	Subgroups	Pre	Post	Total	p-value
		67	55	122	
Age (year)		33.45 ± 3.08	32.45 ± 3.25		0.087 n.s.
Gender	Male	34	33	67	0.283 n.s.
		50.7%	60.0%	54.9%	
	Female	33	22	55	
		49.3%	40.0%	45.1%	
Ethnicity	Malay	20	19	39	0.669 n.s.
		29.9%	34.5%	32.0%	
	Chinese	34	26	60	
		50.7%	47.3%	49.2%	
	Indian	12	9	21	
		17.9%	16.4%	17.2%	
	Others	1	1	2	
		1.5%	1.8%	1.6%	
Role	Specialist	10	9	19	0.953 n.s.
		14.9%	16.4%	15.6%	
	Medical Officer	55	44	99	
		82.1%	80.0%	81.1%	
	House Officer	2	2	4	
		3.0%	3.6%	3.3%	

Continuous values: mean ± standard deviation. Categorical values: frequency n (%)
Level of significance: [n.s.] p not significant, **$p < 0.05$, ***$p < 0.01$

5.4.2 Content Validity

To ensure the content validity of the multi-item scales used in the study, readily established instruments were adapted from prior research. Instruments measuring perceived ease of use (PEU) and perceived usefulness (PU) of using the EMR were obtained from Sykes et al. (2011). Sample items include "*Learning to operate EMR would be easy for me*" and "*I believe EMR would be useful in my job*". Habit (HBT) and intention to use EMR (INT) were measured using Venkatesh et al.'s (2012) UTAUT2 instruments such as "*The use of EMR has become a habit for me*" and "*I intend to use EMR for the foreseeable future*". Instruments measuring dynamic capabilities enhancement (DC) were obtained from Sher and Lee (2004). Sample items include "*EMR enhances learning effectiveness of new knowledge*" *and* "*EMR enhances decision quality*". Instruments measuring physician productivity (PP) were obtained from Bhargava and Mishra (2014). The sample item includes "*EMR allows me to make patent treatment decisions efficiently*". All items were measured on a 7-point Likert scale except for PP, which was measured on a 5-point Likert scale (refer to Appendix for full list of survey instruments).

5.4.3 Results

The empirical results were obtained from a multivariate analysis based on the partial least square structural equation modeling technique (PLS-SEM). The SmartPLS 3 software was used to confirm the measurement model and estimate the structural model (Ringle et al. 2015). The PLS-SEM is useful in handling models with small sample size and makes no distributional assumptions (Hair et al. 2017). The measurement model and structural model were also re-analyzed using a bootstrapping procedure of 5000 resamples to prevent overestimating the test statistics and increase estimation confidence based on the distribution-free sampling method (Hair et al. 2017).

5.4.3.1 Measurement Model

The measurement model was evaluated to ensure for construct reliability, convergent validity, and discriminant validity (see Table 5.2). The construct reliability and convergent validity were ascertained with all item loadings above 0.708, composite reliability (CR) higher than the threshold value of 0.70, and average variance extracted (AVE) higher than the threshold value of 0.50. Sufficient discriminant validity was also ascertained based on Henseler et al.'s (2015) heterotrait-monotrait ratio of correlations (HTMT). All inter-construct correlations were lower than the

Table 5.2 Convergent validity and discriminant validity

Convergent Validity			Discriminant Validity				
	CR	AVE	PU	PEU	HBT	INT	DC
PU	0.966	0.904					
PEU	0.942	0.803	0.835 [.758, .901]				
HBT	0.906	0.707	0.514 [.363, .648]	0.707 [.601, .797]			
INT	0.961	0.925	0.796 [.706, .872]	0.736 [633, .826]	0.742 [.620, .846]		
DC	0.955	0.680	0.661 [.451, .833]	0.592 [.366, .784]	0.425 [.254, .589]	0.586 [.378, .759]	
PP	0.887	0.725	0.631 [.380, .837]	0.522 [.271, .752]	0.412 [.233, .603]	0.583 [.341, .783]	0.835 [.727, .910]

Note PU: perceived usefulness; PEU: perceived ease of use; HBT: habit, INT: intention to use; DC: dynamic capabilities; PP: physician productivity

threshold value of 0.85 based on $HTMT_{.85}$ criterion (Kline 2011). None of the two-tailed 90% bias-corrected confidence intervals of the HTMT contains the value of one (Henseler et al. 2015).

5.4.3.2 Structural Model

The structural model explicates the hypothesized relationships between antecedents (perceived usefulness (PU), perceived ease of use (PEU), habit (HBT)) of the intention to use EMR (INT), and its impact on dynamic capabilities (DC) and physician productivity (PP) pre- and post-pandemic. Inferences were drawn based on bootstrapped *t*-statistics at the specified 1%, 5%, and 10% levels of significance. Overall, the model explained 75.4% (pre) and 63.1% (post) variations of INT, 56.9% (pre) and 4.8% (post) variations of DC, 59.0% (pre) and 61.1% (post) variations of PP. Table 5.3 provides a summary of the magnitude and significance of direct path coefficients that reflect the hypothesized relationships in this study, comparing pre-pandemic and post-pandemic models. Table 5.4 further provides interpretation of our results.

The measurement invariance of the composite models (MICOM) procedure was performed to ascertain the presence of observed heterogeneity in the study. The MICOM established that our empirical model achieves configural invariance and composite invariance based on 1000 permutations with two-tailed 95% confidence intervals. The MICOM results indicated that the same construct was understood and assessed in a similar way across both groups (Chan 2011), although data collection

Table 5.3 Results of hypothesized relationships (pre-and post-pandemic)

Hypothesized relationships	Pre-pandemic			Post-pandemic			Path coefficients (pre- vs. post-pandemic comparison)
	Path coefficients	Effect size f^2	VIF	Path coefficients	Effect size f^2	VIF	
H1: PU → INT	**0.588 (4.774)***	**0.544**	2.699	**0.445 (3.172)***	0.225	2.527	−0.142 (0.434) [n.s.]
H2: PEU → INT	0.021 (0.158) [n.s.]	0.000	4.063	−0.099 (0.636) [n.s.]	0.011	2.561	−0.121 (0.546) [n.s.]
H3: PEU → PU	**0.784 (14.547)***	**1.598**	1.000	**0.760 (10.687)***	**1.367**	1.000	−0.024 (0.808) [n.s.]
H4a: INT → DC	**0.759 (13.293)***	**1.357**	1.000	0.255 (1.179)[n.s.]	0.070	1.000	**−0.504 (0.007)***
H4b: INT → PP	−0.005 (0.034) [n.s.]	0.000	3.710	0.266 (1.297)*	0.072	2.708	0.271 (0.283) [n.s.]
H5: DC → PP	**0.562 (5.121)***	**0.347**	2.362	**0.769 (4.308)***	**1.399**	1.175	0.208 (0.356) [n.s.]
H6a: HBT → INT	**0.412 (3.471)***	**0.367**	1.963	**0.543 (5.900)***	**0.521**	1.621	0.131 (0.389) [n.s.]
H6b: INT*HBT → PP	**−0.198 (3.455)***	0.177	–	0.075 (0.893) [n.s.]	0.020	–	**0.274 (0.005)***

Note Significance level based on bootstrapped *t*-statistics: ***$p<0.01$, **$p<0.05$, *$p<0.10$, [n.s.] p non-significant. Cohen's f^2 effect size thresholds: Large >0.35, medium >0.15, small >0.02. Most of the variance inflation factors (VIF) were below the threshold value of 3.00 and the VIF on H2: PEU → INT was still below the less stringent threshold value of 5.00

was conducted in two different time-periods. Thus, the respondents from the pre-pandemic group and post-pandemic group measuring the same construct were validated (Bialosiewicz et al. 2013). The comparison between pre- and post-pandemic empirical models was also justified and would be meaningful.

Sufficient predictive relevance was obtained to generalize our empirical model to other studies with a similar context. Results from the blindfolding and PLSPredict procedures show that all constructs in the model have cross-validated redundancy Q^2 values higher than the threshold of zero (Hair et al. 2017). The 10-fold cross-validation also confirmed predictive relevance of the PLS-SEM model with all Q^2 values greater than zero, and most testing errors (RMSE, MAE, and MAPE) lower than the linear model prediction.

The empirical results supported four significant hypotheses in both the pre-pandemic and post-pandemic models, namely **H1**: PU → INT, **H3**: PEU → PU, **H5**: DC → PP and **H6a**: HBT → INT. Furthermore, two hypotheses show significant changes post-pandemic, **H4a**: INT → DC and **H6b**: INT*HBT → PP, considering physician new experience in the ICUs. We demonstrate that:

Table 5.4 Interpretation of results (pre- and post-pandemic)

Hypothesized relationships	Hypothesis supported (pre-pandemic) Yes/No	Hypothesis supported (post-pandemic) Yes/No	Significant changes from pre- to post-pandemic? Yes/No	Interpretation of results (comparing pre- and post-pandemic models based on Table 5.2)
H1: PU → INT	**Yes**	**Yes**	No	PU remains a strong predictor that has a direct positive effect on INT
H2: PEU → INT	No	No	No	PEU remains a non-significant predictor that does not directly affect INT
H3: PEU → PU	**Yes**	**Yes**	No	PEU remains having strong but only indirect positive effect on INT via PU
H4a: INT → DC	**Yes**	No	**Yes**	Pre-pandemic: INT has a very strong positive effect on DC ($\beta_{4a_{pre}} = 0.759$) Post-pandemic: this effect of INT on DC has shrunk significantly by 0.504 ($\beta_{4a_{post}} = 0.255$). Hence, INT no longer has significantly impact on DC
H4b: INT → PP	No	No	No	Pre-pandemic: INT did not significantly impact PP Post-pandemic: INT has a positive effect on PP ($\beta_{4b_{post}} = 0.266$) but this effect is weak and only marginally significant at 10% significance level
H5: DC → PP	**Yes**	**Yes**	No	The direct effect of DC on PP is the only relationship that remains consistently significant at the post-adoption stage, from pre- to post-pandemic. In fact, DC has a much stronger direct positive impact on PP, moving from pre-pandemic ($\beta_{5_{pre}} = 0.562$) to post-pandemic ($\beta_{5_{post}} = 0.769$)

Table 5.4 (continued)

Hypothesized relationships	Hypothesis supported (pre-pandemic) Yes/No	Hypothesis supported (post-pandemic) Yes/No	Significant changes from pre- to post-pandemic? Yes/No	Interpretation of results (comparing pre- and post-pandemic models based on Table 5.2)
H6a: HBT → INT	**Yes**	**Yes**	No	The direct positive effect of HBT on INT is comparably strong as PU on INT
H6b: INT*HBT → PP	**Yes**	**No**	**Yes**	Pre-pandemic: HBT used to negatively moderate the effect of INT on PP pre-pandemic ($\beta_{6b_{pre}} = -0.198$) such that intention to use EMR diminishes with increasing habit Post-pandemic: the negative moderating effect of HBT has become positive albeit not significant. Nevertheless, the change of effect from pre- to post-pandemic has significantly increased by 0.274

i. **Pre-pandemic:** technology perceptions (perceived usefulness, perceived ease of use, and habit) significantly result in strong intention to use EMR, but such an intention did not have significant direct impact on physician productivity. Furthermore, increasing habit would diminish the effect of intention on physician productivity such that the use of EMR would become automatic with more experiences in using the EMR (significant negative moderating effect). A key relationship during the pre-pandemic use of EMR is that dynamic capabilities strongly and fully mediates[3] the effect from intention to physician productivity (INT → DC → PP). Thus, technology perceptions leading to intention to use EMR have only a significant indirect effect on physician productivity.

ii. **Post-pandemic:** technology perceptions (perceived usefulness, perceived ease of use, and habit) still significantly result in strong intention to use EMR. Such an intention now has a (very) weakly significant direct impact on physician productivity and no longer directly impact dynamic capabilities. Furthermore, habit no longer has any significant moderating effect on the relationship from intention to physician productivity. The key role of dynamic capabilities has also significantly changed from pre- to post-pandemic. Dynamic capabilities

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[3]Full mediation: INT → DC → PP was significant but INT → PP not significant, therefore DC fully mediates the relationship from INT to PP such that INT has only significant *indirect* effect on PP with no significant *direct* effect.

no longer mediates the effect from intention to physician productivity. Instead, dynamic capabilities now directly impact physician productivity, and this direct positive effect is much stronger post-pandemic (DC → PP).

5.5 Healthcare Service Management Insights and Lessons Learned

This study evidences two significant findings: (1) before the pandemic in the 'normal' condition of EMR use, technology perception has *significant indirect* impacts on physician productivity via the key role of dynamic capabilities. However, (2) after the pandemic in the 'abnormal' condition, the way physicians perceive the use of EMR no longer has any significant impact on their productivity; although their intention to use EMR may have a very *weak direct* impact on their productivity. A key significant change in the new norm post-pandemic is that dynamic capabilities no longer mediate but *strongly and directly* impact physician productivity. This direct positive effect is much stronger than before the pandemic. The COVID-19 pandemic has undoubtedly changed the way physicians perceive the use of EMR and provides insights into the knowledge of technology uses in hospitals.

Healthcare service organizations in developing countries can utilize physician dynamic capabilities as a source of competitive advantage (Agwunobi and Osborne 2016). The EMR organizes structured clinical data that helps physicians make informed decisions to provide accurate diagnosis during their performance in the ICU. Furthermore, the system is often dependent on the collective users of the system. It is because decisions in the ICU require consolidating patient data from various sources to allow physicians a holistic overview of patient condition. Huckman and Pisano (2006) examine procedures performed by 203 surgeons in Pennsylvania and find that a portion of surgeon performance is specific to the hospital. Their results suggest that physician performance is linked to the familiarity of systems in place, and their marginal productivity is not constant across firms. Thus, the implementation of the EMR justifies the cost of capital investment to healthcare service organisations and the cost of time and effort to physicians in learning the EMR system.

Our study provides practical implications in that enhancing physician dynamic capabilities can be leveraged as a source of competitive advantage in environments such as the ICU (pre-and post-pandemic). The increased use of the EMR will improve not only physician dynamic capabilities but also their productivity. Specifically, perceived usefulness and perceived ease of using the EMR would determine whether the enhancement of physician dynamic capabilities could be a source of their increased productivity. Physician productivity is strongly linked to how they utilize the EMR for building and integrating their competencies in daily operations of an intense situation in the ICU.

A distinct advantage of implementing the EMR is to move away from information silos among physicians (who are specialists in their respective fields) towards an integrated interface. Decision-making in hospitals and especially in hospital units that require high vigilance such as the Intensive Care Unit (ICU), is a dynamic and complex process requiring sound medical knowledge from appropriate information sources (pre-and post-pandemic). Quick and accurate decisions may be the difference in preventing clinical deterioration or managing life-threatening events in the ICU. The EMR was put in place to aid such a decision-making process. It functions as a one-stop knowledge-based system that consolidates reliable patient data, credible physician notes, and up-to-date nursing care charts, besides current hospital practice on similar cases.

Although studies have found that computerized entries by specialists or physicians may initially slow down physician productivity during the transition period (Noraziani et al. 2013), this was not captured in our findings. Instead, physicians find that their productivity increased with the use of EMR. It can be accounted for by the heavy usage and familiarity with electronic devices pre- and post-pandemic. All these accounts for the potential advantages of implementing the EMR.

Habit was a moderator pre-pandemic, but not post-pandemic. Given the time-lapse between pre-pandemic and post-pandemic data, the introduction of the EMR could have altered habits across time. However, we could not verify within this study, thus allowing the opportunity for extended studies. Another limitation is that this study focuses on physician productivity and is less oriented towards how the improved service quality of physicians after EMR adoption could impact their patients pre-and post-pandemic.

5.6 Conclusion

This study presents findings that investigate the relationship between physician technology perception on using the EMR (perceived usefulness and perceived ease of use, dynamic capabilities enhancement for knowledge acquisition and deployment) and physician productivity in the Intensive Care Unit (ICU) pre and post-pandemic. This study contributes to the broader discussion on the role of dynamic capabilities in the healthcare sector. As healthcare service organizations migrate to the use of the EMR to digitize patient data and health records, physicians could make better decisions based on consolidated patient information. As Malaysia continues its efforts to flatten the COVID-19 pandemic curve, we are learning more and more about the systemic manifestations of the disease among the critically ill. The EMR has enabled physicians involved in the ICU care of COVID-19 patients to adopt a multi-disciplinary approach with ease. In response to the UN's Sustainable Development Goal for "Good health and wellbeing," our study offers evidence of rapid leverage on the information technology platform to enhance good decision making and patient care in a developing country.

Future research could extend the current model to examine the use of big data resources embedded in the EMR for effective decision making in critical care medicine. Given that the EMR implementation requires significant investment, future studies could determine the rate of return on investment, presently unexplored in this study. Furthermore, future studies may also explore the role of shared decision-making as a potential model for life-threatening diseases for patients in the ICU, as well as focus on how healthcare organizations could improve their physicians' EMR adoption towards patient care.

Appendix: Full List of Survey Instruments

Perceived Usefulness (Sykes et al. 2011) [7-point Likert scale]	PU01	I believe EMR would be useful in my job
	PU02	Using EMR will enable me to accomplish tasks more quickly
	PU03	Using EMR will increase my productivity
	PU04	If I use EMR, I will increase my chances of getting a raise
Perceived Ease of Use (Sykes et al. 2011) [7-point Likert scale]	PEU01	My interaction with EMR would be clear and understandable
	PEU02	It would be easy for me to become skillful at using EMR
	PEU03	I would find EMR to be easy to use
	PEU04	Learning to operate EMR would be easy for me
Habit (Venkatesh et al. 2012) [7-point Likert scale]	HABIT04	The use of EMR has become a habit for me
	HABIT05	I am addicted to use EMR
	HABIT06	I must use EMR
	HABIT07	Using EMR has become natural to me

(continued)

(continued)

Intention to Use (Venkatesh et al. 2012) [7-point Likert scale]	INT01	I intend to continue using EMR in the future
	INT02	I intend to use EMR for the foreseeable future
	INT03	I intend to use EMR at least as regularly as I do now
Dynamic Capabilities (Sher and Lee 2004) [7-point Likert scale]	SLDC01	EMR enhances learning effectiveness of new knowledge
	SLDC02	EMR enhances decision quality
	SLDC03	EMR enhances capabilities of communication and coordination
	SLDC04	EMR enhances responsiveness
	SLDC05	EMR enhances integration in hospital practice
	SLDC06	EMR enhances accumulation of knowledge
	SLDC07	EMR enhances capabilities of resource deployment
	SLDC08	EMR enhances patient relationship
	SLDC09	EMR enhances trust with healthcare providers
	SLDC10	EMR enhances unimitability (unique) of strategic knowledge asset
Physician Productivity (Bhargava and Mishra 2014) [5-point Likert scale]	BMPP01	EMR allows me to easily synthesize information from multiple sources
	BMPP02	EMR allows me to make patient treatment decisions efficiently
	BMPP03	EMR interrupts my workflow
	BMPP04	I enter a lot of information about patients, which can be helpful to other physicians
	BMPP05	On the balance, I do more information entry than information synthesis using EMR
	BMPP06	EMR has increased my documentation time significantly

Authors' Insight

Healthcare service organizations in many developing countries choose to invest in the Electronic Medical Records (EMR) system to improve the productivity of health-care professionals. The current COVID-19 pandemic is adding immense pressure on hospitals as more patients require healthcare services. The world was taken by surprise ever since cases of pneumonia in Wuhan, China were found to be due to a novel SARS-CoV2 virus now known as COVID-19. Over time, healthcare workers are learning more and more of the disease. What was initially thought to be a disease that targets the respiratory system primarily is now known also to have many other systemic manifestations. As of today, more than 1 million COVID-19 positive cases have been reported worldwide, with more than 100,000 associated deaths. Since the outbreak, healthcare service organizations had implemented strict control measures to protect healthcare workers and front liners. The EMR system becomes an indis-pensable tool as the patient's medical records, and history is available at the touch of a button. As the spectrum of manifestation of COVID-19 infection ranges from asymptomatic to severe illness leading to death, often times a multidisciplinary team approach is necessary. The EMR system enables information to be consolidated at a single point, allowing healthcare workers to have access to patient information such as hemodynamic parameters, laboratory results, radiological images, and input from other medical disciplines when necessary. The authors set out to investigate how the pandemic has changed physician use of the EMR system to improve their produc-tivity in leading tertiary hospitals in Malaysia. For physicians in the Intensive Care Unit (ICU), accurate decisions on life and death are made quickly with the available information. The ability to make faster and more accurate decisions using the EMR system increases a doctor's productivity, which simultaneously benefits the patient as every decision made is for the welfare of the patient. In terms of service quality, understanding the impact of the EMR system on physicians will enable hospitals to serve the needs of their patients better. Findings indicate that physicians rely more on the EMR system post-pandemic since the system concurrently captures data on patients' risk and exposure to the pandemic. The 'new norm' requires the healthcare industry to continue to evolve with higher reliance on digital technology, thus leading to an acceleration of the digitization of healthcare services. Since the outbreak of COVID-19, the utilization of the EMR system to save patients has taken precedence over the deliberation about the cost of investing in the system. It has evidenced that the availability of the EMR system significantly enhances physician decision-making and improved their productivity, both factors which are vital to reducing the over-burdened healthcare in such times of global health crisis. As Malaysia braces itself in anticipation of the next wave of COVID-19 infections or even outbreaks of other infectious diseases, the EMR system will prove an invaluable tool in the effort to anticipate, prepare, contain and curb the disease. It is our hope that the EMR system will one day be implemented throughout all the hospitals in Malaysia.

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Chapter 6
How COVID-19 Has Changed the Digital Trajectory for Professional Advisory Firms

Charlotta Kronblad and Johanna E. Pregmark

Abstract As COVID-19 affects populations across the globe, the measures to prevent its spread are increasingly affecting our economies. Restrictions on the movement of people and goods and regulations for social distancing and quarantine affect both the consumption and production of goods and services. In this article, we examine the impact of COVID-19 on professional advisory service providers assisting their clients to excel. We find that COVID-19 has rapidly broken down several previous barriers to digital transformation and has caused a rapid increase in the adoption of digital technology among professional advisory firms. We conclude that although there might be a *corona bump* of rapid digital implementation, a *new normal* has been established, which changes the operational context and implies that the rate of digital trajectory will be steeper, and the pace will be faster, than has been earlier anticipated. This implies that professional advisors will become better suited to advise on the increasingly complex digital context of their clients.

Keywords Professional advisors · PSFs · Digital transformation · Organizational change · COVID-19

6.1 Introduction: Why This Chapter Is Important

COVID-19 is currently affecting economies and people worldwide. In addition to the apparent medical consequences, we have experienced a wide range of economic consequences emerging from the measures adopted to prevent the spread of COVID-19. These measures, which involve restrictions on the movement of people and goods

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across borders and regulations prescribing social distancing and quarantine, have meant that both production and consumption patterns have shifted.

This chapter discusses what COVID-19 has entailed for professional service industries and moving forward, what development we can expect for firms in these industries. When we examine how different industries have been impacted by COVID-19, we find large variation. While many industries are negatively impacted by COVID-19 (e.g., tourism, restaurants, and retail) and some industries enjoy a positive impact due to rising demand (e.g., online gaming and medical suppliers), the impact on professional service firms (PSFs) is not as clear-cut. Compared to other types of firms, PSFs are unique (von Nordenflycht 2010) as the main value from their services is not created in their domain. Rather, they facilitate the value creation of their clients (Svensson and Grönroos 2008). Therefore, the demand for professional services is highly affected by the impact on the industries of their clients. While booming economies can influence and increase the need for professional services, bankruptcies and economies in distress may also increase the demand for certain professional services.

While the scope of PSFs is rather broad and includes healthcare providers as well as architectural firms and advertisers, we limit this study to the more classic PSFs (von Nordenflycht 2010), where we particularly examine law and management consultancy firms (hereafter called professional advisory firms), as these firms are directly involved in value-creating activities for their client firms. Although these two types of PSFs do not necessarily commence their digital transformation from an identical level, they share many of the same challenges and opportunities that appear during the process of digital transformation. We seek to understand how these PSFs have been affected by, and how they have adapted to, the situation caused by COVID-19. Exploring how these service professionals cope with COVID-19 is not only interesting for their own sake but also carries a larger societal value. As these types of advisors are directly involved in the value creation process for their clients, their responses to COVID-19 also play a part in how well they equip client firms with tools to overcome the crisis. These professional advisors have an impact that transcends their firm boundaries and direct areas of operations into the operational space of their clients.

For these professional advisors, the impact of COVID-19 is multi-faceted. It affects their external context—the world of their clients—which impacts demand in terms of what services are sought and to what extent (e.g., increasing disputes relating to contracts, disputes on liabilities and force majeure, advice on how to solve liquidity problems, and how to apply for and use government aid and recovery packages that have been allocated to fight the economic crisis). COVID-19 also impacts the internal context and affects how advisors work in the context of their firms.

In this chapter, we dive deeper into how professional advisors manage the impact of COVID-19 on their internal work. We explore whether COVID-19 has had an effect on their internal way of work and discuss what this means for the future development of professional advisors and their firms. We argue that imposed quarantine and rules on social distancing mean that these professionals have largely turned toward virtual

ways of work and undergone a rapid digital transformation, which has a lasting effect on their internal affairs and those of their clients.

The remainder of this chapter is arranged as follows. First, we briefly describe our qualitative study, outlining the empirical data collection method. Second, we set the stage for our discussion by describing the empirical context, enabling an understanding of what is special about professional service providers (von Nordenflycht 2010; Kronblad 2020; Pemer 2020) and their firms (what characterizes them and what aspects have [yet] served as barriers to their emerging digital transformation). Here, we introduce a theoretical framework to discuss our findings by relating to previous research around barriers to change in general (Kotter 2008) and digital change in particular (Davenport and Westerman 2018), as well as the literature covering digital transformation as such (Reis et al. 2018; Kronblad 2020). Moreover, we include theoretical contributions regarding system change (Beer 2009) and societal impact (Kim et al. 2017) to better interpret how digital changes in professional advisors will impact the *new normal*. Third, we present our findings and show how COVID-19 has affected their internal workstyle. Fourth, we discuss what these current changes mean for the proposed theoretical framework. In effect, we argue that previous barriers to change, such as lack of change capabilities, technological skills, and sense of urgency, as well as cultural barriers (Kotter 2008; Kronblad and Pregmark 2019), have rapidly vanished, creating a *new normal* for professional advisors and their firms. Finally, we conclude the chapter by stating that COVID-19 has created an instant increase in digital activities among professional advisors and changed their digital transformation trajectory, which has increased both in terms of pace and rate of transformation. This means that professional advisors and their firms should not expect to return to what was considered normal before the COVID-19 outbreak, and the changes that are currently underway will not only remain but also strengthen in the future. Thus, the impact of COVID-19 means that professional advisors and other PSFs are subject to not only temporary *corona bump*s in their digital trajectory but also accelerated rate of digitalization post COVID-19, in both their own organizations and in society.

6.2 Method: Collection and Understanding of Evidence from the Field

We selected a qualitative research approach as it is often considered appropriate when striving to understand why a phenomenon occurs (Denzin and Lincoln 2005) and explore the complexity of an ongoing development (Eisenhardt and Graebner 2007). We are clearly exploring such a situation. Furthermore, in this study we have we have seen the empirical context and theoretical fields as intertwined. Therefore, we have used principles of systematic combining, developed by Dubois and Gadde (2002). These principles stipulate that researchers in social sciences can gain in understanding when allowing themselves to go back and forth between theory and the empirical observations.

We collected empirical data through semi-structured interviews with 10 senior legal advisors and 10 senior management consultants. To gain a wider understanding of the context, we also interviewed four additional professionals experts (two judges and two professors) in these industries. We conducted nine interviews through video, five at the interviewees' offices, six outside offices in a city park, and four over the telephone. All interviewees resided in Sweden and all interviews were conducted in Swedish in April 2020. Each interview lasted 30–45 min, during which detailed notes were taken, and specific quotes were written down.

The Swedish research context was chosen because of its convenience. Sweden has previously been discussed as a suitable setting for studies of emergent changes in PSFs because of its liberal legislation (Paterson et al. 2003), allowing for different responses to disruption and digitalization. Moreover, to expand the research context and ensure its validity for a broader application (Rothbauer 2008), we participated in six global virtual conferences discussing the impacts of, and responses to, the COVID-19 outbreak within the selected field of management and legal consultancy. We also gathered additional data through press releases and news articles describing how legal firms and management consultancies have started to respond to the situation at hand.

The data was coded into emerging categories. We then analyzed the data by interpreting it in relation to the literature, as suggested by Eisenhardt and Graebner (2007). We also utilized theories around phenomenon-based research (Schwarz and Stensaker 2014; Von Krogh et al. 2012), advocating that a practical phenomenon (here, the effects of the outbreak of COVID-19 on digitalization of professional advisory firms) often needs to be understood through various theoretical lenses. A phenomenon-based approach is also claimed to be suitable when aspiring to develop knowledge that equally benefits both theory and practice (Von Krogh et al. 2012), which is the objective of this chapter.

