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Enhancing sense-making through intellectual capital: Evidence from a healthcare network

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ABSTRACT

Purpose: The research aims to provide a structured approach for leveraging Intellectual capital (IC) to enhance sense-making within the network, ensuring clarity on the goals and stakeholders involved in each strategy.
Design/methodology/approach: To tackle the research question, an exploratory analysis was conducted to investigate the Campania Oncology Network. Multiple sources of evidence were used to obtain data triangulation.
Findings: We developed a taxonomy of IC-based strategies that enhance sense-making. The analysis allows the identification of the IC activities developed by Campania's Oncology Network to increase the sense of belonging to the network. The activities of health network organisations are used to identify a taxonomy of strategies to enhance sense-making. For each strategy, specific objectives and stakeholders are identified.
Originality/value: This paper offers interesting practical and theoretical implications, presenting a new perspective on the role of IC in organisations.

Introduction

Intellectual capital (IC) has always been crucial for promoting innovation, favouring scientific progress, and improving sense-making in a community (Ali et al., 2023; Cheng et al., 2010). Thus, IC fosters community sense-making, enhancing cohesiveness and effectiveness, and encouraging ongoing learning and collaboration among community stakeholders (Turnbull et al., 2019). The investment in IC allows for improved efficiency and productivity (Arshad et al., 2023; Kianto et al., 2014) in several sectors, especially in knowledge-intensive industries like healthcare (Ardito, Messeni Petruzzelli, & Albino, 2015). Notably, the role of IC in improving sense-making emerged in the context of healthcare networks (Amelung, 2019; Bellucci et al., 2021; Schiavone et al., 2022), facilitating shared knowledge, innovation, and continuous collaboration among members (Xu & Wei, 2023). According to Warwick-Giles et al. (2018), sense-making in healthcare refers to the process by which participants in the network attempt to comprehend the facts, figures, and connections inside the healthcare system.

While most existing literature has focused on IC as a critical aspect of innovation processes, knowledge management, and organisational performance, this paper expands its scope by highlighting its role in improving network sense-making. Although several authors investigated the impact of IC on organisation dynamics (Ali et al., 2023; Arshad et al., 2023; Cheng et al., 2010; Kianto et al., 2014; Turnbull et al., 2019), indeed, the management literature still has not addressed the link between IC development and improved communities' sense-making. For this reason, we aim to fill this gap by identifying the strategies, practices, and critical success factors that contribute to improving collaboration, communication, and efficiency within healthcare network organisations.

This paper aims to explore how IC activities increase stakeholders' sense-making and encourage them to take initiative and participate more to boost overall performance by responding to the following research question: how does IC development create community sense-making within a healthcare network? To tackle the research question, we conducted an exploratory study investigating the case of Campania's Oncology Network. Data were gathered by triangulating several sources of evidence to develop a taxonomy of IC-based strategies that enhance sense-making. The paper is structured as follows: Section 2 shows the theoretical background. Section 3 describes the research methodology, including research setting. Section 4 presents the study results discussing them. Implications, limitations, and future research are analysed in the conclusion.

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Theoretical background

The role of intellectual capital

In the twenty-first century, one of the aims of Europe 2020 is to manage knowledge and IC within organisations to maximize efficiency by identifying innovative solutions to reduce resource consumption, leading to structural, organisational, and process changes (Gogan et al., 2016). Specifically, the resource-based view (RBV) highlights the critical role of firm-specific resources and capabilities, including IC, in attaining sustainable competitive advantage (Enriquez, 2015; Huselid & Becker, 1997).

Among a firm's intangible assets, human IC are crucial drivers for their survival and success over time (Grant, 1996; Marulanda-Grisales & Vera-Acevedo, 2023). Human resources are recognized as the most valuable assets for firms (Baron & Armstrong, 2007). Indeed, it has been consistently reported that skilled employees represent a source of competitive advantage for organisations (Schuler & MacMillan, 1984). IC is defined as "intellectual material, knowledge, information, intellectual property, and experience that can be used to create wealth" (Stewart, 2007). It can be classified into three dimensions: (1) human capital, (2) structural capital, and (3) relational capital (Subramaniam & Youndt, 2005).

