

# New Opportunities in the Time of a Crisis: Perspectives on Virtual Relational Capital Through a CAOS 4.0



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**Abstract** New technologies and digital tools are profoundly affecting today's business scenario, changing how organizations run their business models. Relational Capital as a pillar of Intellectual Capital is also impacted by the increasing importance of virtual relations, which are carried on using new tools and are changing how a company deals with its stakeholders. The COVID-19 pandemic has fostered the application of digital transformation at every level, from the digital competencies and use of customers to the opportunities that organizations can benefit from to enhance their business, for example, by opening e-stores or using social media to engage their clients. Still, virtual relations show different features than other types of connections. Therefore, new models are needed to map and assess such relations to allow organizations to benefit from their potential. The chapter employs a narrative review of the literature stating the current trends, underlining the need to define new framework models. Starting from Paoloni's CAOS model and its relational matrix, reflections on a 4.0. or "Meta" application of it are made.

**Keywords** CAOS model · Relational matrix · Relational capital · Digital tools · COVID-19 crisis · Intellectual capital

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# 1 Introduction

Today's economic scenario is dominated by the rise in the use of new technologies, affecting how organizations shape their business models and, therefore, how they engage with their customers, suppliers, and other stakeholders (Bagnoli et al. 2019). The growth of the invention known as "Industry 4.0" and those technologies linked to the web are bringing new sources of innovations that provide new challenges and opportunities for companies to change the way they conduct their business (Bagnoli et al. 2018). Industry 4.0 technologies like artificial intelligence (AI), advanced and additive manufacturing, big data analytics, cloud computing, Internet of Things (IoT), and cyber security are leading to a digital transformation, which combined effects bring "about novel actors (and actor constellations), structures, practices, values, and beliefs that change, threaten, replace or complement existing rules of the game within organizations, ecosystems, industries or fields" (Hinings et al. 2018; Leone et al. 2021). Digital transformation has the power to "change a business model and provide new revenue and value-producing opportunities", (Garmann-Johnsen et al. 2020) being it "the process of moving to a digital business" (Gartner 2021). All in all, new technologies and the phenomenon of digital transformation cause disruption in the value chain, and as a result, businesses are compelled to reconsider their business models and methods of operation to continue providing value to their clients (Bagnoli et al. 2019).

The use of digital technologies is also changing the way organizations manage their knowledge processes and the relationships they hold with their valuable stakeholders, especially customers, suppliers, employees, collaborators, public bodies, local communities, and so on (Bagnoli et al. 2019). This phenomenon is particularly evident when we consider, for example, social media, which offer a set of computer-mediated tools that allow people or companies to create, share, or exchange information, ideas, and content in virtual communities and networks.

The COVID-19 pandemic at the beginning of 2020 (WHO 2020) had a profound effect on society and the economy all around the world. Several countries were placed under lockdown during the first stage of the COVID era, which the literature refers to as the Emergency phase (Cobianchi et al. 2020). As a result, the majority of businesses were forced to close their public locations and factories, with significant negative economic effects (Bagnoli et al. 2021). Companies had, therefore, to develop novel business strategies to continue operating and retain relationships with their stakeholders, mainly clients. New consumer behaviours and business strategies have emerged (Bagnoli et al. 2021). The closure of schools and kindergartens, the requirement for children to use online and remote learning, and the business disruptions all significantly impacted people, professionals, and firms in general terms, stimulating the use of web-based technologies, and incrementing the digital competencies of the entire population.

While the academic debate was already interested in the shift to new digital technologies and the subsequent opportunities for companies and businesses, the

recent COVID-19 pandemic and the following business disruptions have shed light on a new role of such tools for entrepreneurs.

The paper starts from the premise that virtual relational capital contributes to the value of enterprises in the modern business ecosystem. Therefore, virtual relations and new digital solutions can enhance business performance by promoting new intangible assets that create new relational and structural capital, allowing entrepreneurs to make their businesses thrive despite the crisis. In such a new context, it is crucial to find ways to map and understand the various virtual relations that contribute to the success of the organization. Through a narrative review of the literature, the paper aims to apply the CAOS framework concepts (Paoloni 2011, 2021) to the new business scenario.

