# Futurizing Intellectual Capital Theory to Uncover Pertinent and Unexplored Horizons

Aino Kianto, Sladjana Cabrilo, and Henri Hussinki

**Abstract**

The need to understand the criticality of knowledge and related resources has led to scholarly discussions, and the intellectual capital (IC)-based view of firms has gained increasing importance in the contemporary management literature. Manifold impacts of IC on organizational performance have been widely evidenced, and management mechanisms for various IC dimensions can be found in most established organizations. As research is a strongly path-dependent activity, IC research naturally leans on classical frameworks and conceptualizations constructed a decade or even several years ago. However, large-scale changes in companies' operating environments, such as digitalization, the sustainability crisis, and the COVID-19 pandemic, and related forced move to remote work demand new knowledge resources. In this paper, we strongly argue that normative approaches for conceptualizing IC and its performance relevance would benefit from updating. Furthermore, the new post-pandemic world of work requires novel understandings of IC. To spur new thinking and offer ways forward, we develop a theoretical model that indicates selected ideas for a revised understanding of IC and its role in organizational viability. We suggest important new issues to be examined in terms of various IC elements, organizational performance dimensions, and moderators of relationships among these dimensions. The paper contributes to IC research by constructing a revised model of IC that

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can be used to generate topical research models to be further developed and tested in theoretical and empirical studies.

**Keywords**

Intellectual capital · Future · Digitalization · Remote work · Open innovation · Sustainability

## 1 Introduction

The need to understand the cruciality of knowledge and related resources has permeated scholarly discussions; subsequently, the intellectual capital (IC)-based view of firms has gained a strong position in the contemporary management literature. Complementing the overall knowledge management literature, IC focuses on the knowledge-related resources that are applied in organizational value creation processes (e.g., Edvinsson & Malone, 1997; Bontis, 1998; Inkinen et al., 2017). The manifold impacts of IC on organizational performance have been widely surveyed and evidenced, and management mechanisms for various IC dimensions can be found in most established organizations.

In recent times, work life as we know it has undergone fundamental transformations. The spread of COVID-19 brought a major challenge to companies that had simultaneously been facing global competition and environmental uncertainty. Companies had to not only prevent the spread of COVID-19 through social distancing but also find effective ways to maintain performance. Remote work was found to be a good way to achieve both goals during the pandemic (Liu et al., 2021). Considering that there are more than three billion Internet users in the world and increasing numbers are using digital technologies to work remotely (Donnelly & Johns, 2021), the need for workers to adopt skill sets to meet the requirements of digitalization and future jobs (Habraken & Bondarouk, 2017), and the rise of crowdsourcing platforms and co-creative networks for innovation and prosperity, the main question in this paper is as follows: Do we need to redefine knowledge-based resources that contribute to organizational value-added process and consequently to reconceptualize the IC framework?

Most IC research has leaned on the classical tripod of IC components, a foundation laid down by the first-generation gurus of the field (e.g., Bontis, 1998; Edvinsson & Malone, 1997; Sveiby, 1997; Roos et al., 1997). This tripod divides value-generating knowledge assets into human, structural, and relational capital, that is, the value vested in an organization's personnel, its internal structures and processes, and its relationships. Even though this conceptualization has been challenged by some (e.g., Cabrilo & Dahms, 2020; Inkinen et al., 2017), it still remains the cornerstone of the IC-based view of the firm and is judiciously followed by most researchers in this field. As research is a strongly path-dependent activity, it is natural that IC research leans on classical frameworks and conceptualizations and that most IC

studies tend to adhere to the classical conceptualizations of IC components originally constructed several decades ago.

However, this may be problematic since large-scale changes in companies' operating environments and work life, in general, are likely to demand new knowledge resources. In this chapter, we make a strong argument that normative approaches for conceptualizing IC and its value relevance would benefit from updating. We further suggest that the new post-pandemic era calls for novel understandings of IC. Thus, it is important to rethink the nature and content of IC in the presence of current realities and how that may affect our theorizing of IC.

This paper proposes generalized propositions as provocations for debate and future research. To spur new thinking and to offer ways forward, we develop a theoretical model that points out selected ideas for a revised understanding of IC and its role in organizational viability. In particular, we suggest that the required changes to IC theory stem from five interrelated issues—digitalization, remote work, gig work, open innovation (OI), and crowdsourcing—and strive toward sustainability through ethical leadership, green IC, and organizational resilience. Based on these, we suggest important new issues to be examined in terms of various IC elements, organizational performance dimensions, and moderators of relationships between those. We believe our ideas can shed light on the revised concept of IC and its performance effects in the digital economy and the new post-pandemic world of work.

## 2 IC-Relevant Changes in Companies' Operating Environment and Work Life

Work life is facing many large-scale changes due to ecological, political, and economic uncertainties. To remain competitive in the face of digitalization, diversifying work arrangements, sustainability crises, and the need for continuous renewal and innovation, organizations require new resources and capabilities (Colbert et al., 2016; Habraken & Bondarouk, 2017). In the following section, we discuss major changes that may impact the nature of IC in our times.

