Knowledge management and COVID-19: Technology, people and processes

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Abstract
In this paper, we analyse the impact of the Covid-19 crisis in organizations from the point of view of knowledge management. Specifically, we address the question of technology, people and processes. We conclude, first, that KM should be put at the centre stage in 2021 because, above all, first and foremost, the Covid-19 crisis is a crisis about knowledge, and that a massive knowledge failure has been at its core – namely, the absence of a vaccine and the cure for Covid-19. We furthermore conclude that in organizations, there was a complete lack of “social knowledge” linked with “organizational behaviour” which led to an organizational crisis; quite crucially, we believe that the mentioned crisis was even fostered by the immense technology available, but continued because, despite all the value of people, there was not knowledge about processes; in fact, suddenly, the drastic change in setting caused previously competent people to become incompetent. All this leads to the third conclusion, namely, the solution of the crisis will be achieved using technology and making people competent again and teaching them the right processes. Finally, for the time being, Humanity is still searching for answers, and we believe that all the partial measures (such as use of masks, social distance, washing hands, home/remote working, etc.) will mean an advance and increase in organizational agility.

1 | INTRODUCTION

In December 2019, the world began to hear about a new and strange disease originating in China. Within 3 months, the world was at war against a new, invisible and strange enemy involving world leaders such as President Emmanuel Macron, Prime Minister Jacinda Ardern or the WHO Chairman (BBC, 2020a). Almost 18 months later, at the time of writing, the “war” is still going on, and there is doubt as to when it will end, the number of human casualties, and the extent of economic damage. Regarding this point, many agree that finding a vaccine was a decisive factor (Gallagher, 2020). Regarding expectations, some people now believe deconfinement is here to come, some others fear new variants, and almost everybody believes “no one will be safe until everybody will be safe” – an idea that prolongs the crisis until the end of 2022 or more.

Indeed the COVID-19 crisis may be compared to a World War – it is a global event provoked by an enemy, it causes massive disruption, negative and lasting economic consequences, human casualties, it lasts for a long time, and its end is unpredictable. The similarities between the two World Wars and COVID-19 crisis are shown in the following Table 1:

However, we believe that the COVID-19 crisis is also very different from the two wars we mentioned. The differences between the two phenomena are shown in Table 2 above.

Within this context, we believe that the distinctive feature of the current crisis is that the COVID-19 crisis is about knowledge and information and can only be understood in the scope of the knowledge economy and the society of information. However, and quite interestingly, even if millions of words are written everyday about COVID-19, this analysis has not been done yet. We believe...
there are two main reasons such analysis has not happened. First, KM science is usually too confined within organizational settings, and global and macroeconomic analyses are not very common. Second, KM analysis has been confined to its scientific base, which prompted one of its main scholars (Aino Kianto) once to say that “KM science is more preached by authors than practiced by organizations" – (Dumay, 2016).

Within this perspective, in this paper, we analyse the COVID-19 crisis as a crisis of the service-based, knowledge-driven economy of the information age. Therefore, the research question of this paper is: What knowledge management theories say about the COVID-19 crisis?

In this context and in order to answer the research question, the paper consists of the following sections: Literature Review, Methods and Data, Analysis, Discussion and Conclusion.

2 | LITERATURE REVIEW

2.1 | Basic notions

The Economics of Post COVID-19 was explained in a book (Baldwin & Weider di Mauro, 2020). In this context, basic ideas about KM that matter for the analysis of this paper are the following:

| World War 1 | World War 2 | COVID-19 |
|-------------|-------------|----------|
| Period | 1914–1918 | 1939–1945 | 2019–? |
| Duration | 4 years, 3 months and 2 weeks | 6 years and 1 day | Ongoing |
| Conflict | Allies vs Germany | Allies vs Axis | Mankind versus Virus (BBC, 2020a; Jornal, 2021) |
| Deaths | 18 millions | 73 millions | 4,600,000 and counting (Worldmeters, 2021) |
| Economic damage | Massive stop solved by Versailles Treaty | Massive stoppage solved by Marshall Plan plus URSS actions | Great Confinement major recession since 1929 solved by massive packages for economic recovery: €800 billion in the EU for the period 2021–2026 (European Commission, 2021) and 2 trillion for infrastructures in the US (Tankersley, 2021) |
| Infrastructures | Destroyed | Annihilated | Paralysed |
| Olympic Games | 1916 not held | 1940 and 1944 not held | 2020 postponed and held in 2021 |