## 2 Literature Review

### 2.1 *Relational Capital and New Technologies*

Relational capital is one of the elements of intellectual capital, and it is recognized as a key asset for any firm, being a source of competitive advantage and value creation (Dal Mas and Paoloni 2020; Edvinsson et al. 2022). Relational capital can be defined as the sum of the relationships between the organization and its external stakeholders (Paoloni and Demartini 2012; Schiuma and Lerro 2008). Such stakeholders may include customers, suppliers, employees, other firms belonging to the same or a different industry, public bodies, local communities, universities, schools, and research centres, among others (Yen et al. 2015). Brand, corporate image, reputation, customer satisfaction, and loyalty marketing are all examples of relational capital that firms may rely on as a result of their continuous relationships with stakeholders (Ax and Marton 2008; Bontis 1998).

While in the past, most attention was paid to “traditional” stakeholders like customers, today the situation is different, with ecosystems being more open and interconnected (Secundo et al. 2019b). In fact, a firm’s success is strongly connected to the relationships an organization can hold with other actors in the ecosystem (Edvinsson et al. 2022). The so-called fourth stage of intellectual capital underlines the need for organizations to develop relations and capabilities outside their own boundaries, to work effectively in a new ecosystem (Secundo et al. 2016) which includes not only firms but also nations and countries (Käpylä et al. 2012; Roos and O’Connor 2015), cities (Dameri and Ricciardi 2015), and communities (Bounfour and Edvinsson 2005). The fifth stage of intellectual capital extends the need for organizations to cope also with sustainability and corporate social responsibility issues (F. Dal Mas 2019; Massaro et al. 2018), to ensure that their businesses are valuable and beneficial for the entire society (Biloslavo et al. 2018; REDI 2022).

The need to nurture relationships with a variety of stakeholders with different values and expectations requires organizations to think of new ways of exchanging and sharing knowledge. According to Savory (C. Savory 2009; Clive Savory 2006),

the complexity of the scenario and the actors working in the ecosystem require more effort than a simple knowledge transfer. A more comprehensive translation is needed to ensure that the valuable information can be understood and passed through (Dal Mas et al. 2021), generating new knowledge.

The management of the relationships to ensure adequate knowledge translation and sharing is, therefore, complex, and it requires several tools and facilitators (Dal Mas et al. 2020b). While some of these tools are connected with creativity (Secundo et al. 2019a; Simeone et al. 2018), design (Dal Mas et al. 2020a), or non-technical skills (Stahel et al. 2022), several studies underline the importance of the new technologies to enhance relational capital and nurture the network of stakeholders (Cobianchi et al. 2021; Dal Mas et al. 2020b; Grigoroudis et al. 2012; Karimi and Walter 2016; Loftus et al., 2020a, 2020b).

Moreover, as stated above, new technologies allow new ways to engage the various stakeholders. For instance, thanks to additive manufacturing and simulations, companies are able to offer new products and services to their customers, including prototypes, improving clients' satisfaction (Bagnoli et al. 2019). Big data analytics gives the possibility to understand customers' trends and wishes by analysing vast amounts of data or scrapping numbers from social media (Centobelli and Ndou 2019; Del Vecchio et al. 2020). IoT-connected devices allow monitoring situations, offering customers better live services (Paoloni et al. 2022a). E-commerce and e-payment enable organizations to reach customers that would never be able to visit their physical stores because of the geographic distance, boosting their business worldwide (Bagnoli et al. 2021).

## ***2.2 Virtual Relations During the COVID-19 Pandemic***

The COVID-19 pandemic and related healthcare crises impacted several industries globally (WHO 2020). Many businesses were obliged to close their doors to customers due to non-pharmaceutical interventions (Massaro et al. 2021). Some sectors were severely hit, like tourism, because of the travel ban. Most of the human population of the planet was confined. Pandemics and disasters in general (like natural calamities) have demonstrated the ability to alter the course of history by spurring the development of innovative religious, political, economic, and technological systems (Fuller 2013). Numerous businesses have been halted due to the required closure of several non-essential factories and offices, which has also resulted in a disruption of supplies from international vendors, particularly the large ones based in China. The closure of almost all public places like shops, theatres, cinemas, auditoriums, restaurants, gyms, and fitness centres had the effect of replacing physical interactions with virtual ones, maximizing the use of e-stores and digital platforms (Bagnoli et al. 2021). The closure of schools and universities pushed all organizations active in education and training to boost e-learning platforms in several fields (D'Agostino et al. 2021; Garcia Vazquez et al. 2020; Thannhauser et al. 2010) and for every degree of education. Many people started

“overnight” (The Economist 2021) working from home instead of commuting to work (Risi and Pronzato 2021), bringing their tasks online through online collaboration tools, like Zoom, Microsoft Teams, Google Hangouts, and Google Meet, among others (Paoloni et al. 2021; Park et al. 2021; Prodanova and Kocarev 2021). About 69% of employees in the USA switched to remote work from at least sometimes to full time in April 2020 (Brenan 2020).

