Individual Dynamic Capabilities Influential Factors in Blockchain Technology Innovation from Hospital Settings

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Abstract: - The healthcare sector, characterized by its intricate network of stakeholders and rigorous regulatory demands, presents distinct challenges for the integration of Blockchain Technology (BT). Recent focus has shifted towards harnessing Individual Dynamic Capabilities (IDC) to secure a competitive edge. This approach aims to cultivate novel organizational competencies that generate value, ultimately benefiting all stakeholders in the healthcare system during the adoption of emerging technologies.
This study delves into the significance of IDC in the seamless integration of BT within hospital infrastructures. The aim is to evaluate whether IDC is instrumental in the triumphant execution of BT initiatives in these settings, propelling innovation, safeguarding data authenticity, and cultivating trust among the involved parties.
A systematic literature review (SLR) served as the foundational methodology to address the research objectives. The SLR involved a comprehensive search of databases to identify relevant literature, followed by an in-depth evaluation of the articles that were found.
Through this process, the researchers were able to identify and assess the value of IDC in BT initiatives, as well as identify any potential risks associated with its use. Additionally, insights were gleaned regarding the impact of IDC, extrapolated from theoretical frameworks, and contextualized within the realm of hospital BT management. The findings revealed existing synergies between certain IDC and BT solutions, conferring both strategic and operational superiority by aligning BT with intricate demands. The research further underscored the transformative potential of BT across various healthcare facets, ranging from patient documentation to financial transactions. This research can pave the way for subsequent investigations into the interplay between IDC and BT.

Key-Words: Individual Dynamic Capabilities, Hospital Management, Supply Chain, Healthcare, Blockchain

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1 Introduction

Quality healthcare is intrinsically linked to longer life expectancies. The World Health Organization (WHO) notes that nations with superior healthcare systems boast higher life expectancies. Effective healthcare not only prevents treatable ailments from becoming lethal but also improves the quality of life for those with chronic illnesses, [1].

Economically, a healthy populace is beneficial for any nation. Healthy individuals contribute to the workforce, bolstering the economy and alleviating strains on the welfare system. The Centers for Disease Control and Prevention (CDC) highlights chronic illnesses like heart disease, cancer, and diabetes as primary causes of death and disability in the U.S., contributing significantly to the nation's annual healthcare expenditures, [2].

Healthcare access is often viewed as a fundamental human right. Societies emphasizing healthcare equity usually experience greater social harmony and reduced unrest. Hospital management, a subset of healthcare, is intricate due to the diverse medical needs it addresses, from emergency to planned surgery. Each of these requires specific resources and expertise, [3], [4].

It is challenging for hospitals to allocate resources efficiently, as well as to ensure the availability of essential medical tools and skilled personnel. As well as operating within rigorous regulatory frameworks, they are also committed to ensuring the safety and quality of care for their patients. The global rise in healthcare expenses necessitates hospitals to prudently manage their finances to maintain quality care and financial stability, [5], [6].

The healthcare sector, with its complex stakeholder matrix and rigorous regulations, faces challenges in integrating Blockchain Technology (BT), [7]. The recent surge in healthcare innovations, accelerated by events like the COVID-

19 pandemic, demands rapid adaptability. BT offers a secure and transparent approach to data management in healthcare. However, many blockchain initiatives in hospitals haven't met expectations. BT presents numerous opportunities, especially for public health institutions, [8], [9].

BT's potential in hospitals spans areas like data security, transparency, traceability, efficient supply chain and patient data management, and fraud detection. Global healthcare entities commend BT for its cost-effectiveness, regulatory compliance, and operational improvements, [10], [11].

BT is poised to revolutionize various healthcare aspects, from patient care models to specialized treatments, [12].

However, BT's integration comes with challenges. Healthcare stakeholders, including policymakers and industry leaders, must approach BT cautiously, considering its early stage and associated legal complexities. Successful BT integration requires institutions to enhance their human resources, managerial skills, and technological expertise. This integration is a collaborative effort, necessitating coordination between IT professionals, Healthcare Professionals (HCPs), and administrative personnel.

It's crucial to understand that Individual Dynamic Capabilities (IDC) are vital for organizational adaptability. Those with solid IDCs can drive innovation and enhance adaptability, strengthening organizational resilience. The willingness of HCPs, IT, and hospital leaders to embrace new technologies, especially BT, is crucial for its successful integration.

Clear insights into IDC practices and the capabilities needed for their effective execution can guide the application of IDC to BT implementations in complex settings like hospitals, [13], [14], [15], [16].

However, the relationship between IDC and BT remains ambiguous in the healthcare community, with fragmented literature offering varied perspectives, [17], [18].

These capabilities strengthen the dynamic structure within hospitals, ensuring a smooth integration of BT, [20].

As BT is incorporated, hospital teams are equipped with essential skills, leading to the realization of intended outcomes. Acquiring these skills is crucial, ensuring that BT integrations are both effective and in line with hospital goals and the broader Dynamic Capabilities (DC) framework, [21], [22].

Nevertheless, this is also the area that presents the most disconnections since the key responsible for DC cycles in a healthcare organization (HCO) is the management level or executive management team, which in most cases differs from the IT management team, [23], [24].

This is because executive management teams often have different goals from IT management teams, such as reducing costs or enhancing efficiency. Therefore, they often make decisions without considering the full implications of those decisions on the IT system, [25], [26], [27].

Hence the research identifies a clear problem: the unclear relationship between IDC and BT practices. Therefore, this research aims to understand IDC variations across different hospital roles and their implications for BT integration. It examines IDC's role in seamlessly integrating BT within hospital structures, evaluating its effectiveness in spearheading BT projects, fostering innovation, and building trust. The research adopts a concept-centric, Systematic Literature Review (SLR) approach, focusing on IDC in BT across the three primary stages of DC. This approach offers a structured understanding of each capability's relevance to the blockchain domain.

A SLR forms the research's foundation, providing a concept-based analysis of key research areas. This review offers insights into the value of IDC in BT projects, highlighting potential synergies and risks. The study aims to underscore BT's transformative potential in various healthcare areas, from patient records to financial operations.

The research further delves into the intricate relationship between IDC and BT, especially within the healthcare domain. Given the rapid technological advancements and the increasing reliance on data-driven decisions, understanding this relationship becomes paramount for HCOs, particularly hospitals.

Several pertinent questions are posed to address the existing knowledge gap:

As a starting point, RQ1: What are the most prominent IDCs that have been highlighted in the literature regarding BT in healthcare, and specifically in hospitals? RQ2: In what ways have these capabilities evolved, and in what ways are they positioned within the context of the broader DC framework? RQ3: To what extent do these capabilities contribute to the successful implementation of BT in the healthcare industry?

Answering these questions is vital to comprehending the nuances of IDC in the context of BT. It will provide a roadmap for healthcare institutions, guiding them in harnessing the full potential of BT. By understanding the role of IDC, hospitals can better navigate the challenges of BT

integration, ensuring that the technology aligns with their strategic objectives and delivers tangible benefits.

2 Theoretical Background

2.1 Individual Dynamic Capabilities

The concept of DC is a broad term that encompasses different subtypes and ramifications, including managerial, technical, and strategic capabilities, [28]. Managers, technicians, or subject matter experts, such as HCPs, play an important role in strengthening a healthcare organization's competitive advantage and performance by updating and transforming its resource base, [18], [29].

Entrepreneurship, innovation, or other types of organizational activities are necessary for individuals to achieve this goal. By sensing and capturing opportunities, as well as by transforming resources, these activities are carried out. Generally, studies focus on the role of top managers and CEOs, but mid and lower-level managers may also sense opportunities emanating from the market when they engage in DC-related activities, [30], [31].

As healthcare systems operate outside normal technology scope, their applications extend far beyond health-related society, most recently being applied to complex scientific and medical governance and organizations. In high-dynamic environments and rapid technological environments, organization dynamics capabilities reflect an integrated dynamic theory of the organization, [13].

In the context of hospital settings and the implementation of technology, these capabilities can be particularly effective for several reasons.

Rapid Technological Changes The healthcare sector is undergoing rapid technological advancements. IDC allows hospitals to quickly adapt to and adopt new technologies like blockchain, ensuring they remain at the forefront of healthcare innovation, [5].

Data complexity in healthcare as healthcare data includes a variety of information, ranging from patient records to billing records. To ensure data accuracy and consistency, hospitals can leverage DC to manage and integrate this data into blockchain systems, [32].