Source: Own work.

| World War 1 | World War 2 | COVID-19 |
|-------------|-------------|----------|
| Major leaders | Keiser William and George V | Hitler and Churchill | Emmanuel Macron, Jacinda Ardern, Donald Trump, Joe Biden, Vladimir Putin, António Guterres |
| Problem | Military | Military | Health care with major ramifications |
| Situation regarding trust | Mistrust between two blocks | Mistrust between two blocks | Global mistrust caused by a new and highly contagious and asymptomatic virus |
| Technology | Phone and radio | Radio and film newsreels | Internet |
| Economic Era | Second industrial revolution first part Agriculture based, land driven | Second industrial revolution Industry second part based, human resource based | Fourth industrial revolution Service-based, knowledge driven |
| Human Resources level | Literacy | Primary or low secondary | University |
| Speed of communications | Slow | Fast | Instantaneous |
| Weapons | Guns | Guns and bombs | Vaccine, social distancing |
| End | Peace | Peace | Safety |

Source: Own work.
1. The main concepts are four, namely data, information, knowledge and wisdom and they compose the “DIKW pyramid”. Quite crucially, “information is defined in terms of data, knowledge in terms of information, and wisdom in terms of knowledge” (Rowley, 2007). Furthermore, data are essentially facts; those facts represent reality, or the “state of the world” (Gamble & Blackwell, 2002); also, “data are cheap, but information is expensive”; (T. 2020), because after collecting data, people or organization have to make them available in any form – and for some reason information systems are such an important area in social sciences. However, one may have plenty of information and might not be able to derive any knowledge from it – therefore in order to obtain knowledge from information, it is decisive to understand that information; and that process is a process that involves a space defined by Nonaka as “Ba”, which might be physical, social, virtual or mental (Nonaka & Konno, 1998). Finally, wisdom may be defined as the ability to make sound judgements and decisions apparently without thought (Gamble & Blackwell, 2002).

2. Three basic elements in any KM system are technology, people and processes. Historically KM was first seen as a technological problem, then a human resource problem and finally a processes problem ( Edwards, 2011);

3. The main types of knowledge are tacit and explicit, which are transferred according to the SECI model with socialization, externalization, combination and internalization (Nonaka & Takeuchi, 1995); this process requires a space, originating the “Ba” concept, which is a space in which knowledge creation happens in one of the four phases (Nonaka & Konno, 1998);

4. Trust is a very well-studied topic in KM analysis: trust is based on opportunism, affection, friendship, need to belong, wish to have a leader of competence among other factors (Blomqvist, 1997); trust enhances knowledge creation and information sharing (Sankowska, 2016); trust is slow to be built and may evaporate easily (White & Eiser, 2006); trust is essential for business creation and increases profitability (Chams-Anturi et al., 2020); Reiersen, 2017; Vijay et al., 2019). All this means that to make business and to prosper as societies, individuals and organizations need to trust each other; and in consequence, there is a situation in which fear increases and trust diminishes, everyone (organizations, people and societies) may be deeply affected. As we will see, this perspective applies to the Covid-19 situation.

5. KM science was developed first on companies (Andreeva & Kianto, 2012; North, 2003); then it was expanded to non-profit sector (Granados et al., 2017), the public sector (Abhari et al., 2019), regions and countries (Bounfour & Edvinsson, 2005), and persons (Chatthi, 2012). Quite interestingly, KM has only very rarely been analysed with relation to political activity and political leaders (Podesva et al., 2015).