All in all, people of all ages worldwide were forced to increase their digital competencies and their availability of devices connected to the Internet—as private citizens—being them students or parents/guardians of study-at-home children, or e-customers—or professionals—as remote workers or entrepreneurs, boosting a trend (that of digital transformation) which was already on its way.

### **3 The Need to Map Virtual Relations**

The literature and practice have underlined the massive shift in the type of relational capital a modern organization can hold, stressing the value and contributions of virtual relations in boosting a company’s competitive advantage and business opportunities in a post-pandemic era. Therefore, it emerges the need to find framework models that can map and assess the type and quality of virtual relations to guide the company’s managerial practices.

#### ***3.1 The Qualitative and Quantitative Aspects of (Virtual) Relational Capital***

Relations represent bonds and connections between two or more subjects or groups. According to Paoloni and her renowned C.A.O.S. (Characteristics – Ambience – Organization – Situation) model (Mercuri et al., 2021; Paoloni et al. 2021; Paoloni et al. 2020; Paoloni et al. 2022b), the relational cycle portrays the journey which shows how a firm’s relational capital can be nurtured and transformed into better performances and economic value. Such a path starts with relations, which become stronger thanks to trust, being then converted into relational capital, which boosts the company’s performance leading to an increase in economic value.

Relations can be distinguished according to their qualitative aspects, dividing so between formal and informal relationships (Paoloni 2011). Formal relationships are characterized by the presence of a need or duty, which can derive from regulations, managerial, or economic necessity. Informal relationships escape from any economic bond, but they still may be valuable to support the company’s business. Informal relations are not generated by a specific duty or need, but they are voluntary, and they may merge economic and personal interests.

Moreover, relations can vary according to intensity or frequency, being so permanent or temporary (Paoloni 2011). Permanent relationships imply the presence of a long-lasting life, which is prolonged and consolidated by trust and confidence. Stakeholders engaged in permanent relations mutually appreciate the value and benefits coming from such a relationship. Temporary relationships do not last long, and they are occasionally generated by a specific moment or need. They are rarely based on mutual trust, and they are likely to end, as the mutual benefit is not widely recognized by the involved parties.

The traditional relationship matrix by Paoloni (2011) still looks suitable to assess and map virtual relationships in the post-pandemic era. However, some considerations emerge.

### 3.1.1 A Change in the Tools Used

The original model (P. Paoloni 2011, 2021) did not take into account the tool used to maintain and nurture the relations. Indeed, they could be kept in person (e.g. through meetings, gatherings, shared workspaces, events, boot camps, training courses, or else) or using other ways (e.g. via e-mail or mail, . . .). Still, in the previous scenario, the number of practical tools was limited.

Today, the number of potential tools and devices that can support the development of relationships is more extensive than it was before, and technology is progressing fast. From e-mail services to online meetings through collaborative platforms like Zoom, Meet, Hangout, Webex, from social media and instant messaging services up to new perspectives described for the Metaverse (Hirsch 2022), where avatars are able to e-meet, e-chat, e-play, regardless of where they physically are (Kraus et al. 2022; Lee et al. 2011). Moreover, such new technologies as AI can allow organizations to maintain relationships with their customers without using real humans but, for instance, customer care through chatbots. Even if such a technology is not yet perfect (Baabdullah et al. 2022), it can give feedback and provide customers with some basic suggestions and responses, reducing the number of clients that need tailored assistance (Chen et al. 2022). Such new technologies and ambiances (like the Metaverse) represent structural capital elements that allow not only to keep and nurture relationships but also to boost the business by, for instance, reaching or engaging clients that are physically far, providing them with new services (like online shopping or teleconsultation).

### 3.1.2 A Change in Consumers' Habits

While some people may still claim that they miss the “old fashion way” of doing business and maintaining relations, the consumers' trends tell a different story, especially after the pandemic (Bagnoli et al. 2021). The Internet is today an essential part of everyone's life, as it is hard (if not impossible) to escape from its use. Internet 2.0, where users can generate content beyond what is shared by professional

operators, has become a valuable search engine for every topic (Torabi and Bélanger 2022), from healthcare suggestions (Miceli et al. 2021; Zoghiami and Ben Rached 2022) to tourism tips (Mehraliyev et al. 2022), from the assessment of mass products (Paintsil and Kim 2022) to university and school rankings (Sirkeci and O’Leary 2022)

E-government services in many countries made it mandatory to have an e-mail address or even a Public Digital Identity System to access several services (Abdelhakim and Idoughi 2021), for example, enrolling children on school or asking for funds or fiscal benefits.