### 2.1 Digitalization

In Industry 4.0, also referred to as Smart Industries, digital technologies have increasingly changed the organization and nature of work (Colbert et al., 2016; Habraken & Bondarouk, 2017). Technological developments create greater work flexibility and mobility, which can benefit both workers and organizations (Ludivine, 2017). At the same time, these present challenges, as new technologies are dramatically changing employment and work features across many fields of work (Cooper & Lu, 2019; Felstead & Henseke, 2017). Digital technology enables an increasing fragmentation of work, facilitating complex employment relationships (direct and subcontracted), the growing use of part-time and shift work, and the individualization of the employment, or smaller and more isolated work units, such as virtual

teams (Donnelly & Johns, 2021). In a digitized world where work is crowdsourced to freelancers through online platforms and collaboration occurs across geographical, functional, and hierarchical borders (Lepofsky, 2016), many aspects of IC may need updates.

Increasing robotization and automation demands workers to develop digital competences and adopt new skill sets required to work in new jobs created (Habraken & Bondarouk, 2017). Furthermore, the rise of crowdsourcing platforms and online organizations that organize work by sourcing tasks to their members who are independent contractors or so-called gig workers that are "hired" on-demand (Nakatsu et al., 2014) also fundamentally changes work relationships.

Another valuable personnel competence related to digitalization can be labeled as data literacy. Data literacy is crucial not only for the people directly involved in data curation and data analytics, such as data engineers, data scientists, and data analysts, but throughout an organization (Gupta & George, 2016). For instance, top-level management needs to understand what data the organization possesses in order to develop an intuition of which types of business decisions could be supported with the analyzed data. However, top-level management cannot make all decisions; thus, also middle management and operative-level employees should be trained to understand data and make decisions based on them (Arunachalam et al., 2018).

**Proposition 1** Digital competence is an important aspect of human capital in digitalized work life.

In the digital era, organizations must not only cope with disruptive technologies and innovation but also adapt their business philosophy and models, including mindset (organizational and individual), culture, and competences, to the digital way of working (Murawski & Bick, 2017). Creating an open culture that embraces independent and on-demand workers allows organizations to benefit from their ideas and engage them in innovation and value creation (Smith, 2020). A digital organizational culture supports digital capabilities and innovation performance (Zhen et al., 2021).

**Proposition 2** Open digital and data-driven culture is an important facet of structural capital in digitalized work life.

Since data have recently gained ground as a key competitive resource for many businesses, it is important to ensure that their utilization is guided by real business needs. This can be achieved by establishing a collaboration between data analytics and business experts (Akter et al., 2016; Mikalef et al., 2019). Without such cross-functional collaboration, organizations may end up doing analytics and business in different silos instead of conducting business analytics. Organizations can further increase the level of data utilization by providing easy access to data throughout the organization (Kristoffersen et al., 2021). A centralized data platform where all relevant business data are transferred and stored in an architecturally sound design can

be integrated with different analytics tools and applications. Related to this, the organization should provide employees with adequate analytics tools which they can easily use to perform daily analytics tasks (Akter et al., 2016; Fosso Wamba et al., 2017). This strengthens the organization's data-driven culture, in general, and allows analytics personnel to focus on more demanding tasks that better suit their expertise (Gupta & George, 2016; Mikalef et al., 2019).

**Proposition 3** Business analytics, data platforms, and analytics tools and applications are key elements of structural capital for knowledge-based value creation.

## 2.2 Remote Work

The term *remote work*, sometimes also referred to as telework, locationally distributed work, or virtual work, can be defined as any work that is detached from traditional fixed places of work (Felstead & Henseke, 2017). Remote work is not a product of the COVID-19 pandemic but has gained its momentum and proved its significance as a result of the pandemic's catalytic effect (Liu et al., 2021), becoming a necessity for organizations globally (Donnelly & Johns, 2021).

What used to be a personal choice before the COVID-19 outbreak, where someone chose to work as a high-skilled professional outside an office to better balance work and life and reexamine their priorities, has become a necessity after the pandemic, as people of diverse gender, age, professional backgrounds, and social class worldwide have had to switch to remote work literally overnight (Mahadevan et al., 2022). Remote work has increased in scope and relevance, and the profile of a remote worker has changed and diversified (Mahadevan et al., 2022). This will likely remain an important way of working in the future because workers have experienced the benefits of working from home.

There are certain established concepts in the human resource management literature, such as flexible work arrangements (Berkery et al., 2017), gig work (Boons et al., 2015; McDonnell et al., 2021; Williams et al., 2021), virtual teams (Adamovic, 2018), and digital nomads (Hannonen, 2020), all of which present new ways of working outside the boundaries of organizations and have been related to the larger phenomenon of *remote work*. Externalization of employee work has been mostly seen as a negative trend from an employment perspective, as work relationships become more fluid and short time (Hollister, 2011) and somehow *less under traditional control*. The restrictions of managerial control under remote work arrangements are compensated by employees' self-management and leadership skills.