2.2 | Theory people and processes

Edwards (2011) developed a very interesting model on the evolution of KM. The model indicated three phases, the first one guided by technology, the second by people and the third by processes. Crucially the phases produced better results in succession. We believe that in any organization technology, people and processes co-exist. Moreover, crisis (individual, organizational and societal) exists because there is a lack of technology, people or processes. Finally, the solution to any crisis requires the use of technology, people and processes. We believe these adjust themselves very much to the Covid-19 crisis, and therefore that the model can be very useful to explain the current state of affairs.

2.3 | Competence and incompetence

In human resource development (HRD) science, competence is defined as the ability of doing well a certain job (Mc Guire, 2014); this notion is frequently related with the one of “skills” or “qualifications”, which relate to the way society views a given task, in a scale of difficulties, like the one used by the European Union namely the European Qualifications Framework (EQF) (European Commission, 2008).

Competence is of multiple concepts: Le Deist and Winterton (2005) defined a “matrix” with the following four parts: (1) cognitive competence, including knowledge and understanding; (2) functional competence including skills; (3) social competence including attitudes and behaviour; (4) meta-competence related with the ability to cope with uncertainty (Bratianu et al., 2020).

Svelby, 2012, defined competence as the ability to make correct predictions about future events. He furthermore pointed out that a drastic change in context may make persons incompetent who were previously competent; horse riders became incompetent when cars appeared; and more recently, the financial crisis happened due to the increase in derivatives and other collateralized debt obligations (CDOs), which in fact changed the banking and security markets and made persons who used to be competent in the previous context incompetent in the new one. CDOs were massively issued during 2000 to 2007, generating the financial crisis. This interpretation of competence is relevant for our paper because we are analysing a change in paradigm – namely, the difference between the “old normal” (pre-Covid-19) and the “new normal” (during Covid-19). Accordingly, we believe that the Covid-19 crisis also changed the context in which knowledge is managed and in which businesses are made and value is created. Indeed, one of the major problems of societies and organizations during the last 18 months has been how to adapt the processes in an attempt to maintain well-being, profit and employment levels; and that adaptation was important due to the pandemics many workers and organizations faced with the prospect of becoming incompetent, when before were competent. In consequence, the solution for that competency problem has to be found within the “technology, people and processes” defined above (Edwards, 2011).

2.4 | Agility

As Teece et al. (1997), (2016) emphasize, knowing when and how much organizational agility is needed is an essential managerial skill.
Based on the ideas of this scientific group, we can consider organizational agility as a special ability of an organization to sense and detect continuous changes in the business environment in a timely manner, quickly make decisions about effective strategies and practices, implement these decisions quickly and cost-effectively, to expand and acquire a set of relevant competencies to use profitable opportunities and maintain a competitive position. Businesses with this capability tend to manage uncertainty on the supply side. When it comes to deep uncertainty, organizational agility becomes an essential attribute of an industrial enterprise.

2.5 | KM in the context of the Covid-19 crisis

Drawing an analogy with the organization of production, it is possible to offer the concept of KM in the context of the covid-19 crisis, which is a crisis of great uncertainty.

With the advent of the Fourth Industrial Revolution, the external environment is characterized by changes that occur at the highest speed and on a huge scale, as well as characterized by the systemic nature of the consequences. Researchers (Gunasekaran et al., 2007) are inclined to believe that the modern concept of production organization should focus not only on reducing costs and increasing the quality of goods and services but also on the speed of response and flexibility. In this regard, agile manufacturing is becoming particularly relevant.