The mandatory closure of non-essential activities during the worst waves of the COVID pandemic made e-commerce the only way to access non-essential products.

Social media networks like Facebook, Instagram, Twitter, and Tik Tok represent a growing phenomenon in modern society (Bessarab et al. 2021), used not only to communicate, seek information, or entertain but also to shop (business-to-consumer, business-to-business, and consumer-to-consumer), promote someone’s products, services, or skills, even leading to new job opportunities.

### 3.1.3 A Change in the Concept of Trust

As reported by the literature on relational capital (P. Paoloni 2011, 2021), trust represents a central element which is able to strengthen the relationships between different parties and transform temporary relations into permanent ones. Moreover, trust is a vital step in the relational cycle leading to more performing results and a more decisive competitive advantage. While trust among people or groups is grounded on reciprocal confidence, knowledge, affection, and fondness, the concept of trust in the virtual world is more connected with data and cyber security and technology or the eventual relationship with solid and famous partners. For instance, in e-commerce, online customers do trust big operators, like Amazon or PayPal, while they may be reluctant to buy from (even nice-looking) web portals that do not have any previous ratings or reviews. Therefore, firms willing to sell online would better have or show a profile also on premier online retailers like Amazon or rely as a payment method on PayPal, which guarantees the customers against frauds or illicit use.

Moreover, as stated before, people are more likely to trust official rankings and reviews than what a business entity shows through its official channels (like pictures, websites, leaflets, or product descriptions). Customers’ reviews are perceived to be more genuine than sophisticated marketing tools employed by firms, especially when data are vast. Mass reviews drive customers’ choices more than what a company wishes to express. That is why several companies (like Amazon, Ali Baba, Shein, or hotel chains like Marriott or Hilton) have decided to include transparent customer reviews in their e-commerce portals. Products with poor or low satisfaction measured through reviews would be obscured or end up at the bottom of the page, as fewer people will likely buy those items. Top-rated goods

will, on the contrary, see an increase in their public visibility, as customers love them.

All in all, the concept of trust is less linked to someone’s features and more connected with this someone’s cyber security and online reputation, also measured through customers’ independent assessment.

## 4 An Example of a Relational Matrix

Our narrative review has underlined the features of the new virtual relations that can be beneficial to an organization to boost its business and enhance its competitive advantage.

The following Table 1 reports a possible relational matrix with some of the virtual relations that can be identified according to the current technological, economic, and social scenario.

**Table 1** A map of virtual relations

		Intensity of the relation	
		Permanent	Temporary
Type of relation	Formal	The use of certified e-mail services for the relationships with public agencies The use of certified e-mail services for the official relationships with other businesses (e.g. clients, suppliers, other business partners, . . .) The use of e-signature to sign contracts with multiple parties The use of digital tools for e-booking The use of e-commerce platforms, both managed by the company and using third parties firms (like Amazon) . . . .	The use of chatbots for customer service The use of online messages to respond to customers’ queries The use of crowdfunding portals to collect funds for new investments or initiatives The use of portals to invest in cryptocurrencies . . .
	Informal	The use of social media to promote the company’s products and services The use of simulations or prototypes for clients The creation of avatars or virtual places to engage clients in the Metaverse . . .	The use of web scraping tools to map customers’ satisfaction The use of social media to engage leads and keep the company’s reputation high The use of live streaming, webinars, or Metaverse events to engage new and existing customers . . .

Source: Authors



## 5 Conclusions and Future Research Avenues Concerning a CAOS 4.0 or MetaCAOS Model

In concluding our chapter, we should recall the premises that inspired it. The current business scenario sees the importance of virtual relations as a relevant part of an organization's relational and intellectual capital, especially to thrive in the post-pandemic tough business times.

Our narrative review of the literature has found some new trends and features when it comes to virtual relations. There is the need to use sound framework models that can be considered as "4.0" or "Meta", just to mention two of the megatrends (the technological shift brought by the fourth industrial revolution and the fascinating ambience of the Metaverse). The CAOS model by Paoloni (P. Paoloni 2011, 2021) and the relational bonds among its factors stand as a promising framework to expand the topic of virtual relations, their assessment, and management, leading to a "CAOS 4.0" or "MetaCAOS".

Empirical studies are needed to explore the topic further and translate it into promising research and practice implications.

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