Interoperability as the integration of disparate healthcare systems is a challenge. A blockchain solution with DC will enable hospitals to integrate BT with existing systems in a more effective manner, promoting data interoperability across platforms, [6].

Compliance with regulatory requirements as the healthcare industry is heavily regulated. Blockchain implementations can be quickly adapted to changing regulatory requirements due to their DC, [8], [33], [34].

Thus, continual learning is essential in the healthcare sector since diseases, treatments, and technologies are constantly evolving. With DC, hospital staff are always up-to-date on the latest blockchain applications and best practices, [20], [35], [36].

It is possible to facilitate collaboration between different stakeholders in the healthcare industry, including doctors, patients, and insurance companies, through the use of BT. Blockchain implementations are more likely to succeed if DC contributes to a collaborative culture, [34].

Several studies have shown that promoting and advancing IDC will enable organizations across sectors to gain a competitive advantage in complex times such as the ones we are experiencing today. Those organizations must be both resilient and adaptable enough to shift to different business models when circumstances require them to continue to deliver value in their distinctive way, [20], [21], [27], [37].

However, it is unclear how many healthcare organizations (HCOs) like public hospitals, have adopted solid technology programs to develop and nurture IDC, [6], [17].

According to Teece's original work, companies can fulfill two seemingly contradictory imperatives by taking advantage of DC theory. In contrast to ordinary capabilities, DC is unique to each company and is embedded in the company's history. The management activities that create a DC are sensing, seizing, and transforming. Sensing is about identifying and evaluating opportunities, seizing is about mobilizing resources to capitalize on those opportunities, and transforming is about continual renewal, [38], [39].

HCOs like hospitals can develop employees' complementary skills during different timeframes before or after a technological change, but they will need to act quickly and build the capabilities necessary to preserve as much of the technology's benefits as possible, [6], [29].

It is important to integrate intellectual and management capabilities with the overall organizational strategy, and most HCOs sometimes lack alignment between execution teams and top strategy people when it comes to fostering organizational capabilities, [6].

Adaptability is a theory that applies to constantly changing circumstances as a competitive

advantage, [17]. By doing things extraordinarily well, every great business develops excellent capabilities or gets an edge over the competition. In recent years, skills have played a greater role in management strategy and corporate innovation. To gain a competitive edge, every business strives to develop internal skills and HCOs are no exception to that core principle, [41].

The businesses of today must be quick, adaptable, and innovative to respond flexibly, and innovatively to technology and market changes, and in hospital settings that are a growing reality, [35].

To take advantage of new technology, adapt to shifting process demands like EMR or supply chain management, and, ultimately, outperform internal deficiencies, organizations like hospitals are reorganizing their internal and external resources. A healthcare organization, regardless of the type, will gain long-term value by investing in DC. By developing these capabilities beyond ordinary strategic capabilities, an individual can transform himself and evolve through his IDCs in any healthcare context, [26], [42].

2.2 Healthcare and Health Technology Innovation

The implementation of coordinated and data-enabled approaches, as well as new models of collaboration, is crucial to ensuring that everyone has access to preventive health care and clinical care. Adapting to COVID-19 and preventing future outbreaks will be made possible by strengthening the global health system's resilience, [15], [24].

Governments, businesses, civil society organizations, and experts engaged in the main phases of battling the pandemic while exchanging insights and experiences. A rigid phase keeps casualties down while balancing economic, health, and social impacts to avoid overloading health systems. A struggle phase distributes vaccines while balancing economic, health, and social impacts and a futuristic phase optimizes healthcare systems while converting related business changes into opportunities [43].

Personalized medicine and precision medicine are two of the most promising long-term innovations in healthcare. Different HCOs, such as hospitals, were forced to adapt to technological and market changes in a faster, and more innovative manner during the pandemic crisis, [16], [31], [44].

When companies develop and refine their sensing capabilities, seize opportunities, and transform their business models, they become more innovative and innovative. Hence, companies must remember that innovative offerings and new business models will fail if top management isn't entrepreneurial and capable of leading.

A key role played by technology in healthcare is to provide high-quality services at affordable costs to patients, maintain patient histories, adjudicate payer claims, provide referral and pre-certification services, manage cases, scan paper forms digitally, or create electronic medical records (EMRs) that allow information to be processed quickly and accurately, [45].

Change is accompanied by uncertainty, so even if the change is positive and beneficial if it is not accepted by the relevant stakeholders, it could have uncertain consequences in the intended consequence. Because of the change in existing business workflow and processes that accompany technological innovation, there is some concomitant uncertainty associated with every technological innovation. A dilemma also exists in the healthcare industry between pursuing a competitive advantage through cutting-edge technology and managing the risks and uncertainties associated with it. Bringing in enough technological innovation to provide quality services at a lower cost and managing the risks and uncertainties it brings are the trade-offs the industry must make, [24].

Hospitals, as primary health service providers, store massive amounts of patient data, [46]. This data, crucial for patient outcomes, is often trapped in silos, leading to operational inefficiencies and compromising patient care. Blockchain's promise of a unified, secure, and transparent system makes hospitals the ideal setting for its adoption. Moreover, understanding failures and successes in hospitals can provide lessons for the wider healthcare industry, [3], [11], [42], [43].

As a healthcare organization, all employees and stakeholders must possess the appropriate set of skills to evaluate the appropriate level of technological innovation to adapt to advanced technologies more quickly, reduce service costs, and provide quality healthcare at affordable prices. To counter the challenge of compressing innovation cycles, people, technology, and processes that form the backbone of businesses should be receptive to the inherent change innovation brings, [41].

2.3 Blockchain Technology in Hospitals Information Systems

Managing hospitals is an essential part of managing health care. Managing hospitals in the age of COVID-19 is crucial. There are several constraints and challenges associated with conventional hospital management. By introducing BT into

hospital management, hospital operations can be improved, [42], [47].

Healthcare workflows, telemedical laboratories, and medical workflows for hospitals can use BT during times of pandemics. Clinics and hospitals can also use BT for remote monitoring of patient's health. By using BT to create smart contracts, hospitals can strengthen their remote healthcare system, [21], [48].

In particular, EMRs are kept in secure environments to protect the privacy of individual patients. There are, however, certain circumstances in which the sharing of electronic medical records has become inevitable. In the future, BT could be used to share the EMRs of patients in a decentralized, highly secured, and authenticated manner. Furthermore, BT can enable secure, decentralized data management of patients in a holistic and integrated manner. Patients' data can be better protected with BT; emergency care can be administered faster, and hospital emergency management systems can be improved. It is also possible to use BT for hospitals to share CT images in a fast and secure manner and can help keep the hospital environment safer, [40], [49].

Another perspective is the supply chain management of drugs and medicines, which is another critical area where BT can revolutionize hospital management. Hospital management can be made more efficient by ensuring the timely availability and affordability of genuine medicines for patients. Hospital materials shortages and wastage can be significantly reduced through the collaboration of hospitals through BT. But also, hospitals can use BT to process health insurance claims and settle them more quickly, [27], [41], [50].

Health insurance claims, pharmaceutical supply chains, and remote patient monitoring are some of the different applications of hospital management. In healthcare systems, information asymmetry refers to hospitals' access to patient records due to data centralization. Patients are unable to access their records because only one part of healthcare controls information. An interoperability approach focuses on the communication between different health systems within a single system. A secure platform is needed to prevent cyberattacks against hospitals, as a result of data breaches. BT platforms are being suggested as a solution to these challenges, as they are secure, transparent, and preserve the integrity of healthcare records, [4], [35], [38], [51].

To ensure privacy and security in data sharing, BT has been successfully tested and widely adopted. To avoid security challenges, both off-chain and on-chain techniques are being employed, though off-chain is specifically used to store data sets. Traditional health systems are centralized or managed by third parties, which creates data security challenges. Interoperability has led to difficulties linking patients' information in different systems, resulting in a waste of time and resources since e-health systems do not implement data ownership and availability, [19].

To ensure data security, availability, and system interoperability, BT-centred, patient-centered systems that work in conjunction with cloud storage are constantly being discussed. Researchers can access data directly from individual patients thanks to the output of BT systems, which allow patients to control their data directly under rigid secure protocols are key benefits. To achieve data integrity and confidentiality, shared information is used among entities to address security issues. To avoid exposition, patients' data are divided into sensitive and non-sensitive categories. To develop the permission-based model, BT platforms are growingly being implemented, [10], [25], [52].