Agile manufacturing is a concept of production organization based on the foresight of changes in the business environment and timely response to rapidly changing market needs through the effective use of internal and external resources. Its main strategic focus is achieving organizational agility (Booth, 1996; Goldman et al., 1995; Gunasekaran, 1998; Highsmith, 2004). The conceptual model of agile manufacturing has four main components:

1. drivers (uncertainty, unpredictable changes, the needs of the external environment, for example, changing consumer preferences, improving technologies, global competition, that is, events that require the company to find new ways of doing business in order to maintain its competitive advantage);
2. organizational agility (a special ability of the organization, which consists in identifying changes in the business environment and responding quickly to them by providing appropriate capabilities, among which the keys are timely response, competence, internal flexibility, speed, proactivity, customer orientation);
3. providers (it is assumed that the necessary competencies can be obtained through the introduction of a certain set of methods and tools in such areas of production as organization, technology, human capital, integration, cooperation with suppliers and competitors, interaction with the consumer, which are combined using modern information and communication networks);
4. strategy (different organizations need different degrees of organizational agility, which depends on the type and level of impact of changes, the industry sector, the type of company, etc. The strategy determines the necessary level of organizational agility, important competencies and suitable providers).

The company’s production system, which supports the principles of agile manufacturing, is based on the integration of organizations, highly qualified and knowledgeable people and advanced technologies into a coordinated system to achieve a qualitative leap forward in the competition by providing abilities that exceed those obtained from the current practice of the company (Kidd, 1994). Such an enterprise is a dynamically developing, flexible and reliable business unit, capable of rapid reconfiguration in accordance with market opportunities. According to Kidd (Kidd, 1994), the fundamental resource for an agile enterprise is “knowledge”. People should be brought together in dynamic teams, formed around well-defined market opportunities, so that they can use each other’s knowledge. Through this process, knowledge is transformed into new products and services. Figure 1 schematically describes the agile manufacturing action.

Figure 1 demonstrates the principle of the collaborative production network, which is the basis of agile manufacturing. In this case, the specific market opportunity is determined. Leading enterprise (oval with word “Leader”) initiates the formation of a partner network (little squares) from the platform pool of units. The collaborative network consists of partners with core competencies (little ovals connected by bold lines) necessary to fulfill a specific order. It is important that each partner cannot successfully act separately in the given business environment. The integration of core competencies contributes to the ability to produce the desired product. Such a network organizational form is aimed at overcoming the shortcomings of traditional models of organizational structures due to high multivariance, flexibility and responsiveness to changes, functioning on the basis of a common resource base, and where the interaction of network participants is based on the use of market mechanisms, rather than administrative procedures. Continuously growing a knowledge base is the most important result of the agile manufacturing functioning in the long term because of a pattern: partner companies contribute to the knowledge of the collaborative production network, and the network in turn enhances the knowledge of partners. Covid-19 poses new opportunities for the application of agile processes in organizations; in the long run, societies may become more agile because, at least, organizations will know they have the possibility of choice between “the old normal” (prior to the Covid-19) and the “new normal” (during Covid-19) to build the “normal after Covid-19”. That choice requires agility in and of itself. For now (and in a short-term context), the change to more agile organizations remains ongoing and in debate.

3 | METHODS AND DATA

We collected data from the internet using Google search engine and analysed them considering the theoretical concepts just described. We also defined a series of seven questions (see below), which we use to apply the methodology to the given data.
3.1 | Analysis

In this section, we analyse COVID-19 from several points of view related to KM science, namely: (i) lack of basic scientific medical knowledge, (ii) lack of social knowledge, (iii) lack of information and difficulties in informing policies; (iv) lack of trust; (v) relation between technology, people and processes; (vi) competence and incompetency and finally (vii) management of knowledge and information by politicians.