Figure 6.1 shows how we used the extant literature to comprehend the collected data. We first tried to understand the specifics of the empirical context and details of the responses toward digital transformation among professional advisors and their firms—that is, how and why these firms have resorted to digital models. Here, we recognize the empirical context by the particularities of PSFs (von Nordenflycht 2010; Pemer 2020) and the specific impact of digitalization on these firms (Kronblad 2020). We combine this with general theories around change (Davenport and Westerman 2018; Fredberg and Pregmark 2018; Kotter 2008) and the pace of digital transformation (Kronblad 2020; Reis et al. 2018). To discuss the potential long-term consequences of the *new normal*, we also worked to understand the findings in relation to the literature around system shifts (Beer 2009) and societal effects (Frey and Osborne 2017; Kim et al. 2017). Thus, we analyzed the data and discussed it in relation to the above-mentioned three levels.
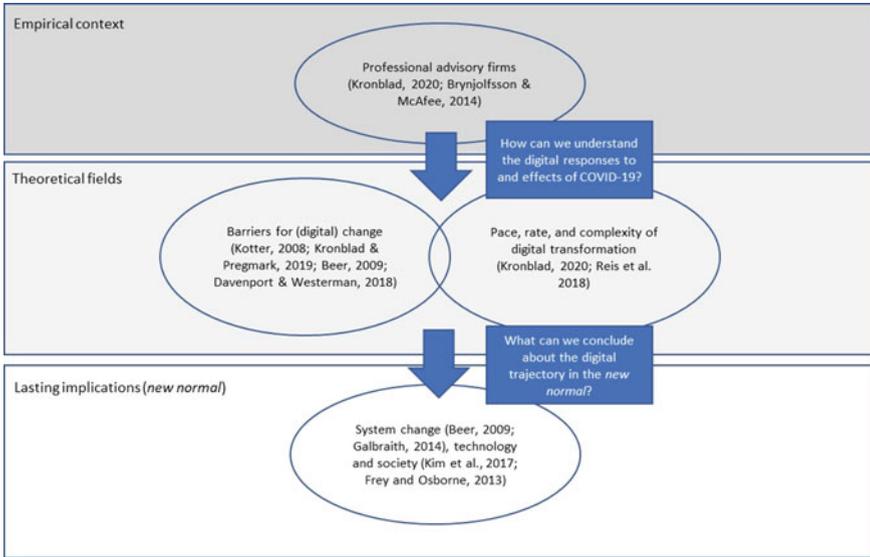
Fig. 6.1 Overview of research fields and literature used to understand the empirical data

6.3 Theoretical Framework

To understand the current rapid digital transformation of professional advisory firms and what this transformation means for the future, we need to create a theoretical baseline that we apply to our findings—this section outlines this theoretical framework. First, we dive into the specific empirical context of PSFs, that encompasses the studied professional advisory firms; thereafter, we present general theories on change and the digital transformation (what are the barriers and what motivates change). Finally, we present the literature that suggests the need for system change for lasting effects and the establishment of a *new normal*.

6.3.1 Theories Describing the Empirical Context of Professional Advisory Firms

PSFs are special types of firms whose primary goal is not their success but to strive for the excellence of their clients (Svensson and Grönroos 2008). PSFs succeed when they provide their clients with services that enable them to mitigate risk and create and capture value. In the past, PSFs have been based on human knowledge intensity, where value has mainly been created by human capital at work (von Nordenflycht 2010). However, the recent literature points to the increasing relevance of technological and structural capital within PSFs, wherein artificial intelligence is expected

to gain positions (Brynjolfsson and McAfee 2014; Huang and Rust 2018; Kronblad 2020). This has catalyzed change in PSFs, both internally and with regard to their clients. As structural and technological capital participates in value creation—replacing and complementing human capital—artificial intelligence is increasingly replacing human intelligence for particular tasks. This suggests that PSFs have been on a path toward increasing digitalization during the past decades. However, while other industries have undergone rapid transformations (Fredberg and Pregmark 2016; Shibata et al. 2019), most PSFs have followed at a slower pace (Kronblad and Pregmark 2019; Pemer 2020).

We specifically targeted professional advisors in management and law that are often described as typical forms of PSFs (von Nordenflycht 2010). Several scholars have investigated the particularities of these types of firms (Maister 2003; Løwendahl 2009; von Nordenflycht 2010; Kronblad 2020; Pemer 2020). One key feature that these researchers highlight is that these firms are often organized in the form of professional partnerships. This structure is formed because of the foundation for value creation being embedded in the human capital of the employed professionals (Løwendahl 2009). Partnership structures have also entailed particular incentive structures such as bonus schemes. In this context, the professionals invest their time and are awarded in the form of promotion. This is typically done in *up or out* promotions (von Nordenflycht 2010), which are particularly common within the hierarchical structures of elite organizations. These types of practices and organizations mean that both financial benefits and status are incorporated into the current way of work (Kronblad and Pregmark 2019), which has reduced the speed of change. While the classic PSFs share many of the same challenges and opportunities in digitalization, it is notable that legal and management advisors do not necessarily begin from the same position toward their aim of digital transformation—it has been shown that established law firms have previously been particularly late and slow in digital transformation (Kronblad and Pregmark 2019), whereas the pace in management consultancies is higher.

6.3.2   Theoretical Fields: Change and Digital Transformation

Organizational change and transformation are broad topics where researchers from many different fields offer valuable contributions. In a fast-paced world, the capability for change and adaptation is more important than ever (Pasmore 2015; Reeves and Deimler 2011). However, research shows that most change efforts fail (Beer et al. 1990; Jacquemont et al. 2015). Here, we focus on some of the barriers and facilitators for change that have been outlined by previous research.

Barriers and resistance to change in organizations is a well-investigated topic in the extant literature (Beer 2007; Conner 1992; Coch and French 1948; Oreg 2003; Rock and Cox 2012). Lawrence (1969) argues that people usually do not resist a specific change but the social relational change that accompanies major changes. This is consistent with the findings of Beer (2007), claiming that it is the fear of losses to relationships, rewards, and identity, which are the root causes of resistance

to change. The fear of losing status, such as formal and/or informal roles, is also frequently referred to as a barrier for succeeding with change (Beer 2007; Trader-Leigh 2002). Other streams of research stress that resistance can be overcome by demonstrating a compelling vision of a future state along with a clear process and an organization-wide sense of urgency/dissatisfaction with the current state (Kotter 2008; Beckhard and Harris 1987; Hayes 2018; Cady Jacobs et al. 2014). Conner (1992) argues for the need for messages of pain being dispersed in the organization, contributing to a strong motivation to leave behind the old way of working.

There are certain barriers to change that are particularly relevant for knowledge-intensive industries, where value creation has been based on the human capital employed in service production (von Nordenflycht 2010) and technological skills have not been needed or asked for (Susskind 2010). Professional advisors have relied on their intellectual capacity and not been exposed to technology being embedded in their work in the manner that professionals in other industries have. Professional advisors also share an institutionalized professional culture (Kronblad and Pregmark 2019), which builds on hierarchies, promoting homogeneity where risk is largely avoided (particularly legal advisors, who are trained to avoid legal risk). This risk avoidance has empowered cultures that prevent them from encouraging innovation. Moreover, successful business models in these industries have, over time, become institutionalized. This has created a path dependency (or rather, a curse of a successful past), which means that these firms have not sensed any urgency to change. Even if they would have sensed a need to change, the high level of institutionalization in these industries means that they lack change capabilities (these firms have simply not needed such capabilities in the past).

Many authors have discussed the specifics of digital transformation (Kronblad 2020; Kronblad and Pregmark 2019, Davenport and Westerman 2018; Reis et al. 2018). These authors discuss how digitalization affects internal processes, external value proposition, and business models, arguing that the transformation impact is greater as digitalization targets a holistic perspective of the organization. Thus, digital transformation requires an interplay of a multitude of components, such as systems, capabilities, and offerings (Davenport and Westerman 2018). In many industries, digital transformation has been seen as a matter of death or survival. As examples, there have been academic contributions regarding this presented for the newspaper industry (Fredberg 2003; Fredberg and Pregmark 2016; Wang 2002), photo/film industry (Shibata et al. 2019), manufacturing (Björkdahl 2020), and retail (Srinivasan et al. 2002). However, in some parts of professional services, this type of urgency has been missing (Kronblad 2020).

6.3.3 Lasting Implications of Technological Shifts in Organizational Systems and Society

Previous research has advocated that the entire organizational system needs to be addressed to succeed with a change in the long-term (Beer 2009; Galbraith 2014; Nadler and Tushman 1980; Pregmark 2019). However, this is easier said than done. Beer, interviewed in Fredberg and Pregmark (2017), states that researchers and practitioners have not yet managed to fully understand and execute system change. Researchers studying system change argue that an organization should be viewed as interrelated parts, where the whole is greater than the sum of its parts. Thus, organizational behavior cannot be understood by studying only the parts. Following that argument, if an organization strives to establish a new behavior, for the desired change to be sustainable, the whole system needs to adapt to support this new behavior within the organization.

Although different models have been proposed for describing organizational systems (see for instance Galbraith 2014 or Nadler and Tushman 1980), they generally include components relating to direction, structure, culture, and capabilities. Here, we will use a system framework to discuss the extent to which the COVID-19 outbreak has influenced the system in the professional advisors to predict the lasting effects of the *new normal*.

An examination of previous technological shifts reveals that they have had substantial and lasting implications for organizational systems and society (Abernathy and Utterback 1978; Rogers 1995). It has been recognized that invention and diffusion of new technologies often accompany progress, but with potential downsides, because power dynamics, work content, and job opportunities can shift. Digitalization, which provides opportunities for exponential growth and new values to be created, is no exception. However, as noted by Frey and Osborne (2017) and Kim et al. (2017), digitalization can also raise unemployment levels as humans are replaced by algorithms, machines, and robots. As PSFs are changing in terms of digitalization, it could have multiple effects for society, which could be interesting when exploring the *new normal*.

6.4 Findings and Data Analysis: What We Learned from the Field

We collected data on how professional advisors manage the impact of COVID-19 in terms of its effects on their work. The coded statements from the interviewees and notes from the conferences were organized according to temporality as we explored what the data revealed about what had happened, what barriers that had been eliminated in the process, and what this could mean for the future. Hence, first we examined the impact of COVID-19, so far, on digital practices and activities

among professional advisors and their firms (von Nordenflycht 2010; Susskind and Susskind 2015). Second, we coded the data in terms of what these new practices entailed in relation to barriers to change, analyzing, for instance, the challenges in the established professional cultures, where resistance to change has been built upon established relationships, reward structures, and identities (Beer 2007). Third, we studied what the data suggested about the potential impact of these changes in a future business landscape. We did so in light of the different components that need to be aligned for a large-scale system change (Beer 2009).

Thus, when coding and analyzing the data, we explored what the current changes, inflicted by the current pandemic, meant for the practices of professional advisors and whether these changes were profound enough (and influential enough to the entirety of the system) not to be reverted post COVID-19. In this section, data is reported and analyzed, whereas the findings and analysis is put in relation to the theoretical framework in the discussion section.

6.4.1 What Digital Effects Did We See for Professional Advisors?

All interviewees told us that they had experienced quick adoption of digital tools ever since COVID-19 started. "*It feels like we skipped forward five years [of digital transformation]*" one interviewee told, and another claimed that "*We have gotten used to the digital tools very fast.*" A third interviewee claimed that "*Corona is making the digital transformation more relevant than ever*" and another one stated that "*Really, the digital transformation is irreversible.*"

We received similar impressions from the conferences that we attended. "*What we experience now is disruptive innovation,*" was claimed in a conversation focusing on law and legal businesses. Another comment was that "*We are moving toward a new normal,*" and that "*The question is not if anymore, it is when,*" describing how COVID-19 had moved the needle toward digitalization. Moreover, many participants discussed that the pace of digital transformation is unprecedented. As put by one participant, "*It is fair to say that no one thought we would get here, just 1.5 months ago.*"

The main change from previous practice was described as the increasing opportunities to work from home and increased activity for online collaborations and meetings, as well as the experience that tools and technology have radically improved during this short time. One interviewee added that the increased use of digital technology had an impact on whom to collaborate with, stating "*It is new times, and they call for new collaborations.*" There is also a new need to collaborate with different digital actors and those with access to and competence in different digital technologies. One interviewee, however, added that "*Technology is not the solution in itself, it is only part of it.*" explaining that a shift in mindset and an effective process of implementation of the technology is needed.

When asked about the practical details of the novelty to their work, the discussion among the legal advisors quickly turned to virtual courts and new implications in courts. This was seen as a good and explicit example of digital transformation. One interviewee expressed, "*We see courts now taking an active part in the digital society.*" Both completely virtual and hybrid courtrooms (allowing some participation online) were discussed, with interviewees stating that "*We just got new possibilities to hear witnesses* via *their cell phones, and last week we had a witness calling in sick in the morning, and instead of canceling the entire hearing we could go ahead with the trial. It is really efficient and works very well, so I cannot see that we would go back and not allow that in the future;*" "*The transformation that we have seen in the courts in these corona-times is really an opportunity to increase access to justice;*" and "*We have started to use virtual courtrooms for some cases, and I don't think that we will go back.*"

Some interviewees also discussed a new collaborative landscape relying more on trust than lengthy negotiations, and a new and improved contract language—often described as simpler and more pertinent. As put by one interviewee, "*To simplify is really the trickiest, what seems to be simple may really be very complex.*" One interviewee claimed that digitalization, by its nature, puts higher demands on language, "*You need to be very precise when it comes to digital tools, and pay attention to detail.*"

6.4.2   *Have Change Barriers Been Broken?*

It is imperative to understand the changes in the work processes and models of professional advisors and their firms, in light of the empirical context, and examine whether COVID-19 imposed changes (reported above) will have a lasting effect on these firms. To explore this, we analyzed the findings in order to understand the barriers that could have been potentially eliminated during COVID-19. The data suggested that several barriers, such as lack of technological skills, change capabilities and sense of urgency, as well as institutionalized traditional professional culture (building on risk avoidance), had been affected. Quotes related to these themes are reported below. While some of the quotes respond to the breakdown of several barriers, we have placed these in the column where we perceive that these statements have the largest effect (Table 6.1).

Table 6.1 Findings: quotes depicting the breakdown of previous barriers

Barrier number 1—*Lack of technological skills and change capabilities*	Barrier number 2—*Traditional culture building on risk avoidance (Lack of trust)*	Barrier number 3—*Lack of sense of urgency*
"Many of the partners and senior consultants – me included – did not really want to learn and use new tools. Perhaps we were a bit afraid of feeling stupid. Perhaps we were lazy. Anyway, it turned out it was possible to teach the old dogs how to sit after all."	*"We have been fine with digitalization of our internal work but always said that the customer interface demands personal interaction in real life. We argued that a new digital way of working would not provide the right sense of confidence. Er… we are now proven wrong."*	*"Why would we stop our extensive traveling, why would we try digital models – the one we used seemed to be working."*
"Lack of adoption has really been a barrier. Legal tech tools have really been regarded too complex, not concrete enough, and not really helping the users, but now it looks like the technology is much better adapted to user needs."	*"This is a really complex transformation because lawyers and judges are all very conservative, and they have not wanted to change in the past, but now there is no choice."*	*"Well, that is clear: we have digitalized faster because we had to."*
"I now know that I can conduct a very efficient workshop through digital tools that I had not even heard of a few months ago." *"I still believe I need to meet with my customers. But digital ways of working will forever be a part of my toolbox."*	*"I think we have been hesitant to really pursue new technology, especially in the customer value proposition. At least I was afraid that I would lose my edge, lose what I do well."*	*"Actually, I think that it has been a problem that everyone in the senior partner group is older than 40. We have had an old-fashioned way of looking at things. Now we were forced to at least dip our toes in the future."*

6.4.3 What Does This Mean for the Future?

The third step in our data analysis was to explore what the breakdown of barriers implies for the continued digital trajectory of professional advisory firms.

From our findings, it is clear that COVID-19 has impacted the current digital environment of these firms, effecting changes that are highly likely to continue in the future (causing a system change in the long-term). While the interviewees bring up many positive effects in terms of value creation and sustainability, rapid digitalization could also create new risks for which professional advisors need to reconsider how they work. A rapid digital transformation also causes unintended side effects that range from smaller issues—where professional advisors express that they need to improve the experience and quality of the digital work and value propositions—to the initiation of larger questions on what the rapid digital transformation means for

Table 6.2 Findings: quotes depicting the implications of the new normal

New practical issues to manage in the new normal	To prepare professionals for the new normal	Future implications of the new normal
"With new practices come new challenges, for instance, we previously did not have a problem with background noise, or people not focusing during the trial, but when people attend from home there are suddenly children running around in the background or someone is vacuuming, so it is hard to create the same air of respect for the legal process. But I guess that this is something that we will work on that will develop over time."	*"We find that this new situation demands new skills and competencies. Really, we need creative persons that want to develop the system and the professional role, but we have experienced that that is very hard to find. Law school does not produce that kind of lawyers."*	*"The future depends on us, and how we handle this situation will determine how the future will look."*
"While there is a lot of good in this fast transformation, we need to be careful and think also about what in human interaction that is lost."	*"You do not really use the stuff you learn in legal education."*	*"When we digitalize it is important that we do it with care. Public trust depends on us doing this right."*
	"This will change a very conservative industry, which means that also education needs to be reconsidered."	*"We are making the future and we need more imagination and we need to create new utopias that should guide our quick digital adoption."*

the future labor markets, what type of professionals we need to progress, and how we should educate them.

Examples of how the interviewees in this study reflected upon the future are reported in Table 6.2. Potentially, this means we need to shift the education and training of professionals to reflect the *new normal* and rethink business models and service delivery to become more aligned with the *new normal*.

6.5 Discussion: Rapid Digital Transformation of Professional Advisory Firms

Below, we discuss how this rapid shift to digital ways of working can be understood and why we believe that these effects are likely to last. We also hypothesize how the shifted digital trajectory of professional advisory firms can affect society in the *new normal* (building onto system change), wherein professional advisory firms will be better aligned to advising in other simultaneously transforming and complex contexts.
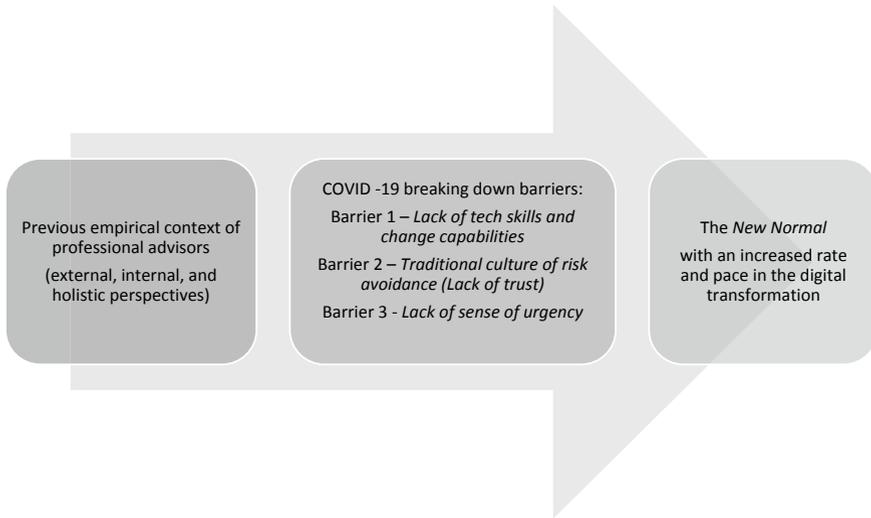
6.5.1 How Can We Understand Digital Transformation During the COVID-19 Outbreak?

Previous research has suggested that the level and speed of digital transformation can be understood through its impact on internal, external, and/or holistic firm dimensions (Kronblad 2020; Reis et al. 2018). Here, we observe that COVID-19, understood as an external shock, has caused a rapid increase in the digital transformation of professional advisory firms. For instance, there has been an increased use of digital tools and technology with new ways of work, including a transformation of physical workplaces to virtual workspaces enabling remote work and remote access. One good example of this is the increased use of virtual courts, although they are not ordinary workplaces for all professional advisors. This shows that a traditional institution such as the court can work virtually, which poses the question that why other services cannot follow this path. Thus, we observe that these extraordinary times have entailed extraordinary changes, which society has increasingly accepted and trusted. One interviewee claimed that she had skipped five years of digital transformation, while another stated that what seemed impossible just a few months ago was suddenly possible. It seems that we have entered a phase of a *new normal*—a new much more digital normal.

To understand the *new normal* and anticipate what will happen after COVID-19, we need to understand the current extraordinary situation in light of the ordinary situation. We need to explore if the current extraordinary practices will last—in particular, if the extraordinary circumstances have made such changes to the ordinary context, which have eliminated certain barriers, causing the system to change for lasting effects.

Our findings show that under extraordinary circumstances (here in the shape of COVID-19), extraordinary measures (that have previously not been accepted) can suddenly be both prescribed and trusted. Our findings indicate that current practices have effectively broken down previous barriers to change (comprising cultural components and the lack of technological competencies and a sense of urgency) and built the base for a *new normal* from where the digital transformation will not only commence but also increase in terms of both rate of change and speed. We argue that the rapid shift to digital models (imposed by COVID-19) has affected internal processes, which have ultimately also affected their external constituents as well as those of the firms in a holistic sense (Kronblad 2020; Reis et al. 2018). The organizations of these professional advisors, reluctant to change just months ago, have undergone a dramatic shift, which suggests that several of the previously strong barriers to change have simultaneously been broken down.

Our data analysis specifically points toward three previously identified major barriers to change that have been eliminated by COVID-19. These are a *lack of technological skills and change capabilities* (Kronblad and Pregmark 2019), *risk avoidance and lack of trust* (Kronblad 2020) and *lack of a sense of urgency* (Kotter 2008). While new technological skills and change capabilities are needed for the continued digital transformation, it is also necessary that a new professional culture

Previous empirical context of professional advisors

(external, internal, and holistic perspectives)

COVID -19 breaking down barriers:

Barrier 1 – *Lack of tech skills and change capabilities*

Barrier 2 – *Traditional culture of risk avoidance (Lack of trust)*

Barrier 3 - *Lack of sense of urgency*

The *New Normal*

with an increased rate and pace in the digital transformation

Fig. 6.2 The components of coronavirus-induced change

is developed that better aligns with the *new normal*. This culture needs to be more accommodating to a larger professional variation and collaboration with external parties and innovation and risk-taking than the previously established culture of professional advisors (which has been more focused on risk avoidance than innovation). Moreover, the presence of urgency is clear in a situation with restrictions and social distancing. The need for a sense of urgency is almost univocally stressed as an important prerequisite for realizing a successful change (Beckhard and Harris 1987; Conner 1992; Hayes 2018; Kotter 2008). However, this urgency has previously been demonstrated to be, at least partly, lacking among PSFs (Pemer 2020; Kronblad 2020).

Figure 6.2 shows how the COVID-19 outbreak—as an external shock— is dramatically changing the digital context and effectively eliminating barriers to change. This, in turn, creates the basis for lasting effects in both professional advisors and society and engenders system change that form the *new normal*.

6.5.2 *A Shifted Digital Trajectory Departing from the* New Normal

Many authors have addressed that organizational transformation needs to be systemic (Beer 2009; Beer et al. 1990; Galbraith 2014) to last. Recently, this notion has also been brought in research around digital transformation, where research has discussed the need to view digital transformation as a part of changing the system rather than focusing on the technology shift as such (Davenport and Westerman

2018; Kronblad and Pregmark 2019). We argue that COVID-19 has forced PSFs in general, and professional advisory firms in particular, to a digital system shift, where internal processes, external propositions, and business models have been affected. Davenport and Westerman (2018) describe how digital transformation needs to be addressed through various intertwined measures—requiring investments in strategy, skills, infrastructure and information technology systems, people, machines, and business processes. To address such system activities and processes have previously proven particularly hard for legal advisors (Kronblad 2020). We argue that this has been possible in a very short period due to COVID-19 effectively breaking down at least three obstacles to digital transformation (lack of technological competence, lack of sense of urgency, and cultural components). These barriers have been broken down simultaneously and have further enabled system change and expedited the process.

We argue that COVID-19, by effectively breaking down some of the strongest barriers to change among professional advisors, has enabled a rapid shift toward technological implementation and digital business models. Moreover, we argue that this shift addresses internal, external, and business model changes. Thus, in just a few months, the digital transformation seems to have reached all levels, creating a *new normal* from a holistic perspective.

Hence, what COVID-19 has done is to accelerate system change (Beer 2009; Galbraith 2014) wherein many intertwined processes are involved. During a short period, digitalization has found its way into strategy, structure, processes, capabilities, and culture, unlike previously when it was viewed more as a project targeting specific (often internal) work processes. This is particularly true for professional advisory firms, as their internal transformation also has an external impact through more relevant advisory services in an overhanging external context. Management consultants describe how digitalization came closer to their value proposition and customer interface and legal advisors describe how they rapidly embraced more processual and internal digital practices. However, although management consultants and legal advisors did not start from the same level of digitalization (legal firms are often described to be slow to adapt, see Kronblad 2020), interviewees from both camps described how COVID-19 forced changes affecting the whole organizational system.

This is also in line with how Davenport and Westerman (2018) argue around a success model for digital transformation, including the alignment of multiple elements. Researchers within the field of organizational change have previously argued that a system change is difficult to accomplish (Beer 2009), however necessary, for lasting effects. The data collected clearly show that COVID-19 has provoked the investigated organizations to react as individual parts of a larger system where the individual changes interrelate and further affect each another, leading us to believe that these organizations are well on the way toward a systemic shift in their digital trajectory. Moreover, new organizational capabilities (structural as well as individual) have been built into organizations during a very short period. Therefore, we anticipate that the *new normal* is only the beginning.
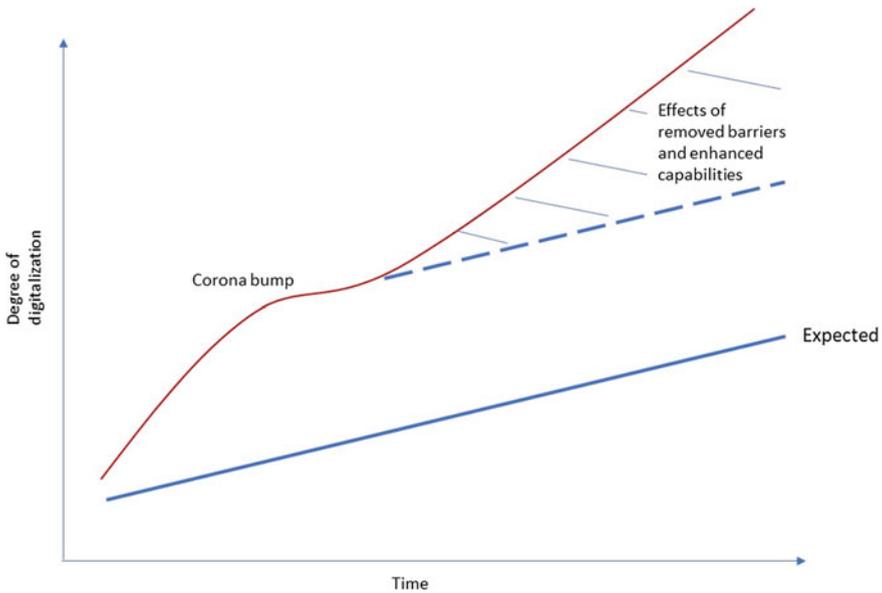
Fig. 6.3 The digital transformation trajectory of professional advisory firms

We propose that the shift to digital work processes, offers, and business models is much more than a "bump" in the digital trajectory for professional advisory firms. As important barriers have been broken down and organizations seem to have changed as systems (Galbraith 2014; Beer 2009; Pregmark 2019) in a very short period, we believe that in the future, we will witness an increased pace and rate of digital transformation. We argue that new capabilities have been built, which, in turn, will continue this acceleration. This is depicted in Fig. 6.3.

We—along with many of our interviewees—see great possibilities in the long-term potential effects of a shifted digital trajectory for professional advisory firms. It is easy to observe the potential in new value creation models, more sustainable ways of working, and more widespread access to professional advisors. This is further accelerated by the roles that professional advisors have in relation to their clients (Svensson and Grönroos 2008). A more efficient digital transformation of the advisors also has the potential to spill over to the contexts of their clients, while improving their advisory services in terms of better, faster, and more relevant content. Thus, the digital transformation of professional advisors will ultimately have further effects on all the external markets and contexts of their clients.

However, we would also like to stress the need for a cross-disciplinary discussion on the unintended consequences of this shifted and accelerated digital trajectory for professional advisory firms. As previous research has pointed out (Abernathy and Utterback 1978), technological advances often have several different impacts on society, which can redraw the landscape of the labor market, the competence required, and power distribution. Recent research on digital shifts shows a similar

pattern. Kim et al. (2017) and other researchers (Susskind and Susskind 2015; Huang and Rust 2018) have highlighted that human work is increasingly being replaced in this shift toward digital ways of working. Thus, as the speed of digitalization increases substantially—as we predict—this might lead us to the need to consider new curves to flatten in the *new normal*, for instance, curves representing increasing unemployment.

6.6   Conclusion

In this chapter, we have shown that COVID-19 has had several effects on the work of professional advisory firms, and potentially other PSFs, and that these changes have altered the empirical context of these firms to the extent that the changes will likely last, leading to systemic change. COVID-19 has effectively meant that firms have gained technological skills and change capabilities that will remain past the outbreak, which will increase the rate of digital transformation. This has also altered the previous homogenous and traditional professional cultures of professional advisors, which has opened up for increased heterogeneity and collaboration with others, thereby ensuring increased responsiveness to other external shocks in the future. Lastly, COVID-19 has created an instant sense of urgency that has increased the speed of digital transformation: "*the question is not if anymore, it is when*". This implies that even if we experience a *corona bump*—reflecting an instant and short term increase in digitalization among professional advisory firms with remote work and virtual meetings that will revert once restrictions on social distancing are lifted— the experiences that the firms have gained means that there is no *old normal* for them to return to. Instead, we witness the development of a *new normal*, where the trajectory of the digital transformation of professional advisory firms increase in both rate and pace. With increased technological skills and change capabilities, and a culture that accepts risk-taking, these firms are better suited to adapt to future needs. These changes among professional advisory firms are particularly important in their capacity to provide other firms (in various industries) with advice on how to conduct their businesses to create value. This implies that the digital trajectory of professional advisory firms also has a large influence on the larger digital trajectory of markets and society.