Structural capital includes tangible assets and systems that support an organisation's operations, such as patents, trademarks, copyrights, software, and organisational routines (Abdulaali, 2018). Relational capital is defined as the value of the organisation's brand, strong customer relationships, and consumer satisfaction (Ramezan, 2011; Sarwenda, 2020). Finally, human capital includes factors such as education, experience, expertise, creativity, and innovation (Ramírez-Solis et al., 2022). Therefore, it refers to the entire knowledge capital generated through relationships with external stakeholders (Mazzotta, 2018). IC can be a strong, sustainable competitive advantage if it satisfies the criteria of value, rarity, inimitability, and non-substitutability (Calza et al., 2014; Freeman et al., 2021). Therefore, organisations that strategically manage their human, structural, and relational capital integration and development can achieve a leading position in their sector (Alrowwad et al., 2020). This leads to increased efficiency and innovation, but above all, it enhances the ability to adapt to changes in the market in which they operate, maintaining their competitive advantage (Alvino et al., 2021).

Intellectual capital in the service industry

In service industries, human interaction and expertise are critical to the quality of the service provided (Pelinescu, 2015). IC enables organisations to better manage intangible resources and adapt to increasingly competitive and dynamic environments (Rehman et al., 2022). Among these resources, human capital is particularly crucial, as employees' skills, knowledge, and experience directly impact operational efficiency and customer-perceived value (Sima et al., 2020). Service industries, compared to other sectors, often prioritize building and maintaining customer relationships, making relational capital a key factor for success (Wang et al., 2014). Establishing strong connections with clients, partners, suppliers, and employees is central to their achievements.

Service industries encompass various fields, including healthcare, education, financial services, and tourism. IC plays a pivotal role in each of these fields, with its significance particularly evident in healthcare. In healthcare organisations, human capital – represented by the expertise and skills of healthcare professionals – acts as the primary driver of value (Evans et al., 2015). Moreover, the quality of relationships within these organisations, which forms the foundation of their relational capital, is a critical factor in delivering high-quality care (Baker & Dutton, 2017).

In healthcare organisations, various types of relationships exist (Mason & Manzotti, 2009), including the critical relationship between doctors and patients. Additionally, these relationships extend to the networks managers build among different stakeholders, such as organisations, universities, and clients (Evans et al., 2015). IC and sense-making are inherently connected in healthcare. The knowledge embedded in human capital enables professionals to interpret complex medical situations, while the relationships within relational capital facilitate the exchange of critical information (Tasselli, 2015). These elements enhance an organisation's capacity to adapt to challenges, innovate, and deliver high-quality care. In healthcare, networks function as "self-supporting groups of professionals working together to ensure cross-speciality sharing of patients and expertise" (Skipper, 2010, p.241). These clinical networks foster the development of innovative practices, which are increasingly essential for improving the efficiency of healthcare systems (Schiavone et al., 2022).

The level of sense-making in a network can indicate the intensity of cooperation within the network (Boud, Cressey, & Docherty, 2006). Sense-making is defined as the process through which members of organisations collectively develop an understanding of their environment (Cristofaro, 2022). Organisations can acquire crucial information, share knowledge, and develop a shared understanding of their challenges and opportunities through a network of strong and well-managed relationships. Sense-making can be facilitated and amplified by strong relational capital, as established relationships provide a constant flow of information and social support that contribute to the construction of shared meaning within the organisation (Choo, 2002).

Hence, IC and sense-making are closely related, enabling business organisations to adapt and operate in complex and dynamic environments (Maitlis & Christianson, 2014). In the literature, scholars (Alfiero et al., 2021; Paloni, 2020) analyse the contributions of the different dimensions of IC within the healthcare sector (Tardieu et al., 2020). They emphasize that IC has the potential to generate significant value within the organisations where it is created and developed, helping managers improve the quality of healthcare transformation.