Self-leadership (Manz, 1986) is a process through which people influence themselves to achieve the self-direction and self-motivation necessary to behave and perform in desirable ways. It is a broader concept of self-influence that encompasses self-control, self-regulation, and self-management. It draws on intrinsic motivation theories (e.g., Ryan & Deci, 2000), social cognitive theory (Bandura, 1986), and positive cognitive psychology (Seligman & Csikszentmihalyi, 2000) to understand sets of behavioral and cognitive strategies designed to shape individual

performance outcomes (Houghton & Neck, 2002; Neck & Houghton, 2006). Self-leadership theory posits that even though external contexts and activities influence behavior, actions are ultimately controlled internally by an individual and focus on how people manage and lead themselves (Stewart et al., 2011). The theory includes self-imposed strategies for managing the performance of tasks of low intrinsic motivational potential and self-influence that capitalizes on the *natural* or intrinsic motivational value of task activity (Manz, 1986). Three distinct but complementary categories of self-leadership influence its outcomes: behavior-focused strategies, natural reward strategies, and constructive thought pattern strategies (Prussia et al., 1998). In remote work arrangements, self-leadership is an important skill for both internal and external human capital and should be included in the associated research models.

**Proposition 4** Self-leadership is an important aspect of human capital in remote work contexts.

## 2.3 Gig Work

In today's digital economy, the traditional full-time employed labor force seems to be decreasing, and a growing number of workers, especially high-skilled professionals, prefer to work as autonomous and independent self-employed freelance contractors (Vaiman et al., 2011). Contingent work is a form of *nonstandard* employment that involves the hiring of workers on *contingent* or *fixed-term contracts* (Connelly & Gallagher, 2004). Organizations worldwide benefit from contingent work by saving on labor and related costs (Smith, 2020) and becoming more agile and able to respond to changes rapidly.

Gig work is composed of short-term jobs (gigs) and presents a type of contingent work that typically falls outside the boundaries of an organization. Digital platforms connect gig workers directly with customers (Harris, 2017); therefore, gig workers are classified as independent contractors rather than employees (McDonnell et al., 2021; Halliday, 2021). In the gig economy, organizations do not hire workers but rather mediate an exchange between gig workers and customers, through a system where tasks and resourcing are managed by the algorithm (McDonnell et al., 2021). In this new economic system, workers are not engaged in *jobs* and have no long-term connections with a company but are hired on demand for *gigs* under flexible arrangements as independent contractors, working only for a defined time to complete a particular task. After job completion, they have no more connection with their employer (Friedman, 2014).

However, as gig workers have no traditional employment relationships with organizations (Friedman, 2014; Halliday, 2021), managing this workforce can be a great challenge. These on-demand *hired* workers may not feel connected to the organization and may not have the same loyalty as full-time employees because they do not belong to any organization. Therefore, further analysis needs to be conducted regarding the implications of contingent work on organizational structure,

leadership and talent management, organizational culture, and trust, as well as to reexamine specific organizational theories and models, such as knowledge-based theory (Grant, 1996) and IC.

Thus, the question here is how to consider the knowledge, skills, and experience of workers with zero-hour contracts, which do not require a minimum number of working hours by an employer as a part of organizational intellectual (human) capital. We argue that irrespective of their formal employment status, workers who create value for a company should be counted as its human capital. However, there have been opposite views, for example, in financial accounting, an asset is any resource owned or controlled by an economic entity, and following this definition, remote workers who are not fully owned or controlled by a company do not represent its human capital. In any case, it is important to rethink concepts and theories that are affected by the externalization of work and other changes in the nature of work, including the concept of IC, which is the main aim of this paper.

**Proposition 5** Gig work and other contingent work should be acknowledged as an important aspect of human capital.

## 2.4 Open Innovation and Crowdsourcing

Recently, OI and crowdsourcing have been hot issues in the innovation management literature (Cricelli et al., 2022). There has been a successive change in the way innovation has been viewed through time. The innovation paradigm has shifted from *closed innovation* to *open innovation*, *networked innovation* models, and now to participative innovation, which is an integral characteristic of open innovation 2.0. (Chesbrough, 2003; Curley & Salmelin, 2018). As innovation is the most typical performance variable in IC research (Inkinen, 2015), this novel innovation paradigm should also entail changes in the IC field.

OI, as introduced by Chesbrough (2003), is an innovation practice that strives to provide much richer knowledge flows and make innovation quicker, easier, and more effective through exchanging knowledge and ideas via collaborative and open-network environments (Curley & Salmelin, 2018). It is characterized by sharing knowledge, critical resources, and capabilities within and across the boundaries of organizations to exploit both internal and external knowledge and ideas (Chesbrough, 2003). In OI, ideas pass to and from different organizations for exploitation. Based on bidirectional knowledge flows, two distinct directions in the OI process are inbound OI (outside-in process) and outbound OI (inside-out process) (Gassmann et al., 2010; Huizingh, 2011). While inbound OI refers to the internal use of external knowledge from various innovation sources, such as partners, customers, universities, and research organizations, outbound OI refers to external exploitation of internal knowledge through selling patents or direct licensing (Cricelli et al., 2022).

According to IC theory, this means that knowledge-based value-creating resources are related to not only intrafirm resources and capabilities but also those

over and across organizational boundaries. Thus, the *external* human, structural, and relational capital should be better acknowledged for understanding OI.

**Proposition 6** External IC resources are important for understanding OI.

*Crowdsourcing*, with its multidisciplinary nature, is a complex phenomenon (Cricelli et al., 2022). It is consistent with the OI paradigm (Bogers & West, 2012), as it refers to the use of outside sources for ideation and crowd wisdom or collective intelligence in value creation (Brabham, 2013). Crowdsourcing indicates the practice of opening the process of getting ideas or performing tasks to the public and asking a body of people (the crowd) to share their knowledge as users to improve their own experience (Buettner, 2015).

