# Digital Collaboration in the Modern Era: A Systematic Exploration of the Literature

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**Abstract.** This research investigates the latest advancements in digital collaboration using a systematic literature review. It identifies emerging trends, challenges, and opportunities across key disciplines such as information technology, management, and communications, offering a comprehensive view of digital collaboration's evolution. The research focuses on critical factors that enhance the effectiveness of digital cooperation, including technological innovations, best practices, and team dynamics. Legal, security, and privacy concerns are also thoroughly examined. By synthesizing these insights, the study provides a deeper understanding of how digital collaboration functions in the modern landscape. Practical implications for improving collaboration and future research directions are discussed, offering valuable guidance to practitioners, researchers, and policymakers seeking to optimize digital collaboration strategies across diverse sectors. This work lays a robust foundation for advancing more efficient and secure collaboration practices in today's interconnected world.

**Keywords:** digital, collaboration, digital collaboration, systematic literature review

## 1 Introduction

In the modern era of rapid technological advancement, digital collaboration has become essential across business, education, and government sectors. It involves using digital tools to facilitate communication and cooperation among individuals, organizations, and nations, reshaping how we work and interact. Understanding digital collaboration is critical for optimizing its benefits in achieving strategic and operational goals. However, this trend also brings challenges, particularly regarding security, privacy, and information management, which must be carefully addressed.

This research aims to systematically explore the literature on digital collaboration, focusing on trends, key concepts, and influencing factors. The objectives are (1) to identify trends in empirical studies on digital collaboration and (2) to analyze variables influencing it. The findings are expected to contribute to the existing body of knowledge and offer valuable insights for practitioners and researchers. Practitioners can better understand factors driving digital collaboration, while researchers can identify future research directions.

This paper is structured as follows: Section 2 provides a literature review; Section 3 outlines the methodology; Section 4 presents the results; and Section 5 concludes with suggestions for further research.

## 2 Literature Review

Digital collaboration is defined in various ways across the literature. Mander and Antoni [1] describe it as employees collaborating via digital media to complete tasks, while Whewell [2] emphasizes its role in fostering changemaker attributes in students, particularly in entrepreneurship and education. As digital technologies evolve, Ciccone [3] highlights three critical principles of Virtually Viral Hangouts (VVH): freeing users from traditional constraints, fostering community building, and harnessing group wisdom.

Innovative technologies for digital collaboration offer solutions to challenges in various industries, including the Australian construction sector [4] and small creative enterprises [5]. Digital collaboration has been crucial in education, particularly during the COVID-19 pandemic, in enhancing student participation, engagement, and knowledge sharing [6] [7]. Social interaction and collaboration have been maintained even in online learning environments[8].

In e-government research, digital collaboration integrates human values, influencing technological developments and facilitating communication, particularly in medical fields [9] [10]. Findings also underscore its impact on organizational communication and innovation, suggesting the importance of adapting digital collaboration for enhanced efficiency and globalengagement [11] [12].

## 3 Methodology

This study utilized the Scopus database due to its extensive coverage of high-quality articles across various disciplines. Following the SLR protocol [13], two research questions were formulated:

RQ1: What are the publishing trends (media, year, methods) in digital collaboration research within Business, Management, and Accounting?

RQ2: What factors influence digital collaboration performance in these fields?

A. Article Identification

Keywords were identified based on Fuller [14], focusing on digital collaboration in areas like virtual teams and business exchanges. A Boolean search using "AND" connected keywords and limited results to relevant research and review articles in Business, Management,and Accounting, excluding non-relevant documents.

B. Quality Assessment – Inclusion and Exclusion

Articles were assessed based on inclusion criteria, such as empirical studies addressing digital collaboration. Exclusion criteria included duplicates, non-English articles, non-research documents, and inaccessible full texts. The initial Scopus search yielded 21,273 records, filtered down to 391 after applying criteria like field, language, and open access. Screening reduced this to 384 relevant records.