3 Methodology

This section outlines the research methodology chosen to validate and address the research questions. The study investigates the crucial role of IDC in facilitating the integration of BT within hospital infrastructures. It aims to assess if IDC significantly influences the successful adoption of BT initiatives in hospitals, fostering innovation, ensuring data integrity, and building trust among stakeholders.

The research further explores the complex interplay between IDC and BT in healthcare. With rapid technological progress and a growing emphasis on data-driven decision-making, grasping this nexus is essential for HCOs, especially hospitals. The research seeks to ascertain if IDC serves as a crucial driver for innovation and effective BT deployment. By examining IDC's impact on the successes or failures of hospital blockchain projects, this study aims to bridge current knowledge gaps, offering both academic insights and practical guidance for BT integration in hospitals.

Key research questions are formulated to address the knowledge deficit:
RQ1: Which IDCs are prominently featured in the literature related to BT in healthcare, specifically hospitals? RQ2: How have these capabilities evolved and where do they sit within the broader

DC framework? RQ3: How significantly do these capabilities influence the successful implementation of BT in healthcare?

Addressing these queries is essential for understanding IDC's role in BT's context, furnishing a roadmap for healthcare entities to maximize BT's potential. With a grasp on IDC, hospitals can adeptly tackle BT integration challenges, aligning the technology with their strategic goals to realize genuine benefits.

To achieve these research aims, an SLR was employed as the core methodology. This involved exhaustive database searches to pinpoint pertinent literature, succeeded by a thorough evaluation of the located articles. This SLR underpins the research, presenting an analysis of primary research domains. The review sheds light on IDC's significance in BT ventures, underlining potential synergies and perils. Subsequent sections will delve deeper, transitioning from the defined research questions, hypotheses, search methods, and review protocols, leading to the implementation phase. The results section will primarily center on bibliometric analyses and co-authorship evaluations, concluding with an SLR approach to offer a holistic and unbiased overview of existing literature on the subject.

3.1 Methodology Procedures

In this SLR, the initial phase was focused on the planning stage, where research questions and keywords were aligned, especially with combinations such as "Individual Dynamic Capabilities", "Blockchain Technology", and "healthcare" or "hospitals". It was vital to retrieve papers that met all three criteria during the search. The Mendeley Reference Manager, accessed through a Chrome plugin, played an instrumental role in validating preliminary analyses. This reference management system ensured that research objectives aligned with the gathered works and the proper selection of data sources.

Data collection transpired between January and March 2023. To unearth additional studies related to the research questions, another search was initiated in April 2023. While the foundational keywords remained consistent, the search was broadened to include terms like "dynamic capabilities", "patient management", "hospital settings", "decentralized solutions", and "digital hospital solutions". The objective was to ensure comprehensive and accurate results. The abstracts' validation was crucial to ascertain the relevance of the papers to the research. Ultimately, all pertinent papers were reviewed to finalize the selection for a detailed study.

Within the SLR that spanned platforms like Scopus, CrossRef, PubMed, and Google Scholar, 234 publications were initially earmarked for preliminary analysis. Of these, 119 passed all validation and quality standards and 46 were selected for the final concept-centric analysis (as shown in Figure 1).

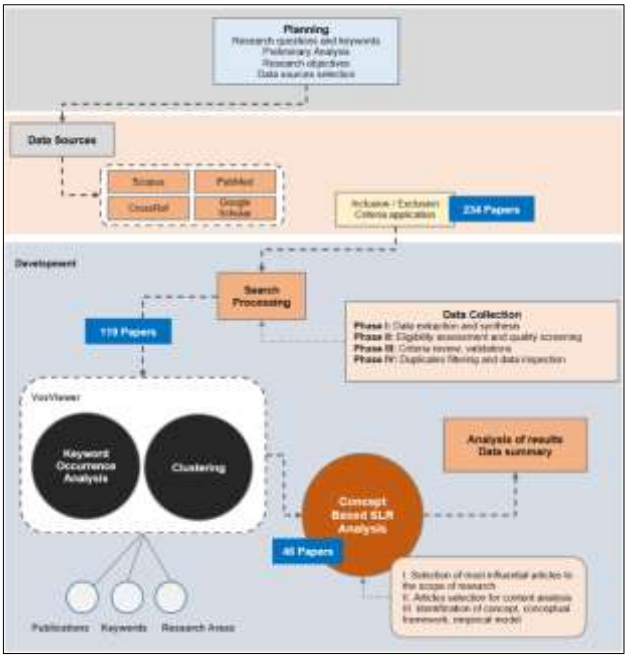

Fig. 1: Methodology phases overview.

For depth in the search strategy, synonyms and related terms were integrated into three main categories: IDC, Healthcare, and BT. Due to the limited initial results, there was a shifted focus primarily on IDC. A series of abstract analyses were undertaken to uncover inherent connections.

Publications were rigorously assessed during the selection process. Exclusions were made based on criteria, such as non-peer-reviewed publications, non-English content, publications predating 2010, redundant publications, digitally unavailable content, and those lacking evidence or outcomes.

Figure 1 provides a comprehensive overview of the research methodology, highlighting the application of search terms, exclusion criteria, and their relevance to specific platforms.

Deepening the analysis, scientific networks, clustering, and co-occurrence maps were carefully examined based on bibliographic indicators extracted from the selected articles, forming the foundation of the research methodology.

Using binary counting, the presence or absence of relevant terms in titles and abstracts was confirmed. The SLR aimed to pinpoint where IDC was pivotal for BT applications in hospital settings.

This research adhered to evidence-based methods and incorporated relevant content concerning IDC, BT, and hospital contexts.

Subsequently, the data underwent bibliometric and co-authorship analyses. A concept-driven SLR approach was then employed to visualize the evolution of knowledge related to the research questions. This process facilitated the identification, analysis, and synthesis of significant trends and patterns. As a result, an exhaustive literature review on IDC, BT, and healthcare BT applications in hospital contexts was compiled.

VOS Viewer, a robust software tool, supports the SLR. It facilitates complex data analyses, including co-occurrence evaluations, network visualizations, citation studies, and intricate co-authorship dynamics.

The chosen bibliometric methodology bolstered the data analysis, helping identify pivotal keywords and data indicators. The entire analysis, enhanced by sophisticated bibliometric techniques, underwent stringent validation.

Co-occurrence relationship analyses further delineated the intricate relationships among academic articles stored in relevant data banks. In sum, the synergy of bibliometrics and network analysis revealed key contributors, foundational works, and collaboration patterns. These insights, previously undetected in existing literature, were further enriched through a robust concept-driven analysis, the details of which will be presented subsequently, [5], [28], [39], [43].

4 Results

4.1 Bibliometric Analysis

This section provides a comprehensive breakdown of bibliographic data, bibliometric network analysis, and visual representations extracted from a review of 46 scholarly articles. Significantly, 21 articles were published in 2023, highlighting the contemporary relevance of our research inquiries to both the academic community and a global readership (Figure 2).

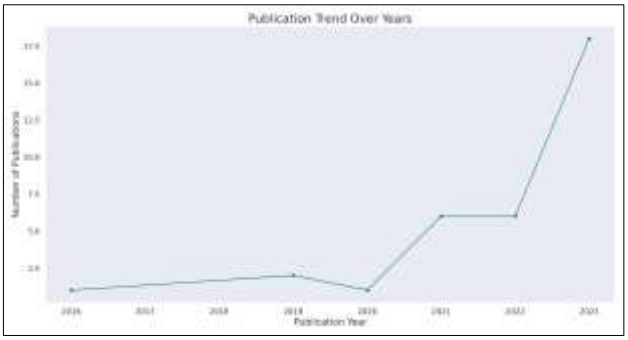

Fig. 2: Selected studies publication year.

The increasing trend in publications, as indicated by our chosen keywords, confirms that the most critical articles have surfaced predominantly over the last five years, especially since 2016. We utilized fractional counting in our co-occurrence calculations, a technique that divides the importance of an author in proportion to link weights. For instance, if two authors collaborated on a paper, their link weights would be evenly distributed. Of the 51scrutinized keywords, 38 reached the established benchmark, appearing at least twice.