Authors' Insight

We argue that the rapid turn toward digital ways of working, that we are currently experiencing, will have lasting effects on professional advisors, as well as on society as a whole. We believe that professional advisors can be seen as catalysts in this transformation—where their value proposition and the way that they conduct their services affects how a wide range of other industries perform. This is because the

main purpose for professional service firms is not their own success, but rather the success of their clients. Furthermore, we believe that the accelerated digital transformation of professional advisors will matter greatly by empowering the digital transformation of society at large. This is important, because it might even have effects on some of the great challenges of our time. For instance, the increasing digitalization of legal advisors could open up for larger accessibility to legal advice adding to the democratization of law. This is particularly important for such legal advice that are directed toward citizens that have previously not afforded, or been able to access, legal services. The increased application of digital technologies ultimately making legal services cheaper, faster and more accessible while potentially also being more consistent, un-biased and reaching a higher quality. On top of democratizing the legal landscape, digitalization could also entail an increased use of sustainable business models and ways of working across professional advisors and their firms in general. This could even out the competitive playing field, which would arguably bring potential benefits to external firms and individuals alike. Perhaps, when physical distance is erased as an obstacle, this will also support new ways of leading and managing organizations. The digital transformation of professional advisors could further push an agenda (stressed by several researchers) for discussing how to ensure that great leaps in technological advances are used for the benefit of society.

However, it is not all upsides, but we also see risks. If professional advisors can be seen as catalysts in the digital transformation, we should also consider what it means for society if this progress is too fast and accelerates out of control. In this chapter, we call for a discussion around these potentially negative impacts on industries and societies. We foresee that technology will increasingly be replacing humans in the workforce (at least for some work tasks). This will potentially lower prices, increase quality and create better access to legal and business advice, however it will also potentially create new curves to flatten and pose new challenges to solve. For instance: will rapid technological dispersion create unemployment? For whom? Who will gain and who will lose? Is this rapid turn to digital business models and ways of working creating an even greater divide between haves and have-nots? These are also some of the greatest questions of our time, and they remind us that we need to look at digitalization in a holistic sense and understand how it is implemented into the system and what wider impacts this transformation will entail.

Once we have landed in the *new normal*, some things will probably go back to the way they were; with people partly returning to their old ways of working and organizing. But this chapter shows us that previous barriers for adopting digital ways of working, that professional advisors have previously run into, have forever been torn down. We believe this is a good thing, and that this could potentially help solving some crucial challenges in society—but this rapid transformation could also come with unintended consequences, and those we should all engage in mitigating.

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Chapter 7
The Lotus in the Mud: A Conceptual Model of Livestream Yoga Service Experience

Sandy H. M. Fitzgerald (née Ng)

Abstract The impact of the COVID-19 pandemic on the service economy is substantive. People processing services—where customers are present at a physical environment for the service exchange in order to receive the service benefits—are experiencing business hardships as authorities around the world have ordered these businesses to shut down face to face operations in an attempt to curb the contagion. People processing services such as yoga studios have found an alternative way to deliver their service during this challenging time through digital technology. That is, the provision of livestream yoga classes. This chapter explores this service offering and posits a conceptual model of the livestream yoga service experience. It discusses key learnings, identifies managerial opportunities and proposes an agenda for future research.

Keywords Yoga · Transformative service research · Customer experience · Digital technology · Wellbeing

7.1 Introduction

As people around the world gathered with their loved ones—family and friends—on New Year's Eve 2019 to ring in Year 2020, filled with hope and anticipation for a positive future, little did they know that a once in a century global health crisis is unfolding. The emergence of the COVID-19 virus was first reported to World Health Organization (WHO) on 31 December 2019 and declared a pandemic on March 11, 2020 (Cucinotta and Vanelli 2020). COVID-19 is highly contagious (Johns Hopkins University 2020).

To stem the contagion, governments around the world began to enforce strict measures such as quarantine, isolation, social distancing, immigration and travel

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restrictions. As a consequence of these public health measures, the impact on the global economy and community wellbeing are concerning. There is consensus that COVID-19 has severe negative impact on many industry sectors and that this dire global financial outlook can last for many years (McKinsey 2020; Statista 2020). Furthermore, COVID-19 situation also has a negative impact on general wellbeing as our normal daily lives and routines are disrupted (Baker 2020a).

People processing services, where customers are present at a physical environment for the service exchange in order to receive the service benefits (Lovelock et al. 2015), are most affected by COVID-19 public health measures. The health and fitness industry are an example of people processing services affected by COVID-19. With consumers having to be in close proximity and share exercise equipment in health and fitness studios, a feasible way to prevent the spread of COVID-19 does not exist (Cohen 2020). Therefore, this industry is mandated by governments to shut down.

The economic consequence of this mandated shutdown is problematic. Prior to COVID-19, consumer patronage of health and fitness studios is the major source of business income (Yeung and Johnston 2019). With the mandated shutdown, established fitness chains and others are struggling to survive. For instance, fitness chain such as Gold's gym has to permanently closed more than 30 gyms to stay viable (Stone 2020). Furthermore, many of these studios are operated by small business owners who may not be able to afford rent or pay their employees during shutdown and as such, many may not survive the imposed shutdown due to the pandemic (Robert 2020).

To prevent the spread of COVID-19, citizens are instructed to stay at home, to stay *safe* and *well* (Menon 2020). Ironically, our collective *wellbeing* is at stake as the new realities of remote working, home-schooling children, lack of contact with family and friends are having an impact on mental health and feelings of social isolation (Bas et al. 2020). So much so that government agencies (e.g., Ministry of Manpower 2020) and global authorities such as United Nations (UN) and World Health Organization (WHO) promptly issued advice to the general public on how to manage their wellbeing through this challenging period (World Health Organization 2020b; United Nations 2020b). As defined by the WHO, health is not merely the absence of disease or infirmity, but rather, it is a state of *complete* physical, mental and social wellbeing (World Health Organization 2020a). The Global Wellness Institute (GWI)—a leading global research and educational resource for the global economy of physical activity—went further and put forth a concept of well-being that consists of six dimensions, namely, physical, mental, emotional, spiritual, social and environmental (Yeung and Johnston 2020). Although the mandated shutdown of health and fitness industry is considered a necessary action, it does negate the function of this industry which exists to keep the communities healthy, resilient and well during this time. Notably, health and fitness services are services that have transformational potential as these services confer the sense of well-being on individuals, social groups, and communities (e.g., Rosenbaum et al. 2011).

Using GWI's definition of well-being as a benchmark, Yoga, an ancient practice that originated from India, and also classified as a type of mindful movement

(Yeung and Johnston 2019) has the capability to enhance all six dimensions of well-being (see Lewis 2008; Mace and McCulloch 2020; Monk-Turner and Turner 2010; Varambally and Gangadhar 2016; Yang and James 2014). With the imposed shutdown, yoga studios had to adjust or froze customer memberships to retain their clientele. In response, yoga studios leveraged on digital communications technology to continue teaching yoga through livestream class to their clientele and also, to the wider community (Kastrenakes 2020; Kwong 2020).

Serendipitously, what began as an ingenuine way of continuing business operations and remain in contact with studio members becomes a new service offering. In this chapter, the following question is explored: "*What are the antecedents and consequences of customer experience with a livestream yoga service?* Laying the groundwork to explore this question, the origin, globalization and the utility of yoga is first explained. Next, an overview of yoga consumers, the impact of COVID-19 and the emergent of livestream yoga class is explained. Following, drawing from disparate literatures, the question raised in this chapter is addressed. Although COVID-19 phenomenon created unforeseen challenges, this chapter will also discuss key learnings from which opportunities are identified to help yoga studio owners navigate and future proof their business and income. To end this chapter, an agenda for future research is discussed.

7.2 The Origin, Globalization and Utility of Yoga

Yoga is a group of physical, mental and spiritual practices which originated from ancient India some 5000 years ago (Askegaard and Eckhardt 2012). Yoga emerged from the Sanskritic cultural mold and is anchored on three Indian religious traditions: Hinduism, Jainism and Buddhism (Michelis 2008). The word Yoga is derived from the Sanskrit root "yuj" that means union—true union of our will with the will of God (Iyengar 2015). Therefore, from a traditional perspective, the original purpose of Yoga is designed to transcend 'ignorance and train the embodied mind to experience Truth' (Alter 2004) through its dynamic and diverse types of practices (Askegaard and Eckhardt 2012).

The globalization of Yoga, specifically its steadied spread to the West, can be largely attributed to Vivekananda's presentation of yoga practices at the 1893 Chicago World's Fair (Strauss 2005). Aware that his audience from the West is unfamiliar with the yoga's ostensibly religious traditions, Vivekananda repositioned yoga and make it accessible to an emerging market such that individuals from the modernizing world could relate to. Vivekananda repositioned yoga as a practical method to acquire, to enhance universalist nonsectarian spirituality pursuits, reduce stress, and regain health and freedom (Strauss 2005).

Modern yoga as it is now practiced globally, tends to have a focus on health and fitness (Campbell 2007; Strauss 2005). As such, yoga is considered as a type of mind-body exercise that typically make use of movement, breathing techniques and meditation to bring about general wellbeing to yoga practitioners (Lewis 2008). Yoga's

increased visibility in media, advertising and commercial enterprises is paralleled by the increased in number of yoga practitioners (Barnes et al. 2008). Considered as a form of mindful movement, Yoga is worth $16.9 billion with close to 165 million yoga practitioners worldwide (Yeung and Johnston 2019).

Yoga is primarily used for health maintenance and preventative purpose but is also considered for the treatment of specific physical and mental health conditions. As such, yoga's utility is evident along the illness—wellness continuum (Travis and Ryan 2004). Yoga has been an effective therapeutic intervention to treat mental health illnesses such as anxiety and depression; and also, obesity (Varambally and Gangadhar 2016; Yang and James 2014). On the wellness spectrum, yoga aligns with a *salutogenic* approach towards health, focused on prevention (e.g., stress reduction) (Riley and Park 2015) and attaining optimal wellbeing that encompass eudemonic pursuits (finding meaning in life) which helps human flourish (Ivtzan and Papantoniou 2014; Trulson and Vernon 2019).

Yoga improves wellbeing of specific population groups for the betterment of human functioning and performance. Notably yoga is applied to these three settings. First, yoga is applied to correctional settings (e.g., prison) to reduce inmates' depressive symptoms, anxiety, stress, anger as well as in the increased of behavioral control (Kerekes et al. 2017). Second, yoga has been applied to workplace as an intervention to reduce work stress and improve employees' wellbeing and work resilience (Hartfiel et al. 2011). Third, yoga has been applied in education context and was found to improve students' verbal and memory capabilities (Rangan et al. 2009). With substantive evidence that yoga can improve general well-being, it is obvious that yoga will continue to grow in popularity. Recognizing yoga has an international appeal and is a holistic approach to health and well-being, the United Nations proclaimed 21 June as the International Day of Yoga (United Nations 2020a).

7.3   An Overview of Yoga Consumers

There are a variety of yoga styles available in the marketplace (Cramer et al. 2016). It ranges from gentler form such as Yin and Restorative yoga to physically demanding types such as Vinyasa and Ashtanga yoga. Michelis (2008) attributes the variation in yoga styles is due to a lack of central authority and institutional structure over the years. The variety of yoga styles is probably another reason for yoga's popularity around the world as the choice of an individual yoga style is based on personal preferences and availability (Cramer et al. 2016). Due to the marketization effort of yoga in the West that started in the Twentieth Century, it is not surprising that the yoga participation rate is ranked 1st in the United States (Yeung and Johnston 2019) and that most yoga research is conducted in Western settings (e.g., Australia, New Zealand, Germany and so forth) (e.g., Park et al. 2015, 2019).

An aggregate of yoga consumption studies show that yoga practitioners (also known as yogis) are generally female, white, of upper socioeconomic status, and middle aged (Park et al. 2015). As such, several news articles constructed yoga as a

luxury commodity that secured social prestige for the affluent and upwardly mobile alike (Antony 2018). Differing from the West, yoga is ranked 9th place in terms of participation rate in India (Yeung and Johnston 2019), a yogi in India is more likely to be male, between 21 and 44 years of age, high school educated and a student (Telles et al. 2017). This is probably because yoga is traditionally practiced by Indian males and the learnings are transmitted in-person, from a teacher (otherwise known as Guruji) to student.

Even though the general profile of yogis differs between East and West (e.g., Park et al. 2015; Telles et al. 2017) the motivational drivers for yoga practice are similar. Leveraging on three yoga techniques, namely, yoga poses (i.e., asanas), breathing techniques (i.e., pranayama) and meditation (i.e., Dhyana) (Ayala et al. 2018), the motivations to practice yoga are to enhance physical fitness, disease management purpose, pursuit of yoga as a hobby, relaxation and spiritual growth (Park et al. 2019; Savelainen 2015; Telles et al. 2017). From a social perspective, yogis are also motivated to practice as they want to feel a sense of belonging and closeness to the yoga community (Savelainen 2015).

7.4 The Impact of COVID-19 on Yoga Service Sector

Although yoga is traditionally delivered and practiced in face-to-face setting; digital technology has afforded contemporary yogis the option to practice remotely. As such, yogis can choose to attend yoga studio classes or subscribe to digital yoga platforms to practice. It is interesting to note that although physical attendance remains the preferential mode of practice for most yogis, a significant portion of the growth in yoga practice worldwide is due to online yoga digital platforms (Yeung and Johnston 2019).

For yogis that prefer to attend yoga classes in studios, these are some of the benefits they seek. They are able to enjoy (1) the group energy, be inspired and motivated by others in the room practicing yoga together; (2) receive hands on adjustments and guidance from the yoga teacher; (3) have access to a range of yoga props (e.g., bolsters, yoga blocks); (4) have access to unique yoga styles that require special equipment such as aerial yoga (e.g., yoga swing or hammock) and hot yoga (a room that the temperature is set between 35–42 degrees celsius); (5) access to a yoga servicescape and finally (6) the opportunity to socialize with fellow yogis and form new friendships (D'Onofrio 2020; Wrigley 2020). For yogis that predominantly practice through online yoga digital platforms, the benefits are as follow. They (1) have the flexibility and convenience to practice at any time of the day in their own homes; (2) access to affordable, pre-recorded online yoga classes; (3) tailor their own yoga practice; and (4) prefers to practice privately (D'Onofrio 2020; Hunsberger 2020; Wrigley 2020). What is clear is that yoga studio classes versus online yoga digital platforms offer different value propositions. As such, yoga businesses either focus on offering yoga studio classes or create pre-recorded yoga classes to be offered through digital platforms e.g., Alomoves. For yogis, whether they prefer to practice

yoga physically in class or via online are driven by different motivations and personal preferences.

The COVID-19 pandemic is unlikely to have substantive impact on yoga digital platforms such as Alomoves and Yoga International that produce pre-recorded online yoga classes as yogis have no other options but to practice yoga remotely. With certainty, COVID-19 has disrupted the operations of yoga studios. With no alternatives, yoga studio owners adopt digital communications technology such as YouTube, Instagram and Zoom, to connect with their members by offering on livestream yoga classes. Understandably, this transition from offline to online yoga service delivery is likely to cause angst to the yoga studio owners as they navigate through the process of offering classes online. Naturally, the peak yoga professional body, that is, Yoga Alliance offers business support to help yoga studio owners navigate this change (Yoga Alliance 2020). With no prior guidelines available, yoga studios launched livestream yoga classes (e.g., Ang and Chew 2020; Whitbread 2020), which are impromptu and organic in nature to maintain its operations at a reduced scale.

As this type of online class is targeted at yogis who value physical yoga classes over online delivery, most studios initially offer it for free (e.g., trial period of two weeks) in the hope that consumers will sign up and get familiar with this type of online class. Subsequently, members are charged a substantive reduced fee to attend the livestream yoga classes as compared to studio classes (see Exhibits 7.1 and 7.2 in Appendix). That is the typical approach to monetize livestream yoga service. On the other hand, yogis are also grappling with whether they should pay or not to pay for these classes offered by yoga studios during the COVID-19 shutdown (Cadena 2020). Some yogis may view that these interim classes should be offered in good faith, to help maintain their yoga practice till studios re-open again. Nevertheless, it is purported that live streamed yoga classes are likely to continue i.e., Post Covid-19 (Handley 2020). First, with social distancing norms and measures established, only a limited number of people are allowed to be at a yoga studio at any given timepoint (e.g., Baker 2020a). Hence, getting a mat to practice in a physical class will be more challenging and as such members may still have to rely on livestream yoga service to practice. Second, consumers may remain wary of going out to public spaces for fear of 'catching' COVID-19 as there is no vaccine in sight at the time of this writing (Koslow and Lee 2020). Given livestream yoga service is going to stay, it would be useful to identify the factors that contribute to the experience of these classes and provide some guidelines on creating a purposeful and engaging experience for yogis. Towards this end, I employ education, marketing and human-computer interaction literature to forward a conceptual customer experience model of livestream yoga service.

7.5 The Case for Studying Livestream Yoga Service Experience

Research has shown that individual needs for a sense of belonging are particularly acute in times of flux, stress, and transition (Strayhorn 2012), liken COVID-19 pandemic. Therefore, the mandatory closure of all yoga studios to 'flatten the curve' disrupt yogis' need for belonging and affect their psychological and social needs (e.g., Hagerty et al. 1996) during this difficult period. Utilizing digital communications technology, studio owners address members' need to feel belonged to the yoga community and continue yoga practice in spite of COVID-19's movement restrictions by responding to their 'crisis of immediacy'—defined as "the need for consumers to receive content, expertise, and personalized solutions in real time" (Parise et al. 2016)—through the offer of livestream yoga service. Livestream yoga service provides a means to (1) socially connect yoga studio teachers with their students and (2) the capability to organize 'live' yoga classes and deliver it online (e.g., Korn and Pine 2011). The emergence of livestream yoga service therefore becomes a new digital touchpoint that augments the way that studio members 'attend' yoga classes and transform their experience (e.g., Parise et al. 2016).

Holbrook and Hirschman (1982) were the first to introduce the experiential perspective of consumer behavior and marketing. Since then, the experiential aspect of consumption has been recognized in general business literature (e.g., Grove and Fisk 1997; Klaus and Maklan 2012; Meyer and Schwager 2007). Customer experience is broadly defined as "events that *engage* individuals in a personal way" and that experience is subjective and contextual (Pine and Gilmore 1998). In further detail, customer experience is conceptualised as the customer's subjective response or assessment of all attributes based on their direct and indirect engagement between the firm and the customer (Klaus and Maklan 2012; Lemke et al. 2011). The notion of engagement is therefore important in studies of online environment experience (e.g., Thakur 2019; Verhagen et al. 2015). After all, the engagement is a state that arrives from customer experiences of a product or service over time (Calder et al. 2016).

Businesses will gain benefits and competitive edge if they pay attention to the management of customer experiences (Pine and Gilmore 1998). Two well-known practical examples are Walt Disney and Starbucks. As technology becomes more ingrained in our daily lives since early 2000s, the study of customer experience with online environments intensify. For example, customer experience with the online environments (e.g., websites, online stores) has predominantly been studied within the hospitality and retail shopping contexts (e.g., Jeon et al. 2018; Wagner et al. 2020). Interestingly, the study of customer experience with synchronous instructional service such as livestream yoga service is lacking in the Service Marketing literature. The emergence of livestream yoga class therefore provides a unique context to study.

Managerially, it is important for yoga studio owners to manage this new service offering as the total customer experience should be managed across complex and diverse offerings, touch points and channels (Ostrom et al. 2015). Importantly the

enhancement of customer experience is identified as a value creation research priority
and that the integration of customers, employees and technology roles for value
creation is noted as a specific issue worthy of further investigation (Ostrom et al.
2015). Therefore, it is necessary to study customer experience of livestream yoga
service as it has the potential to create value for businesses (e.g., the contribution of
online reviews to a service) (Brodie et al. 2011). As voiced by Ostrom et al. (2015),
there is a need to leverage cross-discipline research to move the service marketing
field forward. This chapter integrates education, human-computer interaction as well
as marketing literature to forward a customer experience model of livestream yoga
class.

To frame the conceptual model, the stimulus-organism-response (S-O-R) theo-
retical model by (Mehrabian and Russell 1974) is employed to guide this inquiry
as per prior studies that have used it to understand online consumer behavior and
environment (e.g., Parise et al. 2016; Zhang et al. 2014, 2015). Broadly, the S-O-R
model posits that the environmental stimuli (S) can affect an organism's internal
states (O), which then drives an organism's behavioral response (R).

7.6   Conceptual Model of the Yoga Livestream Service Experience

Applying the S-O-R framework (Mehrabian and Russell 1974), based on cross-
disciplinary research and also informed by personal experience of consuming yoga
livestream service for since 7 April 2020—the start of Singapore circuit breaker
(Baker 2020b), a parsimonious model is forwarded as show in Fig. 7.1.

Consumers who consume a livestream yoga service are yogis who wish to have
a consistent and enhance their yoga practice from a qualified yoga teacher during
the imposed COVID-19 movement restriction measures. I draw on education litera-
ture to identify key factors that can affect a learner/customer experience. Cognizant
that this service exchange is mediated by digital technology, it is also necessary to
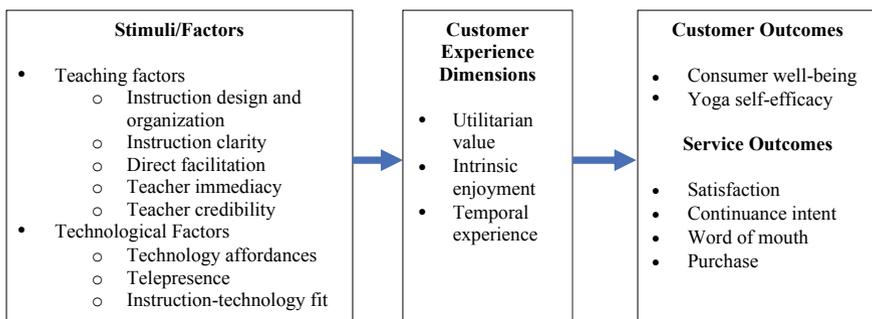
Fig. 7.1 Conceptual model of the livestream yoga service experience

consider human-computer interaction literature to identify key factors that facilitate this learning/customer experience.

7.6.1 Antecendents of Livestream Yoga Service Experience—Teaching Factors

Traditionally, the pedagogical practice of imparting yoga knowledge in India is through oral tradition. This perspective of yoga teaching focuses on the embodied relationship between teacher, his/her tradition/lineage, the student and the knowledge of yoga (Bourne 2010). Since the West has embraced Yoga as a technology for health and well-being and through the process of marketization, yoga teaching is increasingly becoming a regulated profession, with official pedagogic discourse that recognized entry standards and formal procedures for continuous professional development (Bourne 2010). As such, yoga teaching benefits from good pedagogical practices informed by education literature (e.g., Bourne 2010). Yet, pedagogical education frameworks for yoga teaching via different modalities (e.g., face-to-face, online or blended) are lacking (e.g., Antony 2016; McIIwain and Sutton 2014).

At present, practicing yoga in studios remains the most popular option (Yeung and Johnston 2019). A common reason that prevents yogis from practicing yoga online is the perception that it may be easier to incur yoga related injuries as one is not practicing in an environment with a trained instructor (Hunsberger 2020). However, this rationale may be misguided as there is no evidence to show that attending physical yoga class is more likely to prevent yoga-related injury. Consider this. It is unrealistic for a yoga teacher to provide personalized attention, feedback and adjustments to a group of students simultaneously. Therefore, yoga teachers are more likely to prevent yogis from getting yoga related injuries, simply through good teaching and instructing (McIIwain and Sutton 2014). Accordingly, teaching presence is a key determinant in engaging and retaining students online (Stone and Springer 2019). There are five factors that can be subsumed under teacher presence namely instruction design and organization, instruction clarity, direct facilitation, teacher credibility and immediacy. Research has shown that the service environment, be it physical or online can influence customer perceptions, experience and outcomes (e.g., Dong and Siu 2013; Hopkins et al. 2009; Rosenbaum et al. 2020). Given the impact of COVID-19 that has forced many yoga studios to deliver classes online, it is necessary to consider aspects of technology that helps to afford a good learning experience to yogis (Limperos et al. 2015). Specifically, there are three technical aspects namely, technological affordances, telepresence and instruction-technological fit are identified to have an impact on customer experience of livestream yoga service (Limperos et al. 2015; Mulik et al. 2020; Sun 2016). These factors that can influence livestream yoga class experience are now discussed.

7.6.1.1   Instruction Design and Organization

Instructional design and organization were defined as the learners' perceptions that instructor organizes and guides a class, in accordance with the intent/theme of the class (e.g., Jung and Lee 2018). To ensure that the class is well-designed and organised, it is necessary for yoga teachers to prepare their class content prior to teaching. In other words, good yoga teaching requires more than taking yogis through a series of yoga poses within a particular yoga style. To enhance the quality of the class, it would be helpful if the yoga teacher can send yogis digital information that relates to the aim/purpose of the livestream yoga class prior to the actual class. For example, relating a class to a theme such as "moving towards gratitude". By doing so, it would help yogis decide if the class resonates with them. Next, it would be important to organise the livestream yoga service through scaffolding technique. There are two reasons for doing so. First, students can feel supported as yoga teachers move students from yoga poses that establish their foundation to more challenging poses. Second, the sequence to move students from easy to advance poses can also help students experience flow (see Csikszentmihalyi 1990). Indeed, a study has demonstrated that students' perception of skill and challenge offered by the instructor are influential factors that determine their level of flow (Shin 2006). Flow refers to the experience of people "who are deeply involved in some activity…that they are completely and totally immersed in it…and nothing else seems to matter while engaged in the consumption event" (Lutz and Guiry 1994). In sum, yoga teachers should put effort into the design and organisation of a livestream yoga service, such that students have a good chance to flow as it enhances their experience of the class (Novak et al. 2000; Shin 2006).

7.6.1.2   Instruction Clarity

Next, instructional clarity is considered to be one of the fundamental cornerstones of effective teaching (Chesebro 2001, 2003). Instruction clarity is the extent to which the meaning stimulated in students' minds by an instructor accurately matches the meaning an instructor intends to convey (Chesebro 2008). To assure and prevent students from yoga related- injury, yoga teachers need to be are clear with their instructions given that yoga teaching is inherently a linguistically mediated learning context (McIIwain and Sutton 2014). Importantly, their word cues must be relatable to yogis. Consider this. Adho Mukha Svanasana (Sanskrit) meaning downward-facing dog pose. Yogis that have been practicing for a while may understand but unlikely, beginners. Another example, "Activate your quadratus lumborum", simply means activating your back muscles (Peacock 2017). Unless you are well-versed with anatomy, a technical cue is likely to cause confusion with most students!

In yoga, the effects that words have as they "alight" bodies are crucial as knowledge (learning of yoga poses) is literally incorporated simultaneously (McIIwain and Sutton 2014). Because digital technology is a rich medium, yoga teachers who conduct livestream yoga classes have the option to send a short yoga teaching cues that

will be used in the class prior to enrolled yogis for them to familiarise. As a result, the yoga instructions/cues may come across clearer to students during class. This approach may also help students feel more empowered to learn through livestream yoga service. It is also important that yoga teachers take considerable care and time to demonstrate to students and explain in-depth what a correct pose vs. incorrect pose looks like such that time students do not get injured during class. Furthermore, it was found that yogis who received specific instructions in yoga techniques had a higher perceived competence for performing these techniques (Birdee et al. 2016). As such, teacher knowledge to develop and deliver clear instructional messages is vital because when the word cues are clear and relatable, students will be able to comprehend the instructions, not hurt themselves in the process and have a good learning experience (Bolkan 2016).

7.6.1.3 Direct Facilitation

Direct facilitation was defined as learners' perceptions that instructors encourage students and provide them with feedback (Jung and Lee 2018). Based on personal experience, yoga teachers are always encouraging of students to "be present" and do their best to keep pace with the class. Therefore, it is oftentimes not possible for instructors to provide specific feedback to individuals during class, unless the feedback is applicable to *all* students in the class. In a physical environment, yoga teachers often encourage students to seek specific feedback after class. Therefore, it is equally important for yoga teachers who instruct online, to have that option available for students that seek specific feedback individually. Yoga teachers should make themselves available online for a short period of time after a livestream yoga class to provide accessibility to yogis who may have specific questions to ask. This component of teaching presence i.e., direct facilitation to support students is important as it can enhance student learning experience (Zhang et al. 2016).

7.6.1.4 Instructor Immediacy

The perception of teacher immediacy relates to any verbal (e.g., complimenting students) and nonverbal (making eye contact or smiling) behaviors that seek to enhance relational closeness or similarly reduce psychological distance (Mehrabian 1967). As opposed to a physical yoga class whereby teacher immediacy is easier to project, the delivery of livestream yoga service makes it more challenging as it is difficult for yoga teacher to read yogis' verbal and nonverbal behavior through a mediated environment. Therefore, yoga teacher might need to be cognizant and remember to encourage students periodically and intently display positive verbal and non-verbal behaviors so that yoga students feel engaged and a sense of closeness. For example, even though Instagram Live does not afford yoga teachers the ability to see the yogis, instructor immediacy can be demonstrated through teachers acknowledging and greet every yogis by their name/alias name when they login

prior to the start of the livestream yoga class. Through this minute act, it could make yogis feel a sense of closeness to the teacher. However, for most yoga teachers, the rapid transition from teaching face-to-face, to online becomes extraneous cognitive load for teaching livestream yoga class (e.g., Merriënboer and Ayres 2005). Therefore, some yoga teachers, may need to be supported and trained in surface and deep acting (Hochschild 1983) in order to demonstrate teacher immediacy competently. Because instructor immediacy can enhance student motivation (Pogue and Ahyun 2006), it is therefore important to bring across instructor immediacy in livestream yoga service, to ensure students find teachers relatable, and as a result, enjoy the experience (Arbaugh 2001).

7.6.1.5   Teacher Credibility

Teacher credibility constitutes "the degree to which the students perceive the teacher to be believable" (Banfield et al. 2006; Hochschild 1983). Teacher credibility has been conceptualized in terms of three distinct factors; competence, goodwill, and trustworthiness (McCroskey and Teven 1999; Teven and Hanson 2004). Because livestream yoga classes are offered by established yoga studios who would only hire certified yoga teachers, the credibility of teachers are already ascertained within the respective yoga communities who attend prior studio classes. Besides, the reputation of yoga studios also relies on word of mouth (Privin 2020). However, livestream yoga service has greater reach, this means that overtime, these classes may attract other yogis that are not current members through word of mouth. Therefore, to demonstrate credibility and reputation of the yoga studios and their teachers, it would be ideal to create a rating system for yogis to rate livestream yoga classes. By doing so, it will signify a teacher's credibility to potential future yogis. Importantly, it is reasonable to expect the more credible a teacher is, the more experienced he/she is competent with teaching yoga. Therefore, a credible teacher will be able to offer a good class experience (Finn et al. 2009).