The adoption of OI strategies requires the reorganization of how processes are carried out, which need to be linked to a new and more open and entrepreneurial culture, cooperative behavior, and a collaborative mindset of the people involved (Cricelli et al., 2022).

**Proposition 7** Open and entrepreneurial culture is an important facet of structural capital that supports crowdsourcing and the use of collective intelligence.

## 2.5 Ethical Leadership

While transformational leadership aims to develop maximum followers (Northouse, 2012), ethical leadership focuses on a *code of honesty to ourselves* to make leaders and followers more ethical (Anderson & Sun, 2017). Ethical leadership more explicitly estimates the moral values of leaders, such as honesty, motivation, credibility, integrity, and justice (Lu & Guy, 2014), and recognizes top managers as the key personalities who create organizational culture and ethical climate. Ethical leadership involves the demonstration of high moral values in personal actions and interpersonal relationships and the promotion of such behavior to followers through open, trustful, and two-way communication as well as encouragement and empowerment in decision-making (Brown et al., 2005; Ullah et al., 2021).

Research has shown that employees conform to the ethical values of their leaders (Brown & Mitchell, 2010). Thus, a moral leader influences the behaviors and attitudes of their employees (Treviño & Nelson, 2016) and creates a productive employee work behavior (Mayer et al., 2009). In addition, ethical leadership is related to important follower outcomes, such as employees' job satisfaction, commitment, engagement, and voice behavior (Brown & Mitchell, 2010; Ullah et al., 2022). Some previous studies have also demonstrated that ethical leadership and IC, especially in the knowledge-based economy, positively impact business performance (Donker et al., 2008) and that IC facets (human and social) and organizational ethical culture have a mediating effect on the CEO's ethical leadership and corporate social responsibility (CSR) relationships (Ullah et al., 2022).

Ethical leadership positively influences employees' innovative performance (Ullah et al., 2021), as an ethical culture inspires employees to participate in learning (Ullah et al., 2022). Furthermore, Ullah et al. (2021) revealed that IC, particularly human and social capital, plays a mediating role in the relationship between ethical leadership and employees' innovative performance. Higher ethical values may improve IC (Ullah et al., 2021), as responsible leadership plays a vital role in supporting the conversion of employees' tacit knowledge into organizational IC (Kumari et al., 2015). Ethical values can help companies attract talent, improve corporate image, and develop an ethical culture and environment for shared learning, open communication, product development, and teamwork (Ullah et al., 2022).

Ethical CEO leadership supports moral activities and attitudes toward business and generates trust among internal and external stakeholders. Ethics and trust shape an organizational culture of honesty and ethics and create an ethical climate that boosts open communication with employees, teamwork, knowledge sharing, creativity, and better organizational problem-solving, enhancing organizational IC (Maletič et al., 2018). The trust generated by ethical behaviors enables superior relationships, leading to increased relational capital. Ethical leadership and followership attract and retain talents, which can further lead to better human capital (De Hoogh & Den Hartog, 2008). In summary, ethical capital entails leaders to be liable for humankind in general, not just for their firms, and enables leaders to build an ethical corporate culture (Crane et al., 2019) and to be accountable for humanity (Ullah et al., 2022).

**Proposition 8** Ethical leadership creates an ethical corporate culture and is an important facet of structural capital that not only enhances performance and productivity but also supports companies to be more accountable for humanity.

## 2.6 Sustainability

With the global market facing fierce competition, competitiveness has become the most popular slogan and aspiration of individuals, organizations, cities, countries, and regions. An intriguing question is whether competitiveness should be defined through financial indicators or through well-being (Januškaitė & Užienė, 2018). While investments in competitiveness are expected to bring a better future, the future depends on what is done today. Sustainability is essential to ensure that tomorrow comes and is better than today and yesterday.

Sustainability is a crucial issue for the future of the planet and humanity. With growing global concerns regarding the scarcity of natural resources, economic viability, social inequity, poverty and human rights violations, climate change, and rapid environmental degradation, sustainability issues have also become increasingly relevant (Ching et al., 2016; Reboredo & Sowaity, 2022). Environmental, social, and governance (ESG) pillars of CSR have become an important source of competitiveness, performance, and long-term value for organizations (Crifo et al., 2019; Mutuc Burgos & Cabrilo, 2022; Yu et al., 2018). To achieve strategic

sustainability, companies have become more environmentally aware and protective, more involved in social activities that support the well-being of the community and employees, and more focused on corporate governance (Asiaei & Bontis, 2019; Wang, 2011).

The relationship between sustainability and IC is somehow very logical (Aras et al., 2011; Fuentes-García et al., 2008; Jain et al., 2017) but remains insufficiently explored. There is growing demand for firms to balance economic growth and environmental and social concerns (Jain et al., 2017), and firms have become more aware that the productive factor behind their sustainable growth is what they know and can do with this knowledge to make better decisions and create value (i.e., their IC).

