COVID-19 induced emergent knowledge strategies

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The pandemic of COVID-19 is considered the most complex global process generated so far due to its unprecedented power of disruption, interconnection, and lockdowns in all the domains of our life, from health to economy, education, research, culture, sports, and social isolation. The COVID-19 crisis came like any other natural disaster, finding people and organizations unprepared for disruptive power and social nexus. The unthinkable became a reality, and people realized that organizations and governments have no strategies to fight against such a pandemic. They found out that the strategic knowledge gap is enormous, and the only way to navigate this crisis is to create emergent knowledge strategies. This paper aims to analyze the characteristics of emergent knowledge strategies by comparing them with deliberate knowledge strategies and showing how people can develop such new kinds of strategies. The analysis is based on criteria like time perception, systems thinking, type of knowledge, type of changes, and complexity.

1 INTRODUCTION

Emergent contagious diseases such as avian influenza, MERS, SARS, and Ebola produced many deaths and showed the power of an epidemic in many countries worldwide. However, the novel coronavirus pneumonia (COVID-19) that started in December 2019 in Wuhan, Hubei Province of China, made many more victims and spread world-wide (Peeri et al., 2020; Solnit, 2020; Wang, Cheng, Yue, & McAleer, 2020). The World Health Organization (WHO) announced a COVID-19 pandemic on March 12, 2020, when 125,600 confirmed cases were reported from 118 countries and regions from all over the world. In the Situation Report No. 177 published on July 15, 2020, WHO announced that the total number of confirmed cases increased dramatically to 13,150,645, the total number confirmed new cases was 185,836, the total number of deaths was 574,464, and the total new deaths were 4,176 (World Health Organization, 2020). “All this is due to the highly contagious nature of the virus, and the inexorable implications of its explosive spread during the acceleration phase” (Baldwin & Weder di Mauro, 2020, p. 1). Its transmission dynamics is fast and generates an evolution very close to an exponential curve. In China, statistics show that the average incubation period was 5.2 days, and the number of people infected doubled every 7.4 days. Each sick person may infect 2.2–3.8 people on average (Zhou, 2020, p. 35). That is leading to a geometric progression curve that may reach a peak when the capacity of the health system becomes insufficient for treating the huge number of infected people with the virus. The epidemiologic curve may rich an exponential peak if there are no measures for containment, and the contagious chain explodes in high-density population communities.

The fast progression of COVID-19 determined WHO to recommend governments to take drastic measures for slowing down the propagation of the disease and flattening the epidemiology curve down to the treatment capacity of the health system in each country (Gourinchas, 2020). But the health system is only a component of a larger system of systems in each country, and it influences the functioning of all the other systems. The immediate effects were seen in the economy. “Efforts to flatten the epi curve reduce economic activity. The recession, so to speak, is a necessary public health measure. Keeping workers away from work and consumers away from consumption both reduce economic activity” (Baldwin & Weder di Mauro, 2020, p.8). In many countries, governments declared “emergency state” and issued regulations with drastic measures for business, education, culture, sports, and people. For instance, in many countries, hotels, restaurants, hypermarkets, schools, universities, theatres, churches, and stadiums were closed down. There were created special rules for social distancing for communities and people, avoiding meetings in groups, wearing masks and gloves in public places, and isolation at home (Hasanat et al., 2020; Reeves, Lang, &
COVID-19 is a unique phenomenon due to its global impact, aggressiveness, highly contagious, and generating a chain of crises in the health systems, economies, financial systems, retail markets, tourism and hospitality industries, educational systems, and cultural institutions of all the affected countries (Baba et al., 2020; Kumudumali, 2020; McKibbin & Fernando, 2020). As COVID-19 spread, it became evident that we had not faced a similar situation before.

COVID-19 created real challenges for politicians and governmental decision-makers. They had to make decisions under a critical uncertainty for the disease evolution, and under considerable pressure created by epidemiologists, on one hand, and business people, on the other one. The politicians found it difficult to handle the knowledge gaps about the possible future path of the disease. Their response oscillated between the health systems requirements for containment and business needs of continuing its activity. Thus, businesses were faced with a truly unique set of circumstances. The governmental decisions for lockdown came as a disruptive change to them, and new strategies for survival had to be developed fast (Alvarez et al., 2020; Baldwin & Weder di Mauro, 2020; Bolisani & Bratianu, 2018; Syrett & Devine, 2012).