7.6.2   Antecedents of Livestream Yoga Service Experience—Technological Factors

7.6.2.1   Technological Affordances

Technological affordances are perceptual feelings that people form regarding how they are supposed to interact or use a given mass communication tool or technology (Limperos et al. 2015). Simply put, technological affordances refer to how specific features of technology may be impacting the experience of livestream yoga service. To my knowledge, Instagram, Zoom, Facebook and YouTube are key digital mediums that livestream yoga classes are delivered on. Recently, Sundar (2007, 2008) proposed

the "MAIN" model that put forth four types of technological affordances that are present in almost every interaction that occurs via digital communication technology. The four affordances are modality, agency, interactivity and navigability (Sundar 2007, 2008).

Modality affordances are different ways in which yoga teacher can consider presenting his/her instructional content on livestream yoga (e.g., Sundar 2008). For example, a yoga teacher could opt to instruct his/her class using a mic and use good sound systems to play associated music or on the other hand, instruct his/her class without a mic and use the computer audio system to play the music that is required for the yoga practice. It would be reasonable to expect that with better microphone and sound system, it would afford a better experience for yogis. Agency affordances refer to the source of information provided by the instructor through the selected digital mediums (e.g., Sundar 2008). For instance, yoga studios use Instagram to publicize its livestream classes i.e., provision of time, date, cost, payment mode and delivery channel; typically, through Zoom.

Interactivity affordances encompass mechanisms whereby students can relate to instructors and others synchronously when required (e.g., Sundar 2008). Given the plethora of ways in which we can connect with each other online, it is necessary for yoga studios to decide on the types of digital communication tools, to value-add and enhance students' experience of livestream yoga class. For instance, if there are a group of yogis who commit to a series of livestream yoga classes (e.g., moving towards gratitude yoga series), yoga teacher that is responsible could consider creating a Facebook group, and post relevant content and engage students prior and also throughout this series. This interaction will enhance interaction and possibly collegiality within the group. After all, students online do enjoy feeling a sense of belonging (Peacock et al. 2020). Also, as flagged previously, it would be necessary for yoga instructors to provide an opportunity for students to seek feedback. To conduct direct facilitation (Jung and Lee 2018), yoga teachers would need to decide on relevant digital communication tools to interact with students.

Finally, navigability refers to the ease in which students can gain access to the livestream yoga service (e.g., Jung and Lee 2018). It is important that studio owners and yoga instructors ensure the process in which students enroll and gain access to the livestream yoga service is simple, straightforward and seamless. Afterall, literature has long established that good design of navigability will enhance student online experience (Kalbach 2007). In sum, the consideration of technological affordances to offer livestream yoga service is necessary as research has shown that it can influence the experience of students learning through this mediated class format (Limperos et al. 2015).

7.6.2.2 Telepresence

Telepresence is described as the extent to which one feels present in a mediated environment with which one is interacting with (Kim and Biocca 2006; Mulik et al. 2020; Steuer 1992). Telepresence can be a factor in influencing livestream yoga service experience (e.g., Mulik et al. 2020; Novak et al. 2000). Remembering that

the livestream yoga service is fundamentally for yoga studio members when COVID-19 restricts movement, it is important to consider ways to make yogis who prefer physical classes, feel absorbed and present throughout the livestream yoga class. For instance, studio owners/yoga instructors could design a virtual background that resembles the physical space of the studios. This could help yogis feel more "present" as though they are practicing in the actual yoga studio and get more immersed in the experience. If this is not possible, it would also be ideal for yoga teachers to create the mood, feel and space dedicated for yoga practice such that non-essential items (e.g., beds, sideboards) are not part of the backdrop as it could be distracting for students. Hence, it is important that telepresence is considered as part of affecting the student experience of livestream yoga class. Afterall, the more "realistic" the curated environment is perceived i.e., good telepresence, the better the livestream yoga service experience becomes (e.g., Mulik et al. 2020; Novak et al. 2000).

7.6.2.3 Instruction-Technology Fit

Instruction-technology fit follows the fit-as-gestalt approach to capture different aspects of the alignment between online instruction and course technology (Sun 2016). As mentioned, there are numerous digital communication technologies that can facilitate livestream yoga service. However, it is necessary to consider if the technology fits with the purpose and objective the class. For example, if the yoga teacher is leading a yoga class which has a set sequence, (i.e., Ashtanga primary series) and the purpose is to facilitate a class whereby all can practice at a specific time, then using Instagram Live to broadcast and lead the class as the technology of choice fits because there is not a need to offer specific guidance to students during the practice. However, if the intent of a class is to teach a new yoga sequence, to impart new skills, to lead a small beginners' class i.e., 10 people, then Zoom would be a good choice for instruction-technology fit. This is because Zoom affords yoga teachers the ability to synchronously view yoga students practicing their poses and communicate with them from time to time. Ultimately, having clear alignment between online instruction and technology is a critical success factor for students that have to experience remote learning (Bennett et al. 2012; Singh et al. 2010).

7.6.3 Dimensions of Livestream Yoga Service Experience

As customer experiences are events that *engage* individuals (Pine and Gilmore 1998), attention is now turn towards identifying the dimensions of customer experience that are relevant for livestream yoga service. In this context, it is reasonable to expect that students seek utilitarian value and at the same time, seek enjoyment when consuming these classes. Yoga is getting more popular than ever as people recognized the utility of practicing yoga (Yeung and Johnston 2019). Indeed, the importance of utility and value of yoga in our lives are now recognized (Bhardwaj 2012). Hence, the utilitarian

value of consuming livestream yoga service would be a dimension of customer experience. Next, it is equally important that the livestream yoga service is enjoyable. Consider this. Your experience of reading a riveting novel vs. reading a boring textbook. It is obvious that the former is a more enjoyable experience compared to the latter option. Hence, it is necessary to consider enjoyment as a dimension of the customer experience. Lastly, temporal experience is also an important component of a marketing offering (Hirschman 1987; Woermann and Rokka 2015) and is considered a component of customer experience within online channels (Calder et al. 2016; Malthouse et al. 2016; Pagani and Malacarne 2017). These dimensions of customer experience are now discussed.

7.6.3.1 Utilitarian Value

Utilitarian value is defined as an overall assessment of functional benefits and sacrifices (Overby and Lee 2006). For yogis who are used to or even preferred to practice yoga at a physical space to consume livestream yoga service during COVID-19 lockdown period signals that they associate livestream yoga service with necessity and instrumental in the achievement of higher-level goals (e.g., Botti and McGill 2011; Dhar and Wertenbroch 2000). In this instance, the practice of yoga through livestream classes help consumers achieve their goal of keeping well and advancing their yoga practice during this challenging period. Importantly, utilitarian value can be seen as an important aspect of the consumption experience (e.g., Calder et al. 2009; Thakur 2019). This is because the more yogis derive utilitarian value from livestream yoga service, the more satisfied and more likely they will continue to use and make repeat purchases in the future (Bridges and Florsheim 2008). Hence, it is crucial that yoga studios offer livestream yoga service that is supportive of yogis' learning and well-being goals.

7.6.3.2 Intrinsic Enjoyment

An intrinsically enjoyable experience is rewarding or serves as an end unto itself, without concern for practical considerations (Babin et al. 1994). It would be fair to assume that yogis intrinsically enjoy their yoga practice. Intrinsic enjoyment is derived through extreme states of mental stimulation from strong interest, intense involvement and absorbed concentration (e.g., Sullivan and Heitmeyer 2008). The experience with practicing yoga could offer escape from the demands of the daily world. Therefore, it is important that yogis find practicing through livestream yoga service is able to help facilitate the intrinsic enjoyment they get from practicing physically as a group in studios. If yogis' intrinsic enjoyment of yoga practice is supported through livestream yoga service, they will be more likely to make future purchase and even engage in positive word of mouth behavior (e.g., Thakur 2019).

7.6.3.3 Temporal Experience

The notion of temporal experience relates to people's perceptions about the passage of time (Wallace and Rabin 1960). This concept has been studied extensively within service settings (Thakur 2019; Woermann and Rokka 2015) and therefore, appropriate to consider in the offering of livestream yoga service. Research has shown that people's perception of time may be distorted and do not always concur with the real continuum of cosmic time (Thakur 2019). For instance, consumers may overestimate the time they spend waiting in queues, but underestimate time spent when they are having a pleasant time (Knoferle et al. 2012). Similarly, such temporal experience applies in consumer engagement with online environment and platforms (Calder et al. 2009; Malthouse et al. 2016; Pagani and Malacarne 2017). This is because consumers logged onto online environment and platforms for temporal experience that give them a pleasurable escape and help them disconnect from routine chores (Thakur 2019). In this context, it is reasonable to surmise that yogis consume livestream yoga service to (a) maintain their regular yoga practice and (b) to switch off from the possible stress associate with COVID-19 situation and (c) have a pleasurable outlet to maintain their individual wellbeing. Therefore, it is necessary to create a pleasurable temporal experience for yogis as it can prompt future purchase and word-of-mouth behaviors (e.g., Thakur 2019).

7.6.4 Consequences of Livestream Yoga Service Experience

The Transformative Service Research movement started approximately a decade ago (see Ostrom et al. 2010) and it urged researchers to focus on outcomes that are of benefit to consumers. To date, the proponent of research still focused on service outcomes that matter only to business (e.g., Jeon et al. 2018; Demangeot and Broderick 2007; Thakur 2019). Yet, the outcomes of service experiences could be potentially positive or negative for customers and/or service providers (Ajitha et al. 2019). Given the transformational potential of livestream yoga service in creating uplifting changes and improvements in the wellbeing of both individuals and communities (e.g., Ostrom et al. 2010) and also provide a way forward for yoga businesses to continue their operations through COVID-19 lockdown period, this model proposes both subjective wellbeing and yoga self-efficacy as customer outcomes and customer and satisfaction, word of mouth behavior, continuance intent and future purchase as service outcomes.

7.6.4.1 Customer Outcomes

The term wellbeing is used to describe the quality and state of a person's life and it is considered a multi-dimensional construct and there are many approaches to conceptualizing wellbeing (Linton et al. 2016). In this chapter, consumer wellbeing

is conceptualized in accordance to GWI's definition of wellbeing which consists six dimensions, namely; physical, mental, emotional, spiritual, social and environmental aspects. The influence of yoga on wellbeing is well-established (Ivtzan and Papantoniou 2014; Varambally and Gangadhar 2016). Therefore, if yogis have positive livestream yoga service experience, it should enhance consumer wellbeing.

Next, the purpose of consumer livestream yoga service is for yogis to continue with their yoga practice despite the constraints of COVID-19 lockdown. It is important that yogis find the livestream yoga class enhance their yoga self-efficacy. Self-efficacy refers to confidence in one's ability to organize and execute the actions required to achieve a desired outcome (Bandura 1977). Within yoga setting, Birdee et al. (2016) developed a yoga self-efficacy scale to measure students' competency with their yoga practice. As such, it is useful to examine if the experience of livestream class does enhance practitioners' yoga self-efficacy.

7.6.4.2 Service Outcomes

The delivery of positive livestream yoga service experiences is important as it would have an impact on business sustainability during this unprecedented period. In this conceptual model, four outcomes are identified. Customer satisfaction is conceptualized as the emotional state of a customer on the evaluation of livestream yoga class, combining the customer's affective and evaluative aspects of the service experience (e.g., Oliver et al. 1997). It would be important to measure if consumers derive satisfaction from the experience. Continuance intent is included in this model as a cognitive response whereby a positive experience will result in the likelihood that consumers will subscribe to livestream yoga service again (e.g., Lee and Kim 2017). From a business viability perspective, it is critical that yogis will purchase this service as this demonstrates loyalty towards the organization (Zeithaml et al. 1996). Therefore, this conceptual model includes purchase as a service outcome. Finally, this model also includes the consumer action of word of mouth. Word of mouth behavior is characterized by customer making informal communication, such as recommendations and evaluations of goods and services (Zeithaml et al. 1996) and is considered as a credible source of consumer information. This is because the information is conveyed from personal networks rather than from third-party channel i.e., advertising. As such, positive word of mouth behavior can help grow the clientele of livestream yoga service.

7.7 Discussion

Bill Gates described COVID-19 phenomenon as a once-in-a-century pandemic (Gates 2020). Apart from the devastating death tolls, this virus has disrupted service ecosystems around the world (Kabadayi et al. 2020). There is no doubt that COVID-19 represents significant adversity. But, in every adversity, there are always lessons to be learned. This virus has placed a spotlight on the integral role of digital technology

plays in our daily lives and in business. Service organizations need to re-imagine ways to use digital technology, to bring meaningful digital service experiences to consumers as an alternative to face-to-face service consumption. As consumers get used to remote working and now, forced to consume what was typically a physical service i.e., yoga studio class through remote means i.e., livestream yoga class, it is fair to assume people will be receptive, and may even demand more access to livestream yoga classes post COVID-19 due to time and cost factors.

Having a livestream yoga class as another mode of service delivery also expands yoga studios' service offering. Now that studios have set up infrastructure to offer both physical and livestream yoga classes, they are able to offer members different membership categories at different price points. For example, studio yoga membership versus livestream yoga class membership versus a hybrid of both options. The different membership categories will cater to different segments of yoga practitioners and as a result, studios may be able to attract more clientele (i.e., achieve service outcomes) and achieve customer outcomes (i.e., enable continuous yoga practice through different means). For example, some customers who have to travel regularly (i.e., once a fortnight) will not find 'studio yoga only' membership appealing. However, with the existence of livestream yoga service now available, customers who travel regularly are more likely find livestream yoga service or hybrid option more suitable. Furthermore, consumers who are price-sensitive i.e., students would be able to benefit from livestream yoga class as it is more affordable than studio class (based on current market rates).

Whilst it is acknowledged that in current situation, remote working is a challenge (i.e., juggling the demands of family and work concurrently without much foreplanning), it is likely remote work will be normalized post COVID-19 as employees' value flexible working arrangements (Melian et al. 2020). Therefore, for studio owners, there are benefits. Livestream yoga services are appealing to yoga teachers who now have the option to work remotely instead of facing a daily commute to work at various studios. From a business perspective, the emergence of livestream yoga classes means yoga studios can better manage their resources through offering more classes to their clients by scheduling both studio and livestream yoga classes.

Importantly, livestream yoga service provides yoga teachers with another income stream independent of the income they get from studio yoga teaching. At present, most of the teachers that work at different yoga studios are freelancers. The main reason that they teach at studios is so that they need not worried about business-related matters. Now, freelance yoga teachers can start their own online business and teach online to their followers as livestream yoga service becomes normalized and widely accepted within the yoga community (Yoga Alliance 2020). The emergence of livestream yoga class, serendipitously, provides benefits for both yoga community and industry in the long term (Kemp 2018) as it provides greater accessibility, reach and lower cost. Nonetheless, as more livestream yoga classes become available in the marketplace, the industry will need to focus on ensuring the experience and outcomes of this type of yoga class is fruitful. To this end, this chapter has put forward a customer experience model for livestream yoga service anchored on educational, marketing and human-computer interaction literatures.

Future research will need to explore, measure and test the conceptual model posited in this chapter. First, it is necessary to explore the factors i.e., stimuli, dimensions of customer experience and customer and service outcomes that are identified from the literatures through interviews and/or focus groups. Next, it is necessary to find suitable or develop measures for each construct and finally, to test the conceptual model. Given livestream yoga service has gained traction and is expected to be the "yoga of the future" (Kemp 2018), this proposed research agenda will advance service knowledge and managerially, offers useful insights and benefits to the yoga and wellness industry and community.

Appendix

Spaceandlight yoga offered free livestream yoga class to their clients when COVID-19 circuit breaker begun on the 7 April 2020 in Singapore (See Exhibit 7.1). From 4 June 2020, they will start charging a reduced fee (compared to studio class rates), to continue offering livestream yoga class (See Exhibit 7.2). The pricing of Spaceandlight yoga studio classes as provided in Exhibit 7.3.

Exhibit 7.1 The offering of livestream yoga class

Exhibit 7.2 Fee for
livestream wellness services

Exhibit 7.3 In-studio yoga class fee

ADULTS

GROUP CLASS PACKAGES (Mat Yoga/ Pilates; 60 TO 90 Minutes)

Single	SGD 40*
Block of five	SGD185 (valid for 2 months)*
Block of 10	SGD 330 (valid for 4 months)*
Block of 25	SGD 725 (valid for 6 months)
Block of 50	SGD 1,300 (valid for 12 months)
Unlimited one month	SGD 350 (valid for 30 days)
Unlimited three months	SGD 960
Unlimited six months	SGD 1,800

PRENATAL PACKAGES (Mat Yoga/ Pilates)

Single	SGD 45*
Block of 5	SGD 210 (Valid for 2 months)*
Block of 10	SGD 400 (Valid for 4 months)*

TEENS (12-18 yrs old)

Single	SGD 30*
Block of 5	SGD 130 (valid for 2 months)*

KIDS (5-11 yrs old)

Single	SGD 25*
Block of five	SGD 110 (valid for 2 months)*

PILATES PRE NATAL REFORMER & GROUP REFORMER / SUSPEND

Single	SGD 55*
Block of five	SGD 250 (valid for 2 months)*
Block of 10	SGD 480 (valid for 4 months)*
Block of 20	SGD 850 (valid for 6 months)

OFFPEAK SPECIALS
(Only for Monday to Friday Group Mat classes starting 1230pm to 5pm)

Single	SGD 20

INTRODUCTORY SPECIAL RATES

First Time Promo Group Mat	SGD 25

Author's Insights

COVID-19—the once in a century pandemic—left an indelible footprint on our prior normal daily lives and routines. As this contagion spreads worldwide, we are required to rapidly transition to a 'new normal' way of living (e.g., social distancing, smaller gatherings, contact-tracing and so forth). Also, the way we operate our economic activities during these uncertain times have changed. Naturally, a lot of us will miss the old ways of living and in some cases experience a sense of unease and loss. However, as we pivot and adjust to the 'new normal', we need to, according to American author Wayne W. Dyer, "change the way we look at things and things we look at, change". Serendipitously, some of the changes implemented may be more advantageous than prior norms and practices.

This chapter selects yoga service—a segment of health and fitness industry -as an exemplar to showcase that it is a beneficial form of mental and physical activity for communities to practice during COVID-19 lockdown. It also explains how the yoga industry leveraged technology to deliver yoga services remotely to their clients; and the factors that yoga studios need to take note of in order to offer a valuable livestream yoga experience to the students. In this writing, I want to share with you my personal forecasts and thoughts of the yoga industry operating in a Post COVID-19 world.

If you are a yoga practitioner, I am certain that you would have experienced going to a yoga studio during peak hours and felt like you were "jammed in" as the studio is filled to the brim with other fellow students. Some of you might have felt claustrophobic and intimated as you try to get into different yoga poses with others surrounding you, affording you minimal space to relax into any poses! From the yoga business perspective, they attempt to fit as many people in a class for to maximize revenue. Post COVID-19, I forecast that such cram classes will be a thing of a past and moving forward, the yoga classes will be less crowded.

At present, the regulation (e.g., in Singapore) is that the yoga mats in the studio must be placed at least 2 meters apart and facemasks can only be taken off when the yoga practice begins. Currently, the teacher's facemask must remain on while he/she instructs. It is my belief that Post COVID-19, studios will continue to keep the yoga mats further apart as they would not want their clients/students to feel at risk or worried of being infected by others' respiratory droplets that could cause illness. After all, the consciousness of public hygiene is heightened due to COVID-19 and should continue to be the case Post COVID-19.

Next, amenities that yoga practitioners have come to expect at studios such as access to complimentary drinks (such as coffee and tea), snacks, changing and shower amenities, phone charging and communal space for interactions are suspended at present in Singapore to prevent the spread of virus due to communal use of these services. In other words, yoga practitioners are currently receiving a sub-par service experience even though they are paying their full membership. This presents an interesting discussion. Some predict that yoga fees will need to be increased for studios to remain viable, as class capacities are reduced for public health reason. Others suggest that yoga fees will be reduced as the yoga service offering shifts from full service (i.e. with added amenities) to no frills i.e., yoga studios providing just a

physical space to practice yoga. It is not easy to determine potential changes to yoga membership fees and structures at present as businesses are still subjected to weekly advisory from authorities with regard to operation guidelines. Notwithstanding, I project that as a result of COVID-19, any changes to yoga membership fees and structures will need to consider livestream yoga service as an additional offering to yoga students.

I project that livestream yoga service will continue to grow. As an example, apart from yoga studio owners who offer livestream yoga service during COVID-19 in response to mandated shutdown, online yoga business such as *Alomoves* that only offers online yoga videos began to offer livestream yoga classes during COVID-19 as well. The question is, who does it best (i.e., the offer of invaluable livestream yoga classes) will hold the hearts and minds of yoga practitioners and earn well-deserved profits at the same time. On this note, this chapter posits a conceptual model that provides guidelines towards implementing a worthy livestream yoga service experience. The offer of livestream yoga classes also maximise the utility of physical studio spaces for business to operate both physical and livestream classes concurrently. It is clear that this pandemic has forced many organizations to re-imagine their service delivery and there is general consensus within the yoga community that yoga pricing and membership structures will change. What is clear though, is that yoga businesses must extend and bundle their service offerings (e.g., physical class, livestream yoga class, online yoga short courses and so on), to remain competitive, viable and accessible by yoga practitioners.

Now turning the focus towards yoga consumers and practitioners, I expect that more yoga students will be amendable to bring their own yoga mat, towel and props. This behavior harkens back to the heightened individual awareness of public hygiene these days. Yes, a key drawcard of practicing at a yoga studio is that one does not need to lug yoga gear with them all day long just to practice for an hour. However, I believe that by and large, yoga studios will strongly encourage practitioners to do bring their own yoga equipment for their own health and safety and I do believe that yoga practitioners will comply. Where the carrying of yoga prop such as yoga hammock for Aerial yoga is not feasible, I think that yoga businesses may have to consider rebranding Aerial yoga as a niche. As such, it opens up possibilities for yoga owners to charge a special levy, as a way to pass on the cost of sterilizing/cleaning the hammock after every single use to students, in the interest of public health and safety.

For yoga practitioners, one of the key benefits of practicing in-person at the studio, is that the student can get appropriate, manual hands-on assistance when required from the yoga instructor. I see this as an important aspect of an in-person yoga experience. The hands-on assists are useful as they help students understand and be more aware of their body mechanics so that they can get into a yoga pose better and importantly, safely. Obviously with COVID-19 shadowing our every move and decisions we make, understandably, yoga studios are being extremely cautious, with some mandating a no hands-on adjustments for the foreseeable future. Whilst I understand the rationale (i.e., to limit the spread of germs), an astute consumer/yoga practitioner would ponder if there is any real difference between an in-person yoga

experience (without the hands-on assist) from a yoga livestream experience? Given at present, the yoga livestream experience is more affordable than physical classes, would the ban on hands-on assists from yoga instructors in a physical class lead to a critical shift from in-person memberships to yoga livestream memberships? From my perspective, I would advocate that appropriate, manual hands-on assists from yoga instructors is an integral part of a student learning in a physical class. Consider this. Imagine practicing and getting into an inverted pose such as handstand with no support nor assist from a yoga instructor! The risk of getting yoga-related injury is great. Without negating the risk of public health safety, I suggest that hands-on assists can be executed safely to support student learning. Make it a rule that prior and post assisting students physically in class (when necessary), the instructor must always sanitize his/her hands. This would fulfil the public health hygiene criterion, whist also fulfilling and not compromising the purpose of an in-person yoga class.

COVID-19 pandemic has driven home the point that each and every one of us needs to collaborate to prevent the spread of this virus. While at present, the 'new normal' conditions may seem to be an imposition, it is important to remind ourselves that Post COVID-19, we would have adopted a new set of rules and behaviors that could improve our yoga consumption experience. That is, yogis have the flexibility to attend either livestream of physical classes. Imagine practicing in the comfort of a spacious yoga studio environment that you can only hope for prior to COVID-19. Year 2020 will be remembered as a year of great human tragedy with COVID-19 wrecking our prior normal lives as we knew it. Drawing from a quote by Ralph Blum "nothing is predestined: The obstacles of your past can become the gateways that lead to new beginnings". I am certain that the new beginnings are around the corner and yoga services will transform to serve the ever-growing yoga community more effectively. Circling back to the aim of this chapter, that is, to provide guiding principles on the delivery of livestream yoga service experience, I do expect empirical research will be necessary to assess the quality of livestream yoga service experience. In this space, it will be mutually beneficially for yoga studio owners to collaborate with academics to investigate this phenomenon and collectively, design a new beginning i.e., new yoga experience for your members/students. I have a strong interest to continue my work in this area and welcome discussions via email with potential collaborators.

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Chapter 8
Technology and Innovation to Weather the Storm?—A Case Study of the Role of Technology and Innovation for Startup Survival in Shanghai, China

Soong-Chul Ro, Zhigang Zhang, Niharika Dayaneni, and Renan Chen

Abstract This chapter examines the challenges faced by startup companies in China during the great lockdown caused by the COVID-19 pandemic in the first quarter of 2020. A study of six startup companies in Shanghai is conducted focused on the nature of challenges they have faced, their responses to these challenges and the prospects for the post-pandemic business world in their respective area of business. Particular attention is paid to the roles of technology and entrepreneurship ecosystem involving venture capitals, incubators, and governments. The results lead to the conclusion to exercise caution regarding online technologies but highlight the importance of the entrepreneurship ecosystem for startup survival during the pandemic.

8.1 Introduction

Pandemics are not a new thing in human history, but the COVID-19 pandemic, together with the restrictions imposed by governments to contain the spread of the virus, affected many aspects of life for nearly everyone on the planet. "The Great Lockdown" of 2020, as the International Monetary Fund (IMF) described it, is now predicted to become an economic crisis much worse than 2008+ global financial crisis, contracting the world economy sharply by −3% in 2020 (IMF 2020).

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Such a deep crisis is affecting startup companies all over the world as well. Once regarded as the source of innovation, jobs and new vitality in the market, startups are now facing the battle for survival. In the US, troubled startups led to the elimination of almost 4,000 jobs in March 2020 alone, and more workers were sent home on furlough or standby (CNBC, March 31, 2020). The freezing of Venture Capital (VC) is one problem that affects startup companies. In China, VC-backed deals dropped to six-year low and the startups were asked to go into 'hibernation' (*South China Morning Post*, February 21, 2020). According to the World Economic Forum, the entire global startup community is facing a crisis due to the lack of investment. China, ground zero of the pandemic, recorded a 74% drop in the number of Series A + deals in February 2020 compared to December 2019. Similar drops were observed in other parts of the world. Asia (excluding China) experienced a 44% drop and Europe and the USA recorded 14 and 6% drops even at this early stage of the global spread of the pandemic. if the world follows the same trend as in China, WE Forum warns, it will amount to $28 million being wiped out, and if this current dry-spell of VC deals last six months, "a large portion of startups will be wiped out" (WE Forum, May 2020).

It is not all doom and gloom though. Technology-based startups in certain areas, such as telehealth, fitness, and remote work, are finding new opportunities during the crisis (CNBC, April 22, 2020; *Financial Times*, March 18, 2020). Especially in China, where "the world's largest work-from-home experiment" took place with an estimated 50 million homebound customers, the crisis was seen to be an opportunity for businesses such as online education, online grocery, online entertainment and so on (*South China Morning Post*, February 21, 2020).

In the face of such an uncertain time for startups, this chapter attempts to contribute a part of the answer to the question of startup survival through a case study of startup companies in Shanghai, China. Shanghai has been pursuing development led by the finance and service sector empowered by technology, and in 2019, 72.7% of the overall GDP, or 2.7 trillion RMB, of the city's GDP was in the service sector (*Xin Min Wan Bao*, March 10, 2020). Then just after the start of the Chinese New Year in 2020, the whole of China went into a lock-down and the service sector faced the hardest challenge. Businesses scrambled to go online but not all the attempts were successful. Even before the COVID-19 pandemic, Shanghai had numerous technology-oriented business incubators and industry clusters, churning out startup companies with tech-savvy young entrepreneurs, but the onset of the pandemic created a deep divide between the winners and losers. This raises a question: what makes it possible for some companies to successfully adopt innovation and survive the shock, but others fail? To find an answer to this question, we conducted a qualitative case study of young startup companies in the service industry.

We are particularly interested in the actual difficulties faced by startup companies, and whether technology, especially the online technologies, could be an answer to their survival and whether there would be lasting effects of the current crisis in the post-pandemic business world. For this, we have carried out semi-structured in-depth interviews with six startup companies listed in Table 8.1. Five of these

Table 8.1 List of startup companies interviewed

Company	Main area of business	Years in operation	Current stage
Company A	Business consulting services and cultural immersion tourism	3	Founder mentored by neoBay, established outside neoBay
Company B	Educational tourism and exposure	1	Founder mentored by neoBay, established outside neoBay
Company C	STEM education	6	Finished incubation from neoBay and became independent
Company D	Disinfectants manufacturer	3	Currently being incubated in neoBay
Company E	Robots for intelligent manufacturing	2	Currently being incubated in neoBay
Company F	Robots design (cleaning robots)	3	Established outside neoBay; seeking series A funding

companies are directly or indirectly affiliated to neoBay Venture Capital (https://neo bay.cn/home/abou) which provides an innovation and entrepreneurship ecosystem in cooperation with Shanghai Jiao Tong University, Shanghai Municipal Government, and Shanghai Land Group. Inspired by the idea of "incubator 5.0", neoBay creates a comprehensive entrepreneurship ecosystem in close partnership with other organizations in public and private sectors to provide policy guidance, financial services, legal consultations (including intellectual property rights protection), as well as accommodation, catering, fitness and so on. It also works with a range of other local innovation support groups such as Peeli Ventures, EFG, Sensor Space, South Science & Innovation Training base, School of Design of SJTU, Advanced Industrial Technology Research Institute (AITRI) of SJTU. In 2019, neoBay has extended its ecosystem globally through the International Ecosystem for Innovation and Entrepreneurship (IEIE), linking innovation ecosystems around the globe based on the principles of equality, mutual respect, win-win cooperation, good faith, and non-intervention in internal regulation. IEIE is an international collaborative mechanism for sharing resources, matchmaking, and technology transfer in innovation and entrepreneurship, providing opportunities to access different markets as well as relevant industries for businesses in participating ecosystems.