Although the literature connecting these issues remains scarce, studies have confirmed that IC is a key element in sustainable operations (Chen, 2008) that can also change the impact of CSR activities on firm performance and value (Mutuc Burgos & Cabrilo, 2022). Sunday (2017) demonstrated a positive relationship between IC and corporate sustainability and a significant impact of human capital on economic, social, and environmental sustainability. Human capital seems to be specifically important for a firm's environmental and social performance (Reboredo & Sowaity, 2022). More competent employees with professional credentials positively affect a firm's reputation and contribute to the overall trust in firms' activities (Nemiño & Gempes, 2018). Thus, human capital improves stakeholders' perceptions about a firm's sustainable development, which can be further translated into higher market value (Smith et al., 2010). Finally, motivated employees expand relationships with stakeholders and feel more responsible for their overall corporate behavior (Mutuc Burgos & Cabrilo, 2022).

Some studies have also found that IC positively mediates the relationship between CSR and financial performance (Surroca et al., 2010; Jain et al., 2017), although findings may vary for developed and developing economies and according to different CSR dimensions (ESG) (Mutuc Burgos & Cabrilo, 2022).

## 2.7 Green IC

For a long time, it was considered that competitiveness and environmental sustainability cannot work together, as natural resources are limited and industrial production creates waste and pollution. However, with concepts such as green innovation and green IC, this situation has changed, and now industries can grow without damaging the environment (Janušk aitė & Užienė, 2018; Liu et al., 2022).

Green innovation integrates green concepts and environmentally friendly techniques into business operations and the innovation process (Barrena-Martínez et al., 2020; Liu et al., 2022). It includes the implementation of new ideas and methods to reduce the negative effects of production and increase economic, social, and environmental benefits (Zhang et al., 2019).

In the knowledge economy, knowledge-based resources and capabilities are the leading drivers of environmental and social innovations (Chen, 2008). Thus, the

process of accumulating green IC is a process of promoting sustainability within organizational operations and business value creation (Liu et al., 2022). Green IC refers to the sum of existing knowledge and skills that are used within a firm in organizational and environment-oriented processes and activities and that give the firm an opportunity to maximize its economic, social, and environmental performance and achieve a sustainable competitive advantage (Chen, 2008; Chang & Chen, 2012; Liu et al., 2022).

Green IC can be categorized as green human, green structural, and green relational capital (Chen, 2008). Green human capital refers to the general environmental knowledge and ability of employees and managers and their commitments to sustainable development (Chen, 2008). It plays an important role in green innovation and environmental management in the face of external pressures (Wang et al., 2020). Green structural capital refers to organizational capabilities and commitments, knowledge management systems and processes, reward systems, information systems, databases, and organizational culture that reflect environmentally friendly principles and philosophies (Chen, 2008). Green relational capital refers to the relationships between a firm and its stakeholders with respect to environmental protection and green management issues (Chen, 2008).

**Proposition 9** (Green) IC is a key element of corporate sustainable growth and can maximize economic, social, and environmental performance and innovation.

## 2.8 Organizational Resilience

Organizational resilience refers to organizational viability over the long term under varying conditions (Tengblad & Oudhuis, 2018). Resilience should be "an everyday habit rather than something grasped for only in moments of crisis" (Välikangas, 2010, p. 3). Companies that create value for their customers over a long time achieve resilience. Thus, resilience should be considered as not only a capability but also a philosophy of how organizations can manage sudden and unpredicted changes and face complex and uncertain environments in responsible and proactive ways, often even before a crisis occurs (Tengblad & Oudhuis, 2018).

A holistic resilience framework proposes intangibles as the prime sources of resilience (Tengblad & Oudhuis, 2018). While many tangible traits and processes for resilience have been well researched, it is important to develop new perspectives on resilience and include intangible capabilities and resources in resilience models. Resilient leadership always prioritizes the development of companies' resources (Tengblad, 2004), although it may sometimes lead to employee dissatisfaction and declining returns. Resilient leaders need to lead innovations and change processes with courage and must have the strength to resist opposition to their solutions. Only the most innovative, imaginative, and daring leaders can effectively combine their resilience resources. However, courage, ambition, and optimism are not always positive qualities. The danger is that they may lead to unnecessary risk-taking and

personal dominance, which can damage relationships and reputations, undercut organizational development, and lead to organizational failures (Kayes, 2015).

There are also many leaders who have successfully managed their companies, not being heroes without failures. This indicates the importance of resilient and constructive followership that includes the subordinates' initiative, enthusiasm, engagement, responsibility, and loyalty, which makes companies' results different. Andersson (2018) identified relevant conditions to develop supportive followership for organizational resilience (trustful and constructive relationships, community spirit and cooperation, engagement, meaningfulness, responsibility, and initiative) and highlighted social resources, such as the commitment and responsibility of employees, as essential for creating organizational resilience. Distributed leadership promotes such commitment and responsibility and, above all, the development of constructive followership.

**Proposition 10** According to the holistic resilience framework, IC and intangibles are the prime sources of organizational resilience.

## 3 Consequences for IC Theory

### 3.1 IC Components

Considering the global externalization of work, changing employment and work relationships, and required skills and mindset at work, the concept of IC would benefit from updating in the increasingly digital economy. The large-scale changes discussed in the previous chapter have brought new challenges for IC, and tackling them requires new knowledge assets.