After lockdowns and severe social and business restrictions, the epidemiologic curve in many countries flattened, and politicians decided to relax some of them. That happened during summer vacation when the tourism and hospitality industry's pressure was huge, especially where its survival is vital for the country's economy. As a direct consequence, the COVID-19 generated the second wave of confirmed cases. According to the World Health Organization (WHO), the global situation on October 1, 2020 can be synthesized by two indicators: 33,842,281 confirmed cases and 1,010,634 deaths. The situation by WHO regions is given in Table 1 (www.covid19.who.int).

Being unexpected, with many and dramatic health, economic, and social consequences, COVID-19 is considered by some experts like a Black Swan phenomenon. The concept of Black Swan has been introduced by Taleb (2007), who defines it as “an outlier, as it lies outside the realm of regular expectations, because nothing in the past can convincingly point to its possibility” (p. XVII). Also, “it carries an extreme impact” (Taleb, 2007, p. XVII).

Emerging as a black swan (Taleb, 2007), the COVID-19 crisis put off all the deliberated business strategies and faced companies and governments with new strategic gaps due to the absence of knowledge for such a pandemic. As Peeri et al. (2020) concluded in their analysis, “We did not learn from the two prior epidemics of coronavirus and were ill-prepared to deal with the challenges the COVID-19 epidemic has posed” (p. 2). The only reaction to such a situation was to think about how to bridge these knowledge gaps by designing emergent knowledge strategies. However, designing such strategies requires a different approach based on a new paradigm, which we will describe in the present paper.

### TABLE 1  Situation by WHO regions

| WHO regions       | Confirmed cases |
|-------------------|-----------------|
| Americas          | 16,624,745      |
| South-East Asia   | 7,071,811       |
| Europe            | 5,937,969       |
| East Mediterranean| 2,405,123       |
| Africa            | 1,187,269       |
| Western Pacific   | 614,623         |
A knowledge strategy is focused on the knowledge a firm needs to achieve a specific long-term goal, and on the practical ways of creating or obtaining that knowledge from the business environment. Thus, we may say that a knowledge strategy is defined by “the goal in terms of knowledge resources, the plans about how to achieve, manage and deliver these resources, and the internal and external sources and structures that the company will need” (Bolisani & Bratianu, 2018, p. 103). A knowledge strategy can be designed by considering all processes of knowledge creation, knowledge acquisition, knowledge sharing, knowledge transformation, knowledge transfer, and knowledge use, within the framework of the firm's knowledge management (Donate & Canales, 2012; Nonaka & Takeuchi, 1995; Snyman & Kruger, 2004). Knowledge strategies should be created by considering both internal and external business environments. Managers should reconsider the company's strengths and weaknesses such that new knowledge structures and capacities to be developed (Garcia-Perez et al., 2020). They should also continuously analyze the external environment for identifying new opportunities and threats, especially during these crazy times. The focus should be on the opportunity space that is defined as “The combination of the business model, the organization's ability to execute upon it, and the detailed structure and process of the external environment” (Spender & Strong, 2014, p. 10).

Understanding the meaning of knowledge strategies, we will analyze how the COVID-19 crisis has induced in firms the need to consider and design emergent knowledge strategies as a new paradigm of strategic thinking.

### 3 | METHODOLOGY

The method we used for the present research is based on a comparative analysis of the deliberate and emergent knowledge strategies.

### TABLE 2 Deliberate versus emergent knowledge strategies

| Criteria                | Deliberate knowledge strategies | Emergent knowledge strategies |
|-------------------------|---------------------------------|------------------------------|
| Time perception         | Moving observer and stationary time | Stationary observer and moving time |
| Future predictability   | Predictable future              | Unpredictable future         |
| Environmental changes   | Evolutionary changes            | Disruptive changes           |
| Mental models           | Systems thinking                | Complexity thinking          |
| Dominant business logic | Achieving competitive advantage | Surviving and recovering     |
| Type of knowledge       | Rational knowledge              | Rational, emotional, and spiritual knowledge |
| Dominant knowledge      | Knowledge exploitation, knowledge hiding | Knowledge exploitation, knowledge sharing |

The COVID-19 epidemic that started in Wuhan, China, and then transformed into a global pandemic was not predicted. It happened suddenly, and it manifested with an accelerated infection rate. It was a shock for the population and for the health systems designed for normal conditions of operation (Gourinichas, 2020; Peer et al., 2020). To understand such a phenomenon, we had to accept a different time perception when the future is coming toward us with incredible speed.