Of the six companies interviewed, two are currently located within neoBay's incubation facility, one has finished incubation period successfully and moved out of the neoBay facility in 2019, and the other two are founded by young entrepreneurs with previous experience in being incubated in neoBay and have received mentoring from neoBay's entrepreneurship program as an undergraduate student in the past. The last one was introduced to us by one of the companies. In terms of the business areas, one is involved in tourism, two in education, three in technology products

including robots. Interviews and follow-up interviews took place throughout May 2020 focusing on three broad areas of interest: (1) the challenges they faced during the pandemic, (2) responses to those challenges and technology utilization, (3) prospects for the post-pandemic period. Most of these interviews were carried out online but two of these interviews took place in their offices face-to-face with the easing of the restrictions in Shanghai. Three of these companies are not in the service sector, however, our focus here is to understand the roles played by the venture capital and entrepreneurship ecosystems as an area of advanced business service during the crisis and for this, we incorporated experience of neoBay Venture capital and another venture capitalist to triangulate and get broader perspectives.

In the following parts, we will first describe the spread of COVID-19 and the government responses which formed the backdrop for the challenges faced by companies. This will be followed by descriptions of each case and discussions on the challenges, responses, and prospects for the future.

8.2 Case Description

8.2.1 Responses to COVID-19 in China

The first official actions by the National Health Commission on epidemic prevention started on January 14, 2020. By January 20 it was officially confirmed that the virus can transmit human-to-human, then on the 23, on the eve of Chinese New Year, an emergency was declared in Wuhan and the city went into an official lockdown sending a shockwave of uncertainty and fear throughout the country during the busiest long-distance travel season of the Chinese New Year. Soon, the people in the whole of Hubei Province were banned from leaving houses except for buying daily necessities for survival, and even then, under strict control. Such control spread throughout the country within the next few days as more and more cases of infections got discovered (*China Daily*, January 22, 2020; February 1, 2020). For about two months, travel became strictly restricted throughout the country. People coming in and out of residential areas had to be checked for symptoms of the virus, and people returning from outside the country had to go into a 14-day quarantine. Schools delayed opening till March and when they opened all classes were online. Non-essential gatherings were more strictly restricted for longer. National Parks and public places including Disneyland in Shanghai closed until May 11, when the pandemic was well under control (Xinhua, May 11, 2020). Religious meetings such as churches and temples have not reopened as of May 2020.

The lockdown gradually eased starting in March. On March 4, State Council announced that work resumption could be carried out in an orderly way. Schools were also notified to allow middle-school students and fresh graduate students to come back from April 27, while ensuring their safety (*China Daily*, March 24, 2020). By May things began to recover. Offices, factories, and public places started to

resume works and more people came back to work through unobstructed roads, and most entertainment venues reopened, although health monitoring such as temperature checks continue in public places and some eateries do not allow dining-in customers and rely on take-outs.

During the two months of tight control, economic activities in China froze. People spent more time at home, directly decimating incomes of the businesses that relied on people being outside, such as hotels, tour operators, shopping malls, restaurants, (non-official) education, and entertainment. Those located around big tourist attractions got especially seriously affected. Added to this was the sharp decline in venture capital. As shown in Fig. 8.1, VC investment in the first quarter of 2020 amounted to only 38% of the previous year in terms of invested amount (in USD) and 26% in terms of cases.

The month-by-month figure of VC investment in China shows a bounce back in March: up by more than 150% from February, followed by a slight drop in April, and another slight drop in May in terms of the amount. The number of investments made in May fell by 27%, from 352 cases in April to 256 cases but the amount dropped only 3% from 9.04 billion USD to 8.75 billion USD, showing a strong tendency for the investment to concentrate around a smaller number of projects. All in all, although some recovery is visible, the figures of VC investment until May does not show signs of a full recovery (Fig. 8.2).

During this period, the governments of China at various levels worked out policies to support startup companies. For example, on February 7, the municipal government of Shanghai published a 28-points policy measure for "the epidemic prevention and supports & services to the sustainable development of enterprises" and on February 12 Minhang District Government echoed similar policy and published "10 policies supporting the stable development of enterprises". The specific measures included reduction or cancellation of taxes, reduction or cancellation of rents, creation of special support funds for struggling companies as well as 'technology innovation
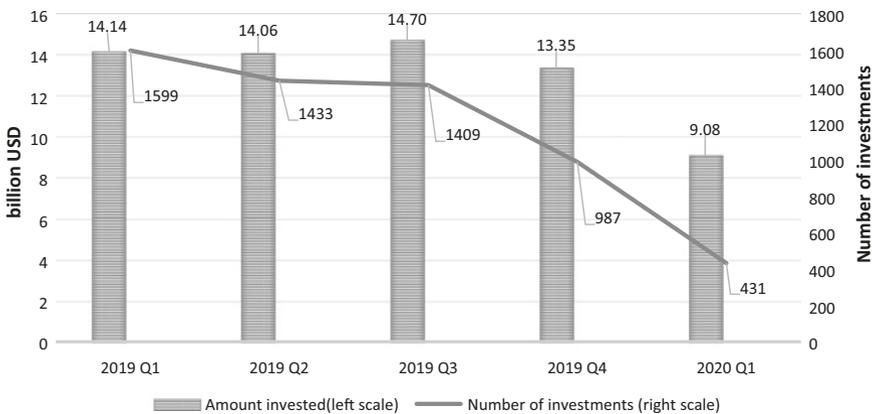
Fig. 8.1 Investment in China's venture capital market from Q1 2019 to Q1 2020 (*Data Source* chinaventure.com.cn, June 24, 2020)
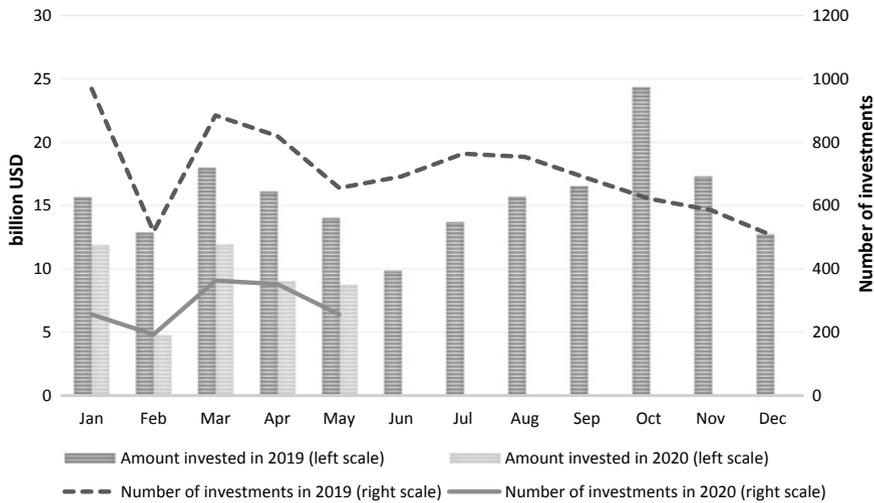
Fig. 8.2 Investment in China's Venture capital market from January 2019 to April 2020 (*Data Source* chinaventure.com.cn, June 24, 2020)

support funds' and green channel for innovative projects that were deemed vital in the efforts to support livelihoods of people during the lockdown (Shanghai Municipal Government, February 7, 2020; see also *Shanghai Bendi Daily*, February, 12, 2020). This is the background upon which the companies we have interviewed waged their battles for survival.

8.2.2 Startup Cases: Impacts and Responses

Company A has been in business for about 3 years. It is often mistaken as a niche market tour company that provides guided tours for unique and unbeaten tracks in Shanghai but it is much more than that. According to the founding CEO, Mr. Zhu, a young entrepreneur of barely thirty who also has rich experience in international social and educational entrepreneurship, the company aims at making positive impacts to the world by providing cultural immersion and educational experience to various groups of foreigners such as business people, students and educators, artists, officials and so on, customized to their needs. Many of the customers are business people who want to learn about China's environment and therefore it is more properly a consultation company connecting the world's brands and merchants, whether large or small, with China's businesses and consumers.

Before the pandemic, it was actively developing explorative learning programs aiming at cultivating cross border business culture through actual (offline) visits and meetings in and around Shanghai. It is not hard to imagine the impact of the pandemic on his business. All the planned visits by his customers in the first quarter of 2020 had

to be canceled or postponed indefinitely. China is recovering from the lockdown fast and all service sectors are gradually returning to business but the conditions in other countries affect international travel and without knowing when international travel will be possible, working out plans to find new customers became an impossible task.

Therefore, business innovation, according to Mr. Zhu, is not for scaling-up or expanding into a new market, it is a matter of survival. The first step he took was an overhaul in the company's operational model. Team discussions and meetings incorporated more online technology to maximize cooperation while working from home and the company also had to go through job cuts while remaining work-force, including Mr. Zhu himself, took salary cuts. The circumstances created by the Pandemic, the "everything-through-internet" environment, according to Mr. Zhu, has forced him to refocus on the very core of what the company needs and what it can provide its customers and shake all the nonessentials out. "Everything-through-internet" also applies to his market as well. The only way of getting customers during the pandemic for the company was to embrace online technology and adapt to the company's main service to this new environment through innovations. In this respect, the company is currently putting all its efforts to apply innovations: to find an entry point into the market, to redefine the core appeals, and carry out its business with targeted, concerted, and innovative efforts. One example is the virtual workshops and programs that the company implemented since February. Such online medium reduces the costs in terms of both finance and time, and Mr. Zhu hopes that it will also help him not just survive the pandemic but to develop a better understanding of Chinese market through the instant online access to partners within different loca-tions in China who are now also getting accustomed to online-based meetings and events. He says it is hard to see how much fundamental changes the pandemic has brought to his business but certainly, the world is becoming more accepting of online meetings and events at least during the lockdown. How much will this remain in China and outside after the pandemic remains to be seen but he is positive that the lessons learned during this difficult period will also help him when the pandemic is over.

Company B is a very young company—about a year old—run by three people altogether. Mr. Sun is the young co-founder of the company which focuses on orga-nizing educational tours for high school students in smaller cities in China to visit top universities located in Beijing and Shanghai. These tours are mixed with lectures by the faculty and experts providing an experience of university and also helping the students and parents understand different majors and future career paths. Before the pandemic, this company was on the way to take-off with four top universities of China as main partners, working out plans for students to stay in Beijing and Shanghai in hotels that have also agreed to become partners to provide accommo-dation, food, and venue for group activities to the visiting students and parents. His company was on the way to scaling up the operation by acquiring more high schools and strengthen trust with them with the long-term ambition of enlarging the scale of impacts all across the country and beyond.

The onset of the pandemic shook the whole foundation of his business. For one thing, all the tourism-related businesses have been cut off by the government under the strict traveling restrictions. Even the movement of goods became restricted for a time, not to mention the movement of teenaged students in groups from one city to another. For another, the key competence of the education tour lies in the trust from the schools that agree to cooperate with his company. During the pandemic, the safety of students became any school's top priority, and no one in managerial roles of a school is willing to run the risk of being called responsible for even the smallest possible chance of exposure of the students to the virus. High schools gradually opened classes starting from around mid-April but as of May 2020, no school in China allows anyone not immediately working or studying at the school into campus and this applies to universities too. Schools agreeing to organize students in a group tour to visit universities in other cities has become too much of a risk: it will probably remain so for a while longer after everything else returns normal.

As a graduate of a top engineering school in China with a degree in computer engineering, Mr. Sun is familiar with all the technologies that are being tried in education, such as VR or preference algorithms and so on. His business before the pandemic, however, focused on communication skills and he was not very keen to explore these technologies as an option for his business. The pandemic changed the situation. Demand collapsed totally but he is not particularly worried about the profit. The company does not have an urgent financial problem for survival: it has enough investment from before the pandemic to survive several months and a small team of three people does not require much anyway. He is aware of various financial support from the government but does not feel the need even to actively inquire about them for the time being. The problem is being forgotten by the existing customers and partners as well as the pressure to do something to remain in touch. Hence Mr. Sun's company has started to actively switch their business to online lectures and consultation, utilizing existing social media apps and platforms. The company has already held several online events to guide parents and students to learn more about university education, different majors, and how best to prepare to get into good universities. Currently, he is focusing on increasing the quality of the consultants and guest lecturers at the same time as finding ways to maintain and expand customer-base as well as gain their trust. As of now, the company is still exploring and experimenting with different operational models, contents, and core services, and feeling its way into the new set of rules regarding cost and income in this new market.

Overall, Mr. Sun feels that the trust between him and the clients is somehow more stable than before. He attributes this, in part, to the fact that all stakeholders in education have now experienced and got accustomed to the online channels. His instant messenger account is becoming inundated with questions from anxious parents and it became easier for him to deliver advertisement of his company's activities to parents and other partners. There is also a sudden increase in the number of contents and platforms. This in turn gave parents and educators plenty of exposure in different platforms and contents, making them more seasoned reviewers of online education products. Apart from the changes in customers, he also thinks that there is an important change in the industry due to the pandemic. Boundaries between different

types of businesses are becoming thinner and educational businesses are no longer simply delivering courses to students: it already blends tourism, event management, media/contents creation, and various types of consultations including education, employment, and business. At the same time, the online environment is making the branding power of existing national or international extra-curricular education providers less important than the contents they deliver. For one thing, parents, who pay for the education, now has the chance to screen the actual contents of the education and observe their children's reaction more closely than when the education was happening behind the closed doors of the classrooms.

Looking ahead into the post-pandemic period, Mr. Sun thinks that there are too many companies crowding into online education, exploring all sorts of areas of information gap for an opportunity and he thinks it will be too risky to regard online education as the main market for him. Furthermore, he started this business to help students and parents get better prepared for universities and to help them make informed choices about higher education. He also believes that knowledge is best acquired through experience. For this, he thinks online platforms are too limited and, although he is likely to keep online-based events as a way of maintaining contacts with new clients, his company will return to off-line based experiential tours and consultations as the main focus of his company.

Company C is another education-related company that focuses on providing science and innovation education for teenagers. The company started in neoBay about six years ago but finished its incubation period and has moved out of the facility of neoBay in November 2019. Earlier on, the company used authorized course materials developed by other companies to deliver computer-related education. Recently, however, Mr. Qian and 10 employees of the company put much effort into developing their own material that delivers more than coding training, aiming at increasing innovation and design capacity of teenagers in China.

Before the pandemic, Mr. Qian's company had operated offline to expand the influence of its products and to put its self-designed courses to practice. Although he had put some resources and time into making content deliverable online, it was designed to be used by a trained teacher in the face-to-face classroom situation. The outbreak of the pandemic has made his offline-based business unable to continue and forced him to reconsider the online option. Nevertheless, he remains cautious in moving his business online. This is not because of his lack of understanding of technology—he holds an advanced degree in computer science as do most of his employees. There are too many companies moving education online and the official education is also taking place online. Fierce competition, for one thing, makes it difficult to make enough profit to balance the efforts in developing content and maintaining online-based educational operation. For another, students are getting their official school education online, sitting at the desk in their home, watching the computer screen all day. This is more than enough online time for a day for many younger children. Parents are becoming worried about the health and the eyesight of their house-bound children staring at the computer all day and they are less and less likely to sign up for extracurricular activities online. Hence, increasing competition

over decreasing the market is what is happening to the extracurricular online educa-
tion, and he does not think it wise to put the company's resources into developing
online courses forced by the circumstances. He prefers a model that combines online
and offline courses and offer different design based on customer needs. He thinks
the online model is probably more suitable for university or high school students
while younger ones will need more offline time. For the time being, Mr. Qian is
outsourcing his team's skills to develop apps, software, and online content for other
companies instead and is also exploring the possibilities of opening a not-for-profit
subsidiary to provide innovation and design education to underprivileged students
and get grants from foundations.

Previous three companies are in the typical service sector and suffered from the
loss of the customers but the following three examples are technology-based startups
that produce disinfectant (Company D) and Robots (Company E and F). Of these
three, Company D and E are both currently being incubated at neoBay Venture Capital
and they are examples that found new opportunities during the crisis, and Company
F however is a representative case of a startup suffering from the investment freeze
during the pandemic.

Company D was established in February 2017 and its main business is producing
disinfectant. It currently employs close to a hundred workers and for apparent reasons,
this is a company that faced the opposite problem from the three previous examples
in that they met a huge increase in demand due to the pandemic.

Since the pandemic became a global phenomenon, the company has been receiving
orders from all over the world (except for the USA) and received 20 million RMB
amount of orders just in March and April 2020. The challenge for the company was to
meet this sudden increase in demand. Travel restriction proved to be the major huddle.
On the one hand, the supply chain had been broken as suppliers of some crucial
materials became difficult to reach and factories were not operational in response to
the government's policy of lockdown. On the other hand, travel restrictions disrupted
the movement of goods and business meetings. The company had to quickly build up
the capacity to meet the sudden increase in demand under such circumstances that
meant hiring more workers who faced overtime works, identifying and preparing
more factories, and at the same time managing international customer relations.
According to Dr. Yan, the founder of the company, government support was crucial
in making all these happen, and being in neoBay made it easier to communicate with
the government. The first significant increase of the order since the outbreak of the
pandemic was the government in line with the policy to promote entrepreneurship
and at the same time fight the spread of the virus. Then, the government directly
provided funds to help the company build factories to speed up the production process
and gave travel permits to the company's staff so that they could move across the
country bypassing the lockdown and negotiate with more factories and suppliers.
The government and neoBay also helped the company to get loans from various
SME stimulation funds from banks while also providing tax breaks and lowering
rents which all other SMEs received for the hardest period of the pandemic.

The experience of the company has left them with a large customer base all over
the world and now it is exploring to utilize this newly acquired asset to new business

opportunities in other areas where the company can exert impact through a new line of medical products as well as disinfectants for households and communities.

Company E is another technology startup that was established in neoBay in November 2017 and started operation in April 2018. The main business of the company is producing robots for smart manufacturing, integrating AI with manufacturing robots. Until the time of the pandemic, the company's main clients were manufacturing factories. Since factory production halted and market shrunk due to the lockdown, 2020 would have been a very bad year for the company. On top of that, buyers of the company's robots would require actual demonstration that no online meetings can satisfy and the nation-wide lockdown would have affected the company negatively in this respect as well. According to the marketing manager Ms. Liu, during the pandemic, the company did try some online meetings using video demonstration of the products with the customers, but it proved to be less effective than real offline demonstrations.

Nevertheless, the company responded to these challenges of the pandemic in an active and timely manner by putting efforts into redesigning their robots to help fight the pandemic. To be specific, the company came up with five kinds of medical apparatus and instruments that can be deployed at hospitals: mobile food delivery robots, drug delivery robots, waste disposal robots, patrol robots to measure temperature and intelligent disinfectant. According to Ms. Liu, the invention of these robots coincided with market demands and social requirements. And the sales of these products and the cooperation with more partners helped the company not only to survive but prosper during the pandemic. Ms. Liu has an interesting story behind the invention of a patrol temperature measuring robot. On the eve of Chinese New Year, Dr. Zhang, the CEO of the company, received a phone call from one of his friends who worked at a hospital, complaining about the inconvenience of the temperature measurement system in hospitals. After receiving this call, Dr. Zhang immediately called his team to research and develop a new product to help solve this issue utilizing their specialty in AI-empowered robots. The whole of the technical team worked without rest for three days, over the Chinese New Year, and finally got the prototype built. When the pandemic swept across the country in force after the Chinese New Year, the company was ready with the very product that the country and the world needed.

Similar to the case of the company D mentioned above, company E also received similar support from the government and the new product helped the company open up a new market with customers from all over the world. The success was also, in large part, due to the dedication of the team that worked efficiently and tirelessly to develop and introduce new products as well as making upgrades and customization to meet further customer needs. According to Ms. Liu, this has been a very different experience from the standardized procedures and routine cooperation that the company had for years before the pandemic with manufacturing factories. They were also working with different and more diverse customers such as hospitals, schools, and even some tourist attractions. This led the company to develop more varieties of robots compared to the time when they were only working with factories, providing more challenging tasks for the team. All these led to the company becoming something very different from what it used to be before the pandemic,

they became an even more closely knit team than before and this transformation will remain after the pandemic. What made this possible? In answering this question, Ms. Liu, echoing the CEO of the company Dr. Zhang, emphasizes the word 'responsibility' as against 'opportunity'. What motivates the individuals to work in teams to put more effort even during the biggest holiday and continue to work together towards moving target is the sense that they are doing the right thing for the society, rather than doing a clever thing to increase the company's profit. It is this sense of responsibility that gives the team a sense of joy in making a positive contribution to the world through what they do.

Company F is also a technology-based startup company in robotics that specializes in designing cleaning robots. Established in 2017, it was growing smoothly before the pandemic and started another round of investment in November 2019. Then the pandemic happened to interrupt the whole process of seeking investment. The same policy that helped Company D and E worked against this company. As we examined in the case of company D, many factories were reoriented to produce equipment and material necessary to fight the pandemic. One of the key components for the cleaning robots is the brushes, and during the pandemic, those factories that make brushes for cleaning robots were 'recruited' to make masks and other medical supplies: workers in these factories were either occupied or forced to stay at home. The shipment of other raw materials and components was also disrupted. The orders placed before the pandemic was delayed for about two months and did not recover until the second half of April. Besides, as company E experienced concerning their key product before the pandemic, company F also faced difficulties in getting new contracts with customers due to the lack of the means to demonstrate the product and services. On top of that, many of his target customers, which include hotels and restaurant chains, were undergoing difficult times of their own due to the travel restrictions.

Financial troubles were inevitable for this company. Investment deals that had started in November 2019 have not finalized and made no progress since the Chinese New Year. Mr. Yao, the founder of the company, tried many other potential investors but has not been successful so far. This is pushing him to go into 'hibernation' mode. At least, he found some help from the government policy. Shanghai municipal government gave it a full three-month delay of payment, of social security accumulation funds, saving up to 20 thousand yuan per month per employee. Mr. Yao is not worried about survival. He hopes that the venture capital will eventually resume normal operation in May as well as his suppliers and customers. Venture capital or other forms of investment are coming back, staying alive and active in the first week of May. He predicts exponential growth for intelligent robots in the future and emphasizes the significance of offline life as human life is still mostly anchored in the real world, not in the virtual online world. To be more specific, even after the pandemic, the restaurants and hotels would still be recovering from their loss during the pandemic and continue to suffer from low demand, high rents, and high labor costs, it would be natural for them to switch to robot employees rather than a real human who desire

monthly wage. According to Mr. Yao, the pandemic did not destroy his business but "it's a delay in responses, and you need to have guts and stick to your intuition and instinct."

8.3 Discussion

The key findings from the cases can be summarized in Table 8.2.

There are not many surprises in terms of the opportunities and challenges created by the COVID-19 pandemic for the startups in China. The pandemic created some opportunities through increased demand in existing products (disinfectants) or new market (thermometer robots) as well as government incentives in activities related to fighting the spread of infection but it proved to be a challenging time through diverting customers into online and freezing investments. The policy of lockdown as well as the diversion of resources to fight pandemic created supply chain paralysis for some businesses too.

Companies that could not find alternative business models went into 'hibernation' or inactive survival (Company F) while others continued to remain active for survival, trying different methods following the migration of the customers into online space, though without a clear business model (Company A, B). One company engaged in bricolage, utilizing existing skills and outsource itself to others, as in Company C that builds apps and software for other companies. Survival was still possible because of the small size and some government support such as tax break, rent cancellation and delays in social security payments. Although none of the companies interviewed received direct financial support from the government or banks for survival, after downsizing and furloughing survival was not a big problem for them.

Companies that were able to make use of the opportunities expanded their businesses during the pandemic. These were companies that had been either producing items that faced increased demand such as disinfectants as in company D, or that could very quickly develop new products that filled the market needs. The existence of a motivated and skilled team as well as government incentives also played an important role in such expansion. The relationship between different impacts of the COVID-19 pandemic and the responses are summarized in Fig. 8.3.

There are not many surprises in both the impacts of the pandemic on startups. There are, however, some important lessons we can draw concerning the responses to the challenges and the future of the post-pandemic world.

Table 8.2 Key findings from the cases

Company	Challenges	Responses	Prospects for post pandemic period
Company A (cultural immersion tourism)	Loss of customers due to the ban on international travel	Job cuts, salary cuts, increase communications, create virtual tours and online events	The online components are inevitable currently, but it is hard to say if these will become a part of the central business model in the post-pandemic period. The evaluation will have to be made later
Company B (educational exposure)	Loss of customers due to lockdown (domestic travel and nonessential crowd gathering ban); lack of online-based business model	Exploring online-based events using existing social media platforms to maintain contacts with customers	Returning to offline-based experiential tours but supplementing it with online events to acquire, maintain, and grow customers Boundaries between different types of businesses are becoming fuzzier and the contents will become more important than brands in the future of education business
Company C (Innovation and design education)	Loss of offline customers; stiff competition for online education; parents and students becoming tired of too much time spent online	A mixed approach combining online element and offline interaction Providing app development services for other companies Exploring not-for-profit subsidiary funded through grants	Companies are going online not because of this is an opportunity but because this is the only option at the moment He expects online education to supplement the offline model not replace it
Company D (Disinfectant)	A sudden increase in demand; broken supply chain	Expanding team; Received government Support	Expand the application of the existing product and target market. Build international cooperation
Company E (Smart Manufacturing Robots)	Decreased demand in the existing market; logistics disruption	New product focusing on social needs; received government support	New business approach, new customers, new market

Table 8.2 (continued)

Company	Challenges	Responses	Prospects for post pandemic period
Company F (Cleaning Robots)	Production halt; supply chain disruption; lack of investment	Hibernation	Demand for robots to replace manual labor will increase
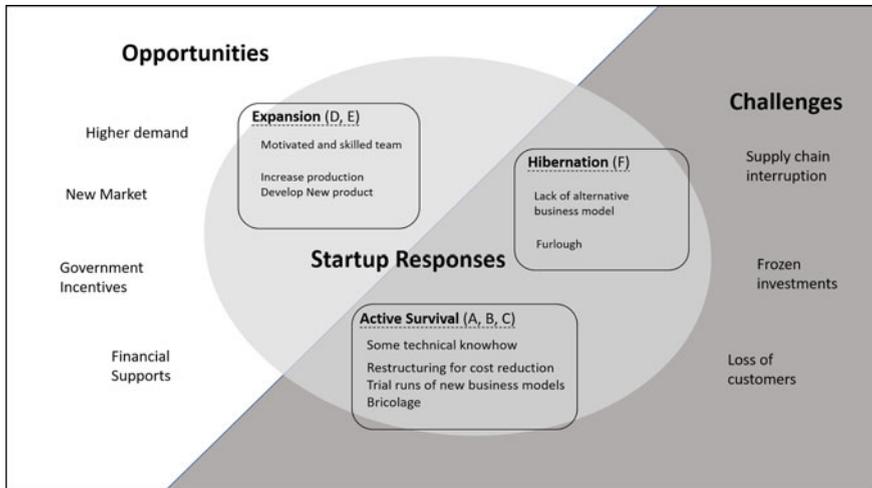
Fig. 8.3 Startup responses to COVID-19 opportunities and challenges

8.3.1 Use of Online Technologies

There was no doubt a shift to online education. The shift was very sudden, with many users and providers of education not having online experience. COVID-19 even expanded the online education to a new user base of kindergarten and primary students (Kologrivaya and Shleifer 2020) shifting over 278 Million students online. The managers of two companies in education that we have interviewed all had some background in computer engineering and are not expected to face particular technical difficulties in moving online. Company C had experienced providing online education services before the pandemic. The current study reveals, however, that there are reasons for caution towards online-based services as a replacement for the face-to-face interaction even during the lockdown. Although it might be true that students, parents, and teachers have become more accustomed to online-based teaching/learning, this does not mean it will be appropriate for all ages. Parents of young children are becoming worried about the lack of outdoor activities by their children and the same concern should also be a concern for older students and teachers. Also, the current exodus to the online environment is more because there is no other

option than because the businesses see the benefits or profits out of it. Many of them seemed to have dipped into online services without a clear business model or pricing plan and once this experiment is over, there will be a calculation of cost and benefits through which businesses will have to make their own decisions regarding the mix of online/offline components. How many of them will remain or even utilize online components remains to be seen. Even for companies with technical knowledge, developing new online business and content takes time and resources but the market is already saturated and cannot guarantee a profit. Besides, the effort spent to acquire the technical support for the shift to online may not pay off because the competition is too stiff, and since it may not be used in the post-pandemic period.

Online-based interaction also has limitations in replacing face-to-face meetings and visits from which important business deals are made. Both companies E and F that build robots for institutional buyers before the pandemic found that they could not effectively replace face-to-face demonstrations with online demonstrations, as the latter could not generate enough sense of trust in the potential customers. A similar problem can be raised regarding the lack of investment during the lockdown. One reason that investment in startups froze during the lockdown is that the investors need face-to-face meetings observing the applicants and their team in the place of their work to get full information that the applicants themselves do not reveal voluntarily. This is especially true for venture capital which invests in people. Since the investors have many uncertainties about the future and how they want to use their money, investors require multiple meetings with companies before they can decide to go ahead with investing in the company. Not able to meet these startups in person makes it difficult for investors to gauge the progress and trustworthiness of the investment. Whether this kind of business meeting can be replaced by an online concall is questionable. Even with the promise of blockchain technology that ensures a possible decentralized method of building trust among the two parties, (Liang et al. 2017) to make such principle apply to the subjective field of VC investment is not going to be easy. As the VC capital insider points out, "sometimes it is entirely based on people and the feeling they give out. You cannot get it from an online conversation, website, or documents transferred over email".