A significant body of literature addresses structural capital (Evans et al., 2015; Guo et al., 2017); however, fewer contributions focus on relational capital, particularly human capital (Cavicchi et al., 2017; Evans et al., 2015). Despite its pivotal role in healthcare organisations, this finding underscores the limited attention given to human capital studies. Further research is required to understand what types of organisational activities can be used to increase, improve, and leverage human and relational capital in healthcare organisations. For this reason, our research aims to fill the gap in the literature by examining the factors that influence the content, quality, and ease of transfer of IC characteristics within and across organisational performance. The theoretical framework is supported by Table 1, which summarize the background and limitations of the most recent literature. The studies included in Table 1 were selected as the most relevant and up-to-date references on IC in healthcare, particularly concerning performance enhancement, IC in digitalized health networks, and sense-making. The first study was chosen for its discussion of IC's impact on the healthcare sector and its potential to improve performance. However, it does not fully explore how IC influences skills development and network dynamics within healthcare performance. The second study investigates the creation of an IC-based framework aimed at improving healthcare policies, focusing on the role of digital platforms and their impact on various healthcare actors, such as physicians, nurses, administrators, and patients. Given the critical role of digital platforms in decision-making processes, further research could explore these aspects in greater depth, incorporating actual data and practical case studies to enhance healthcare policy. The third study highlights the significance of sense-making in team dynamics within healthcare, leaving room for further exploration into how managers use sense-making to inform decision-making and improve organisational activities in healthcare.

Table 1
Background and Limitations of Recent Literature on IC, Healthcare Performance, and Sense-Making.

Topic	Title	Content	Limitation	Authors
IC in healthcare for enhance performance	*Intellectual capital-based performance improvement: a study in healthcare sector*	This paper investigates the impact of IC on the performance of healthcare organisations within the Italian healthcare system.	The study does not include the data to analyse variables such as leadership skills, relational networks, and secondary factors that may impact IC and healthcare performance.	Alfiero et al., 2021
IC in digitalized health networks	*Revealing the role of intellectual capital in digitalized health networks. A meso-level analysis for building and monitoring a KPI dashboard*	The study seeks to improve healthcare policies by developing an integrated meso-level framework based on the centrality of IC components (structural, relational, human).	Given the significant role of the decision-making processes in the healthcare sector using case studies, Future work should explore specific examples of how these digital platforms influence different actors in the healthcare system, such as doctors, nurses, administrators, and patients.	Schiavone et al., 2022
Sense-making	*Sensemaking, sensegiving and sensebreaking The case of intellectual capital measurements*	This paper explores how IC measurement requires sense-making and sensegiving, emphasizing the need for more research on how IC metrics influence stakeholders' understanding and actions.	More in-depth studies are necessary to investigate how IC indicators are used and how managers interpret or misinterpret them when making decisions.	Giuliani, 2016

Source(s): Authors' elaboration.

Methodology

To reach the research aim, the authors examined the relationship between community sense-making growth and IC. Community sense-making was considered the dependent variable, and IC development activities were the independent variable. Using the so-called "Campania Oncology Network" (ROC) as the unit of analysis, the case study technique was used as a research approach (Yin, 2009) to highlight the potential of IC in the healthcare industry. This network is an excellent example of how IC initiatives affect value creation in the healthcare industry. It catalyses value creation through innovation, collaboration, and sharing, enabling organisations to maintain their competitive edge. The research setting and data collection and analysis are described in the following sections.

Research setting

One of the key drivers of value creation in the healthcare industry is the high level of expertise and the quality of services provided, making it a highly "knowledge-rich" environment. This positions healthcare organisations not only as service providers but also as knowledge creators. Developing, acquiring, and enhancing intangible assets, such as IC, is a major source of value creation today. The exchange of information is thus essential to the sector's development processes, particularly within healthcare networks, which consist of diverse actors with a wide range of skills and interests working together in a coordinated way to ensure equitable, high-quality healthcare provision.