Cognitive scientists demonstrated that our thinking is based on analogies and metaphors. These conceptual constructions represent much more than some linguistic styles; they constitute mental mechanisms used in understanding new concepts and ideas (Gentner, Holyoak, & Kokinov, 2001; Lakoff & Johnson, 1999). “Conceptual metaphors point to an obvious way in which people could learn to reason about new, abstract concepts. They would notice or have pointed out to them, a parallel between a physical realm they already understand and a conceptual realm they do not yet understand” (Pinker, 2008, p. 241). Metaphors are produced by both the conscious and unconscious mind.

A metaphor is composed of a source domain, a target domain, and a mapping function. In the source domain, we place the known object with its attributes; in the target domain, we place the abstract and less known object; the mapping function transfers some critical attributes of the known object from the source domain to the less known object placed in the target domain. In this way, the less known object enriches its semantic field. The mapping operation is not performed by a mathematical function; it is done mostly unconsciously by our mind based on the experience we have in dealing with both the known and less known objects (Fauconnier & Turner, 2002; Gentner et al., 2001; Lakoff & Johnson, 1999). As Cornelisson et al. (2008, p. 8) remark, “Metaphors connect realms of human experience and imagination. They guide our perceptions and interpretations of reality and help us formulate our visions and goals.”

Time is an abstract construct, and its perception is based on using space as a known concept placed in the source domain of the time–space metaphor (Boroditsky, 2000; Lakoff & Johnson, 1999). There are two fundamental metaphors used in understanding time and future dynamics: (1) the metaphor of moving observer and stationary time; (2) the metaphor of stationary observer and moving time. In the
first metaphor, time is considered *stationary*, like the space surrounding us, and the observer is moving through it toward a well-defined future. We use this metaphor in our daily language. For instance, we say: *I shall come to you next weekend.* The perception of that future is like an extension of the present state of the business environment. That allows the top managers to design *deliberate strategies* based on the best knowledge available today. It is just an extension of the logic used in operational planning, and it has been heavily used in the first phase of strategic planning (Mintzberg, 2000).

In the second metaphor, the observer is stationary, and time is coming toward him. The time is moving, like in the expression: *The Christmas time has come.* The future is unfolding to us without any possibility of knowing its structure and content. If the time’s motion is accelerating and we are totally unprepared for that, the future may create a shock. The case of this COVID-19 unexpectedly came to us and made all deliberate business strategies useless. When the future is emerging to us, we need to react with emergent knowledge strategies.

### 4.2 Future predictability

Experts could not predict the explosion of COVID-19 crisis, and they are unable to predict the end of it and all the consequences of this global phenomenon. For such emergent crises, the future is hard to be predictable, and experts use mathematical models only to create possible scenarios for the future based on hypotheses (McKibbin & Fernando, 2020; McKibbin & Triggs, 2018). Uncertainty can display several patterns, as shown by De Meyer, Loch and Pich (2002). The simplest form is when many small variations lead to a change in a firm’s performance. These changes can be foreseen, and this form of uncertainty can often be resolved through risk management. Unforeseen uncertainty is more complex and more difficult to manage. COVID-19 came out of such uncertainty. At the upper limit of this type of uncertainty, chaos may appear if managers cannot find adequate solutions in due time.

New knowledge gaps (Zack, 1999) appear, and managers need to switch from deliberate to emergent knowledge strategies. “Given the fact that no effective medicine is available for viral infectious diseases, the preventive measures including control of the source of infection, early detection of patients, cutting off the transmission, and protecting susceptible population are paramount” (Zhou, 2020, p. 8). Even if the knowledge related to all these preventive measures can be shared between different countries, their application depends on each country’s culture, education, and political system. Already we have seen different approaches between Sweden and the other European countries, and between countries where there are democratic political regimes and those based on overly centralized political power like Russia and China.