To maintain performance and competitiveness in the changed and digitalized environment, companies should rethink and revise the IC concept and start using updated metrics to manage it. Changes in organization, work relationships, nature of work, job-demand skills, and innovation require a more *open approach* to the IC concept, meaning that it is necessary to open the IC management boundary to the outside and to adequately emphasize the external dimensions of IC (Chen et al., 2015). All previously mentioned changes redefine the boundary between a firm and its surrounding environment, making the firm more porous and connected loosely with other value creators in an OI ecosystem (Chesbrough, 2003).

To address the challenges faced by contemporary companies, this paper reconstructs the concept of IC by expanding the concept from previously more internally defined to include important knowledge-based resources outside organizational boundaries, such as gig or on-demand workers or other external knowledge and innovation co-creators that support organizational value creation. With changed working relationships, increased digitalization, and collaboration between the company and its external actors, external dimensions of IC should be an indispensable part of a company's IC. Thus, we expand the content of IC to include the external dimensions, covering all internal and external knowledge-based resources that

create a competitive advantage for the company. Mindful also of the wicked problems and challenges that sustainability issues are causing to the organizations, we propose that "green supportive" types of intra-and inter-firm IC components are of especial importance.

In human capital, the main issue is including contingent workers and gig workers in its examination and ensuring the necessary digital skills, such as data literacy and self-leadership skills of those who participate in the organization's value creation activities. For structural capital, an open and digital culture that supports entrepreneurial activities is more essential than ever. In addition, the roles of data availability, analytics tools and platforms, and data-driven culture are becoming valuable for organizations that aim at a more comprehensive use of their data. External relational capital is fundamental for OI and tapping into collective intelligence (Fig. 1).

### 3.1.1 Human Capital

As remote/hybrid work has become the norm across organizations, the abilities of organizational employees in executing such outside-office work have become increasingly relevant. Accordingly, a crucial feature of human capital is digital competence. Digital competence encompasses the knowledge, abilities, skills, and attitudes required for working in the digital age (Murawski & Bick, 2017). On an individual level, it is an umbrella term covering both the general digital competences required for nearly every occupation and the specific role- or task-related digital competences that are different for every occupation. For instance, most employees should possess basic-level data literacy to understand what data are available and what they indicate (Gupta & George, 2016), while the data literacy requirements are much heavier for analytics personnel who are involved in data curation and development of analytics solutions. In summary, digital competence can be defined as the ability to adopt new or existing technology to analyze, select, and evaluate digital information to solve problems and develop collaborative knowledge within a specific organizational context (Vieru, 2015).

Furthermore, the increase in gig work means that an increasing amount of human intellect working for a firm may come from outside of the realm of its fully employed human resources (McDonnell et al., 2021; Williams et al., 2021). Thus, the inclusion of freelancers in human capital is important. In the remote work context, self-leadership skills are an outstanding aspect of human capital, which are likely to impact the performance of organizational employees and freelancers and other contingent workers alike (Neck & Houghton, 2006).

### 3.1.2 Structural Capital

OI and related crowdsourcing activities require the active management of knowledge and information. Crowdsourcing is an innovative way to organize flexibly using the dispersed skills and ideas of a wide set of actors (e.g., organizational members, customers, suppliers, consultants, and gig workers). Capturing value from *the wisdom of crowds* necessitates wide participation, which can be supported by crowd management activities such as designing a platform, building a crowd culture, and sharing the captured value (Cricelli et al., 2022). Consequently, open