A new organisational paradigm in oncology has recently emerged at the global level, centred on the creation of regional cancer networks. Cancer networks have long been the preferred organisational approach for oncology healthcare management. They enable healthcare organisations, companies, and indirectly, their stakeholders, to realize numerous benefits. These include improved clinical and organisational efficiency, enhanced professional information exchange, and the delivery of care services more precisely focused on the needs of oncology patients. An example is the so-called "Campania Oncology Network" (ROC), which was founded to bring together all the institutions involved in the prevention, diagnosis, treatment, and rehabilitation of malignant cancers. The Campania Region established the Campania Oncological Network (ROC) in September 2016 to create efficient and well-defined diagnostic and treatment pathways. This initiative aims to prevent delays in diagnosis and treatment while promoting equitable access to care, appropriate treatment settings, and better coordination between hospitals and community healthcare services (Crispo et al., 2022).

The ROC's mission, through the definition of Diagnostic Therapeutic Care Pathways (PDTA), is to "ensure a multidisciplinary approach to patient management throughout the entire care pathway, providing continuous diagnostic and therapeutic care, timely and appropriate interventions, reducing waiting times, and ensuring that treatments are delivered in the correct sequence". The ROC has three main constituent bodies: (1) Level II Centres, or Multi-Specialist Oncology Reference Centres (CORP), which perform diagnostic, therapeutic, and follow-up oncology functions; (2) hospices and pain therapy wards/outpatient clinics; and (3) Regional Reference Centres for specific activities in the field of oncology (CORPUS). A Multidisciplinary Oncology Group (GOM) consisting of "specialists responsible for defining and implementing the diagnostic, therapeutic, and care pathway for patients", has been established for each PDTA. A digital platform has been adopted to facilitate communication between participants and provide a significantly broader range of information at each stage of cancer treatment. This platform allows each professional to record tests and visits conducted with the patient, enabling efficient monitoring of the patient's progress throughout the network. Additionally, the platform provides access to a comprehensive range of data related to both patients and medical professionals.

The diversity and multidisciplinarity of the network's stakeholders thus highlight the necessity for ROC to rely on IC to drive innovation, quality improvement, and patient engagement, and to develop strategies to meet the challenges of a dynamic and increasingly complex healthcare system. The capacity of health networks to provide high-quality care is contingent upon the competencies of their workforce. Furthermore, the advancement of healthcare is contingent upon the generation of novel IC, which in turn facilitates the development of innovative therapies, tools, and practices that enhance patient care.

Based on these assumptions, the ROC's value and success are grounded in its intangible assets IC. The relationships between the various stakeholders are intrinsic to the network's nature. Additionally, the technological infrastructure developed and implemented by the ROC enables real-time data and information exchange, enhancing coordination and sharing, which makes care processes more efficient. This underscores the importance of the network's intangible resources, whose effective use allows the organisation to enhance the sense-making of those involved, thereby increasing the value of the care provided. Several activities and features of the network are designed to boost the value of the collective experience of stakeholders: (1) continuous training and the exchange of best practices; (2) the development of multidisciplinary groups that facilitate the exchange of objectives and opinions, leading to the alignment of clinical strategies; (3) coordination and standardization of care to reduce fragmentation and make professional interventions more efficient; (4) the creation and implementation of a digital platform that ensures quick and concise access to patient information, fostering a transparent and collaborative decision-making process; (5) joint and multidisciplinary research projects that enrich the network's collective intelligence by improving decision-making.

There were several critical issues in carrying out such a study. Firstly, the ROC is characterised by a large amount of sensitive data. Therefore, the researchers had to design a research protocol to ensure data protection compliance with the GDPR. Secondly, IC is a very complex intangible concept to measure accurately and objectively. This complexity is particularly evident in the healthcare context, where the value of human resources is constantly being updated. In addition, there are organisations with different objectives and values. The authors, therefore, sought to understand and overcome possible conflicts and resistance.