C. Data Extraction and Synthesis

Selected articles were analyzed using content analysis and Microsoft Excel. Descriptive and

interpretive approaches were applied to answer the research questions, and the results are presented in the following sections.

# 4 Results

The concept of Digital Collaboration varies across the literature. Ribeiro [15] defines it as how employees collaborate via digital media to complete tasks. International digital collaboration fosters changemaker attributes in students, preparing them for global impact in education and entrepreneurship. The highlights that digital collaboration, when combined with technology, builds communities and facilitates collective problem-solving. Innovative technologies supporting digital collaboration have been identified as potential solutions to address fragmentation in sectors like Australian residential construction [4]. Joint efforts with partners, facilitated by digital tools, influence social innovation capital, particularly for small innovative enterprises [5]. Furthermore, SMEs utilize digital technology through awareness, inquiry, and transformation to assess readiness for digitization [16]

The COVID-19 pandemic accelerated the adoption of digital collaboration platforms (DCPs) in education [6]. Digital platforms such as BIM enhance cross-disciplinary teamwork and information sharing [11]. Razmerita [7] concluded that digital collaboration significantly improves student participation and performance, especially during pandemic-related restrictions. Gopinathan noted its role in maintaining social interaction in online education [8]. International digital collaboration has also improved students' digital skills, cultural competency, and global awareness [17]. In healthcare, digital collaboration tools have enhanced surgical care in developing regions [10] while emphasizing collegial expectations, which improves practitioner adaptation [18].

Digital collaboration is tied to dynamic capabilities and IT-enabled governance mechanisms in organizational contexts. A study of 200 Chinese companies found that digital collaboration with channel distributors strengthens organizational capabilities [11]. Additionally, systematic literature reviews (SLR) combined with digital collaboration as a learning method have succeeded in higher education [19]. Digital collaboration technologies have also transformed large-scale construction projects, enhancing communication, collaboration, and distributed innovation across distances [12]. In remote work environments, time autonomy and digital collaboration play crucial roles in job design and mitigating burnout [1].

# 5. Discussion

## 5.1. Publisher Outlets and Citations

This subsection summarizes the articles based on their respective journals, publishers, and citations from the Scopus database. Figure 1 shows the articles published.

Analysis of the distribution of articles and citations in narratives shows the dominance of several major scientific publishers, such as Elsevier, Taylor & Francis, Wiley, Emerald & MDPI, and Springer. Elsevier is the most significant contributor of these publishers, with 34 articles and 1571 citations, accounting for 28% of the total citations. Emerald Group Holdings Ltd., with 27 articles and 630 citations, followed by Elsevier Inc., with 25 articles and 906 citations. The overall citation distribution reached 8432, with Elsevier accounting for approximately 54% of the total.

Other publishers, such as Wiley, Springer, Emerald, Taylor & Francis, and MDPI, also made significant contributions. This citation distribution reflects thesepublishers' critical role in shaping and advancing the discourse on Digital Collaboration. Although several other publishers also contributed, comparing the number of articles and citations confirms the strong dominance of the leading publishers, especially Elsevier, in this research arena.
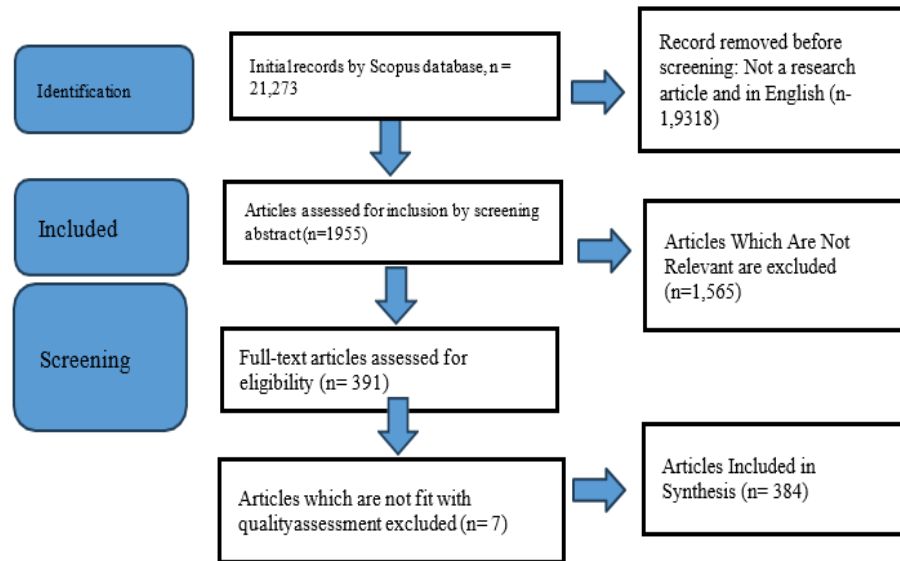