Co-occurrence analysis is invaluable in discerning interrelations among items by quantifying the volume of shared documents, search terminologies, and keywords. Our ensuing bibliographic data analysis will feature visualization spotlighting keyword co-occurrence. For clarity, we used absolute, not fractional, counts of term co-occurrences to determine if authorship-based links are of consistent importance. Resulting visualizations spotlight the most potent co-occurrence links between terminologies. Such ties mainly indicate term relatedness, gauged by the interconnectedness determined by document counts. A term's frequent citation in articles indicates its widespread recognition, while the spatial closeness of two terms in the visualization implies their correlation. By contrasting the articles connected to each term, the visualizations clarify prominent interconnections. The visualization's color coding designates clusters of related terms.

Prominent relationships in the visual depictions are signified using curved lines (refer to Figure 3). The term "DC" had a link strength of 71 across twelve mentions, while "Dynamic managerial DC" was cited seven times, achieving a link strength of 15. Interlinked clusters containing terminologies such as entrepreneurship and innovation, among others, appeared thrice, amassing a link strength of 11. These data points accentuate the predominant co-occurrences of terms, evaluated based on relatedness, occurrence frequency, and the volume of affiliated documents.

Complementing our initial methodology, we conducted a text-centric analysis, which enabled the development of co-occurrence maps showcased in Figure 3. By applying binary counting to the titles and abstracts of the chosen articles, the occurrence of pertinent terminologies was ascertained, circumventing non-essential elements like copyright notes.

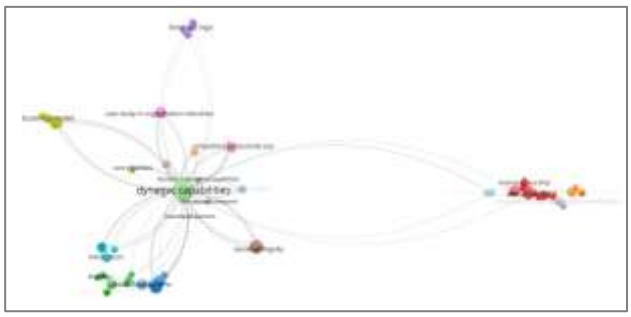

Fig. 3: Co-occurrence analysis of keywords from selected studies sample.

For the 31 examined terms, each received a relevance score, facilitating the identification of the most relevant terms based on their prominence (see Figure 4).

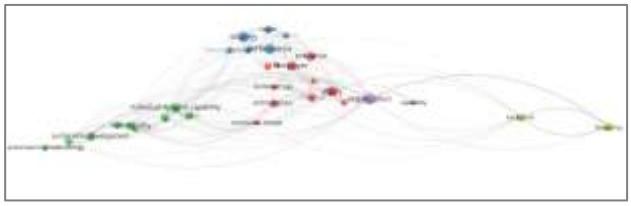

Fig. 4: Co-occurrence analysis of keywords from selected studies sample.

The Vos Viewer analysis reveals connections based on term co-occurrences, linking terms such as performance to others like IDC and active learning.

Term closeness in the visual depiction is influenced by its occurrence frequency, with a term's pervasive presence underscoring its interconnectedness. As evident in the visual representations (Figure 3 and Figure 4), the distribution of publications uses binary counting, accounting only for the presence of a term within an article.

As defined by the search parameters, DC is intrinsically linked to aspects of individual progression and competitive advantage. This link offers insights into the diverse capabilities observed during the COVID-19 pandemic, notably in areas like human resource management, crisis response, and innovative strategies.

Lastly, an in-depth exploration of the articles unveiled content clusters associated with IDC. These links became apparent only after a rigorous analysis of the content within these academic compositions.

4.2 Concept-based Findings

Our analytical techniques provided a rich tapestry of subthemes within each analytical domain. Alongside deriving specific insights and quantifiable metrics from the scientific network, our intensive approach enhanced our comprehension of the results of both the literature review and the bibliometric analyses.

The distilled list of 46 papers accentuated BT's instrumental role in enhancing operational management, resilience, and sustainability in healthcare, particularly within hospitals. Some literature positions BT as pivotal for economic advancement, rooted within a DC framework. A substantial portion of this literature accentuates the mutual reinforcement between DC and organizational agility, shedding light on their ramifications for risk management, navigating uncertainties, and steering innovation strategies. Some publications also highlight BT's transformative impact in healthcare, especially evident in hospital environments, [20], [36], [50].

From the aggregated studies, the emergent narrative underscores the escalating imperatives for healthcare institutions, especially hospitals, to streamline anti-counterfeiting measures, refine electronic medication tracking, and implement rigorous data governance and analytical standards. Such initiatives enhance their decision-making acumen.

Furthermore, our analysis highlights the indispensable role of IDC in leveraging BT to capacitate healthcare institutions in adeptly overseeing product life cycles, Electronic Medical Records (EMR), and Patient Healthcare Records (PHRs), all benchmarked against pivotal hospital management indicators, [5], [23], [33], [37], [47], [50].

Our discourse predominantly pivoted around deciphering the confluence of IDC, BT, and their healthcare implications. Although we didn't set explicit research questions, objectives, or hypotheses initially, our subsequent engagements unveiled findings that could be mapped to each of our research questions.

4.2.1 RQ1: What are the most prominent IDCs that have been highlighted in the literature regarding BT in healthcare, and specifically in hospitals?

Addressing our primary research query: which IDCs have been accentuated in the literature concerning

BT's deployment in healthcare and, specifically, hospitals?

In response, visualizing the frequency with which each IDC appears across all literature paints a vivid picture. It's insightful to trace the temporal evolution of these capabilities. A bar chart, enumerating the frequency of diverse IDCs in BT and healthcare literature, further enriches this perspective, [23], [40], [43]. These capabilities, sequenced in ascending order based on mentions, enable discerning the most and least discussed capabilities. Darker hues highlight more frequently addressed capabilities, as seen in Figure 5.

The exploration of IDC within the literature revealed a wealth of insights spanning multiple contexts, with healthcare and business emerging as dominant themes. Each publication offers a unique perspective, contributing to the ever-evolving academic discourse on DC.

One of the benchmarks that attest to a paper's influence and academic worth is its citation count. In our dataset, the citation range varied. Some publications boasted a high citation rate, signifying their profound impact and acceptance within scholarly circles, while others had fewer citations, indicating either their novelty or niche focus.

A temporal analysis of the papers indicates a surge in publications on DC in recent years. This trend underscores the escalating interest and recognition of DC's relevance, especially in today's fast-paced, technology-driven ecosystems.

To comprehensively understand the nuances of DC, especially in the context of blockchain within healthcare, a concept-based literature review was undertaken. The cornerstone of this approach is the quantification of each theme or concept's prevalence. To this end, several metrics were deployed: the frequency of mentions within the literature, the cumulative citation count associated with these mentions, and other quantifiable indicators. Such a methodology ensures a holistic and objective evaluation of the landscape.

This overview encapsulates the depth and breadth of the literature on DC, offering readers a quantified snapshot. By integrating citation counts, frequency of mentions, and temporal distribution, we present a vivid picture of the academic landscape. Such an approach enables discerning the pivotal themes, emerging trends, and the overarching significance of DC, especially in the promising realm of blockchain within healthcare.

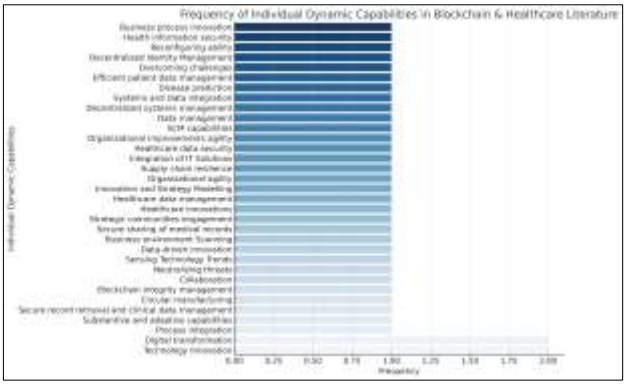

Fig. 5: Frequency of IDC in Blockchain & Healthcare Literature

The relevance score or citation counts serve as proxies for determining the significance of these capabilities, [44], [45], [53].

Following this, it's vital to pinpoint the IDCs accentuated in BT's healthcare literature, particularly in hospital contexts. A heat map, detailing the annual frequency of IDC mentions, offers a panoramic view. Each heatmap cell denotes the volume of literature discussing a specific capability in a designated year. Darker intensities symbolize elevated frequencies, with annotations furnishing precise counts, as shown in Figure 6.