Data collection and data analysis

To tackle the research question, an exploratory qualitative analysis was undertaken (Eisenhardt, 1989; Yin, 2013) to elucidate the enhancement of community sense-making through the development of IC. Data triangulation was employed to ensure methodological rigor, drawing upon several sources of evidence (Eisenhardt, 1989; Yin, 2017). Specifically, the investigation encompassed: (1) participant observations, (2) online documentation, (3) reports, and (4) archival records. Our study focuses on examining the impact of IC on the creation of community sense-making within the healthcare network.

We conducted the case study following the Rashid et al., (2019) steps: (1) foundation phase, (2) prefield phase, (3) field phase, and (4) reporting phase. Specifically, the first phase involved studying the social phenomenon of interest to identify the most appropriate research method based on various ontological and epistemological perspectives (Coll & Chapman, 2000; Maree, 2015). An abductive approach was adopted with the aim of understanding "social phenomena in terms of the motivations and understanding of social actors" (Rashid et al., 2019, p.11) through the observation of everyday activities and the analysis of relevant theories (Dubois & Gadde, 2002; Järvensivu & Törnroos, 2010). The second phase involved designing a protocol to define the set of procedures for collecting empirical material (Yin, 2009). During the field phase, the authors contacted participants and defined the appropriate data collection tools to ensure triangulation of sources. Finally, the structure for writing the case study itself was established.

One researcher engaged in eight months of participant observation (October 2023-June 2024) within the activities of Campania's Oncology Network to document observations and gather data. Kawulich (2005) defined participant observation as the methodological approach whereby researchers immerse themselves in the natural setting of the subjects under investigation, thereby gaining insights through observation and participation. Furthermore, it affords opportunities to witness and engage with unforeseen occurrences, thereby enriching the comprehensiveness and accuracy of data collection and analysis (Kawulich, 2005; Musante & DeWalt, 2010).

The authors chose to participate in three main IC development activities: (1) research projects, (2) scientific events, and (3) training events. Particularly, the authors attended three scientific events, two training events and ten research project meetings.

Through their observation, we identified the range of actions targeted at building the IC that enables the network to generate value and improve stakeholders' sense-making. The authors classified the network's operations as either regular or irregular (DeWalt & DeWalt, 2002), alerting participants to the researcher's goal and emphasising the need for their attendance to ensure adherence to ethical standards. To avoid any potential bias or prejudice on the part of the observer, all elements were recorded in an impromptu manner without regard to their significance to the prevailing conceptual framework (Becker, 2017).

Regarding the archival records and online documentation, we analysed several reports about research projects and official events from ROC's digital platform. Thus, an analysis of the official website of ROC was conducted to get different activities carried out and stakeholders involved. To ensure the quality of the sources, Hox and Boeije's (2005) approach involved selecting secondary sources based on their relevance to the research objectives. Additional information was gathered regarding the study's aim, the data collection methods, and the units analysed.

The data were transcribed for content analysis using NVivo software (Krippendorff, 2018). The content analysis created a taxonomy of IC-based strategies for generating and promoting sense-making within the network. Four strategies were identified: (1) education-based strategy, (2) knowledge exchange strategy, (3) scientific excellence strategy, and (4) e-health adoption strategy. The following section will give the key sentences that allowed for their identification.

Findings and discussion

The findings are based on both secondary and primary data. Secondary data was collected through published documents related to ROC members and its organisational structure. Primary data was gathered through exploratory qualitative analysis, comprising interviews and focus groups with ROC network stakeholders.