We proceed to detail these ideas as:

(1) Lack of basic scientific medical knowledge: The most important fact about COVID-19 is that it increased due to lack of knowledge – the vaccine needed to stop the virus; and even nowadays, one and a half years after the outbreak, we do not have a cure – just (hopefully) many different and competing experimental vaccines whose testing continues even during the process of implementation of vaccination due to the urgency in going back to the “old normal”. Many similar situations happened in History, the last big flu having existed in 1918 to 1919, which is generally accepted to have killed more people than World War I did, but due to the distinctive globalized characteristics of the 21st century, the dimension of the crisis was amplified.

(2) Lack of social knowledge – in the absence of a vaccine, the powers of the world tried to achieve several goals by using some ideas about social behaviour. The goals to be achieved were safety for citizens, political survival of the leaders and a minimal economic crisis. The safety goal was obviously stated, for instance, when President Macron declared the “war on COVID-19” (BBC, 2020a); the political goal was not explicitly stated, even if opinion polls about politicians made it clear who would face an easy re-election post-COVID-19 and who would not – a clear sign of the importance of COVID-19 on politics (Sargent, 2020); the economic goal was mentioned in a deep trade-off with safety measures, raising two types of discussions: in one hand how big and how long would the COVID-19 recession be (Gopinath, 2020), and on the other hand, what would be the best policies to achieve a better mix of safety and low recession – in this last case the discussion went around the fact whether the lockdown measures were too harsh or fully necessary, with Sweden being the most controversial case (Kim, 2020). The instruments used to combat the crisis were essentially linked to social distancing, hand washing and face masks. The most active measure for detection is massive testing. These measures led to declarations of lockdown, emergency states and closure of frontiers; those general measures led to big disruption of social and economic life. From a knowledge science point of view, we are saying that there was no complete, accurate and sound scientific basis for combating the social and economic problems originated by COVID-19; the world was taken aback due to lack of knowledge; the repercussions of this problem are ongoing and might be felt for a long and unforeseen period of time, in all the world, prompting the comparison with a “war”.

Furthermore the reliance on basic mathematics, such as exponential or factor of contagion named R, proved very soon to be too weak to evaluate the socio-economic impact of COVID-19 when in fact, the following factors could be considered: (a) population density; there is good reason to believe that COVID-19 spreads faster in more densely populated areas; (b) age: elderly people, particularly over 70 are clearly more affected than younger generations; (c) number of elderly in care homes: there is good reason to believe that this anti-quated way of treating the elderly undeniably helps the spread of the virus (Holt & Butcher, 2020); (d) number of tests done: there is a scientifically based assumption that more testing may decrease the spread of the virus by detecting more infected cases and therefore contribute to the protection of everyone else (Hasell et al., 2020); (e) average temperature: due to the characteristics of the virus, it is understood that all things being equal a hotter climate would decrease the spread of the virus and its consequences; (f) public health policy measures i.e., using masks: it is understood that those policies may have a reducing effect in the spread of the virus and its consequences (World Health Organization, 2020); (g) income, education and health levels: we may assume that each one of the components of the Human Development Indicator (HDI) is negatively related with the spread of the virus because wealthier societies, more educated individuals and healthier regions have more money, more skills and more natural resistance to fight the virus.

(3) The aforementioned lack of knowledge was also based on deficiencies of information, which created difficulties in informing policies; governments did not know exactly what to do, so they mostly reverted to extreme measures such as lockdowns and emergency states; if there had existed more previous knowledge, about sectorial, regional or age related policies, it would have been possible to restrain life less; and crucially that knowledge would have been based in information obtained on the spot, which in this case, because it was the first wave of a new disease, was non-existent; in the second and third waves, policies were better administrated than in the first case because, added to the existence of the vaccine, already some socially
Based knowledge existed and information to make it useful had been collected:

(4) Lack of knowledge and greatly needed information about a new disease of seemingly uncontrollable spread, which “could kill up to two percent of the world population”, lead to fear (Brooks, 2020); fear in turn lead to a financial crisis (The Guardian, 2020), then economic crisis with social consequences (BBC, 2020b); possible political and cultural consequences may emerge from COVID-19 as the debate about the “new normal” shows abundantly (Harper, 2020); quite crucially for KM science, fear is the contrary of trust and trust is a concept that has been deeply and vastly studied in KM science as we pointed out in the previous section.