### 4.3 Environmental changes

COVID-19 induced disruptive environmental changes, which requested immediate and dramatic measures from the political leaders. In many countries, governments imposed “emergency states,” which are special situations with a series of human liberties cut off in order to diminish the infection rate and to flatten the epidemiological curve. The main ideas are social distancing, people isolation, and at the limit, people *quarantine*. Schools, universities, and churches have been closed such that they could not become centers of infections. Schools and universities switched to online learning supported by e-learning platforms. Thus, university governance had to react immediately with emergent learning strategies and intergenerational learning models (Bratianu, 2014; Bratianu & Pinzaru, 2015).

Restaurants, hotels, malls, theatres, stadiums, and public gardens were closed. Many international airplane travels were canceled, and many public transportation systems were severely restricted. Because of all these restrictions, the tourism and hospitality industry in many countries was dramatically affected (Baba et al., 2020; Kumudumali, 2020). The COVID-19 crisis generated in many countries business and social crises, which were unthinkable a couple of months before (Baldwin & Weder di Mauro, 2020; Coibion, Gorodnichenko, & Weber, 2020; Hasanat et al., 2020; Wang et al., 2020).

### 4.4 Mental models and dominant business models

All of these disruptions in the normal operation of such firms and institutions showed a complexity that could not be understood and explained by using the mental models based on deterministic and linear thinking (Bratianu, 2015; Bratianu & Vasilache, 2010). We have to develop nonlinear and probabilistic mental models, which adequately approach pandemic evolution and prediction (Gourinchas, 2020; Kahneman, 2011; Taleb, 2007). Even the classical systems thinking logic should be enhanced by a complexity approach supported by the new perspectives of nonlinearity, dissipative structures, and learning on the edge of chaos (Bereiter, 2002; Jackson, 2019; Senger, Senge, 1990; Stacey, 2001). For instance, many people ask every day, “when the crisis will end?” Nobody can answer because a crisis is not a well-defined process with a deterministic evolution.

The epidemiological curve shows almost an exponential evolution based on the number of infected individuals, a number that depends on the people behavior in communities, the capacity of the health system to test and treat the infected individuals, and the type of regulations imposed by authorities in each specific region and country. “The response to COVID-19 has changed the way people interact with businesses, presenting supply-and-demand disruptions, as well as logistical disruptions that have made operations unpredictable” (Google, 2020, p. 17).

In such situations, firms cannot aim to achieve a competitive *advantage* anymore; they must think for their *survival*, and all the strategies they can design should be focused on the recovery phase of this crisis. Their emergent knowledge strategies should incorporate new business ideas and specific efforts for their implementation. For instance, instead of being closed down completely, a restaurant may
develop a take-home service line, or a textile manufacturing may introduce a new production line for medical masks and protection equipment for people working in hospitals. Schools and universities were closed, but they switched immediately online by using e-learning platforms. Digitalization and working from home became the new dominant business models (Baldwin & Weder di Mauro, 2020; Google, 2020).

4.5 Knowledge type and dominant knowledge processes

A detailed analysis of the COVID-10 crisis from the knowledge management perspectives shows that while deliberate strategies incorporated rational knowledge and economic data, the emergent knowledge strategies open toward emotional and spiritual knowledge. The COVID-19 crisis created a climate of fear due to the unknown: “The fear of an unknown deadly vims is similar in its psychological effects to the reaction to biological and other terrorism threats and causes a high level of stress, often with longer-term consequences” (McKibbin & Fernando, 2020, p. 4). All the new government regulations strengthening social distancing and isolation created a complex psychological climate dominated by emotions and humanistic values. The theories of knowledge fields and knowledge dynamics based on the energy metaphor and thermodynamics principles (Bratianu & Bejinaru, 2019; Bratianu & Bejinaru, 2020) can explain much better that psychological climate than classical knowledge management based on rational thinking.

This new knowledge dynamics based on the theory of knowledge fields contributes to a better understanding of the learning–unlearning phenomena manifested at the individual and community levels (Cegarra-Navarro, 2005; Cegarra-Navarro & Wensley, 2019; Martinez-Martinez et al., 2019). Just think of the new rule of keeping social distance from the other people and wearing a mask in closed spaces and in public transportation vehicles. That is a hard experience of intentional unlearning to shake hands with your friends, especially in Mediterranean countries like Spain and Italy. Also, working online from home changed the daily agenda for many people completely, with many associated new aspects, from the daily routines to a new way of thinking and making decisions.