**Figure 1.** Flowchart of journal elimination not aligned with Digital Collaboration in Scopus

Researchers and scholars will likely rely heavily on publications from these leading publishers to gain insight and contribute to existing knowledge in the field. Number of Articles Number of Citations This finding shows that Elsevier is the most influential publisher in terms of citations in scientific discussions related to this topic. The high number of citations from journals uploaded to Elsevier proves this.

A rationale to note is that some research articles published in earlier years may have garnered more citations than more recent articles. The most cited study, Elsevier Ltd, with 34 articles and 1571 citations, shows its continued impact in the literature. Emerald Group Holdings Ltd. followed with 27 articles and 630 citations, confirming his significant contribution. Meanwhile, Elsevier Inc., with 25 articles and 906 citations, also plays a crucial role in developing knowledge.

The third most cited study, represented by Routledge with 25 articles and 274 citations, is essential to research development. All of these studies, from Elsevier to Routledge, reflect early research that has a central role as the primary source for the latest articles in digital collaboration. By looking at data on the number of articles and citations from various publishers, it can be identified that these articles are essential in guiding and directing the flow of scientific developments in digital collaboration—the distribution of papers among the top 20 journals in this study. The majority of research is published in leading journals, such as Sustainability (MDPI), Pacific Basin Finance

Journal (Elsevier), World Development (Elsevier), China Economic Review (Elsevier), Asia Pacific Journal of Management (Springer), and Economics of Transition (Wiley). Specifically, these journals featured 26, 8, 6, 5, 5, and 5 studies. It is important to note that the distribution of these studies is in line with the dominant publishers mentioned in the previous table, indicating the consistency and significance of the contributions of each publisher to the literature in this field. Elsevier Inc., with the journal Technological Forecasting and Social Change, has 14 articles cited 282 times, while Elsevier Ltd, with the journal Technovation, has six articles and 260 citations. This detailed distribution provides further insight into the relative contribution of each journal to research and recognition from the scientific community.

## 5.2. Publications by Year and Country

Figure 2 shows the trend of article publications from 2003 to 2023 based on publications by year. Overall, the number of studies regarding digital collaboration has increased significantly over the last ten years. This article experienced a stagnant number from 2003 to 2011. However, it started to grow slowly from 2015 to 2023 in line with technological developments and the possibility of interaction in cyberspace. The highest publication occurred in 2023, with 112 articles.