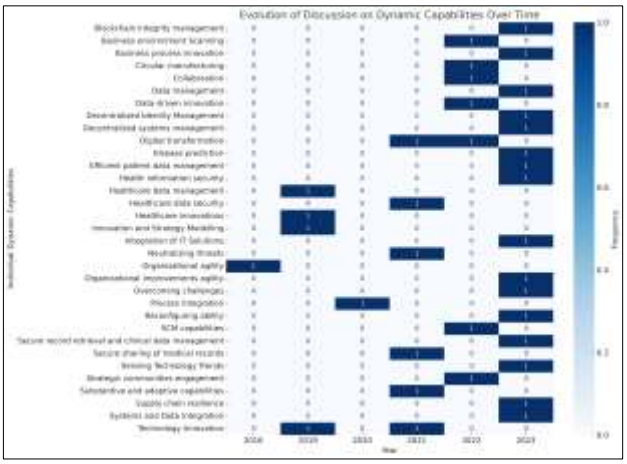

Fig. 6: Evolution of Discussion on IDC Over Time

Additionally, a bar chart delineating the predominant methodologies linked with each IDC was employed.

As shown in Figure 7, distinctly hued bars symbolize varied methodologies, illustrating which methodological approach is predominantly harnessed for discussing each capability, [35], [40], [42], [43], [50], [54].

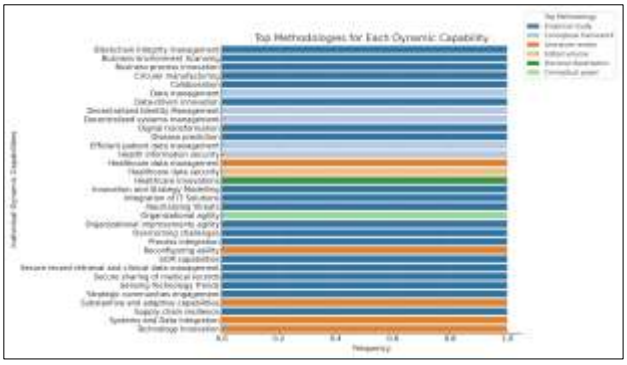

Fig. 7: Top Methodologies for each IDC

Moreover, another heatmap spotlighting the annual publication count was incorporated. The years are arrayed on the x-axis, IDCs on the y-axis, and the color gradient mirrors the paper count, elucidating which capabilities captivated scholarly attention during specific years, as shown in Figure 8.

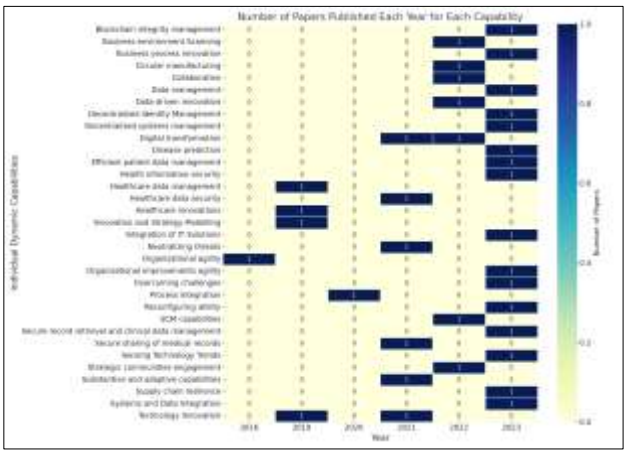

Fig. 8: Number of papers published each year for each IDC.

This heatmap (Figure 8), illustrating the annual paper count concerning each IDC, offers an intricate perspective on research trajectories. The y-axis enumerates the diverse IDC, while the x-axis enumerates the publication years. The chromatic intensity within each cell correlates with the publication count. Annotations elucidate exact paper counts, rendering a meticulous overview of research orientations across years.

4.2.2 RQ2: In what ways have these capabilities evolved, and in what ways are they positioned within the context of the broader DC framework?

In response to RQ2, which pertains to the evolution and positioning of the IDC within the broader DC framework, the sequence of stacked bar charts provides an overview of how IDC has been distributed across distinct phases and over varying years. Each charted bar pertains to a phase, like Sensing, Seizing, or Transform, with segments in that bar representing IDCs relevant to the corresponding year and phase, [22], [37], [55]. The segment magnitude correlates with how often literature mentions that capability within the particular phase for the year. The legend assists in differentiating each DC, as shown in Figure 9.

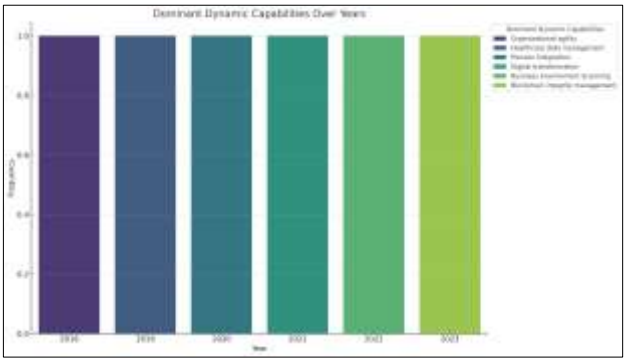

Fig. 9: Dominant IDC over the years

An integral part of our visualization was the box plot, as shown in Figure 10. It graphically displays the spread and skewness of the relevance scores across the Sensing, Seizing, and Transform phases. The core of the data, denoted by the box, encapsulates 50% of the scores, while the whiskers extend to indicate variability outside the upper and lower quartiles. Outliers might be indicated if data points are beyond the whiskers. The visual representation, with its gradated colors and well-defined boxes, proficiently delineates the distribution and variance of relevance scores across phases, [37], [43], [56].

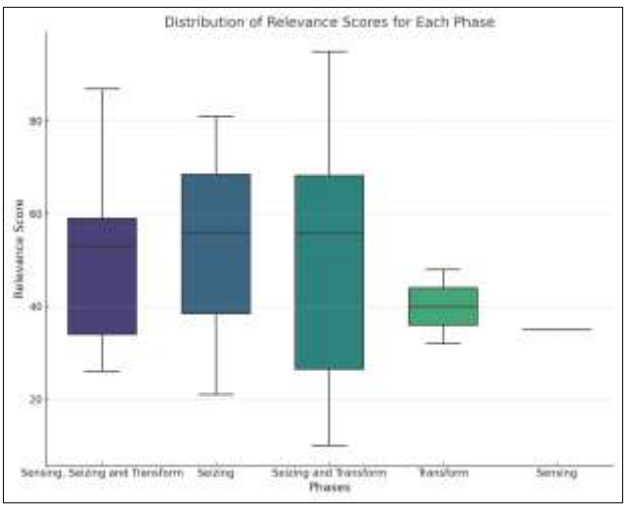

Fig. 10: Distribution of relevance scores for DC in each phase.

Subsequently, the stacked bar chart emphasizes the proportionate relevance of IDCs across the Sensing, Seizing, and Transform phases. Each bar symbolizes a distinct DC, with segments signifying the average relevance scores of the phase. The visual clarity and separation of segments ensure easy comprehension, making evident the comparative importance of each capability across these phases, as shown in Figure 11.

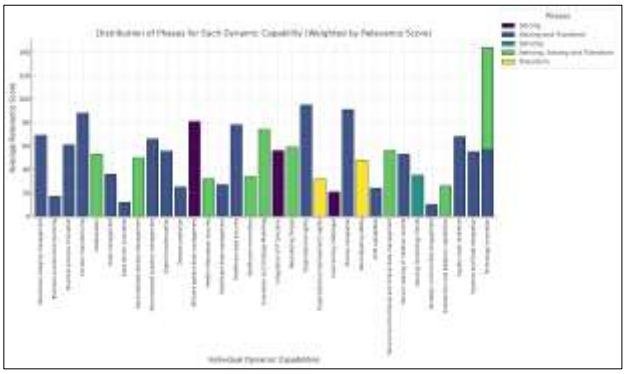

Fig. 11: Distribution of phases for each DC.

4.2.3 RQ3: To what extent do these capabilities contribute to the successful implementation of BT in the healthcare industry?

Addressing RQ3, concerning the contribution of these capabilities to the successful BT deployment in healthcare, the designed bubble chart was instrumental, [38], [41], [57]. Leveraging the number of mentions, the chart gauged the significance of IDC, as shown in Figure 12.