8.3.2   The Role of Entrepreneurship Ecosystem for the Startup Survival

Observing all the cases, it is important to note the role played by the government and other components of the entrepreneurship ecosystem involving VCs and incubators. Company F is an example that faced challenges due to government actions during the pandemic. The policy to divert available materials and resources to factories manufacturing for the needs of the pandemic was a necessary move but it broke the supply chain of startups that use the same resources. Yet, it also benefited from government policy to delay social security payment for employees that was crucial

for its survival. From the start of the official recognition of the outbreak and implementation of lockdown policies, various governments in China, as in other countries, provided supports for the startup companies to survive. For example, the Shanghai Municipal government, as well as the Minhang District government, issued policy measures including:

- Increasing the financial assistance for enterprises to alleviate the difficulties
- Increase the subsidies for stabilizing positions of enterprises
- Supporting key epidemic prevention materials supply and marketing enterprises to expand production (Shanghai Municipal Government, February 7, 2020; see also *Shanghai Bendi Daily*, February, 12, 2020).

Not only for survival, but the government efforts to fight the pandemic can provide an opportunity for a company in the right business area. Both the company D and E were helped by the government in lining up factories for production and developing sales channels. For these companies, finding financial resources to fund the new opportunities for expansion was a key to success.

This is the point where an entrepreneurship ecosystem can play a vital role in the survival of startups. The entrepreneurship ecosystem provides a meeting place for the government, banks, and startups creating a sense of mutual trust between all the parties involved. This helps bridge the information asymmetry between financers and startups and provides each party with the necessary trust to start the conversation that leads to deals. Both companies D and E, that experienced a tremendous increase in production during the pandemic were able to do so because of the loans from banks arranged through the neoBay and it only took 2 weeks from initial contacts to the delivery. Apart from these two examples, neoBay has helped 25 companies receive special grants issued by the Science and Technology Commission of Minhang District; it also helped dozens of companies receive special low-interest loans from Shanghai Minhang Bos Rural Bank during the pandemic taking advantage of the simplified procedure by-passing conventional credit application process. Apart from finance, neoBay works as an information-sharing platform for available resources and promotional policies by the government, it also provides connections with companies both inside and outside the ecosystem, from SMEs to Fortune 500 companies, to help companies access horizontal and vertical integration. It also provides other services such as mentorship and all of its services have been available online from the period before the pandemic. With the establishment of the IEIE in 2019, now such benefits have expanded to international markets and business partners through international co-incubation processes. All of the 470 startups in neoBay have survived the lockdown and such findings are consistent with what has been observed in Germany by Kuckertz et al. (2020) in that "startups rely heavily on the support of their entrepreneurial ecosystem to manage the crisis" (Kuckertz et al. 2020, 8).

8.4   Concluding Remarks

As mentioned at the beginning of the chapter, there is a good amount of gloom over the future of startups with a sliver of hope for them lies in their ability to adopt a technology-based business model successfully. This chapter provides some insight based on the experience of the businesses in China that met the full force of the "Great Lockdown" before any other country. Although this case study cannot be a comprehensive representation of the whole story, some implications become obvious. First, the investment freeze is real, and this reveals the limits of online and ICT technologies in assisting VCs in making investment decisions. This is due to the limits of online-based communications in delivering contextual or ambient information and other non-deliberate information to the participants. The same reason limits the ability of the online-based medium in making important business deals. Second, despite this, startups can survive. Some necessary adjustments in the workforce and operational procedures can be painful, but due to the small size, startups can survive after downsizing for a couple of months. Third, some startups can utilize technology to create a new market but this needs much more than technology. Versatile and motivated team to make the shift in the product, services, and business models in time; access to information regarding government support; ability to fund the expansion—all these non-technological elements become important factors. Fourth, the current trend in online utilization will leave a certain mark, but whether it will be a replacement or a disruption to existing industries in service, even in education, depends on the assessments of the online-based learning experiences during the current lockdown including the self-assessment by the business owners of their experiments. Finally, the current lockdown is providing an opportunity for all to experiment with things online and makes the society look for technological solutions but for this to become an opportunity much more than knowledge of technology is needed, and an entrepreneurship ecosystem can provide a platform to link all these resources, information, and network to help individual startups weather the storm.

Authors' Insights

Although VC investment has not fully recovered, the doomsday scenario of six months' freeze wiping out the majority of startups as cautioned by the World Economic Forum does not seem likely, at least in China. Yet, there are some visible signs that investors are becoming more cautious in venturing into startups, creating the tendency for the investment to concentrate on a few promising projects. As VC insiders told us during the interviews, "investors compete against each other to get

their fingers on few good projects, while most of the projects cannot find investments". Therefore, the pandemic and the post-pandemic world will still be a testing ground for entrepreneurs.

To be able to remain standing in such a harsh environment, a versatile team, willing to try different methods, able to work with different partners to serve a different market, will be needed. Inclusive entrepreneurship ecosystems can provide entrepreneurs with means of exploring a new market, chances of acquiring required skills at a lower cost, and access to resources or support by providing extra trust to buyers or investors. Most of all, entrepreneurs need to be passionate about their mission that stays true through changing circumstances and compromises: the passion that enables them to motivate themselves, their teams and inspire others around them; a sense of purpose that guides them through the storms of disruptions and works as an anchor around which changes are purposefully made, not being aimlessly tossed by the winds and waves of the storm; a sense of achievement that comes from the conviction that their products and services are making positive contributions to the world.

The post-pandemic world will be different. The coronavirus-19 pandemic has brought significant loss and damage to the whole world and has changed the way we live, work, socialize, and think. Even when this pandemic is over, we will still see another pandemic or similar challenges in the future. We need to solve the present and future problems in a new way. Entrepreneurs need to use their wisdom and ability to contribute to a better tomorrow. Changes in society often provide abundant opportunities for innovators and entrepreneurs. Facing the challenge bravely, abandoning the shackles of the past but thinking from the perspective of the future, this might well be the best time for entrepreneurs.

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Chapter 9
Enhancing Transportation Service Experience in Developing Countries: A Post Pandemic Perspective

Emmanuel Mogaji, Ibrahim Ayoade Adekunle, and Nguyen Phong Nguyen

Abstract The impact of COVID-19 on human activities has been immense, and the consequences are still unfolding. The arrival of COVID-19 has changed the provision and delivery of transportation services. This chapter specifically focuses on the anticipated post-pandemic changing nature of the service and service industries with particular reference to the Nigerian transport industry and its post-pandemic outlook. Nigeria, a developing country with existing underlying economic challenges, weak transportation infrastructures, and a growing population, faces a multitude of challenges adjusting to the 'new normal' post-pandemic. This chapter contributes to the emerging literature on the impact of the pandemic on developing countries; it presents the opportunities and inherent challenges for services providers, service design and service quality and improvement. The study recognises the impact of poor infrastructure on transportation and ardently on transport services provision and service system and process. Managerial implications for government, policymakers and transport services providers were also provided. Transportation service providers also need to redesign and co-create value in their services in recognition of an immediate transition of service processes, effectively communicate and engage with the customer through social media and other platforms and ensuring technology-enabled customer encounters.

Keywords COVID-19 · Pandemic · Nigeria · Developing countries · Transportation · Service experience · Service design

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9.1 Introduction

The impact of COVID-19 on human activities has been immense, and the consequences are still unfolding. Its impact on transportation is also well acknowledged, but the dimensions to which COVID-19 affects transportation as a critical service industry remains ambiguous. This paper moves beyond the recognition of the impact on dealing with this image in the "new normal" (post-pandemic). This study specifically focuses on dealing with the impact of this pandemic in developing countries. It is essential to recognise that while the pandemic is threatening every country, developing countries do have their fundamental economic and structural challenges, which make them deal with these impacts on a different level and scale.

This chapter focuses on dealing with the present and long-term impact of COVID-19 on transportation services in Nigeria. With a population of over 200 million, Nigeria, a key regional actor in the African continent and an emerging economy with underlying economic challenges that persist as it copes with the pandemic. The country ranks as Africa's largest producer of oil and the sixth-largest oil-producing country in the world, with approximately 90% of its export earnings being tied to oil (NNPC 2020). Nigeria has 36 states, and Abuja is the Federal Capital Territory.

Nigeria is one of the world's major emerging economies, which includes countries like Brazil, China, Colombia, India, Indonesia, Iran, Mexico, Russia, South Africa, Turkey, and Vietnam. These are countries with large populations, experiencing considerable changes to their urban structure (Pojani and Stead 2017). These developing countries are facing institutional adversity and with underlying economic challenges that persist as it copes with the pandemic (Mogaji 2020). Besides, as remote work is trialled globally and people working from home, reducing travel needs, power supply and internet connections. Moreover, the large informal economy in Nigeria has often ensured people have to travel daily to work, putting much pressure on public transport and other infrastructure.

The road is the most prevalent and extensively used form of transportation (Nwafor and Onya 2019); used in Nigeria. However, the inadequate fleets of public transport vehicles and sparse road networks present significant concerns for the country pre-COVID, and worse scenarios are anticipated post-pandemic particularly with the desire of transport stakeholders (commuters, operators and government) to adhere to social distancing directives. Nigeria has been one of the most populated countries around the world. The concern of safety placed in the forefront of transport demands of commuters at the time of this global pandemic, the nation is expected to record significant growth in the number of vehicles on the road, leading to traffic congestion and gridlock as well as the shorter life span of transport infrastructure and increased cost of transport facilities maintenance. Commuters lose up to 75% of weekly working hours as a result of traffic congestion (Obi 2018). With more vehicles on the road and transportation of human and goods having to be done in a way that ensures strict adherence to social distancing protocols, the average journey time will almost double what it is now and loss of working hours as a result of traffic even made worse.

In light of the above and coupled with the impact of this pandemic on a global scale, this chapter fills a gap in the understanding of how developing countries can cope with the impact of the pandemic in both short-term and long term. This chapter response to the call for a better understanding of the impact of COVID-19 pandemic on transportation services and how developing nations can deal with the 'new normal'. The chapter is expected to make a theoretical contribution to the study of post-pandemic management and delivery of transportation services, especially in developing countries. Also, it offers practical suggestions for transportation services managers about how to protect transport operators, redesign their infrastructures and services to meet the changing needs of the commuters. Finally, the insights from the chapter should help transport managers, technology developers and government policymakers to make suitable adjustments to the built environment, develop technology to aid service delivery and the integration of other relevant transport technologies.

The rest of this chapter is organised as follows. The next section presents insight into transportation in Nigeria, recognising its unique features and existing challenges. This section is followed by a case study analysis of COVID-19 induced transport service delivery in Lagos, Nigeria. The subsequent section explores measures of enhancing transport service experience in developing countries, citing examples from developed countries and the analysis of the result. It highlights the need for customer engagement, service design and service process. The final section concludes the chapter.

9.2 Transportation in Nigeria

There inherent challenges in managing urban transportation in sub-Saharan Africa (SSA) are daunting (Gorham 2017). The urban land-use patterns, transport governance, decision-making, and financing and spatial structure create challenges that present massive difficulty in managing urban transport (Pojani and Stead 2017). The political and socio-economic state of Nigeria shows a distinct characteristic of urban transportation (Gorham 2017).

To contextualise the impact of COVID-19 on transportation in Nigeria, it is essential to recognise the enormous population in the country and its limited transportation options. These issues could be attributed to the increasing urban populations and the incongruence with the geographic size of the country (Gorham 2017). The railroads in Nigeria are pre-colonial, and they are no longer function optimally (Okoye et al. 2019) while the new rail system is just currently under construction and could be ready until 2022 (PremiumTimes 2018). Lagos State Waterways Authority (LSWA), manages the Waterway, but the use of ferries and boats has not been well received as people feel it is not safe and does not serve most locations. Besides International Airways through Murtala Muhammed International Airport and Nnamdi Azikiwe International Airport, Abuja, road transportation is, however, the most dominant and most extensively used form of transportation in Nigeria (Nwafor and Onya 2019). It involves

(1) the Lagos Bus Rapid Transit (BRT), regulated by the Lagos Metropolitan Area Transport Authority (LAMATA) and currently operated by Primero Transport Services Limited
(2) The Lagos Bus Services Limited (LBSL),
(3) Minibuses (locally called danfo), distinctly painted yellow and carries approximately 12–18 passengers, and they are owned and operated by individuals (See Fig. 9.1),
(4) Taxis and Shared rides like Uber and Bolt
(5) Tricycles (locally called Keke) and
(6) Motorcycles (locally called Okada).

While there is government involvement in transportation services in developing countries, the ongoing dominance of small-scale, informal provision of transport services in most urban contexts has also been recognised (Gorham 2017). This ownership structure presents a significant implication on urban transport governance and responsibility for effectively managing the effect of this pandemic. This suggests that some of these small-scale individual owners may not be financially capable of providing measures to cope with the "new normal", which includes the provision of facemask, hand sanitisers and even social distancing. There are possibilities that they may decide to ignore the social distancing rule and carrying full passengers to keep making the profits they were making before the pandemic.

Fig. 9.1 Image of Minibuses (locally called danfo) in Lagos, Nigeria

9.3   Case Study Analysis of COVID-19 Induced Transport Service Delivery in Lagos, Nigeria

In our case study analysis, we gauge the perceptions of individuals as to whether transport operators and commuters adhere to the social distancing directives while navigating their profit-seeking objectives and transportation demands, respectively. The instrument used as a barometer to generate credible inferences along the path of COVID-19-transportation dynamics in Lagos is presented below. We ask practical questions in our survey of around 334 commuters and transport operators in Lagos, Nigeria and obtained a response of 329, which makes up 98.5% of our entire sample. Questions raised in the survey address the concern for safety, ease/ambiguity of navigating commuters transport demands, surge/fall in transport and desires for an alternative mode of transportation. Participants were also invited to provide thoughts on the impact of COVID-19 on transportation in the state. This submission provided additional qualitative data for the study.

9.3.1   Quantitative Data Analysis and Result

We obtained a 98.5% response rate, with about 329 samples correctly filled and returned. In other sections of the questionnaire, we analysed the demographic characteristics of the respondents. We predicted the post-pandemic changing nature of the transport service industry on observable changes in the transport demands of commuters and the associative fare prices hike at the time of COVID-19. In other climes, we analysed the expected income structure of the transport operators, which somehow determines a proportion of government revenue coming from ticket fees, taxes on transport facilities and so on. Our state-level analysis was based on questions addressing the core objectives of this study distributed along the Likert scale from one (1) to five (5). One (1) denotes no influence, two (2) represents a negligible influence, three (3) connotes indifference, four (4) indicates moderate influence and five (5) shows the significant influence of COVID-19 on transport demands of commuters, the profit-seeking objective of transport operators and welfare enhancement objectives of the government. With the global pandemic still in its active days and social distancing guidelines, the most pervasive option for reducing the spread of the virus, as well as restriction of movement and gathering in place in most cities across Nigeria, the convenience sampling technique became the most appropriate. The non-randomisation experimental approach of the convenience sample technique overrides other forms of data gathering procedures mainly as it allows for experimentation of a group of the respondent or individual respondent within reach. We accounted for outliers by expunging observations with sub-optimal information. We adopted the one-way analysis of variance (ANOVA) to predict the possibility of a significant difference in COVID-19 induced transport service delivery pre- and post-pandemic.

In our baseline inferential statistical analysis, we reported various paths and dimensions to which COVID-19 influence the transport service delivery in Lagos, Nigeria. In Tables 9.1, 9.2, 9.3, 9.4, and 9.5, we showed the demographic characteristics of our dataset, including age composition of the respondent, categorisation of transport stakeholders, available transport modes, and the transport outlook in Lagos, Nigeria in the time of COVID-19.

Table 9.6 presents the result of the one-way analysis of variance test to gauge the possibility of a significant difference in COVID-19 induced transport service delivery during pre-pandemic and pandemic. The analysis of variance determines explicitly whether the differences between group means are statistically significant or not. We compared the p-value to the significance level to assess the null hypothesis. In these results, the null hypothesis states that COVID-19 influence on transport service delivery pre-pandemic does not significantly differ from COVID-19 influence on transport service delivery in the time of COVID-19 in the study area. Because the p-value of 0.000 was less than the significance level of 0.05 ($p < 0.05$), we reject the null hypothesis and conclude that COVID-19 influence on transport service delivery pre-pandemic significantly differs from COVID-19 influence on transport service delivery in the time of COVID-19 in the study area. The differences between condition means are likely due to chance and not likely due to manipulation.

This poor infrastructural development, high investment costs are ubiquitous challenges in developing countries alike (Gorham 2017) also presents another challenge for Nigeria. There is considerable reliance on the road, and another transportation option has not been well explored. The built environment has not supported walking, cycling, and other micro-mobility, which poses challenges for the country on how to deal with the impact of the pandemic on transportation.

While recognising these challenges, the subsequent section explores different measures that need to be put in place as commuters and transport providers operate post-pandemic. It is essential to understand that despite these challenges, measures have to be put in place to alleviate the impact of this pandemic both in the short- and long-term.

Table 9.1 Demographic characteristics of the dataset

Gender	$N = 329$	Relative %
Male	177	53.8
Female	152	46.2

Source Authors, 2020

Table 9.2 Age composition

		Relative %
18–35 years	157	47.7
36–50 years	129	39.2
50 years and Above	43	13.1

Source Authors, 2020

Table 9.3 Transport stakeholders categorisation

		Relative %
Workers on essential duties (Commuters and Cab Operators)	91	27.7
Workers on non-essential Duties (Public) (Commuters and Cab Operators)	22	6.7
Workers on non-essential duties (Private) (Commuters and Cab Operators)	89	27.1
Self employed/business owners (Commuters and Cab Operators)	103	31.3
Not employed (Commuters and Cab Operators)	24	7.3

Source Authors, 2020

Table 9.4 Transport modes in the time of COVID-19

		Relative %
Commercial vehicles/motorcycles	172	52.3
Private vehicles/motorcycles	147	44.7
Walking	10	3.0
Cycling	–	–

Source Authors, 2020

Table 9.5 Lagos transport outlook in the time of COVID-19

		Relative %
Hike in fare price	176	53.5
Inadequate fleet/excess transport demand	72	21.9
Gridlock/congestion on major road network	50	15.2
Adherence to social distancing guidelines	31	9.4

Source Authors, 2020

Table 9.6 One-Way Anova result

	Sum of squares	*Df*	Mean square	*F*	Sig
Between group	44.088	4	13.552	26.478	0.000
Within group	175.462	324	0.511		
Total	219.550	328			

Source Authors, 2020

9.3.2 Qualitative Data Analysis and Result

Two hundred seventy-one participants provided qualitative insights into how COVID-19 has impacted their transport service experience. The comments were extracted from the Excel Spreadsheet and copied into Microsoft Word, where they were numbered and formatted. It was later imported into NVivo qualitative data analysis software program (Farinloye et al. 2019). Braun and Clarke's (2006) six phases of

analysis were adopted for the analysis. The first phase is concerned with familiarisation with and immersion in the data, which involved reading the comments repeatedly to understand better how participants were engaging with transport services provision, the fears about travelling during the pandemic and measures they are putting in place to keep safe. From the familiarisation, initial codes were generated. These initial codes correspond to 'the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon' (Boyatzis 1998, p. 63). Third, subthemes (child nodes) related to the main themes (parent nodes) were identified. Fourth, the subthemes were reviewed and refined as it became evident that some of them were closely related. Fifth, when the refined child nodes were considered satisfactory, they were renamed to agree. Finally, the analysis identified three key themes that shape the commuters' experience of transport services.

9.3.2.1 Government Involvement

The participants had an expectation from their government with regards to transportation services. They expected the government to provide solutions to their travel troubles through reducing transportation fees, removing the transport restrictions and importantly, improving the transport infrastructures.

> The government should have a say on the transportation fee because it is extremely high. I have my car, which I started frequently using now because of COVID, but notwithstanding traffic is something else. Govt, please look into it.

> Our government needs to come up with practically workable guidelines that would both place operators and commuters in an advantage position economically and public health-wise so that at the end of the day, it would be a win-win scenario for both parties.

> The government should totally ease the lockdown and open the economy so that everything can get back as normal. Let the transporters stop taking advantage of any situation to hike prices.

The participants reported that the pandemic has put huge pressure on existing inefficient transportation in Lagos State and further suggested that a mega city like Lagos should have a more developed transportation system that can cope with the pandemic and any other emergencies.

> The government needs to provide better public transportation. Everyone can see that we are not ready to be a megacity. The impact of Covid19 on transportation, like almost every other sector, is adverse. There is a great need to evaluate the current approach.

> Bad impact. First, the high cost of transport. Second, scarce transport.

> It has exacerbated the mayhem commuters are often subjected to as a result of heavy traffic congestion on the highway.

9.3.2.2   Business Operation of Service Providers

Moving on from the demands from the government, commuters also recognised the role of the services providers and the impact of their business operations. Participants noted that even with the social distancing in place, they do not feel safe using public transportation as the drivers are not putting measures in places to protect them

> There is no social spacing at all; we were all rushing to get the bus. You would expect the bus owners to take some responsibility, but it seems no one cares. You must take care of yourself. No social spacing on these buses.

> Social distancing not observed, terrible hiking of transportation

> Although fares have been hiked, commuter buses are still conveying passengers at full capacity. Also, for a fast-paced city like Lagos, where the use of "Okada" is the "norm", suspension of commercial motorcycle operators has put a strain on public commute.

There were also concerns around the cost of transportation, these confirmed findings from the quantitative studies, commuters further noted that the transportation prices had been shifted to the passengers.

> The impact of COVID-19 on transportation in Lagos is severe. The cost of transportation has gone up due to the fact that the number of passengers carried by the transport vehicles has reduced and the passengers are made to pay more to augment it. Also, there is a shortage of transport vehicles because some drivers are scared of the COVID-19 and will prefer to use their buses for other purposes rather than for transportation services.

> Less buses and high fares. BRT provided by the government also not available most times.

> Base on the times that I have been out, due to the reduction of numbers of passengers in tricycles from three to two transports has been double.

9.3.2.3   Call for Regulation

As commuters complained about their experiences on public transportation, the lack of protection and organisation, there were concerns about the need for the transportation industry to be regulated. It is important to note that there are many stakeholders in this sector, as there are the individual self-employed drivers, there are the Okada riders and the government owners.

Transportation in Lagos is so disorganised and no wonder it cannot be monitored. It is time for the government to structure the sector, make them accountable, and make people feel safe. They cannot just be increasing transport fare, flaunting social distancing spaces and nothing will happen to them.

In line with the demand for regulation, there are demands for private transportation, which can be well managed and safe. People feel that there is a need for more private investment, recognising the huge population of the state, there is a big market

> We can see that transportation in Lagos is not right at all, and I think there is an opportunity for private investors. Somebody who can invest in boat transportation and do something different.

Cheaper and faster means of transportation will be truly welcome in Lagos.

While we wait for the government to invest in transportation, the private investor might come in to save us. They have banned Okada, but I think there are other business opportunities for transportation service in the state.

9.4 Enhancing Transport Service Experience

This unprecedented time calls for unprecedented action to protect the safety, security and health of transport workers and commuters. This chapter focusses on dealing with the impact of COVID-19 pandemic on transportation services in developing countries. The results indicates commuters concern about the hike in the price of transportation, the inadequate fleet of transportation, which is not meeting the transport demand, the traffic congestion and lack of adherence to social distancing guidelines. There are implications for transport service providers to redesign their offering and the government to provide an enabling environment.

This section serves as the discussion of the result of the case study. It highlights key measures and recommendations, based on customers' insight that emerges from the survey and subsequent analysis and examples from developed countries, to highlight what has been done and what can be achieved in many of the developing countries. These action plans are presented in recognition of customers' need and desire to have a good experience using the transport services.

9.4.1 Customer Engagement

There is a paradigm shift, and customers are more aware and cautious of their health and safety as they use transportation. Therefore, service providers need to engage with customers concerning different actives and measures in place to ensure their safety. There is a massive responsibility of the service providers to recognise the impact this pandemic has had and will have on service provision and, therefore, effectively communicate with customers and all stakeholders. Efforts should be put towards improving customer services, engagement, and communications, and Service providers need to reassure their customers that their wellbeing is important, communicating the changes and adjustments with the customers. New York's Metropolitan Transportation Authority (MTA) has launched a new "Keep them Covered" public awareness campaign to wear a face-covering while riding public transportation (MTA 2020). The new campaign includes digital signage across more than 7000 digital screens, audio announcements in stations and on trains, and more than 7000 printed signs for buses and paratransit vehicles. Service providers can use social media for customer engagement and communication, updating their websites

for relevant information and use various media to engage with the customers (Gökerik et al. 2018; Mogaji et al. 2020).

9.4.2 Service Design

9.4.2.1 Protection of Staff and Commuters

In coping with the new normal, masks, gloves and sanitisers are the new reality of public transportation. Passengers on public transport and stations are expected to wear face coverings in all situations where the social distance rules cannot be maintained. In some countries in the developed world, wearing a mask is being made compulsory. The service design recognises the need to make these protective wears available for staff and commuters. In Moscow Metro stations, protective masks and gloves can be purchased at vending machines and stations' retail outlets. While, in some cases, these masks are provided free of charge, it is crucial to consider the modalities in emerging countries where the provision of the masks may not be financially sustainable in the long run. The affordability and provision can become an issue in developing countries. Service providers may want to consider making this available for customers, provided it is economically viable. Likewise, hand sanitisers will be needed as we move on post-pandemic. These masks and hand gel could be provided by the transport owners to ensure the safety of those using their transportation mode.

9.4.2.2 Protecting Share Rides

Moving beyond public mass transport, there are also concerns for protecting share rides and taxis, taking into consideration they have an increased risk of acquiring the virus, given their close contact with their customers (Yezli and Khan 2020), it is essential to put measures in places that these self-employed individuals are taking responsibilities to protect themselves and their customers. As seen with Lyft, rideshare company, they have made face masks mandatory for their rides, an effort to protect riders and drivers. The rideshare company recently announced a Health Safety Program with new policies, commitments, and products designed to address the needs of our community during this critical time for public health (Lyft 2020). As a matter of changes to the design of the mode of transportation, drivers will have to be partitioned and protected. This, however, provided a different challenge for developing countries where they use different types of transportation modes, which may not make social distancing feasible. There are motorcycles and tricycles where there are close contacts with the riders. The protection of the driver may not be possible; therefore, using a nose mask may be a better alternative.

9.4.2.3 Temperature Scanners

In addition, to service design, there will need to install temperature scanners at terminals and airports to check the temperature of people before boarding. Singapore's Land Transport Authority (LTA) installed thermal scanners at selected stations to provide an additional layer of screening before commuters enter the public transport network. Passengers who have been picked up by the scanners as having a fever will not be allowed to enter the station and be asked to seek medical attention at the nearest clinic(s) immediately. For a start, these thermal scanners have been deployed at Serangoon and Tiong Bahru MRT stations. Other types of surveillance using Artificial Intelligence (AI) are also possible. Kogniz has created a thermal security platform that uses AI to track fevers from a distance, identify exposure risks, and enforce social distancing and protective.

9.4.2.4 Social Distancing Markers

There are physical infrastructural changes that need to be made as transport service providers and commuters cope with the new normal, among which are the social distancing marking to encourage people to leave the required distance between themselves even though they must use public transport. Singapore's Land Transport Authority (LTA) requires all trains and train stations, as well as buses, bus interchanges, and bus stops to be marked with safe distancing stickers. Markings on the footpath, intersections, and at the bus stop to support physical distancing are also encouraged. Controlling the crowd and the insufficient transports infrastructures in these developing countries possess a challenge in implementing this. While commuters are expected to adhere to the spaces that are demarcated, to maintain safe distances from others when commuting, it is essential to have measures in place to enforce this social distancing. The service providers need to put policies and measures in place to support their staff to implement this spacing. Drones for communication, enforcing social distancing rules, and delivery of essential goods like foods and medical supplies. As social distancing will reduce the number of spaces on available fleets, there is a need to increase the number of fleets to meet the growing demands.

9.4.2.5 Co-creating Timetable and Schedule

The transport services need to be redesigned to meet the changing needs of the commuters and also the social distancing policy as long as it is in place (Mogaji 2020). The infrastructural redesign is necessary as part of the measures to enhance the customer service experience. Both the service providers and the government are responsible for the redesign. However, there are possibilities for co-creating the service with the customers. Transport service providers should endeavour to co-creating the new scheduling and timetabling arrangement. The service providers

need to know the travel behaviour as a pattern of the commuters, especially post lockdown, when there could be reduced motivation to travel. The bus that was previously serving 20 people may have to help ten people now, and there are bound to be some inconveniences, scheduling and timetabling will go a long way in easing the pressure. For example, as a way of improving transport networks as a result of COVID-19, Oxford Council reorganised bus routes and timetables to create additional spaces and frequent services. This could also become relevant if there is a need to limit the number of commuters who can enter train stations, ferry terminals, and bus stops.

9.4.3 Service System and Process

9.4.3.1 Infrastructural Development

Government support in enhancing service delivery cannot be overemphasised. However, there are economic challenges in developing countries, and the government will have to bear some responsibilities, either through subsiding the transportation, providing loans and grants to those who want to change their fleets, providing cleaning materials and PPE for drivers and commuters. Oxford Council in the United Kingdom had to temporarily reallocate road to allow people to walk and cycle safely, and this was achieved through road closures, traffic light controlled one-way streets, and broader pavements, segregating network of cycle routes and improving cycling infrastructure like on-street cycle parking. France has announced a scheme to encourage people to cycle more. London had to ban cars from certain roads to reduce the overcrowded pavements and make our daily exercise more accessible and safer. Likewise, Paris had some its streets closed to vehicles after the lockdown and turned into cycle highways, Auckland Transport announces changes to a significant road to increase space for those walking, on bikes and more area at intersections and crossing to reduce crowding and give people space to cross. These examples around the world highlight how the government has worked with transport service providers to ease the journey and allow other modes of transportation. It is, however, necessary to recognise the challenges with developing countries where there are limited existing infrastructure, urban plans and layout has not been designed to accommodate the changes and likewise the economic implication of making these changes, notwithstanding, it is essential to plan for the future, deigning dedicated cycling lane to encourage people to cycle across the cities safely.