The qualitative analysis of ROC stakeholders highlights how IC development enhances community sense-making (Giuliani, 2016). On June 7th, 2022, the Campania Region approved Deliberation No. 272, implementing Decree No. 477. This decree redesigned the map of surgical centers eligible to join the Campania Oncology Network (ROC) with a three-year plan aimed at progressively achieving targets for 18 oncological diseases. This initiative addresses healthcare fragmentation and mitigates patient migration (Pignata, 2022). The new map includes 41 regional accredited facilities, each selected for its expertise, alongside a selected number of Multidisciplinary Oncological Groups (GOMs) (Pignata, 2022). GOMs comprise various medical specialists responsible for managing the Diagnostic Therapeutic Path Care (PDTA), ensuring comprehensive care for oncology patients. Within the GOM, the Case Manager, a nurse with specialized training, coordinates the care pathway, becoming the primary reference and facilitator of care continuity. This role also includes overseeing the coordination between the healthcare facility and territorial care services (Health Districts).

The ROC implemented several IC-related activities, including (1) *research projects* (*e.g.*, Val.Pe.ROC, MASTER, MEGE-ROC), (2) *scientific events*, and (3) *training events*. These activities allow for identifying four IC-based strategies to improve ROC's sense-making: (1) *education-based strategies*, (2) *knowledge exchange strategies*, (3) *scientific excellence strategies*, and (4) *e-health adoption strategies.*

Education-based strategies

Organisational learning - acquiring and integrating new knowledge - expands a firm's range of strategic choices and enhances its innovativeness (Kang & Snell, 2008; Yu et al., 2013). It also improves the organisation's ability to continuously build and adapt unique capabilities (Snell & Morris, 2014; Vera et al., 2012) and prevents core capabilities from becoming rigidities (Leonard-Barton, 1995; Starbuck, 2017). Structural capital relates to learning and knowledge retention (Kong & Thomson, 2009).

The ROC network organises training events and workshops for case managers, doctors, general practitioners (GPs), and patients. These events, targeted at different stakeholders, enhance IC by fostering learning, information sharing, involvement, and professional development. They also strengthen stakeholders' understanding of the network's purpose, fostering engagement and professional growth. According to Alfiero et al. (2021), IC inside a healthcare network is represented through continuous medical education, which influences both corporate culture and the skills of individuals and teams (Evans et al., 2015). In the healthcare sector, relational capital also depends on patient satisfaction with care received (Alfiero et al., 2021). ROC network is fostering a cultural shift towards continuous learning, which is vital in these strategies. In order to promote an environment where

open communication, curiosity, and innovative approaches to healthcare challenges are encouraged, The ROC healthcare organisations are carrying on education-based initiatives, in which case managers, GPs, nurses, and patients are involved.

Knowledge exchange strategies

Education-based strategies are closely related to knowledge exchange. Firms operating in dynamic environments rely on intangible resources and competencies to survive in a knowledge-based economy (Denford, 2013; Schiliro, 2012). According to the knowledge-based view (KBV) (Grant, 1996; Grant & Phene, 2022), the uneven distribution of knowledge within organisations requires the sharing of knowledge (KS) among individuals, teams, and units. Capturing, creating, and accumulating knowledge is crucial for organisations to structure resources and build capacity (Iqbal et al., 2019; Wang et al., 2012).

Knowledge sharing is a key feature of network communities (Kwok & Gao, 2004). Collaboration between healthcare stakeholders fosters innovative solutions to complex problems and enhances IC by integrating diverse perspectives. Knowledge sharing is also tied to health literacy initiatives (Andrus & Roth, 2002; De Wit et al., 2018; Weiss, 2003), which help improve community and patient understanding of healthcare information. Scientific dissemination activities (Huang et al., 2021) further co-create IC and strengthen community sense-making. The ROC organises a series of events such as workshops and seminars to bring together healthcare professionals, community members, and experts to share knowledge, exchange ideas, and tackle healthcare challenges collaboratively. Key ROC stakeholders involved in knowledge exchange initiatives include researchers, GPs, medical specialists, other healthcare practitioners, and patients.

Scientific excellence strategies

Scientific excellence studied and debated for decades, includes institutional and cognitive dimensions (Al Shobaki & Naser, 2016). In Europe, scientific excellence is often measured quantitatively (Sunkel, 2015). International and multidisciplinary collaborations involving researchers, healthcare professionals, policymakers, and community stakeholders address healthcare challenges, creating a stimulating environment where members feel part of a high-level scientific community. These networks promote interdisciplinary collaboration, generating insights and innovative solutions, such as the ROC network does.