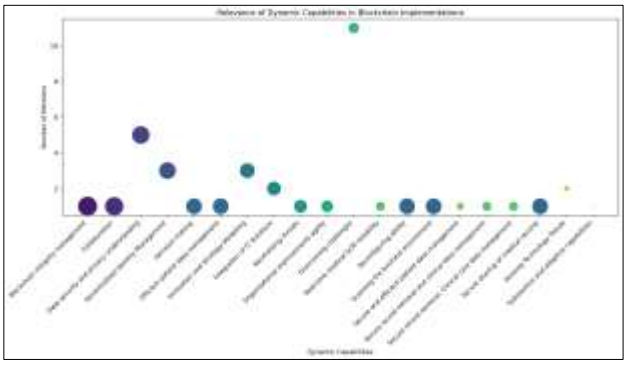

Fig. 12: Relevance of IDC in BT implementation.

Further, the heatmap displayed a synthesis between average relevance scores and cumulative citations for each IDC. Such a visualization clarifies which capabilities have attracted heightened academic attention and gauges their intrinsic relevance, with darker hues underscoring more frequently cited capabilities, as shown in Figure 13, [31], [49], [50], [52], [55], [58].

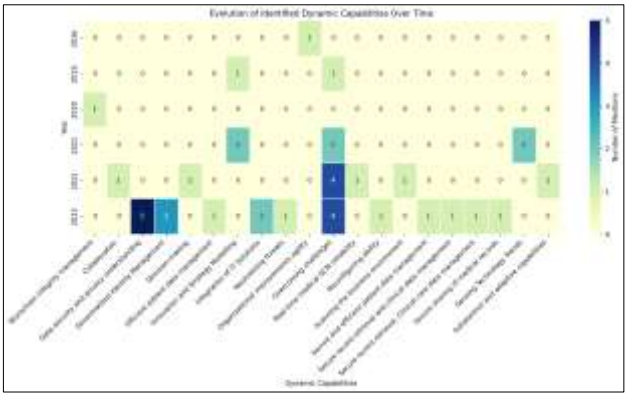

Fig. 13: Evolution of identified IDC.

The following table provides a concept-centric literature review of individual dynamic capabilities in blockchain, categorized by the three main stages of dynamic capabilities. It offers a structured way to understand the relevance of each capability to the blockchain domain across the sensing, seizing, and transforming stages, as shown in Table 1.

Table 1. IDC correlation with DC stage and relevance to BT

Reference	IDC Identified	DC Stage	Relevance to Blockchain
[23], [33], [52]	Technological Monitoring	Sensing	Blockchain as a new tech
[20], [24], [36], [49], [50]	Market Sensing	Sensing	Blockchain market trends
[14], [31], [47], [48], [49]	Opportunity Sensing	Sensing	Blockchain opportunities
[12], [18], [33]	Strategic Decision Making	Seizing	Blockchain strategy
[14], [15], [19], [21], [44]	Collaborative Learning	Seizing	Learning with blockchain
[19], [22], [33]	Resource Allocation	Seizing	Allocating blockchain resources
[26], [29], [33]	Co-evolution	Transforming	Evolving with blockchain
[14], [15], [18], [29], [44]	Reconfiguration	Transforming	Adapting to blockchain
[28], [31], [37]	Knowledge Integration	Transforming	Integrating blockchain knowledge
[14], [15], [18], [39], [44]	Organizational Transformation	Transforming	Transforming with blockchain

Finally, the stacked bar chart showcased the annual publication count, segmented by the three phases. The visualization offers a temporal perspective on the scholarly interest in each phase, delineating patterns, and thematic shifts over time. The chart serves as a visual chronicle of how research concentration in each phase has evolved, shedding light on changing academic and industry preoccupations, as shown in Figure 14.

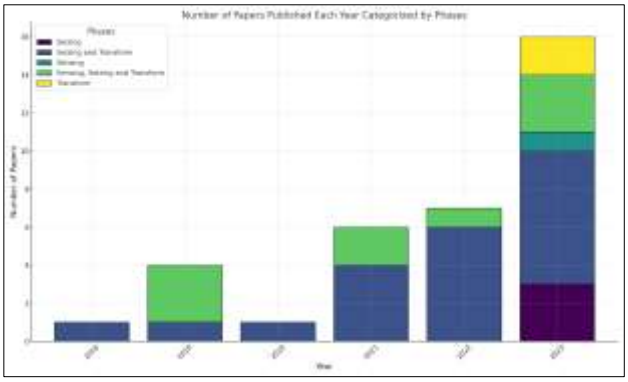

Fig. 14: Number of papers published each year categorized by phases.

4.3 Key Findings

From the analyzed literature, several illuminating insights have emerged regarding the integration of BT in healthcare, especially in the context of hospitals, [4], [5], [52].

Firstly, the literature unequivocally heralds the multitude of advantages BT offers hospitals, particularly in navigating the complexities of system architectures. BT emerges as a panacea for challenges such as ensuring data privacy, tailoring healthcare services, and enabling real-time patient monitoring. These insights are anchored in a rigorous literature review, [18], [26], [33].

As we delved deeper, it became patently clear that a growing number of healthcare institutions are actively collaborating with tech companies. These synergies are geared towards ideating and creating concepts that harmonize technology with clinical processes, giving rise to sophisticated platforms designed expressly for medical settings.

One prominent takeaway from the literature is the cardinal role of IDC in the seamless and efficacious integration of BT in healthcare. IDCs, especially in volatile environments like hospitals, can profoundly amplify organizational outcomes. Personnel armed with a robust set of IDCs are more adept at pioneering innovations, honing adaptability, and reinforcing organizational resilience, as indicated in various sources, [15], [18], [33], [41], [43].

BT's transformative potential in healthcare is another dominant theme, positioning it as a linchpin technology, especially for safeguarding and disseminating patient data across a gamut of healthcare stakeholders, ranging from primary care institutions to retail pharmacies. Furthermore, BT's critical role in magnifying the integrity of clinical trials has been spotlighted, championing data efficiency, transparency, and security, [14], [45], [47], [48], [49].

Hospitals employing blockchain offer an avant-garde approach to healthcare data storage, transactions, and fostering trust in a decentralized data-sharing milieu. Yet, as BT adoption in healthcare accelerates, dialogues surrounding data security and privacy are gaining heightened salience, [14], [15], [48], [49], [50].

The literature also lauds BT's game-changing potential to overhaul conventional healthcare mechanisms. It is envisioned as the cornerstone of a more cohesive healthcare matrix, championing transparent data sharing, [18], [44], [49], [50].

Moreover, the indispensability of IDC in this narrative is resonant. Professionals fortified with IDC are instrumental in trailblazing innovations and ensuring a nimble-footed adaptation to the rapidly evolving landscape of healthcare. Their acumen and predisposition towards embracing blockchain technologies are pivotal determinants of successful BT implementation. Furthermore, a salient observation is that the actualization of blockchain in medical settings is inherently collaborative. This necessitates an orchestra of IT mavens, HCPs, and administrative personnel. Their synergistic collaboration is the keystone to flawless BT assimilation, [8], [29], [33].

Another focal point in the literature is the emphasis on sensing capabilities. This pertains to the capability to identify external opportunities and threats, undertake market research, and leverage IT to amplify business operations and spur innovation. In the labyrinthine corridors of hospitals, managerial prowess, especially in decision-making, becomes invaluable. It ensures a clear alignment of project goals and helps navigate the maze of complexities. Superior execution capabilities, on the other hand, ensure the visions carved for BT harmonize seamlessly with overarching hospital goals, translating into cogent strategies and prudent resource allocations. Tailored training curricula, grounded in micro-DC, are vital in sculpting individual proficiencies, and fostering a culture of agility and adaptability within clinical teams, [3], [6], [17], [29].

Amidst the whirlwind of technological advancements enveloping hospitals, IDC emerges as a beacon. It ensures hospitals are primed to seamlessly embrace and integrate avant-garde technologies like blockchain, placing them on the frontiers of healthcare innovation, [26], [29], [33].

However, the multidimensional nature of healthcare data poses intricate challenges. This data spectrum encompasses everything from intricate patient histories to financial nuances. IDC equips hospitals with the acumen to proficiently harness

and embed this data within blockchain architectures, ensuring consistency and accuracy, [14], [31], [47].