Trust is slow to build or rebuild – this explains that in countries that are already easing the lockdown at the time of writing (June, 2021), the recovery in the economic activity and social life has been slower than the rush to paralysis in March and April of 2020 – people are still afraid of being relaxed, and it will take some time to readjust their confidence levels back to normal (Crary et al., 2020).

Trust is directly proportional to economic activity, and lack of trust causes economic slowdown (Sapienza & Zingales, 2012) – this was shown in the COVID-19 crisis by several facts. Firstly, the stock exchange stayed at high levels for a long time but decisively tumbled when President Trump decided to close the United States to flights from Europe (BBC, 2020c); this lack of trust was expanded to the economic area when the lockdown began to take form – suddenly billions of trades were without demand, and fearing not to have money to fund themselves; the continuation in time of that situation led to layoffs and unemployment; the fact that the end of the crisis was not foreseeable led to more fear and less trust. In fact, the most decisive fact about the COVID-19 crisis was that it is a problem of sudden, unexpected and massive lack of trust; and regardless of many other discrepancies, everybody seems to agree that the only way to get a somewhat “normal” life is to get trust back; an example of this is the fact that the country that was more efficient to eradicate COVID-19 (New Zealand) was the one in which life got back to normal quicker because people felt safe again and had trust again (Fifield, 2020);

We may say that, due to lack of trust and rise of fear, which were based on lack of medical and social knowledge and lack of due information, the social and economic pandemonium generated by COVID-19 has been at least as important as the pandemics itself. – 4.6 million deaths and 223 million cases at the time of writing resulted in world recession of seven percentage points in income in 2020, which will only be completely overcome in 2022, generating unemployment, poverty and inequality (Bell et al., 2020; Gopinath, 2020). All those bad economic and social consequences derive from lack of trust and will only go away when and if trust is re-established. The most important question about the “new normal” is in fact on how much trust there will be between people and in the business world; all this means that and given that crucially the basic economic infrastructure is not damaged, the solution for the COVID 19 crisis, lies within the KM realm.

(5) From the start, COVID-19 showed the world the immense power of technology; the planet seemed to be a tiny village, and information circulated instantly to everybody; people, in particular doctors, also administrators and politicians, and soon business persons and workers were put into severe stress due to the uncertainty and the ever more visible economic and social consequences of the lack of trust; finally, processes were the big problem, because particularly in the absence of a vaccine, social based science was needed and everything was lacking in this aspect with the exception of some basic ideas including social distance, washing of hands and wearing masks.

(6) One of the most complex and important issues for businesses and organizations nowadays is that they do not know how to cope with the “new normal” in terms of tasks, skills and competences; “digital transformation”, which was perceived as a possibility before Covid-19, became an urgent necessity with Covid-19; people who, according to Sveiby’s analysis, presented below were absolutely competent in selling, teaching or performing administrative tasks in a presential world with face-to-face relations, became incompetent with Covid-19; the problem of making those people competent again is a KM problem and is among the biggest challenges the world faces today.

(7) Politicians were at the centre stage in the crisis; they tried to ensure their re-election along with the ideas about economic and political cycles well-known by economists (Drahokoupil, 2020): however, KM scholars should devote attention to the fact that during COVID-19, politicians and administrators were exposed in front of the population, as they are in wars, trying to manage the society, and for that, effectively managing knowledge (Tomé & Figueiredo, 2015).

4 | DISCUSSION

As time passes, humanity is slowly solving the Covid-19 problem. However, at the time of writing (September 2021), many questions remain open to debate.