Organizations had to capitalize on the full spectrum of knowledge (i.e., rational, emotional, and spiritual) in order to develop their knowledge capital and the critical knowledge capabilities for dealing with the new challenges of the COVID-19 social and economic crises (Garcia-Perez et al., 2020; Lafayette, Curtis, Bedford, & Iyer, 2019). For instance, increasing the organization’s entropy can be done by knowledge sharing, stimulating people to share their experience and expertise (Bratianu, 2019; Vatamanescu et al., 2020). Knowledge sharing proved to be a dominant knowledge process between companies within the same industry, as the tourism and hospitality industry (Baba et al., 2020; Martinez-Martinez et al., 2019).

Finally, we would like to remark that deliberate knowledge strategies are based mostly on knowledge exploitation, while emergent knowledge strategies focus on knowledge exploration (Bolisani & Bratianu, 2018). The new knowledge gaps created by the COVID-19 crisis require new discoveries in medicine in the preparation of adequate drugs for treating the disease and new vaccines for preventing the infection with coronavirus. Also, there is a vital need for new knowledge for surviving the economic crisis and learning how to recover after that pandemic in business. As Solnit (2020) remarks, “The future will not, in crucial ways, be anything like the past, even the very recent past of a month or two ago. Our economy, our priorities, and our perceptions will not be what they were at the outset of this year”.

The complexity of multiple crises generated by COVID-19 and the new uncertainty landscape induced emergent knowledge strategies and imposed an integration process of deliberate and emergent knowledge strategies. Thus, managers could use critical knowledge incorporated into deliberate strategies and explore new opportunities for knowledge creation and reducing chronic business uncertainty.

5 CONCLUSIONS AND LIMITATIONS

The COVID-19 crisis has induced many drastic changes in social, economic, political, educational, cultural, travel, and religious domains. The complexity of all these phenomena needs a different way of thinking and different approaches for solving business problems. This paper focuses on the need to switch from deliberated knowledge strategies to emergent knowledge strategies and provide arguments in favor of this unprecedented change.

Time is not waiting for our travel to the future and is coming toward us with accelerated speed creating shocks and discontinuities. The future is not an extrapolation of the continuous present time but an emergent complex of phenomena with implications in all aspects of our personal and community life. Deliberate strategies cannot help any more, and we must react quickly for our survival. Deliberate strategies are designed based on what is known, while emergent strategies focus on what is unknown yet. Thus, knowledge management must switch quickly from knowledge exploitation to knowledge exploration, and from the state of knowing what we do not know to the state of not knowing what we do not know. The known-unknown matrix is shrinking toward the most complex and challenging position.

The present paper is focusing on these new challenges created by the COVID-19 pandemic for knowledge management and knowledge strategies design. The emergent knowledge strategies should be based on the deep understanding of time perception and future dynamics, on the impact of uncertainty on switching from deterministic to probabilistic thinking, and the black swan phenomenon. Organizations must create new knowledge structures, knowledge capital, and critical knowledge capabilities based on the theory of knowledge fields and the learning-unlearning process’s new dynamics. The COVID-19 pandemic induced many changes in consumers’ behavior due to these dynamics, and the emergent new business environment requires from managers emergent knowledge strategies for surviving and fast recovery when the pandemic
will be over. The new normal business landscape remains at this moment, only a guess based on mathematical modeling and intuition coming from business experts.

The present research limitations come mainly from the complexity of the COVID-19 global crisis and the many unsolved problems yet. We still do not clearly understand this disruptive phenomenon and some validated methods for designing knowledge strategies. Also, we focus our attention only on the emergent knowledge strategies and their main differences concerning the deliberate knowledge strategies. The dynamics between known knowns and unknown unknowns continue to challenge our intelligence and creativity.

Implications of the present research are for both academics and practitioners working in business or in knowledge management. The paper shows how the COVID-19 crisis challenges the paradigm of deliberate knowledge strategies and opens the discussion for the new paradigm of emergent knowledge strategies, and of the need of their integration in complex and creative strategies, which are based on a dual perception of time, a probabilistic thinking model for exploring possible futures, and new transformative business models supported by digitalization.

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How to cite this article: Bratianu C, Bejinaru R. COVID-19 induced emergent knowledge strategies. Knowl Process Manag. 2021;28:11–17. https://doi.org/10.1002/kpm.1656