In light of the relentless regulatory rigor that healthcare operates under, IDC paves the path for swift acclimatization to the ebb and flow of regulatory tides, ensuring BT integrations remain compliant. IDC fosters an organizational culture steeped in continuous learning, ensuring hospital staff remains conversant with the nuances of BT applications and methodologies. Moreover, from a collaboration standpoint, BT amplifies synergies amongst diverse healthcare stakeholders, bridging clinicians, patients, and payers, [39], [52], [53].

The kaleidoscope of challenges hospitals grapple with, from administrative conundrums to clinical intricacies, necessitates IDCs. IDC bestows HCPs with the toolkit to astutely manoeuver these challenges. Among the most resonant revelations from the literature is the potential of IDC in these intricate BT settings to be the torchbearer of innovations, ensuring hospitals remain agile and adaptive. Furthermore, while patient-centric care remains paramount, the operational efficiency of hospitals is equally critical. IDC undeniably plays a pivotal role in accentuating this efficiency, especially in the canvas of BT deployments. This guarantees not just optimal resource utilization but also ensures timeliness in patient care, further spotlighting IDC as a linchpin in hospital operations, [24], [35], [48], [49], [55].

In the milieu of the integration of BT in hospitals, IDC emerges as particularly potent. Hospitals today are steering through a tempest of technological metamorphosis. IDC bestows them with the agility to seamlessly onboard and leverage pioneering technologies like blockchain, ensuring they remain at the pinnacle of healthcare advancements.

Yet, the mosaic of healthcare data presents intricate challenges. This data spans everything from intricate patient dossiers to financial intricacies. IDC empowers hospitals to adeptly marshal and meld this data within BT frameworks, ensuring data integrity and precision, [14], [35].

A prominent challenge in healthcare is the orchestration of myriad systems. Armed with IDC, hospitals can seamlessly weave blockchain solutions into their prevailing systems, fostering data cohesion across disparate platforms. Furthermore, given the relentless regulatory scrutiny healthcare is subjected to, IDC ensures nimble adaptability to these regulatory fluxes, ensuring BT integrations remain within the compliance ambit, [27].

IDC inculcates a culture of relentless learning, ensuring hospital personnel remain in lockstep with the vanguard of BT applications and paradigms. From a synergy standpoint, BT amplifies collaborations amongst a diverse cohort of healthcare stakeholders, bridging clinicians, patients, and insurers, [39], [52], [57].

Emerging paradigms of sustainable supply chain management, particularly catalyzed by the COVID-19 pandemic and the digital transformation zeitgeist, are increasingly taking center stage, especially in the pharmaceutical sector. This evolution underscores the primacy of information-sharing edifices and e-healthcare. However, certain terrains within hospital technology management remain uncharted and warrant meticulous exploration in future research endeavors, [4], [5].

The SLR offers tantalizing glimpses of potential synergy between IDC and BT, suggesting potential cross-pollinations amongst strategic management, organizational strategy, and digital technologies, especially in the realms of electronic healthcare and pharmaceutical research. While there are insinuations regarding the impact of DC on innovation and technological frontiers, a nuanced and comprehensive grasp of IDC's cardinal role in the digital transformation narrative demands more granular exploration, [14], [25], [37].

Our preliminary findings are unambiguous in asserting that IDC plays a cardinal role in the technological innovation tapestry, especially in arenas like patient enrolment, EMR processing, and the orchestration of patient services via BT. Through DC, our comprehension of capabilities linked to human resources, crisis mitigation, and innovation strategies has deepened, assimilating individual developmental trajectories for competitive leverage.

From the DC theory perspective, the three fundamental phases have distinct subdivisions, each tailored to varying levels of organizational operations. Specifically, the 'transformation' phase encompasses 'co-evolution' at a strategic level, followed by 'tactical reconfiguration'. During this phase, the operational focus is on 'knowledge integration,' while the strategic focus is on 'organizational transformation'. An organization's ability to adapt and respond to changes in the external environment is examined by being DC, a theoretical framework. It examines how organizations can develop the ability to proactively detect and respond to external changes and to rapidly develop new capabilities in response to changing market conditions. The 'sensing' phase of DC, on the other hand, is underpinned by 'technological monitoring' at the strategic echelon, [4], [5], [16].

At the tactical tier, it emphasizes 'market sensing', while the operational dimension is defined by its focus on 'opportunity sensing'. Lastly, the 'seizing' phase strategically leans into 'strategic decision-making'. Tactically, it accentuates 'collaborative learning', and from an operational vantage point, its essence is captured by 'resource allocation'. These IDCs are crucial in understanding the successful implementation of BT, especially within the intricate environments of hospital settings, as shown in Figure 15.

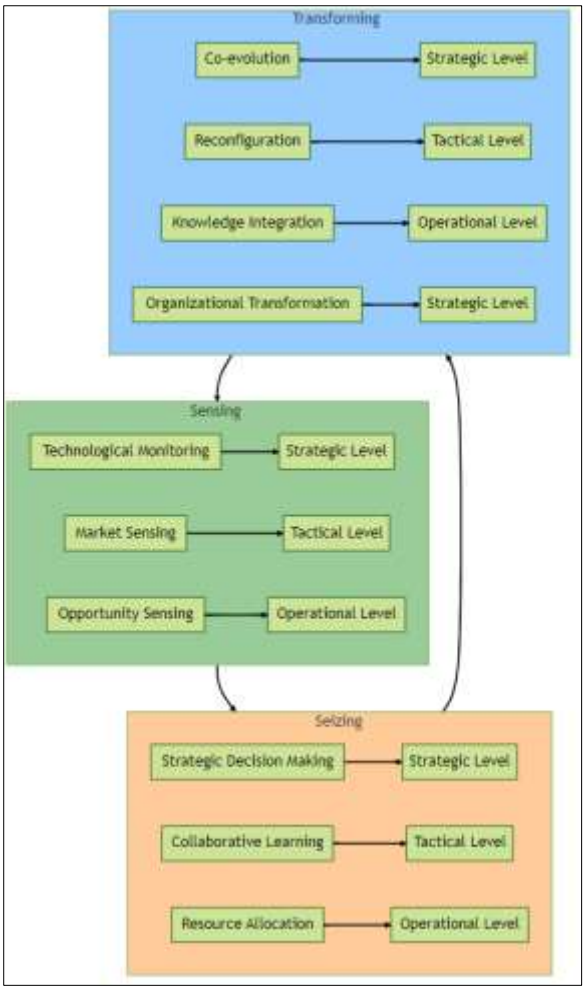

Fig. 15: DC phase interconnections with most relevant IDC components.

Our rigorous analysis revealed distinct IDC-centric themes, whose presence became discernible only after an assiduous exploration. The SLR underscored not just the advantages germane to hospitals but also extrapolated benefits related to data privacy, security, personalized healthcare, and continuous patient health monitoring. Furthermore, it was palpably clear that an ever-increasing number of healthcare institutions are forging partnerships with tech conglomerates to co-create innovative solutions. The harmonization of technology with clinical workflows holds the promise of enhancing control over patient data, birthing advanced platforms tailor-made for medical institutions, [24], [25].

The literature was unequivocal in extolling the potential of IDC in augmenting hospital operations, spanning facets like appointment orchestration, prescription management, and billing processes. IDC facets like agile problem-solving and operational prowess emerge as especially pivotal in these contexts. Moreover, the full-scale integration of BT in hospital management systems, covering the gamut from billing nuances to instant radiology alerts, underscores its expansive utility. Holistic pharmacy management, embracing stock management and incisive reporting, is another testament to this integration, [28], [31], [37].

IDC components, particularly those rooted in data security and agility, are vital in enabling efficient retrieval of patient data. Such facets enable seamless access to a rich tapestry of patient information, ranging from historical medical data to intricate billing nuances. The operational acumen of Electronic Medical Records (EMRs) and Electronic Health Records (EHRs) is magnified manifold through BT, especially when underpinned by IDC components. The literature resonates with the assertion that while patient-centric care is the North Star, the operational efficiency of hospitals cannot be relegated to the periphery. IDC emerges as a linchpin in augmenting this efficiency, especially against the backdrop of BT integration. This not only ensures judicious resource allocation but also underpins timeliness in patient care, further amplifying IDC as a keystone in hospital operations, [14], [15], [18], [49], [50].