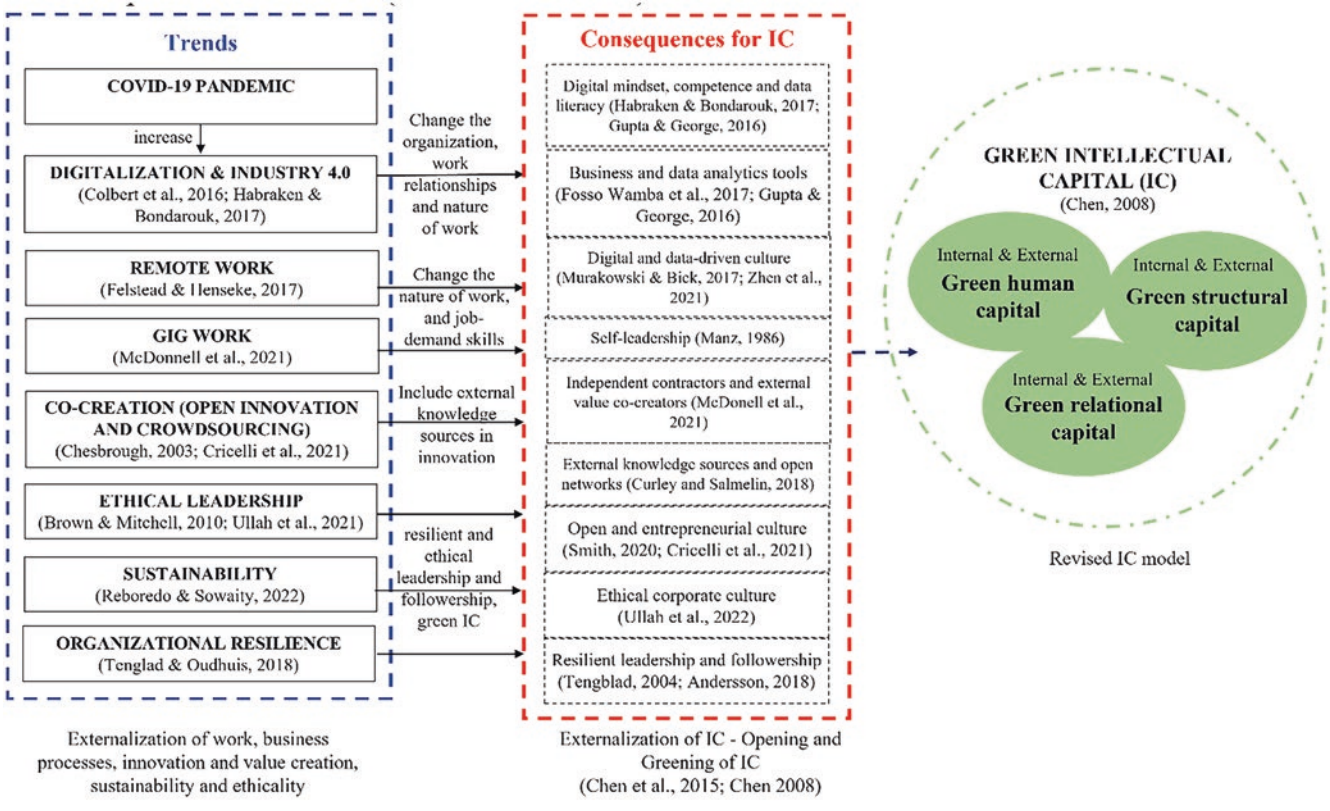


**Fig. 1** Reconceptualization of IC (revised IC model)

and collaborative entrepreneurial cultures and associated activities represent a new important facet of structural capital in the face of OI models.

In addition, the success of digitalization depends on how well the organizational culture in place supports it. Digital culture comprises a set of shared assumptions and overall understanding and values concerning organizational practices in a digital context (Zhen et al., 2021). Culture both restricts and guides activity and provides tools for actors' agentic behaviors. Digitalization can be leveraged by espousing a culture that encourages risk taking, supports innovation, and facilitates wide collaboration (Grover et al., 2022). One specific digitalization-related cultural orientation is data-driven culture (e.g., Gupta & George, 2016; Kristoffersen et al., 2021). To enable large-scale data utilization and data value capture, the organization should strive to train and encourage its management and employees to make data-based decisions (Arunachalam et al., 2018; Kristoffersen et al., 2021). After all, data have only little intrinsic value, and almost all data value potential remains untapped when people or organizations act upon it, for instance, in decision-making situations.

To enhance the performance and productivity of an organization, it is crucial for the management to undertake responsible and ethical leadership, which not only enhances effective teamwork, creates ethical culture, and improves structural capital but also boosts employee work behavior and innovation performance and therefore overall IC of an organization (Kumari et al., 2015).

### 3.1.3 Relational Capital

While the conceptualization of relational capital is manifold, ranging from the internally oriented social capital construct of Subramaniam and Youndt (2005) to the externally oriented customer capital of Edvinsson and Malone (1997), we think these two variants should be segregated once and for all. We follow Inkinen et al. (2017) and suggest splitting relational capital into internal and external components, referring to relationships with intraorganizational and interorganizational stakeholders, respectively. Internal and external relationships create value in different ways: internal relationships present a crucial infrastructure for knowledge exploitation and benefit process and management innovation more, while external relationships might be more beneficial in knowledge exploration and therefore for product/service innovation (Cabrilo & Dahms, 2020).

External relational capital includes relationships with external knowledge and value co-creators, such as traditionally covered users, suppliers, competitors, universities, and other cooperative partners, as well as those with newly added stakeholders, such as gig workers, virtual teams, and digital nomads. External relational capital is critical for successful collaborative innovation (Chen et al., 2015). OI requires entrepreneurial culture, cooperative behavior, and a collaborative mindset (Cricelli et al., 2022). Also important are innovation intermediaries who facilitate the innovation process through enabling knowledge and technology exchange and transfer among organizations and crowds (De Silva & Meyer, 2018).

### 3.2 Performance Implications of IC

Innovation has been the most keenly studied outcome of IC management in organizations (e.g., Inkinen, 2015). The current innovation paradigm views innovation as open, networked, and participative (Curley & Salmelin, 2018). This updated approach to innovation should be acknowledged in the IC literature. Such innovation processes may further be supported by different IC elements than the more traditional closed R&D-driven innovation processes (Chen et al., 2015) and merit more examination.

Additionally, several well-known IC scholars (Dumay et al., 2018, 2020; Edvinsson et al., 2022; Secundo et al., 2017) have recently called for a more environmentally and societally oriented approach to IC that should be motivated by sustainability goals. This argument has been for an expanded concept of value creation beyond organizational wealth and into wider society, as well as from managerial to an ecosystem perspective. Ecological, societal, and economic sustainability are fundamental values, and advancing IC-based understanding on how to better contribute to them is important. IC can be used to mobilize a firm's IC to implement sustainable development in business practices (Wasiluk, 2013). In contrast, CSR activities can also be used to drive and advance human, structural, and relational capital (Gangi et al., 2019).