First and foremost, there is the question of knowing if, when and how humanity will have the knowledge to solve the Covid-19 crisis. Some voices believe Covid-19 will be eradicated (Biospace, 2021), others think it will stay around as something similar to flu, for which the most sensible members of the population would be vaccinated every year (Nature, 2021). Those two hypotheses mean that in some time, life will slowly go back to something similar to the “old normal” that existed pre-Covid-19. In this situation, the post-Covid-19 processes will be very much like the old normal. And in consequence, the processes to be used post-Covid-19 will be similar to the “Old normal” ones. However, there is an interesting fact that should be considered. As the Greek Philosopher Heraclite said, “One cannot take a bath in the same waters of a the same river” (BrainyQuote, 2021). This means that “Change is permanent”. And change takes time. Moreover, the Covid-19 crisis already lasted 18 months. In those 18 months, people, organizations and societies had to adapt to many new processes. That adaptation was many times forced, painful and not wanted, but necessary (Juveta et al., 2021; Tomé et al., 2020). But, quite interestingly, those trials and tribulations gave to persons, organizations and societies experience in a completely new and
The post-Covid-19 phase, those people, organizations and societies have more options than before because they will have the “old normal” plus “covid-19 way of acting or new normal” to choose from. Giving a very simple example, in the “old normal” working at a distance was rare, and in the new normal, it became a painful norm; but it may be possible that in the post-covid-19 some people, in some organizations and in some societies, will work from a distance. Specifically, and for instance, it is likely that the number of webinars will increase because people will not need to move physically, given they will have the possibility of using Zoom, Skype or Microsoft Teams.

This change was already envisaged by Bratianu and Bejinaru (2021) who stated that “Time is not waiting for our travel to the future and is coming toward us with accelerated speed creating shocks and discontinuities.” Furthermore, these authors pointed out that Covid-19 forces the development of emergent knowledge strategies; and those strategies have the following characteristics: are based in knowledge sharing and exploration processes; use rational, emotional and spiritual knowledge; they face an unpredictable future and disruptive changes in which the dominant business logic is to survive and recover; they are done through complex thinking. In the same kind of reasoning, Tomé and Gromova (2020) concluded that Covid-19 will emphasize the need for unknown-knowns, which are based on knowledge sharing, and also the unknown-unknowns, that are based on knowledge exploration; and knowledge exploitation and knowledge acquisition based in the known-knowns and the known-unknowns became less valuable. This analysis was made by Tomé and Gromova (2020) to Universities but may be extended to people organizations and societies. Following Tomé and Gromova (2020) and generalizing, the mixture of “old normal” with “covid-19” strategies will probably result in “agile organizations”, which will be (and already are) those that will use the best and right strategies and the best and right dynamic capabilities and will have better results. Finally, due to the foreseeable hybrid nature of the post-COVID-19 future, agility will be decisive for an organization’s sustainability.

The dynamic capabilities needed are crucial for the “People” part of Edwards (2011) and also answer to the riddle posed by Sveiby (2012) in his analysis. Tomé and Gromova (2020) stated that “Organizational agility is the ability of an enterprise to sense changes in the business environment and respond effectively to them.” In this context, the basic dynamic capabilities act as the ability for organizational change, on the basis of which a set of dynamically changing best organizational and managerial methods, models, tools and techniques used for the sustainable achievement of long-term competitive advantages is formed. The dynamic abilities of the second level are the factors, driving forces, objective conditions, as well as the reasons for the emergence of core competencies necessary to achieve long-term competitive advantages of the enterprise. In other words, dynamic capabilities of the second level are the causes, conditions and driving forces behind the formation of core competencies, while reserves are the currently unused opportunities to increase the efficiency of interaction, productivity, consumption, exchange intensity and the proportionality of the distribution of resources in the space and time of production. In sum, these form the core competencies of the enterprise. Core competencies provide potential access to a wide range of markets, contribute significantly to consumer benefits and should be difficult to imitate by competitors (Tomé & Gromova, 2020). Finally, and crucially, the old normal was based on conscious competences (knowledge exploitation) and conscious incompetence (knowledge acquisition), but the Covid-19 crisis put forward unconscious competences (driving knowledge sharing) and unconscious incompetence (which led to knowledge exploitation) (Tomé & Gromova, 2020), creating the “hybrid” environment, of the post-Covid-19 era.