5 Discussions

IDC serves as the bedrock for organizational resilience and adaptability, a trait that is of paramount importance in domains as critical as healthcare and hospital settings. These capabilities, which could be envisioned as a unique blend of competencies and skills, are often vested in managerial and decision-making echelons.

A perusal of the available literature offers myriad insights into IDCs across a spectrum of contexts. However, a discernible gap emerges when one delves into the direct correlation between IDCs and the embrace of blockchain in the realm of healthcare.

One of the predominant themes in the literature revolves around the micro foundational aspect of IDCs. This perspective underscores the influence of

individual actors on molding and sculpting organizational capabilities. Another vital dimension is the source of information. The infusion of diverse information repositories, straddling both digital platforms and human interactions, stands out as a cornerstone in fostering IDCs. Furthermore, the literature unequivocally resonates with the role of IDCs as the guardians of organizational resilience, especially when navigating the turbulent waters of unpredictability and dynamism.

Yet, the intricate interplay between IDCs and BT adoption in healthcare is conspicuously absent. The IDCs, recognized for their prowess in driving innovation and fortifying organizational resilience, don't seem to have been extensively explored in the context of blockchain's integration within healthcare. Given blockchain's revolutionary potential for reshaping healthcare paradigms, discerning the role of IDCs becomes imperative. Such understanding could serve as a beacon for healthcare entities that are on the precipice of harnessing the might of this transformative technology.

For stalwarts in the healthcare domain, cultivating IDCs among their workforce might hold the key to seamlessly ushering in avant-garde technologies, such as blockchain. By championing initiatives centered on training, fostering a culture of relentless learning, and ensuring consistent exposure to an eclectic mix of information sources, healthcare entities can foster fertile ground for IDC growth. Such a proactive stance could pave the way for a more fluid and efficacious technological assimilation trajectory.

5.1 Limitations and Recommendations

Within the healthcare sector, particularly in hospital environments, there's a noticeable gap in research exploring the interconnections between various dimensions. Thus, the primary aim of this study was to discern these pertinent correlations. The outcomes of this research could potentially guide future investigations into IDC and BT, especially in intricate domains like hospital supply chain management, operational processes, and product traceability, ultimately fostering positive results.

While our search criteria were expansive, encompassing all sectors and delving deeply into the public hospital context, we encountered limitations. Notably, there was a dearth of research papers focusing on IDC within the healthcare realm. This underscores the potential for refining healthcare supply chains and hospital management processes in the future.

The current SLR zeroes in on the healthcare sector, with an emphasis on public hospital settings, diverse BT applications, and the prospects of IDC. It also sheds light on potential future challenges, suggesting that subsequent research might offer deeper insights through broader scopes or quantitative methodologies.

Looking ahead, it's imperative to further evaluate hospitals, given their susceptibility to technological project failures. Embracing IDC, as an integral component of the broader DC methodology, could enhance governance, capability development, and maturity in BT implementations, and possibly in other technologies like artificial intelligence.

Hospitals present intricate technological management challenges. For instance, the pivotal role of Electronic Health Record (EHR) systems is undeniable. Their malfunction can severely hamper patient care, billing processes, and the overall functioning of hospitals. Similarly, the failure of medical equipment can directly jeopardize patient care. Hospitals' reliance on communication systems is paramount, and any disruption can result in care coordination lapses, leading to potential errors and delays. From an integration standpoint, technologies like BT, AI, and Big Data can be harnessed synergistically to address these challenges.

Furthermore, the financial ramifications for hospitals cannot be overlooked. Operating within tight financial constraints, hospitals can ill afford-technological project setbacks. Such failures can exert undue pressure on their financial health, necessitating budgetary adjustments in other sectors or, in extreme cases, leading to potential shutdowns.

6 Conclusion

IDC within the framework of BT and the healthcare sector encapsulates an exciting confluence of innovation, challenges, and transformative opportunities. Through the SLR, they endeavored to traverse the dense landscape of research, aiming to decode, analyze, and present the multifaceted interplays at this juncture.

Several salient insights emerged:

- Innovation and Evolution: IDCs play a pivotal role in fostering innovation within healthcare institutions, especially when paired with BT's potential. This combination provides avenues for new methodologies, improved patient care, and operational efficiencies.
- Challenges and Resilience: While the promise of BT in healthcare is immense, its

integration is fraught with challenges, ranging from technical intricacies to regulatory considerations. IDCs equip organizations with the resilience and adaptability to navigate these challenges, ensuring that the potential of blockchain is harnessed optimally.

- Transformational Outcomes: Blockchain's ability to ensure data security, enhance transparency, and streamline processes aligns seamlessly with the principles of modern healthcare. With IDCs, HCPs can better navigate, adapt, and optimize these technological integrations, paving the way for transformational outcomes in patient care, data management, and operational efficiency.
- Future Horizons: The SLR suggests that while significant strides have been made, there's still uncharted territory in the integration of IDCs, blockchain, and healthcare. This presents vast opportunities for further research, technological innovations, and the development of best practices tailored to the unique needs of healthcare institutions.

In essence, as we culminate this review, the overarching narrative underscores a vibrant, dynamic, and promising future for the triad of IDCs, BT, and healthcare. The insights gleaned not only spotlight the current state of affairs but also chart a roadmap, highlighting the potential, challenges, and transformative trajectory this fusion can usher in for the healthcare sector.

The SLR undertaken delved deeply into the relationship between IDC and BT within the healthcare domain, with a specific emphasis on hospital environments. This research highlighted the mutual benefits of integrating IDC and BT, showcasing their potential to align blockchain strategically and operationally with the intricate requirements of healthcare.

The study underscored BT's potential to revolutionize various healthcare facets, from recording patient details to managing financial transactions. It also spotlighted the growing partnerships between healthcare entities and tech companies, aiming to craft innovative solutions that harmoniously blend technology and processes, specifically designed for hospitals and medical establishments.

In the ever-evolving landscape of hospitals, IDC stands out as a crucial element for the triumphant rollout of BT in healthcare. Professionals fortified with these capabilities are ideally positioned to champion innovation, amplify adaptability, and strengthen organizational robustness. Moreover, the integration of blockchain into hospitals demands a synergistic effort, bringing together IT specialists, healthcare practitioners, and administrative personnel.

Considering the swift pace of technological advancements and the intricate nature of healthcare data, the indispensability of IDC becomes evident. It guarantees that healthcare experts can promptly adjust to changing scenarios, ensuring unparalleled patient care. Furthermore, IDC enables hospitals to proficiently gather and integrate varied data into blockchain systems, upholding data consistency and accuracy.

Healthcare challenges, such as integrating varied systems and navigating the rigorous regulatory environment, can be proficiently addressed with IDC. It aids in the rapid adaptation to shifting regulatory directives, ensuring that blockchain solutions adhere to compliance standards. Fundamentally, this research accentuates IDC's pivotal role in propelling innovation and positioning hospitals at the pinnacle of medical and technological advancements, while also highlighting the significance of operational efficiency in these intricate institutions.

Through the SLR methodology, this study meticulously examined the interrelations and applications of IDC and BT within hospital contexts. This methodological approach sheds light on the opportunities and potential pitfalls of BT initiatives that harness IDC. The research revealed that various BT initiatives across healthcare institutions and hospitals exhibited strong correlations with IDC, leading to both operational and strategic benefits.

Furthermore, the SLR offered a deeper understanding of the interplay between individual perspectives and DC, pinpointing specific IDC sets that can be harnessed for successful BT implementations. For hospitals to cultivate IDCs, there's a need to enhance organizational human capital, managerial acumen, and technological understanding.

The research also showcased how IDC and BT can optimize resource efficiency across the entire supply chain, from product traceability to electronic medical records. Despite the limited literature on this subject, our analysis of BT applications allowed us to discern the dependencies, challenges, and future trajectories associated with IDC.

In conclusion, this study affirms that IDC, in tandem with DC, can bolster high-performing

business models, while also fostering leadership and managerial prowess that propels the organization's strategy and performance. For executives and managers to navigate the competitive global markets and the mounting challenges in healthcare, there's a pressing need to deepen their understanding of organizational growth. By leveraging IDC, healthcare entities can cultivate novel competencies to navigate emerging models like decentralized BT solutions, thereby amplifying technological innovation. The applicability of these theoretical frameworks in diverse scenarios warrants further exploration in subsequent research.

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Conflict of Interest

The authors have no conflicts of interest to declare.