The articles were categorized based on their geographical focus, and this information most studies were conducted in the United Kingdom. The second highest number of publications was in the United States, followed by Germany, which is a country that has rapid industrial development with a total of 32 articles published, equivalent to Italy. The next position is Finland, which has published 30 articles; Australia, which has 28 articles; France, which has 27 articles; and Sweden, which has 25 articles. The following positions are in the Netherlands, Canada, China, India, Indonesia, Switzerland, and Austria, with the publication of 12 articles. Most of the publications are dominated by developed and industrial countries, with the Asian region represented only by India, Indonesia, and China. India and Indonesia are developing countries, while China is a country with economic strength and is competing with the USA. Articles related to digital collaboration are the results of research from several higher education institutions, including University College London with 11 articles, equivalent to Politecnico di Milano, then with a total of 8 articles published from LUT University, the University of Reading has published seven articles, the University of Graz has publication of 6 articles, Henley Business School has published six articles. In contrast, several universities which have the same number of publications are Helsingin Yliopisto, Bina Nusantara University, Aalto University, Scuola di Management, I'ICD Business School, which have five articles, and several universities and institutions with the same number of publications, namely four articles, including the Lulea University of Technology, Coventry University, Copenhagen Business School, Politecnico di Bari. The distribution of authors in digital collaboration articles includes the highest publication of 4 articles by the authors Papadonikolaki, Saunila, Ukko, and Belitski and the publication of 3 articles by Dell'Era, Nasiri, Rantala, Thalman. Baumgartner, Belhadi, Cavallo, Cepa, Fernandes, Ghezzi, Ghobakhloo carried out publication of two articles.

## 5.3 Research method and type of industry sample
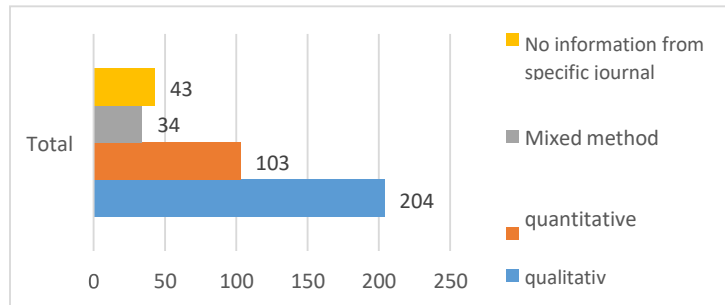
**Figure 1.** Research Methods and Approaches

The distribution of article data according to the methodology used is divided into several sections, including qualitative data with the most significant number of 200 articles, 103quantitative articles, 34 articles using mixed methods, and finally. These articles do not specifically indicate the methodology used.
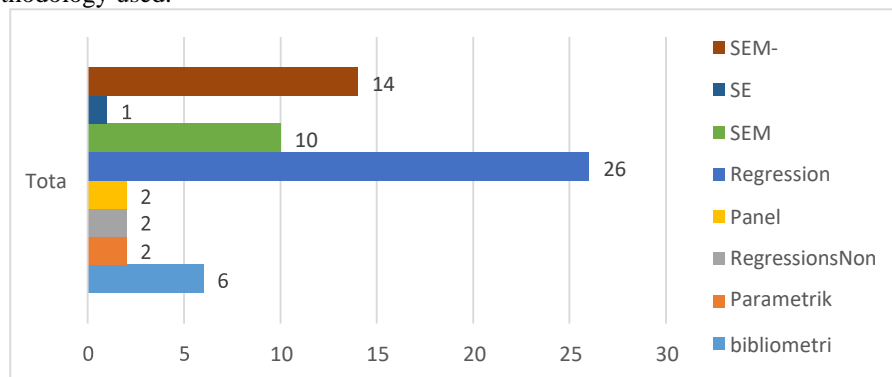