Scientific journals, conferences, webinars, and online repositories ensure that research knowledge related to the ROC is accessible and actionable. By encouraging healthcare institutions to adopt evidence-based practices through training, guidelines, and quality improvement initiatives, the network enhances care quality and fosters community sense-making.

The ROC scientific committee ensures that research conducted within its stakeholder community upholds the highest scientific rigor and ethics standards. Through collaboration with universities, several healthcare organisations (Local Health Authorities – ASLs), research institutions, and policymakers, scientific excellence strategies carried out by ROC network enhance IC and, thus, community sense-making.

Strategies based on the adoption of E-health

E-health offers predictive, personalized, preventive, and participatory medical services, playing a crucial role in improving care for patients with various conditions (Alonso et al., 2019; Paoloni et al., 2023). The ROC utilizes a modular web platform to manage patient pathways within the regional healthcare system and monitor GOM care.

This platform enables bi-monthly monitoring of network activities, helping prevent diagnostic delays. It also facilitates the continuity of care by allowing the request for territorial services to be sent directly to the patient's residence. The use of this platform improves healthcare access, increases patient engagement, and enhances knowledge sharing among healthcare providers. Data analysis through this platform provides actionable insights for improving care delivery, enhancing community sense-making, and supporting evidence-based practices. The stakeholders of this platform and this strategy are patients, caregivers, GPs, nurses, and medical specialists.

A new taxonomy for IC in the ROC network

The ROC's IC-related activities are addressed to identify IC-based strategies to enhance sense-making inside the network. These strategies involve the different stakeholders of the network and are executed through various initiatives.

Furthermore, given that IC consists of human, structural, and relational capital (Bontis, 1998; Edvinsson & Malone, 1997; Leitner, 2005; Vergauwen, 2007), it is possible to derive a taxonomy in which the IC category is linked to the pursued strategy, the activities carried out, and the stakeholder involved (Table 2).

The ROC network adopted strategies well-established in literature as mechanisms to enhance IC (human, structural, and relational capital). More precisely, in the ROC case: 1) human capital is crucial as the skills of GPs, medical specialists, and nurses, together with their knowledge and experience, directly impact the operational efficiency of the network and the value perceived by patients and caregivers; 2) structural capital encompasses the organisation's culture, systems and structures. It pertains to the retention and learning of knowledge within the network; 3) the constant flow of information generated by substantial relational capital contributes to the construction of shared meaning within the network. Multiple stakeholders are involved in the various initiatives, which can be considered as a series of different types of IC development processes.

Conclusions, implications and limitations

IC, comprising a firm's skills, knowledge, and experience, is critical for sustaining competitiveness, performance, and shareholder value (Seemann et al., 2000). Given that IC also encompasses the network of actors and stakeholders involved (Ramírez Córcoles et al., 2011), the analysis of the ROC network highlights how IC, developed through the network, enhances sense-making within the community. The ROC network analysis reveals four distinct strategies for increasing IC, all adopted by the ROC. These strategies, aimed at expanding IC, are targeted toward enhancing community sense-making, leading to the identification of a taxonomy of IC in healthcare networks:

Table 2
Taxonomy of IC-based strategies in the healthcare network.

Strategies	Activities	Stakeholders	IC category
Education based strategies	Training events, workshops and seminars.	Case managers, GPs, and patients.	Human capital & Relational Capital.
Knowledge exchange strategies	Brainstorming, Scientific dissemination events.	Researchers, GPs, medical specialists, other healthcare practitioners, and patients.	Human capital & Relational Capital.
Scientific Excellence strategies	Research projects, conferences, webinars.	Universities, Research centres, Local Health Authorities (ASLs), Policy makers, Associations.	Human capital, Structural Capital & Relational Capital.
Strategies based on the adoption of E-health	ROC Web Platform.	Patients, GPs, medical specialists.	Structural capital.