Finally, in the post-Covid-19 era, two basic elements will have to be taken very seriously and will be linked, specifically, leadership and trust. Taking into consideration what was written above, in post-Covid-19, the best leaders will be those who will promote a form of “hybrid” world, and will choose the best agile strategies; also, they will acknowledge Covid-19 as a big problem and a change; by acting as mentioned, those leaders will help decisively to restore trust in citizens, and within organizations and societies. Trust, we consider, will be the major factor to define the post-Covid-19 era. With trust restored, the crisis will vanish. So, leaders will have to implement knowledge strategies and develop competences with agility to restore trust. With trust, economies will grow and societies will prosper.

A very good example of specific solutions for the Covid-19 crisis may be found in the Skolkovo Institute of Science and Technology (Russia) whose researchers have developed computer software based on artificial intelligence, which automates the processing of computed tomography of the chest and detects foci of a dangerous virus. According to the founder of the start-up “AIRA Labs” M. Belyaev (Intelect, 2021), “When analysing the data collected at the beginning of the pandemic, we observed that doctors tend to overestimate the volume of lung damage, and sometimes significantly, by tens of percent”. Apparently, the doctor sees at some anatomical level a strong lesion and subconsciously believes that in the other lungs the lesion is just as severe, although they may be almost clean, and the real percentage of the lesion may be significantly lower. Using the company’s product allows you to get an objective assessment of the actual proportion of the lesion and the degree of severity.” As the developer explained, all images from the diagnostic equipment were sent to a single cloud storage, to which the service was connected. According to him, the total analysis time, considering the data transfer, was on average 2 min, after this period of time, the result of automatic processing became available to the radiologist. In 2020, more than 100 thousand studies were processed, and at the peak of the pandemic, the daily flow was six thousand studies, that is, up to two terabytes of data. For example, in Moscow, during the pandemic, the number of scans performed increased several times, greatly increasing the burden on radiologists. According to the results of the experiment, according to the centre for diagnostics and telemedicine of the Moscow Department of Health, computer vision technologies allowed to reduce the time for preparing a conclusion by an average of 7 min. If we assume that five thousand to six thousand studies were conducted daily, then artificial intelligence saved up to 700 h daily. In February, doctors from all over Russia opened access to the HUB...
platform, which will host a service for processing images with artificial intelligence. After registration and verification, doctors will be able to upload their images for consultation with artificial intelligence services.

5 | CONCLUSIONS

We conclude, first, that most importantly, the Covid-19 crisis happened as a crisis about knowledge; namely we assume that a massive knowledge failure was at its core and made the crisis grow; namely, on the one hand, the absence of a vaccine and the cure for Covid-19; the massive problem of “social knowledge” linked with “organizational behavior”, which was solved with “social distancing” set of measures, like working from home whenever it was possible.

We also conclude that in order to solve the Covid-19 crisis, a mix of “old normal” and “covid-19” strategies on knowledge will be needed. Most importantly, the new strategies will develop new competencies and capabilities. The emergence of those new competencies and capabilities fits the Sveiby (2012) model and its “forecast” that change turns the previously competent into incompetent. Those new competencies will be met using technology (as hybrid solutions), will change people (dynamic capabilities and competences) and will require new processes (new knowledge strategies). Finally, agile organizations that will mix “old normal” with “Covid-19” solutions will require agile leadership. Agile leadership will restore trust. With trust economies will grow and societies prosper.

This is just a theoretical and conceptual study. We hope to do further studies, of a qualitative and quantitative scope, to deepen our understanding of the relationship between Covid-19 and KM.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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