9.4.3.2 Contactless and Mobile Payment

In addition to physical modifications done to service delivery, service providers in developing countries may want to adopt technology and integrate contactless and other mobile payment platforms. While this is prevalent in ride-hailing platforms

like Uber and Taxify, other transport service providers may want to explore this cashless payment as they revamp their service system and process. Mogaji (2020) noted that cash payment is predominant on Lagos transport, and this puts drivers and essential workers at a higher risk of spreading the virus.

9.4.3.3   Regular Cleaning and Disinfection

Regular cleaning and disinfection of transport and transport hubs will be an integral part of the service design to reduce the spread of the virus. To increase the protection of taxi drivers and protect them and their passengers from the coronavirus, Dubai's Road and Transport Authority (RTA) has provided a self-sterilisation booth to sterilise taxis, drivers, clothes and shoes as soon as they finish work. The self-sterilisation corridor sprays disinfectant around the body circumference (Oommen 2020). Madrid has made a 9000-square-metres space available for local taxi drivers to clean and disinfect their automobiles for free (Dimitrova 2020). On a long-term plan, transportations service providers may have to consider installing medical-grade air cleaning systems in their cabins to reduce the spread of the virus, which is airborne, possibly. Also, surfaces will have to be protected with long-lasting coasting on materials that will not support the spread of the virus.

9.4.3.4   Evaluation of Service System and Process

As part of the service design, it is essential to evaluate different measures that are in place continually. As commuters and transport service providers engage in the new normal, there are possibilities that some of the measures put in place may not be adhered to. Service providers need to be sure that their staff are not lackadaisical, policies, procedures and guidelines that have been put in place should be strictly adhered to. The government may also have to come on board in a situation where the service provider may not want to respect the social distancing.

9.4.4   Newly Emerging Product-Service Systems

9.4.4.1   Technology in Service Redesign

Technology will play a crucial role in the redesigned service delivery. EnelX, the innovative global business line of the Enel Group, and HERE Technologies, a global leader in geographical data and mapping services, launched "City Analytics—Mobility Map" which provides Italian government agencies with mobility indicators to support in the COVID-19 emergency (EnelX 2020). The big-data solution estimates variations in the public's movements and kilometres travelled throughout national, regional and municipal areas in Italy. Customers' engagement with different

touchpoints can be evaluated to have a better understanding of travel behaviours and service consumption. The technology can also be used to support customer engagement and interaction. AI and data analytics will also become relevant in understanding the consumers' behaviours and changing the services to meet their needs (Dwivedi 2019). AI can be used to identify areas that need more support. There are possibilities for improving service delivery through improvement through digital assistants to meet better the increasing demand and dynamic environmental changes (Schweiger 2020). This digital assistant could be used to substitute for human contact regarding purchasing fare products and supporting less abled commuters (Schweiger 2020).

9.4.4.2 Alternative Transport Mode

As the world copes with the new normal, it is essential to adjust the physical planning of the environment to encourage other forms of transportation beyond just road. There are huge opportunities to provide train transport services, waterway way transport services, and even cable cars. These, however, will hugely rely on government investments in infrastructure and policies to support private investors.

Other means of transportation for those who may not want to use public transport are also possible. David Spielfogel, Lime Chief Policy Officer, described the post-COVID world as the micro mobility's moment (Spielfogel 2020). Lime Bike has also made plans to reactivate small fleets of scooters to meet the growing demand for micro-mobility. Micro mobility devices, including bicycles, Ebikes, electric scooters, electric skateboards, shared bikes, and electric pedal-assisted (pedelec) bicycles, should become an integral part of transportation mode in the post-COVID world. They, however, need to be supported by infrastructural changes to the built environment (Farinloye et al. 2019). The environmental benefits of these additional modes of transportation also need to be considered as more justification for its inclusion. Besides, it opens opportunities for emerging service system for those who are looking for alternative means of transportation.

9.4.4.3 Freight and Cargo Transportation

As public transportation may be significantly hit and slowly recover from the impact of the pandemics, freight and cargo transport may need to be redesigned to meet the growing needs. Commercial truck drivers were exempt from the non-essential business closures and stay-at-home orders implemented by most countries, and this may make many other transport service providers may have to explore this option to remain commercially viable. This could also include exploring railways, which can enhance export markets through coastal ports (Okoye et al. 2019), with little reliance on on-road transportation.

9.4.4.4 Autonomous Vehicles

As people want to avoid contact on public transportation, there is the possibility of an increase in the development and use of autonomous vehicles (AVs) as people will want to avoid contact. Rather than public transport services being operated by humans, robots, who are susceptible to disease and infection, may be responsible for public transport services. While this may not be an immediate agenda for developing countries with more pressing it, it is presented as a plan worth exploring.

9.5   Conclusion

Transportation plays a significant role in the life and the development of a nation. Indeed, several authors both practitioners, professionals and those in academia have all accepted the fact that the life of a nation depends on its transportation systems, not only because it plays an increasingly important part in the nation's daily activities but also of its role in socio-economic and political development of the nation. However, in many developing countries, including the knowledge of the ways and means in which transport can best be planned to fulfil its central role is still very limited. The arrival of COVID-19 makes the understanding of transport infrastructure development even more imperative as commuters, operators and government device new means to navigate their transport demands, profit seeking objectives and revenue generation processes respectivley.

   Without doubt, there is a wide gap between the assumed role of transportation in the development of the countries and the extent to which in practice the development of transport can be put into effective use for the development of this nation more pressingly in the time of COVID-19. The social distancing guidelines and practice of good hygiene to abate the spread of the virus has intensify the need to redesign and reframe existing transport modalities and functions to suit all and sundry. It is in relation to these this chapter is written. In other words, this chapter brings into contemporary focus a detailed account of COVID-19 has impacted transportation, transportation service and logistics in Lagos, Nigeria and highlights through some suggestions on how best the transportation systems and physical distribution of goods and services can best be improved in the time of COVID-19 and the post pandemic. It brings into focus the basic principles of how alternative transportation modes can be explored to reduce the pressure on popular road network and highlights their characteristics and the extent to which they have been valuable and could be valuable to the long term development of the country during the pandemic and post pandemic.

   This chapter recognises that COVID-19 will change the provision and delivery of transportation services, especially in developing countries with existing underlying economic challenges, weak transportation infrastructures and growing population. While it is still uncertain how the pandemic will eventually end, we will see prolonged effects from COVID-19 on all areas of human activities.

This chapter has identified implications for transport workers whose role may be changing as the consumer shift their behaviours and technology become more relevant. There is going to be less interaction due to demarcations that have been installed, a mobile application providing direction and autonomous driving. The changing commuters' behaviour is also recognised—wearing personal protective equipment like a face mask and using hand gel, social distancing, going through temperature scanners and using an alternative mode of transportation like walking or cycling. The role of technology and data analytics in shaping transportation services while recognising the limitations with devices and internet connections have also been discussed in how to cope with the new normal.

This chapter makes key theoretical contributions. First, it contributes to the emerging literature on the impact of the pandemic on developing countries (Adekunle et al. 2020; Mogaji 2020). Second, it provides theoretical insight into service provision post-pandemic, highlighting how the transport service will change as it meets the changing demands of customers. The pandemic is a global problem, and a holistic understanding is needed. Third, the chapter focuses explicitly on transportation services in developing countries. It recognises the opportunities and inherent challenges for services providers, service design and service quality and improvement (Caro and García 2007; Mogaji and Erkan 2019). Four, this chapter contributes towards a study on transportation, travel behaviour and the built environment. It recognises the impact of poor infrastructure on transportation and ardently on transport services provision and service system and process.

Managerial implications for government, policymakers and transport services providers were also provided. Developing countries have their challenges, but notwithstanding, they need to plan and adjust for what lies ahead as stakeholders navigate this precarious time and chart a new path for individuals and many other developing countries. Short-term and long-term plans have been identified in coping with the new normal and enhancing customer experience management. The government has a responsibility to provide the infrastructure that can support transport service delivery while policymakers need to provide an enabling environment for the service providers and prospective investors. Services providers also need to redesign and co-create value in their services in recognition of an immediate transition of service processes (Grönroos 2011), effectively communicate and engage with the customer through social media and other platforms (Mogaji and Erkan 2019) and ensure technology-enabled customer encounters (Lee and Lee 2020). The service provision landscape is changing to align with customers' expectations. The role of technology as part of infrastructural changes to enhance customer experience management cannot be overemphasised. There are huge possibilities for smart service innovation in the developing countries where information about travel patterns and customer engagement can be used to ethically collected, opportunities for cashless payment and enhance customer engagement with services providers through chatbots and virtual assistants.

This chapter has some limitations, which we hope future studies will address them. Participants were recruited from Lagos Nigeria, a state with a population of over 20 million people. Therefore, the number of participants in this study is not

a representative sample. Likewise, the data collected may not represent the travel behaviour, impact, and experiences of commuters in Nigeria or other developing countries. Future studies may want to explore the impact of COVID-19 on services provision using a larger sample and to replicate the study in many other developing countries

The qualitative insight from this study was based on the open-ended questions that commuters' answers during the survey, future studies may want to carry out proper interviews with commuters to generate qualitative data which will provide more insight into the experience of transport services. Besides, services providers were not surveyed as part of this research due to the time constraints and logistics in reaching out to the future research should endeavour to surveyed service providers to understand how their service delivery has changed, their value co-creation process and measure put in place to ensure customer satisfaction and safety. Likewise, future research can engage with policymakers and government officials to understand their responsibility to enhance transport service delivery and commuters' experience.

Appendix

SUMMARY OF THE QUESTIONNAIRE

Are you resident and presently in Lagos at the time of filling this questionnaire?

[ ] Yes

[ ] No

What is your usual mode of transportation in Lagos?

[ ] Public Transport

[ ] Private Car/Motorcycle

[ ] Walking

[ ] Cycling

From your experience, what has been the major impact of COVID-19 on Transportation in Lagos?

[ ] Cost of Transportation

[ ] Shortage/lack of Transportation mode

[ ] Traffic congestion

[ ] Social distancing

What is your usual mode of PUBLIC transportation in Lagos?

[ ] BRT

[ ] Danfo

[ ] UBER/Taxi

[ ] Keke/Tricycle

[ ] Okada (Motorcycle)

[ ] Ferry

[ ] Train

Since the outbreak of COVID-19, have you experienced a rise in the cost of transportation? Has transportation become more expensive?

[ ] Yes
[ ] No
How has the coronavirus impacted your transportation within Lagos?
[ ] 1—No impact
[ ] 2—Minor impact
[ ] 3—Neutral
[ ] 4—Moderate impact
[ ] 5—Major impact
How has the coronavirus impacted your economic activities?
[ ] 1—No impact
[ ] 2—Minor impact
[ ] 3—Neutral
[ ] 4—Moderate impact
[ ] 5—Major impact
How has the coronavirus impacted your social activities (visiting friends, attending parties, going clubbing)?
[ ] 1—No impact
[ ] 2—Minor impact
[ ] 3—Neutral
[ ] 4—Moderate impact
[ ] 5—Major impact
How has the coronavirus impacted your religious activities? (going to church, going to the mosque, Easter or Ramadan).
[ ] 1—No impact
[ ] 2—Minor impact
[ ] 3—Neutral
[ ] 4—Moderate impact
[ ] 5—Major impact
How likely are you to keep observing the lockdown?
[ ] 1—Extremely unlikely
[ ] 2—unlikely
[ ] 3—Neutral
[ ] 4—likely
[ ] 5—Extremely likely
How likely are you to consider alternative travel mode?
[ ] 1—Extremely unlikely
[ ] 2—unlikely
[ ] 3—Neutral
[ ] 4—likely
[ ] 5—Extremely likely
How likely are you to use a Bicycle or walk?
[ ] 1—Extremely unlikely
[ ] 2—unlikely
[ ] 3—Neutral
[ ] 4—likely

[ ] 5—Extremely likely
What Local Government Area do you reside? _____
What is your Employment status?
[ ] Essential Worker (Nurses, Doctors, Food seller)
[ ] Non-Essential Worker (Public)
[ ] Non-Essential Worker (Private)
[ ] Self Employed/Business Owners
[ ] Not Employed.
What is your Age group?
[ ] 18–35
[ ] 36–50
[ ] 50 above
Gender
[ ] Female
[ ] Male
Open-Ended Question: Any closing thoughts, experience or description of transport services in the state?

Author's Insight

Transportation is essential to the economy since it aids the mobility of human, goods and services. Despite its established importance, there is little infrastructural investment from the government in developing countries to meet rising transportation demands of its populace. Underdeveloped and unexplored alternative transportation modes relative to the road transportation options have kept enormous pressure on the existing road networks and facilities leading to traffic congestion, pollution, accident and more significant concerns of public health deterioration.

The arrival of COVID-19 has exposed further the inadequacies of our transport infrastructure development strategies. The novel diseases transmitted from human-to-human has forced upon us new ways of navigating our transportation demands and how transport operators and government can meet up the rising transportation needs of the people. The challenges of transport service and delivery are forcing us to devise better ways of enhancing our transportation system. From the commuters who are conscious of their safety in commercial transit and rise in transport fare, to operators who are concerned about the return on their transport investment, and also the government who are equally worried about revenue generation from tickets, taxes, the rising cost of road maintenance. As we begin to see more people travel in personal vehicles to reduce contact in the time of COVID-19, the dimensional changes to transport service and delivery during and after the pandemic is a challenging but also an exciting discourse that needs to be framed appropriately for policy and research.

Notwithstanding these challenges, the transportation services are being redesigned, and there are new behaviours that are becoming part of the new normal.

To further enhance this experience, the role of government cannot be overemphasised. While the government may increase their effort towards improving facilities and providing infrastructures, we envisage a delay in the timeline, this, however, will spur digital innovations as commuters, and other stakeholders look for alternative solutions to ease their transportation problems. Policy measures to support this innovation is nonetheless essential.

The service redesign needs to consider the policies of the government, so as not to invest where there is no priority by the government. There will be more investment in private transport mode, starting with road transportation with more conducive albeit expensive but private executive transportation for members of the public. There will be more investment in the waterways, encouraging more passengers to use ferry and boats to access cities (in our case study experience, rise in Ferry usage has begun within Lagos during the time of COVID-19). Train transportation, albeit maybe complicated to innovate considering its huge investment. Again, government support is essential to make this work.

For self-employed service providers, it is projected that they will find alternatives to keep themselves viable, possible they will not adhere to social distancing, or there will be an increase in price as their business operation changes and they want to remain commercially viable. It is, however, essential for commuters to change their travel behaviour. This change could either mean working more from home to avoid travel or using alternative means like walking. Many may now want to consider buying a car because it can be regarded as safer, there are however implications on transport congestion as there are more vehicles on the road. Cycling could be an alternative approach, but it may be challenging to integrate into the urban layout of a state like Lagos, perhaps this is a long-term investment, again on the part of the government.

We also projected more improved transport services, where all stakeholders are known, engaged ad monitored. The transport routes are documents, easy to carry out tracing and importantly adopting technology to ease the service provision. The tech companies may take the driving seat in the discussion for a more regulated industry, but the reluctance of the government, policymakers and other groups with a vested interest may not make this achieved quickly. Transport service will change post-pandemic, the government has to support the services providers because they have a crucial role in having a role to play in ensuring the customer's experiences are positively enhanced.

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Chapter 10
Post-pandemic Penury of the Financially Marginalized in India: Coping with the New Normal

Ardhendu Shekhar Singh, Bhama Venkataramani, and Dilip Ambarkhane

Abstract The poor in India are worst affected due to COVID-19 pandemic. The nationwide lockdown though an effective safety measure, has made their condition more pathetic. As per, World Bank 2020 estimates, there are around 50.7 million people in India living in extreme poverty with income of $1.90 per day. The Government of India has announced several remedial measures to tackle economic as well humanitarian crisis but its effective implementation is a major challenge due to enormity of the problem and the large number of affected people. Moreover, the measures announced are based on top-down approach and not on detailed assessment of impact on different sections of the population. The different segments of the poor have suffered from the impact of the pandemic and subsequent lockdown, in different proportions. They have suffered from severe financial losses. In this chapter, we have made detailed assessment of impact of the pandemic on individuals, different sectors of economy and on Micro, Small and Medium Enterprises (MSMEs). The measures announced by the Prime Minister are discussed along with their implications for the poor and MSMEs. At the lowest end of the spectrum, are the migrant labors who are worst affected. They are required to travel for their homes due to loss of livelihoods and require immediate relief. At the other end, are the skilled labors working in organized or unorganized sectors, who have not lost their jobs but are facing reduction in wages. In order to make the systematic assessment of the requirements, we have grouped the people in three categories namely high impact, medium impact and low impact and have assessed the requirements for each category. So also, it is deliberated as to what extent, the government measures address their requirements. The gaps are identified and detailed suggestions are made. Major structural changes

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such as extensive use of information and communication technology, development of on-line platforms for education, strengthening of rural infrastructure, development of health infrastructure, creation of employment opportunities in rural as well as in urban areas and provision of credit and capital have been suggested. Furthermore, suggestions have been made to improve credit flow to MSMEs and for launching temporary social security system for the poor.

10.1 Introduction

The world is witnessing an unprecedented pandemic—COVID-19, triggered by the Corona virus which has brought about situations that mankind was not prepared for. Amongst a range of responses that the world is searching for, one significant area that demands a reasonably fast solution is the way livelihoods and economic activities may be restored in order to bring them back to at least their pre-Covid situation. However, this aspiration seems unrealistic in the background of the magnitude of damage done to economic activities and the uncertainty about addressing the same effectively in the near future. With the requirements of social distancing, the absence of a tested vaccine and no knowledge on how long this virus will prevail, any decision on economic activities will be tempered with the requirements of keeping COVID at bay. There is no denying that this event has completely changed the dynamics of the economic environment—whether it is of the country or a business entity or an individual. It is therefore imperative that they will all have to adjust to and accept the tectonic change brought about in the economic environment as the 'new-normal'.

While this is true for all business entities, it will have the maximum impact on low-income population. Given the vulnerability and already unbanked/less banked position of these low-income consumers they would find it difficult to cope with this health pandemic during the period of infection and will also take a long time to recover from the damage created.

If, we draw an analogy, with the responses of health professional to reduce the impact on the economic condition of people, we will have three sets of people: (1) Low Impact (just got connected with high-impact people)—keep them in quarantine for 14 days—equivalence would be—giving some money and they will be able to recover, (2) Medium Impact—Got infected but have high immunity and will recover—protecting them from competition for some time, give them time and money-they will be able to recover, and (3) High impact—infected and need ventilation—need special package to come out of this situation.

Likewise the pandemic has impacted the different people in different proportions and even amongst the poor, migrant labors are worst affected whereas those with permanent jobs and houses are not affected to that extent. Therefore, we have classified people in three categories namely high impact, medium impact and low impact on the basis of impact of the pandemic. The pandemic and the subsequent lock down have caused considerable financial losses to the people. The financial loss is caused due to reduction in wages, temporary or permanent loss of livelihood.

There are around 50.7 million people in India living in extreme poverty with income of \$1.90 per day (World Bank 2020). It is necessary to classify the poor due to enormity and precipitousness of the problem. There is an urgent need to ensure that relief and rehabilitation measures are implemented effectively and that the poor require help on time. Therefore, it is necessary to decide the priorities and prepare strategy and plan of action. Moreover, the measures announced by the government in response to sudden crisis are based on top down approach without detailed assessment of impact on different sections of people. Therefore, it is possible that there are gaps in the requirements and the measures announced. This chapter identifies such gaps and suggests measures to address these. The measures suggested mainly pertain to financial services sector.

During this, process we will need support of multiple stakeholders like, banks, cooperatives, Mico Finance Institutionsetc. in terms of responding to the new needs of society. In addition, getting data about the victims of economic pandemic is also going to be a daunting task as majority of them are part of unorganized sector in India. So, we need to reduce the information asymmetry and make sure that we do not fall victim to adverse selection.

This chapter is organized as follows. The Sect. 10.2, deals with impact of the pandemic on the poor and the sector wise impact on economy as well as on Micro Small and Medium Enterprises (MSMEs). In Sect. 10.3, measures taken by the Government of India to alleviate the problems, are discussed. The next section deals with implications of the measures by the government on the poor and MSMEs. The Sect. 10.5 deals with classification of the poor and MSMEs on the basis of impact and identifies category wise requirements, government measures and shortcomings. The category wise suggestions for bridging the gap are also given. The next section discusses suggestions by the experts. The Sect. 10.7 deals with the proposals to cope up with the new normal which is followed by concluding section.

10.2   Impact of COVID 19

The Pandemic has impacted labor, both in the organized and the unorganized sector. It has also affected the Micro Small and Medium Enterprises sector and start-ups severely.

a. *Impact on individuals at the lower end of the spectrum.*

The laborers working under Mahatma Gandhi National Rural Employment Guuarantee Agencyare worst affected as they have lost their jobs on account of the lock down. Most of the labor associated with construction companies, factories, supply chains and automotive sector, have lost their temporary jobs.

In addition, small business men such as florists, tailors, washer men, fishermen, folk artistes, salon owners and artisans, and those in seasonal employment are facing deprived of their livelihoods.

As per NITI Aayog Annual Report 2018, 85% of the total workforce in India is in the unorganized sector. The Government of India (2018), reveals that 71% of the regular employees in the informal sector do not have a written job contract. In view of the lock down and job losses, migrant workers are leaving metro cities in large scale, for their native homes.

Thus, the pandemic has caused long-term livelihood shocks and occupational displacement requiring the poor to socially readjust. In this scenario, it is being predicted that India would go into recession, which would further affect the unorganized sector and semi-skilled jobholders. As being reported by Centre for Monitoring of Indian Economy (CMIE), unemployment in the organized sector has increased to 27% (Nanda 2020). It is reported that the lower-rung of the society faces the battle of hunger and poverty—battling an economic pandemic in addition to the health pandemic.

In addition to financial distress, a globally observed development is that social distancing norms, movement restrictions and isolation from community have led to substantial increase in anxiety and depression, drug addiction and violence against women and children (WHO 2020). In India too, the number of domestic violence complaints registered in police stations are reported to have surged during the COVID lockdown (Ratnam 2020).

b. *Sector wise impact on economy*

The impact of the pandemic on different sectors of the economy in terms of Gross Value Added (GVA) is given in Table 10.1.

It is observed from Table 10.1 that all impacted sectors are labor intensive and a majority of them are in the unorganized sectors. Furthermore, the financial sector is worst hit and will be wary of lending—leading to further financial distress. In India, rural areas are relatively less affected by COVID 19 and consequently, the agriculture sector has not been severely affected. This offers opportunities for employment and further investment.

Table 10.1 Sector wise impact of COVID-19 on Indian economy in terms of GVA

Sr.no.	Sector	Impact in percentage
1	Financial, real estate & professional services	−17.3
2	Mining and quarrying	−14.7
3	Electricity, gas, water supply and other utility services	−13.9
4	Construction	−13.3
5	Trade, hotels, transport, communications and broad casting	−9.7
6	Manufacturing	−6.3
7	Agriculture, forestry and fisheries	−1.3
8	Public administration, defense and other services	−0.4
9	Overall average	−9.3

Source Statista (2020)

c. *Sector wise impact on MSMEs*

It is observed that in India, urban areas have been majorly hit by the pandemic and rural areas have been relatively less impacted (BloombergQuint, July 5, 2020). The Table 10.2 gives details of the number of registered MSMEs and the corresponding employment generated in rural and urban areas. (Updated record of unregistered Micro enterprises is not available).
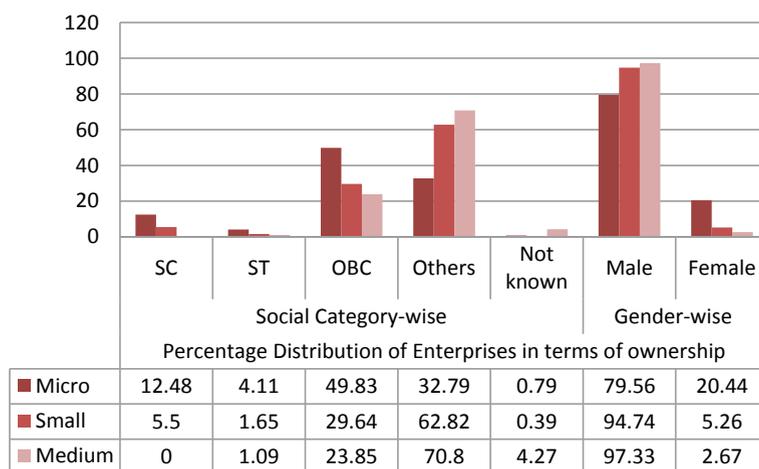
As per Table 10.2, in the absence of information regarding the MSMEs that were impacted by COVID-19 and given that the urban areas were more affected than rural areas, it may be inferred that all the 3.09 crores enterprises situated in urban India were badly affected displacing 6.12 crores labourers from their livelihood.

The social category-wise and gender-wise impact can be assessed from Fig. 10.1 which gives this distribution of MSMEs as on 2019. It is observed that the percentage of Scheduled Castes/Scheduled Tribes category owners of MSMEs is 16.5, 7.15 and 1.09 respectively. Thus, given their social vulnerability, large number owners of

Table 10.2 Details of MSMEs in rural and urban areas 2019 (In lakhs)

Sector/MSMEs	Number of enterprises		Employment	
	Rural	Urban	Rural	Urban
Manufacturing	114.14	82.56	186.56	173.86
Trade	108.71	121.64	160.64	226.54
Other services	102.00	104.85	150.53	211.69
Total	324.85	309.05	497.73	612.09

Source Annual report, 2018–19, Ministry of Micro, Small and Medium Enterprises

	SC	ST	OBC	Others	Not known	Male	Female
Micro	12.48	4.11	49.83	32.79	0.79	79.56	20.44
Small	5.5	1.65	29.64	62.82	0.39	94.74	5.26
Medium	0	1.09	23.85	70.8	4.27	97.33	2.67

Fig. 10.1 Percentage distribution of enterprises in terms of ownership 2019 (*Source* Annual report, 2018–19, Ministry of Micro, Small and Medium Enterprises)

micro enterprises in this category are likely to be affected. Similar is the situation in Other Backward Class category with 49.83% owners of micro enterprises.

Figure 10.1 further reveals that women own 20.44% of Micro enterprises—the highest proportion as compared to women owners of small and medium enterprises. Micro enterprises owned by women are likely to be very highly impacted by the COVID-19 situations. While identifying the affected people and executing the relief and rehabilitation measures, it is necessary to give extra attention to this vulnerable population.

10.3   Measures Taken by Government of India to Alleviate the Problems

The policy response of the government of India had been summarized by the Prime Minister of India, in his address to the nation. He has affirmed that post-COVID India will be strikingly different and that there will be five distinguishing pillars of the new-normal.

The Prime Minister elaborated on each of the five supporting structures namely (1) Economy (2) Infrastructure (3) System (4) Demography and (5) Demand, that will define the new normal (*India Today*, May 12, 2020).

A. Economy: There is going to be a quantum jump in the economy. Two sectors in India have potential for growth and generation of employment. The first being the manufacturing sector, has high potential to grow as India has third largest pool of scientists and engineers in the World. Some of the small units manufacturing hosiery products were agile to re-position themselves and responded to the new requirements by manufacturing masks, hand gloves etc. Similarly, in the health-care sector manufacturing organizations have responded very efficiently to the call of the hour by expanding the production capacity for generic medicines and 'private protective equipment'. In the health care sector, in addition to the manufacturing units, there is wide scope for creation of employment and these opportunities must be seized immediately.

   There is very high scope for its expansion because of the availability of expert doctors and health care professionals in India. Thus Indian entrepreneurs supported by favorable policies of government, financing institutions can take a great leap forward.

B. Infrastructure—An infrastructure that can be the new image of India;

   India will have world class infrastructure through public private partnership. Therefore, construction of roads, waterways, dams and power generation will be taken up in a big way. This will create new jobs in short run. These activities will require skilled and unskilled labor in large numbers. These jobs can be given on priority basis, to the persons who had lost their livelihood.

   Development of industries, business centers and markets should be undertaken across the transport routes.

C. System: As per the Prime Minister's announcement India will create a system that can fulfill the dreams of the twenty-first century.

The government of India has already started taking steps in this direction. As per, the World Bank Ease of Doing Business Report, 2020; India was placed at 63rd position (2019) making an improvement of 14 places from its 77th position (2018). India's ranking improved basically on four parameters:

  i.   Starting a Business—The starting of business is made easier in India by fully integrating multiple application forms into a general incorporation form,
  ii. Dealing with Construction Permits—This cost of obtaining permits has been reduced significantly. For constructing a warehouse, this cost was reduced to 4% of a warehouse cost from 5.7% in the previous year,
  iii. Trading across Borders—A single electronic platform has been developed for submission of documents, port infrastructure has improved and import and export process have been made easier.
  iv. Resolving Insolvency—The processes for resolution of insolvency have been made easier. As a consequence, recovery rate of resolving insolvency has improved significantly to 71.65 from 26.5%. Moreover, the time taken for resolving insolvency has also come down significantly to 1.6 years from 4.3 years.

D. Demography—India's demography is vibrant.
India is the youngest nation in the world with, 62.5% of its population in the working age group of 15–59 years. This proportion is increasing and will be at the peak of 65% in around 2036. This indicates that India has the potential to leverage its demographic dividend for about 15 years and grow economically stronger during this period.

E. Demand—the demand and supply chain need to be utilized and strengthened.
Recovery of Indian economy post COVID will be propelled by huge domestic demand but demand and supply chains need to be strengthened.

The Prime Minister had announced Rs. 20 lakh crore financial package which will touch upon four Ls namely (i) Land, (ii) Labor, (iii) Liquidity and (iv) Law—and added that local manufacturers like MSMEs and cottage industries will be benefited from same (*India Today*, May 12, 2020).