Source(s): Authors' elaboration.

(1) *Educational-based strategies*: These strategies aim to increase the knowledge, skills, and experience of network members through training, workshops, and seminars. By enhancing practitioners' competencies, they ensure that network members stay updated on the latest advancements and maintain a high standard of care.
(2) *Knowledge exchange strategies:* These foster reciprocity, interpersonal trust, and self-efficacy (Vhen & Hung, 2010). The primary outcome of these strategies is the improvement of sense-making within the network through the sharing of knowledge and expertise.
(3) *Scientific excellence strategies*: focus on strengthening partnerships, alliances, and collaborations between healthcare organisations, academic institutions, research centres, and industry stakeholders. Through the exchange of resources, expertise, and best practices, this strategy seeks to derive best practices and guidelines. In the ROC network, these strategies aim to integrate research findings into clinical practice, fostering a multidisciplinary community where various actors feel a sense of belonging.
(4) *E-health and platform-based strategies*: Knowledge, best practices, research findings, and educational resources are organised, shared, and disseminated via platforms, databases, and repositories. Data collected and analysed through these technologies contribute to the effectiveness, timeliness, and safety of healthcare actions.

Increasing IC empowers the network and its members. All the activities organised by the ROC network are designed to build a multidisciplinary community of practitioners and other actors. Each participant in this community is supported through the ROC's various initiatives, fostering active participation, a sense of responsibility, and a sense of belonging. This ultimately enhances community sense-making through the development of IC.

The ROC network case study illustrates how IC development can drive community sense-making within a healthcare setting. This case highlights key strategies that can be applied more broadly in the healthcare industry to strengthen and empower networks. By fostering collaboration, knowledge sharing, and stakeholder engagement, these strategies can serve as a roadmap for healthcare organisations seeking to enhance their collective intelligence and improve overall system effectiveness.

This paper offers significant theoretical and practical insights. Theoretically, it provides management scholars with a framework to study the relationship between IC and sense-making in organisations. The ROC network case study explores how IC development influences sense-making, making a valuable contribution to management theory. From this perspective, IC is not merely a resource to be accumulated and managed but a dynamic process of meaning creation that shapes decision-making, organisational learning, and strategic alignment. The ROC case study shows that IC enhances network sense-making through four main strategies: (1) education-based strategies, improving the IC of each member; (2) knowledge exchange strategies, fostering reciprocity, trust, and self-efficacy; (3) scientific excellence strategies, strengthening partnerships, collaborations, and knowledge-sharing across healthcare, academic, and industry sectors; and (4) e-health and platform-based strategies.

Moreover, this study introduces a taxonomy in which IC categories are linked to the strategies pursued, activities promoted, and stakeholders involved.

The developed taxonomy offers healthcare managers a tool to reflect on strategic choices that can enhance stakeholder sense-making while improving organisational performance. The practical implications of this work relate to decision-making and strategic management. The integrated framework, linking IC taxonomy with strategies, activities, and stakeholders, can help healthcare governance and hospital managers leverage IC development to promote organisational sense-making. By fostering a culture of knowledge-sharing and exchange through training, knowledge-sharing strategies, and e-health platforms, managers can make better-informed decisions that positively impact patient outcomes. Additionally, policymakers could consider promoting scientific events focused on human resource training, enhancing the sector's IC.

This study has its limitations. The results may be influenced by the specific context of the ROC network and the Italian healthcare system, which operates on a regional basis. The findings are derived from a single case study, which limits their generalizability. Future research could explore comparative analyses across multiple regions or incorporate quantitative methods to further validate these findings.

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CRediT authorship contribution statement

Francesco Schiavone: Writing – original draft, Supervision, Project administration, Conceptualization. **Federica Zeuli:** Writing – original draft, Validation, Project administration, Methodology, Formal analysis, Conceptualization. **Claudia Perillo:** Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Anna Bastone:** Writing – original draft, Project administration, Methodology, Investigation, Conceptualization.

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