Studies have also confirmed that firms' attitudes and decisions about the disclosure of ESG pillars of CSR and IC transparency affect internal firm performance, external stakeholder engagement, policy makers' attention, and firm value by reducing investors' information symmetry and agency costs (Cabrilo, 2015; Tang & Luo, 2016; Yu et al., 2018). Environmental performance disclosure reflects corporate eco-literacy, social performance disclosure addresses HRM policies regarding the number and structure of employees and the impact of business activities on society, and governance performance disclosure is a safeguard against mismanagement (Reboredo & Sowaity, 2022). ESG information disclosure may enhance a firm's reputation and increase the value of intangible assets, embracing employee expertise, organizational processes, and the sum of knowledge contained within the organization and helping in recruiting, managing, and retaining talents and high-performing employees (Reboredo & Sowaity, 2022). However, whether disclosure on each ESG dimension, individually or aggregately, affects IC remains an important question for the future.

In addition, disruptions and knowledge storms (Tovstiga & Tovstiga, 2021) like the recent COVID-19 pandemic bring the *new normal* environment (Hitt et al., 2021) with global irreversible changes in how we view the world, do business, interact, and ultimately live our lives. All involved parties, including governments, organizations, and individuals, during and after a disruptive crisis struggle to restore stability, which further indicates the indisputable importance of resilience. For organizations, resilience arises from a combination of change capacity, efficiency, and reliability (Tengblad & Oudhuis, 2018). It requires the renewal and reassembly of resources through energetic and courageous innovation, resilient leadership, and followership, as well as intensive learning, to evolve from an absence of critical

knowledge, fear, and uncertainty to the full mastery that draws on experiential knowledge and enables purpose-driven decision-making and actions (Čabrilo, 2021). Therefore, intangibles and IC are the prime sources of organizational resilience (Tengblad & Oudhuis, 2018), but these areas are still under-studied in the literature.

### 3.3 Moderating Variables

A moderating variable affects the relationship between a dependent and an independent variable by changing the strength or direction of that relationship (e.g., Hair et al., 2006). While many of the issues mentioned so far in this paper may be considered moderating variables, here we would like to especially underline the extent of remote work as an important contingency that may impact the extent to which various IC elements influence organizational performance. For instance, for a firm that mostly works online, technological infrastructure and related capabilities are essential for value creation. In contrast, in an organization where most work is conducted in the office, digital skills are not essential for ensuring high performance, and IT investments may even have a negative correlation with performance due to trade-offs with investments in building opportunities for face-to-face knowledge sharing.

### 3.4 Proposed Theoretical Model

Combining the suggestions made in previous chapters concerning the novel elements of IC, its relevant performance indicators, and potential contingencies, we now examine how value creation in the digitalized and largely remote work life in the VUCA world can be examined through the IC-based view.

Figure 2 presents the constructs and paths of the model. First, the novel facets of human, structural, and relational capital can improve the environmental, economic, and social sustainability of an organization. Remoteness of work arrangements conditions the impact of particular types of IC elements on organizational outcomes. The moderation effect is expected to be positive: the more remote the work arrangements in an organization, the more relevant the IC elements in the model will be for facilitating performance.

## 4 Conclusion

This paper argues that to remain relevant despite the recent large-scale changes in companies' operating environments, such as digitalization, sustainability crisis, and the pandemic and related forced move to remote work, IC theory would benefit from updating. We suggest some novel understandings and viewpoints concerning

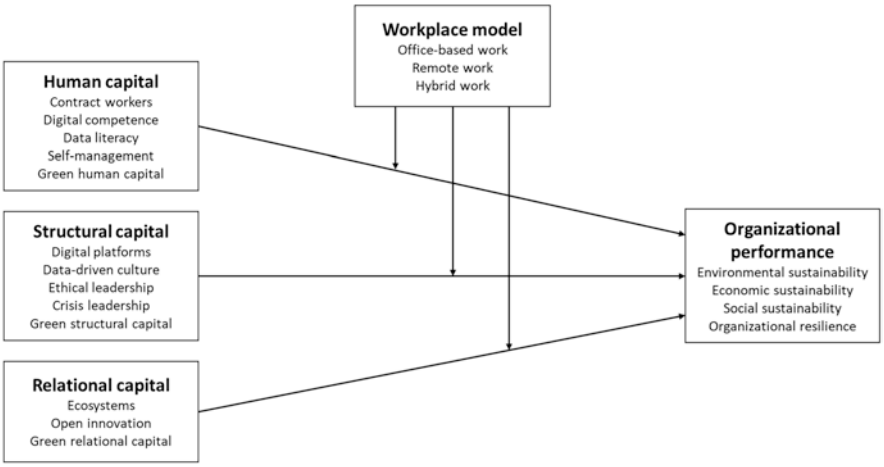


**Fig. 2** IC and performance, example of a research model

the nature of IC components, organizational performance dimensions, and moderators of relationships between them.

The new research topics for the IC field, spurred by the recent developments in current work life presented in this paper, tap into the following questions:

- What types of new human capital issues are relevant for organizations?
- What types of new structural capital issues are relevant for organizations?
- What types of new relational capital issues are relevant for organizations?
- Are there new performance variables that are relevant for IC research, and if so, what are these?
- What types of new contingencies should be considered when addressing the IC-performance relationships?

This chapter contributes to the topicality and relevance of IC research by inspiring new thinking and offering ways to revise the research models that are developed and tested within this important field. We hope that our ideas will encourage scholarly discussion on how IC theory should be revised in the new post-pandemic world of work.

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