10.4 Implications of the Package for the Poor People and Micro Small and Medium Enterprises

In order to alleviate the sufferings in the short term, the following measures have been announced:

  i.   Food distribution: About two-thirds of the population will be covered under the Pradhan Mantri Garib Kalyan Anna Yojana (Food scheme). Everyone under this scheme will get 5 kg of wheat and rice for free in addition to the current 5 kg

allocation for the next 3 months. In addition, 1 kg of preferred pulse (based on regional preference) will be given free of cost to each household under this Food scheme for the next three months. This distribution will be done through Public Distribution Scheme (PDS) and can be availed in two installments (*Times of India*, June 30, 2020).

ii. Direct benefit transfer: Farmers currently receive INR 6000/- every year through the PM-KISAN scheme (minimum income support scheme) in three equal installments. The government will now be giving the first installment upfront for fiscal year starting April 2020. About 86.9 million farmers are expected to benefit from this immediately.

iii. Mahatma Gandhi National Rural Employment Guarantee Act: (MNREGA) The government of India has started rural employment scheme in 2006. The wage for MNREGA workers has now been increased from INR 182/- to INR 202/- per day. Such increase will benefit 50 million families. The wage increase will amount into an additional income of INR 2000/- per worker. Funds allocation to MGNREGA has been increased by Rs. 40,000 crores.

iv. Economic stimulus measures for MSMEs: The major economic stimulus to MSMEs is Rs. three lakh crores lending facility offered through banks. These loans will be fully guaranteed by the Government of India. There are around 63.4 million such enterprises in India and there are credit delivery challenges which need to be overcome.

   a. Small enterprises are expecting a cash handout for payment of employee wages and tax waivers in addition. The government, on the other hand, is encouraging them reboot by borrowing more, albeit on easier terms.
   b. With increase in eligibility criteria for medium and small enterprises, micro enterprises with investment of Rs. 25 lac and below will be sidelined and larger firms will be eligible.
   c. EPF contribution: Employee Provident Fund (EPF) support for business and workers has been extended for 3 months providing liquidity support of Rs. 2500 crores. In addition, statutory provident fund contribution for those who were covered earlier has been reduced to 10 from 12% (Dhawan, May 13, 2020).

10.4.1   Suggestions for Easing Out the Credit Delivery Challenges

All micro enterprises should be made eligible for additional 20% working capital. Out of this additional disbursement meant for disbursement to the wages etc. should be made in 'near-cash' form using digital infrastructure bank correspondents and payment banks that provide the last mile connectivity.

v. Insolvency and Bankruptcy Code (IBC): Threshold of default under section 4 of the IBC has been increased from Rs 1 lakh to Rs 1crore with the intention

to prevent triggering of insolvency proceedings against MSMEs. If the current situation continues beyond 30 April 2020, sections 7, 9 and 10 of IBC will be suspended for 6 months in an effort to stop companies at large, from being forced into insolvency proceedings.

vi. Regulatory measures: All lending institutions are being permitted to allow a moratorium of six months on repayment of installments for term loans outstanding as on March 1, 2020. Lending institutions permitted to allow deferment of 3 months on payment of interest with respect to all such working capital facilities outstanding as of March 1, 2020.

10.5   Category Wise Requirements, Measures Taken by the Government and Identification of Gaps

The classification of the people in high, medium and low impact categories is done on the basis of financial impact of the pandemic. The pandemic has adversely impacted income of households and the firms and has increased health related expenditure. This has resulted in reduction in consumption of goods and services available in the market. The financial uncertainties have increased the stress within the households. In addition, the lock down has eliminated the possibilities of spending time with the friends or in social gatherings. Such occasions were the easily available to households and individuals in pre-pandemic time, as stress busters. Thus the pandemic has impacted consumption of market as well as non-market utilities (World Health Organization 2009).

The impact is different on the different types of people depending upon their status of employment such as permanent, temporary or causal and also the place of employment viz. migrant or local.

For those who are in acute poverty such as migrant labors, the pandemic has caused severe financial as well as social distress. In some cases, human capabilities are impaired or there is a loss of life. So also, financial distress has resulted into sale of financial as well as physical assets (World Health Organization 2009).

While deciding on the impact categories; we have considered only the current impact of pandemic on household and firms and not the long term effect on their lives. Furthermore, while judging the impact, post-pandemic condition of the poor, is compared with the corresponding pre-pandemic the situation. As such, the assessment is judgmental and not based on survey, estimates or calculations.

The categorization will help prioritizing the resource allocation. In this section we have identified category-wise requirements for revival along with the corresponding measures announced by the government. Furthermore, shortcomings of the measures have been identified and suggestions have been given to fill up the gap. The details are given in Table 10.3. This classification and analysis is done only for marginalized sections of society.

Table 10.3 Category wise matrix of requirements and shortcomings of government measures

	Low impact	Medium	High
Classification	Skilled labour working from Organized and some unorganized MSMEs Those who have not lost jobs, but facing a wage cut	Owners/Employees of MSMEs Self-employed skilled workers, (electrician, plumber, gardener, painter) Such others who are likely to get back their jobs after the pandemic Domestic workers	Homeless and jobless • Migrant labour • Street vendors
Requirements to revive	Short-term loans to tide over immediate financial crunch Consumption loans, for children's education expenses, repayment of EMIs etc. (to ensure that they are not pushed out of the main-stream to money-lenders)	Medium term Financial support with moratorium on repayments Factoring Facilitation and Creation local markets	Livelihood (restore jobs, long-term loans at highly subsidized rates, start/restart small businesses)
Which government measure addresses the requirement?	Deferment of EMI	Support only for working capital Moratorium for six months	Employment under the MNREGA scheme
Shortcomings	No other financial assistance available	No infusion of medium term funds No concessions for losses incurred during lockdown	Commitment of only 100 days employment
What can be done to address the gap?	Short-term loans at reduced rates without collaterals	Leverage Factoring to complement banking services Infusion of medium funds	Create employment opportunities—Technology platform for employment exchange Long-term, subsidized funds for skilled businesses Skilling, re-skilling and upskilling

Source Compiled by authors

10.5.1　High Impact Category

This category comprises jobless and homeless people mainly comprising street vendors and migrant works with many of them having left their place of work for their homes. These are unskilled or semi-skilled laborers. It will be necessary to identify

their immediate requirements such as food shelter etc. Thereafter, affected people should be connected to Government agencies or Non-Government Organizations (NGOs) for ensuring that the schemes announced by the government are effectively implemented and reach these people for whom these measures were intended. This can be done with the help of Panchayats, local leaders.

As they have lost their livelihood, the immediate requirement is providing them with livelihood opportunities. Some of them will require long term loans for starting/re-starting small businesses. These should be provided at highly subsidized rates with flexible repayment schedules adjusted to their cash flows.

Table 10.3 draws attention to the fact that the measures announced by the government do not fulfill the requirements to put the economic pandemic on the track of recovery. The jobs under MNREGA scheme are provided for only 100 days in a year and these are temporary in nature. By and large, these will be available only after the monsoon season i.e. in October 2020. It is necessary to create employment opportunities for them. This issue can be addressed by skilling, re-skilling and up-skilling the migrant laborers and by creating a technology platform for employment exchange connecting the job-seekers with the employers. Long term collateral free loans at highly subsidized rates should be made available to them.

10.5.2   Medium Impact Category

This group comprises owners and employees of MSMEs, self-employed skilled workers, (electricians, plumbers, gardeners, painters, tailors, domestic help etc.) and such others who are likely to get back their jobs after the pandemic. These people require medium term financial support with moratorium on repayments. A portion of their receivables will remain unpaid during the period of lockdown and for some time thereafter out of which some receivables may turn bad. Such 'bad' receivables may be required to be written off. The measures announced by the government only provide support for working capital requirements. They require infusion of medium term funds in addition to more working capital, to tide over the losses incurred during lockdown period.

Banks should provide medium term loan towards infusion of funds. The working capital requirement could be addressed by providing Factoring services on priority basis with a counter guarantee by the government in deserving cases. In addition, they should be provided with interest waiver and partial waiver of the principal.

10.5.3   Low Impact Category

This group comprises skilled labor working in organized and some unorganized MSMEs. The people, who have not lost jobs, but facing a wage cut, are included in this category. They require short term loans to tide over immediate financial crunch. Their

requirements can be for consumption purposes, for children's education expenses, for repayment of EMIs etc. These are necessary to ensure that they are not pushed out of the formal banking to money-lenders.

As against these requirements, the government has provided only for deferment of repayment installments and no financial assistance is made available. They should be provided with collateral freeshort-term loans at concessional rates.

10.6 Suggestions by the Experts Not Yet Implemented by the Government of India

The government of India has taken several steps to alleviate the impact of the economic pandemic. However, experts(mentioned below) have suggested certain measures which are yet to be taken. Some of these are:

  i. Helping affected people and small firms with waiver or reimbursement of loan installments.
 ii. Cushion the effect of lockdown due to staying home. As reaching out to the people is difficult, the state governments and local governments should be given the liberty to use resources at optimum level.
iii. Creation of health infrastructure in India (Singh, June 1, 2020).
 iv. Creation of Special Purpose Vehicle (SPV) for limiting Government exposure while providing adequate liquidity to industry. Thereafter the Reserve Bank of India can buy government bonds in the market through SPV and inject liquidity in the market (Subbrao, May 11, 2020).

The experts have expressed different opinions on the impact of pandemic on the economy. Some have expressed optimism indicating that economy will revive fast after the pandemic subsides. This is because, the pandemic not being a a natural disaster, our infrastructure, transport system factories and talent are intact and can be deployed once the pandemic subsides(Subbarao, May 11, 2020) On the other hand, others have expressed that demand and supply both will be affected and recovery will take a long time (Panagariya, April 26, 2020).

10.7 Coping with a New Normal

It is widely discussed that life of human beings will not be the same any more. Social distancing and physical distancing will become a way of life. Further, health and hygiene will assume more importance where wearing masks and frequent use of sanitizers will no longer be seen as applicable to specific situations or to an elite class but will become a necessity across all strata of society. However, the new normal will not be restricted to these Covid-induced practices. It is expected that society will witness a change in the way people prioritize their requirements. There could

a tectonic shift in the way education is imparted, businesses are run, communities function and families live. Education may not continue to be only for the privileged, businesses will have to innovate and behave more responsibly, communities will be required to be more inclusive and at the smallest level, families will value health and happiness more than material possessions. This 'new normal' will also throw up new requirements that the government and its people must together address. These requirements may demand structural changes and/or change in the approaches in dealing with issues. Some of these situations and requirements are discussed below.

We have suggested structural changes and requirements namely, use of technology, development of rural infrastructure, creation of employment opportunities and provision of capital and credit to MSMEs.

In India, remote rural areas lack adequate infrastructure such as roads, transport, communications etc. therefore development of rural infrastructure will improve connectivity and accessibility to these areas which will provide a vigorous push to economic development (Samanta 2015). In addition, development of information and communication technology network will build faster communication network facilitating industrial growth and development of economy (Sein and Harindranath 2004). This will create increased employment opportunities for youth in India.

In view of large scale unemployment, there is a need to create employment opportunities in rural as well as urban areas. India has largest the largest proportion of young population amongst the nations in the world, but it is not possible to take advantage demographic dividend due to high level of unemployment. Therefore creation of employment opportunities will boost up economic growth (Sinha 2013).The promotion of MSMEs can create employment opportunities on a large scale. However growth of this sector is hindered by inadequate supply of capital and credit (Thampy 2010).

a. *Structural changes required*

The measures taken by the government and action suggested in support of the disadvantaged will not be effective unless some structural changes are undertaken and effected.

We suggest the following structural changes in the context of social distancing and post-Covid requirements:

i. **Use of technology**

It is expected that the after-Covid environment will encourage business organizations and educational institutions to leverage technology significantly, such that it will impact the personal and professional lives of people. This will require enhancement of IT infrastructure both at the end of manufacturers/service providers and at the end of employees and customers/clients. Further, extensive use of IT by educational institutions, business organizations and banks will require a robust cyber security system that will instill confidence in the users. This comprehensive IT infrastructure will then become a powerful mode to deliver services.

a. Online education

Educational institutions starting from schools will have to adopt information technology to facilitate on line and blended learning. With the IT infrastructure in place, one could expect significant expansion in reach and access to education. While this could impact the level/extent/quality of engagement between teachers and students, it will permit students to learn at their pace and convenience. Further, it is also expected that competition in offering online education will lead to lowering of costs.

b. Work from home

The new normal will witness massive expansion of Information Technology (IT) infrastructure even in remote areas of India to facilitate use of technology. Business and industries will adopt automation. Business organizations will now explore the possibilities of identifying the tasks that may be completed from home and permit employees to do so from their homes. Contrary to the belief that such tasks may all be knowledge based and IT enabled, even the manufacturing sector can explore such possibilities. For example, garment manufacturers could permit tailors to work from home by providing the necessary machines and material that needs to be stitched together. Similarly, assembly of parts, packaging etc. can also be permitted to be completed from home subject to adherence of strict quality norms. This provision of 'work from home' will bring about benefits like reduction of overheads and also help in maintaining social distancing norms at a given period without reduction of workforce or requirement of more space. Further, this will also create employment opportunities for the women who were constrained to remain at home for various reasons.

c. Creation of a technology platform to connect employers, banks and job-seekers

In India, there are perennial complaints by industry and business houses about the lack of employability of graduates from the colleges and universities. On the other hand, there are an equal number of unemployed, qualified youth in search of good opportunities. There is an information asymmetry between employment opportunities and labour—skilled, semi-skilled and unskilled. In order to address this asymmetry, there is a need to create a technology platform to help the employers connect with the job-seekers. This platform would allow registered employers to announce opportunities/roles with specific qualification, skill-set requirements, experience, location, vacancies, salary etc. Similarly, job-seekers could register giving details of qualifications, skill-sets acquired, age, experience, location preference etc.

This will help industries, business houses and MSMEs for selecting persons with right type of skills. Technology intervention can facilitate merit based selection, promote healthy competition and reduce malpractices in the job market. It can also help job seekers in developing the right type of skill sets required by the industry and business.

The same platform may also be used by skilled technicians seeking to be self-employed or by entrepreneurs seeking to set up small businesses to apply for loans. The system should have in-built prioritization and preference for:

- Entrepreneurs who propose set up business in the rural sector or agri-based business
- Skilled technicians seeking to settle down in rural areas
- Job-seekers seeking employment in rural areas.

d. Training—re-skilling and up-skilling:

With the reverse migration of labour heading back to their home-towns and looking for employment opportunities in the vicinity, it is likely that some of the skilled labour may not find suitable jobs and are likely to take up other jobs that they are not trained in. This will lead to de-skilling (lack of use of skills leading to loss of skills) and may require re-skilling, upskilling or development of new skills. This can be done on online platforms using technology.

e. Reduction of overheads and facilitating supply of credit for MSMEs:

The major challenges faced by MSMEs in India are credit constraints and cost inefficiency. The credit requirements of this sector are not fulfilled in spite of the policy of directed lending adopted by the banks in India (Banerjee and Duflo 2014). This is mainly because banks face serious challenges in respect of financial information (Thampy 2010). Challenges related to cost and improving efficiency can be overcome through use of information technology (Todd and Javalgi 2007). MSMEs will make use of IT enabled services for functions such as Finance (preparation of financial statements etc.), HR, training, and marketing. This will reduce overheads for MSMEs. The use of cloud computing will help MSMEs in several aspects in addition to reduction in overheads, such as easy deployment process, easier access to latest information and communication technologies, automatic updates and upgrades, scalability, flexibility, and improved disaster recovery and back-up capabilities (Kumar et al. 2017).

f. Reduction of human interaction wherever possible

Social distancing norms will require minimization of physical meetings and contacts. There will be an attempt to identify those tasks that can be either completed on-line or be replaced by technology. For example, the role of receptionists may be replaced by information kiosks, checking in at airports may be automated, robots deployed to serve at restaurants etc.

ii. **Strengthening rural infrastructure**

a. Provide good IT infrastructure to improve connectivity

At present there is inadequate IT infrastructure in rural India with related maintenance support services almost absent. Under the post-Covid environment, reverse migration, establishment of MSMEs and service providers in rural India will all increase the need for better IT infrastructure. Along with providing a more robust IT infrastructure, there will be a need to create awareness, provide training and handholding in the initial stages of development. Once the government provides the

basic IT infrastructure, more private players will enter this market as they will find it lucrative.

b. Provide robust infrastructure that will match urban amenities and enhance ease of living and doing business

- Provision of stable electricity, water and better connectivity:
  Uninterrupted power supply, adequate water and good connectivity (rail, road and air) are basic requirements not just for business organizations but also for families to be attracted to live in rural India. These have been the major constraints in the development of industries and business centers in rural India, which if addressed, will attract more business organizations and in turn, create employment opportunities.
- Establishment of good educational institutions and reliable medical facilities The former President of India Dr. APJ Abdul Kalam, has mentioned that lack of basic amenities such as good educational institutions and medical facilities are the major hindrances for development of rural India. If these are made available in rural areas, more people would prefer to settle there to take advantage of other benefits such as reduced commutation, cheaper accommodation, a life closer to nature with more tranquility and peace.
- To provide platforms either technological or physical to encourage marketing of locally made products
- Marketing in rural areas is a major issue due to lack of connectivity, ware-houses and links to markets. This in turn, leads to spoilage of produce and reduced bargaining power resulting in reduced prices. This can be overcome by improving infrastructure of roads, development of storage facilities along with development of technology platforms for establishing links between sellers in rural areas and the buyers.

Care should be taken to restrict the number of business organizations that will be permitted to operate in any given village based on the size of the village and its natural resources so that the native characteristics of the village are not adversely impacted.

iii. **Creation of employment opportunities in urban and rural India**
 a. Provide attractive subsidies for setting up of manufacturing and Agri-based MSMEs in rural areas
  According to newspaper reports around 120 million migrant workers are leaving for their homes from metro and urban centers. The government has assured them jobs under MGNERGA. But these are temporary jobs and this should only be a stop gap arrangement. This is an opportunity for the country to encourage reverse migration. The governments and private sector should join hands for setting up industries and business enterprises in the rural areas of the different states. The rural areas will be able to provide land and labor at rates much cheaper than the urban areas supportive government policies including improvement in supply chain infrastructure will complete the eco-system. This will reduce burden on metro and urban centers which have become unmanageable.

b. Provide attractive subsidies and tax concessions for starting or reviving service sectors like travel and tourism, health, education, IT etc.

IT, Education, Health, Travel and Tourism sectors are expected to grow and flourish. India has pool of IT engineers and talented doctors; in addition, medical services in India are among the cheapest in the world. This is expected to attract massive investment in health care sector in India, so that foreign nationals are attracted due cost advantage and world class expertise. Medical tourism will also prosper. In addition to manufacturing, these sectors will create employment in the near future.

c. Reverse migration—moving towards the rural and tier 3 cities. A large number of labourers are moving back to their home towns leading to reverse migration. This has resulted in loss of livelihoods and the need to creating employment opportunities for these laborers. The government must leverage this situation and take up and complete pending infrastructure projects relating to roads, bridges, dams etc. as they all have a potential for large-scale employment.

d. Provide training for skilling, re-skilling and up-skilling to equip unskilled labour (that cannot be imparted on a technology platform) to avail of new opportunities. This will be essential to manage the increased competition in the informal sector because of a sudden surge of job losses in the organized sector.

e. Issue of special identity cards for migrant workers under skilled, semi-skilled and unskilled categories and provide concessions on travel, health services, insurance, education etc.

f. Leveraging government agenda to 'make local and use local'

The emphasis will be on Indian or local manufacturing and consciously using local made goods. This will be a new form of nationalism in post COVID-19 era. This will boost 'Make in India' program creating jobs making use of domestic demand. In order to develop sustainable demand for domestic or local goods the local industries will be thriving for continuous improvement in quality, supported by continuous improvement in technology. Care should be taken to support these entrepreneurs with necessary training in other functional aspects such as marketing, quality control etc.

The revolution will be similar to the one that had happened in Japan after World War-II. In medium term, India will develop competitive global brands.

iv. **Provision of credit and capital**

a. Investment in agriculture

Investment in agriculture, both in public and private sectors have not increased significantly since the introduction of economic reforms in India in 1991. Our agriculture productivity is just about one third of agriculture productivity in USA or China. This is due to the low level of adoption of farming technology, use of low-yielding seed varieties, high proportion of dry land farming, lack of warehousing and cold storage facilities. Therefore, it is high time to invest extensively in research and development in agriculture, technology development, development of high yielding seed varieties, construction of warehousing and cold storage facilities and undertaking minor irrigation projects. This will attract

agro-based industries to rural India which will in turn create job opportunities and will also provide a market for local produce.

b. Special loans and subsidies for fresh start-ups that manufacture for local consumption

The government has appealed to the people of India to encourage local production by choosing local products over imported ones. This will be a successful model only if the local producers are able to manufacture a variety of quality products at affordable costs. To support the manufacturers in this endeavor, the government should provide an ecosystem that provides financial help in form of subsidies and concessional loans as well as seed capital till these achieve break even.

c. Flow of credit to Self Help Groups (SHG), MSMEs, Farmer Producers Organizations (FPOs), small businesses

The government has taken measures to enhance the credit that can be made available to SHGs, MSMEs, FPOs and small businesses. However, in view of the large proportion of non-performing assets, banks are wary of extending credit to these borrowers who do not have collaterals or a credit history. There is a need to change the norms and procedures adopted by banks. The government should issue suitable directives to the banks to expedite the credit disbursement.

d. Provision of initial financial support for skilled, self-employed technicians/entrepreneurs.

There is large scale migration of skilled and self-employed technicians (such as plumbers/carpenters etc.); some of them would like to start business/work at their home town or in its vicinity. Such migrants should be given financial assistance in form of soft loans at subsidized rates with flexible repayment programs. If required, they should also be given loans for consumption purposes till their small business activities reach a level of financial sustainability.

e. Connecting Factoring with MSMEs on a technology platform—with a preferred status for high impact MSMEs

One of the major constraints faced by MSMEs is availability of adequate working capital. Most MSMEs in the manufacturing sector are suppliers to large scale industries and have an on-going relationship with them. However, due to the scale of operations, the MSMEs are at a disadvantage while negotiating the terms of credit with the large scale industries (the purchasers). This pushes them to increasingly depend on banks for their working capital requirements. It is here that Factors can play a significant role by financing of receivables. Currently, the proportion of receivables financed by factors for working capital is much lower than possible.

Accessibility of factoring services can be substantially enhanced by creating a technology platform under the supervision of the Reserve Bank of India. Through this, registered MSMEs can provide information about their purchasers, purchaser-wise average value of receivables and their ratings. Factors can approach MSMEs for providing services and charge according to ratings of buyers and sellers. This will reduce turn-around time, develop and strengthen associations between factors and MSMEs. In addition to the expanding of market

for factoring services in India, this will reduce the burden on banks and also improve the working capital availability for MSMEs.

v. **Other suggestions**

a. Measures to ensure mental health, happiness and well-being:

- Online Counseling centers: People in the high impact group, especially migrant laborers are under severe mental stress as they have lost the job and shelter. They need immediate psychological support. The government and Non-Government Organizations should setup online counseling centers for these people.

- Newer ways to measure success—not based only on GDP. At present, the success of a country, state or an individual is measured by income and wealth. Of late, there has been a trend to also consider the Human Development Index and the Happiness quotient of countries. COVID 19 could be expected to trigger the pursuit of measurement metrics and tools that are more holistic and not just focused on economic prosperity. The post COVID era will require Gross Happiness Index as a measure of success rather than Gross Domestic Product. At the individual level, the lockdown and the uncertainties that come with it along with the opportunity of staying with the family have compelled many people in India to appreciate the old values of family bonding and re-visit their goals in life. It is likely that they value 'pursuit of happiness' as a measure of success rather than 'pursuit of money and wealth'.

- Temporary Social security system: In view of the large number of affected people and large-scale displacement, it is possible that in spite of implementation of all the measures, some people will remain unemployed and there might be some households left out, in which there is no person with a livelihood. It is necessary to set up temporary social security system for those such households while simultaneously providing training to equip at least one member with livelihood skills/opportunities.

b. Measures for effective implementation of government policies and programs

- India post: India post has the reach to provide the last mile connectivity in India. They can act as Business Correspondents (BC) for banks and other financial institutions including Factors. They can help as facilitators for adoption of technology in rural India by providing training and handholding. Similarly, farmer producer organizations (FPO) may also play the role of BCs as they have a strong network and reputation among the farmers.

- Forming association of multiple stakeholders—In order to implement policies and programs for relief, effectively, it is suggested that an association of multiple stakeholders such as government agencies, non-government organizations, panchayat members and local leaders be formed. This association may agree on a common agenda where each member will undertake to implement one portion of the collective responsibility. This will facilitate coordination and immediate feedback on the efficacy of the policies and programs. This dynamic feedback loop will help the

government and society in minimizing the damage and overcome the challenges arising from of this situation.

10.8 Conclusion

Covid 19 as a pandemic has impacted almost all countries of the world and while this crisis is being addressed, there seems some hope at the end of the tunnel since many countries are striving to invent a vaccine to cure this disease. However, this disease has also created an economic pandemic that has severely impacted the livelihoods of a large number of people, more so in developing countries like India. The unfortunate truth is that there is no single solution for this pandemic and recovery of economies will require a multitude of parallel interventions.

The Government of India has announced various measures to provide short-term and medium-term relief but given the nature of damage done, these measures are not sufficient. We have classified the affected people as low-impact, medium impact and high-impact categories and have suggested measures to appropriately address the requirements of each category either by matching the announced measures to the requirements or by identifying gaps and by suggesting new measures.

Among the measures suggested are (1) use of technology (2) strengthening rural infrastructure, (3) creation of employment opportunities in urban and rural India (4) providing credit and capital and lastly, a few other suggestions and (5) measures to ensure positive mental health, happiness and well-being of those impacted (6) measures to ensure effective implementation of policies and programs.

Finally, the authors observe that the success of any program or policy depends to a great extent on the quality of the decision making process. In this context, given the gravity, magnitude and impact of this economic pandemic, it is imperative that all organizational processes are agile in their responses and all leaders, quick and empathetic in the decision making to ensure that the benefits of the measures taken reach the intended beneficiaries in time.

Considering the magnitude of relief and rehabilitation measures, it is necessary that the Governments, NGOs and the Corporate across the World, join hands in partnership, based on understanding and respect for each others' strengths. It appears that pandemic is likely to last for a year or even more. Therefore, this an opportunity to develop these partnerships on long term basis which will be beneficial for the people. On financial front also there is a need to make measured responses by taking a long term view and release the funds in stages as the situation is dynamic and the requirements are likely to change for different sections of the people, during the course of incidence of impact of the pandemic.

Authors' Insights

The measures announced by the government should not be viewed in a static setting. It has to be implemented in a dynamic context, requiring modifications as the situation unfolds. The experts hailed the early imposition of strict nationwide lock down in India, for preventing the spread of the pandemic. It had brought the entire economic activity to a virtual standstill. This has not only put individuals and the firms in financial distress but has caused financial strain on the state governments as well as central government, because near stoppage of economic activities has resulted in huge loss of revenue to the government. The similar situation prevails in most of the countries across the world and therefore, the experts are recommending for relaxation of lockdown and resumption of economic activities in a careful and calculated manner. The Government of India is responding to this suggestion and lockdown is being relaxed gradually.

As per the figures reported by the state governments as well as the Government of India, the spread of the pandemic and the consequent death rate is low as compared to most of the western countries. This gives us time to train medical personnel and to manufacture essential requirements, such as masks, beds and ventilators, as it will not be possible to import these. In India, several NGOs and civil society organizations and the corporates have joined hands with the local governments in an effort to combat the crisis. The individual citizens and the corporates in India have come in a big way to donate to Prime Minister's Citizen Assistance and Relief in Emergency Situations (PM CARES) created to fight COVID-19 crisis. The corporates are also making funds available under Corporate Social Responsibility for the purpose.

In India, the major issue is lack of adequate health infrastructure. The situation is worst in rural areas. There are reports that adequate number of tests are not conducted and the actual number of infected cases are three times higher than the reported number (which is around 18,000 per day, as on 1 July 2020). Thus the peak may occur in November 2020 or even after that and that the pandemic will last up to June 2021, as it will not be controlled until effective vaccine is discovered and manufactured on a large scale. The most optimistic reports predict the discovery of vaccine by early or mid-2021. Furthermore, there are worrisome reports that some migrant labors have started coming back to metro cities like Mumbai in search of livelihood. This makes the situation still worse for the people in general and for the poor in particular. It is necessary that relief and rehabilitation measures are taken on a massive scale. In addition to providing relief measures there is a need to convince the migrant labors that alternative livelihood will be made available to them at their home town. The local leadership can play crucial role and help them staying at their home towns.

In this difficult time, it is necessary that the government, NGOs and the corporate should join hands to undertake rehabilitation work. They need to cooperate and utilize each other's strengths. All stakeholders need to be transparent i.e. sharing the actual situation on real time basis and show the concern towards each other. We need to explore the traditional practices and see the relevance, customize it to suit the

requirements. In order to build the trust, each stakeholder will have to demonstrate that they are interested in log-term relationship and show the commitment to cross this difficult phase of business and life.

The government of India has announced several measures to mitigate the crisis. However, the response to the crisis should be measured and should be made after taking a long term view of the situation. As Dr. Arvind Pangaria former, Chief Economic Adviser to the Government of India, suggested, The government should make the disbursements of funds in stages; otherwise it will lead to inflationary pressures in the economy.

The pandemic also brings few opportunities for India. It is high time to decrease the digital divide in India, so that the effectiveness of any program can be improved. The technology infrastructure need to be made available at both the ends i.e. customer as well as organizations. Another flip side of is the ability to use technology properly. Organizations will have to create a space for technology literacy for consumers as well as for employees.

The pandemic would take us towards more value co-creation in general and for service industries in particular. The improved connectivity between customers and service providers will enable them to spend more time with each other using the technology. This will lead towards better understanding and enhanced value co-creation.

India has many assets to bank on. India has a demographic advantage with largest proportion of young people in the world who possess higher immunity as compared to older people. Moreover, we have well developed pharmaceutical industry which may develop affordable vaccine at an early date. The faster implementation of suggested measures will go long way to re enforce these strengths and in helping us to come out of crisis.

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