**Figure 2.** Research Methods and Approaches

Several methods were used for the research approach, including the regression method with 26 articles, 14 articles with the SEM-PLS method, ten articles with the SEM method, six articles with the bibliometric method, and two articles with the fuzzy logic method,then two articles. Two articles were published using non-parametric methods, one using the panel regression method and the other using the SEM method.
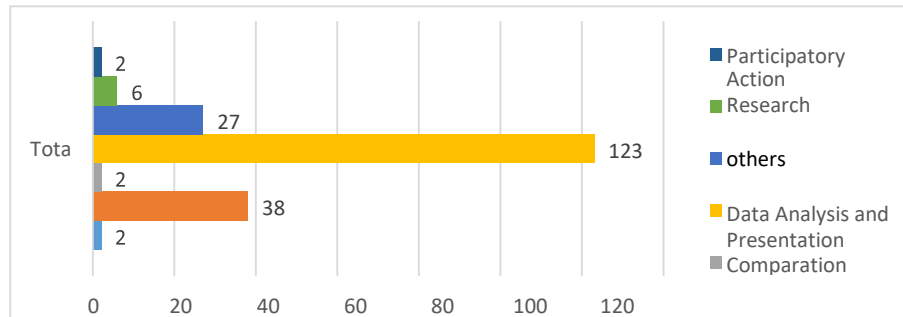
**Figure 3.** Distribution of research analysis techniques

The articles used in SLR research related to digital collaboration consist of 123 with data analysis and presentations, 38 articles using research with narrative and thematic analysis,27 articles with participatory action research analysis techniques, and six articles with grounded theory. In comparison, two articles with FGD analysis, analysis comparative, and analysis techniques that are not explicitly mentioned in the journal.
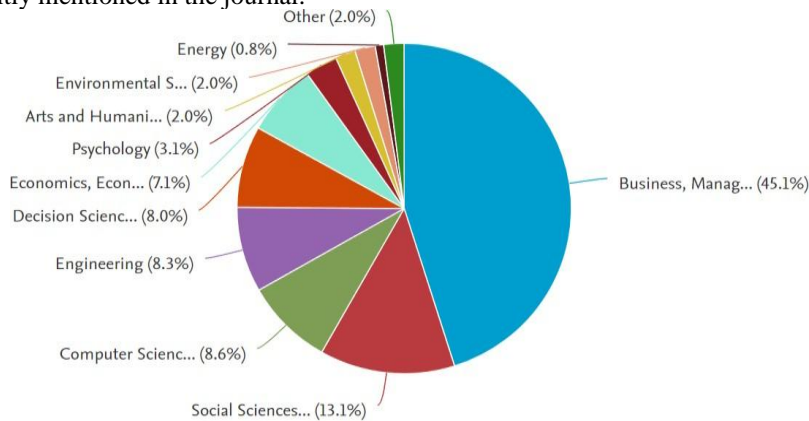


**Figure 4.** Type of Industry Sample

Based on the circle diagram above, the distribution contained in SLR digital collaboration includes several parts, including the business and management industry, which has a high percentage with a total rate of 45.1%, social science at 13.1%, computer science at 8.6%, engineering at 8.3%, decision science at 8%, economics and followed by psychology, arts and humanities, environmental and energy and others not explicitly mentioned in the diagram.
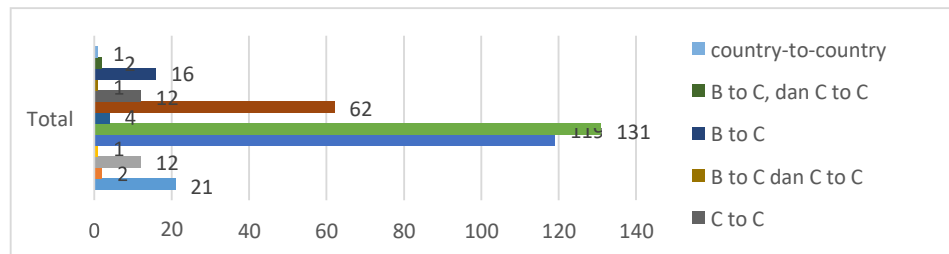
**Figure 5.** Collaboration Relationship

Based on the Figure above, 119 journals are articles with business-to-business collaboration relationships, 131 are research with internal collaboration relationships, 62 articles have B-to-C and C-to-C relationships, 21 articles have country-to-country relationships, and 16 articles have country-to-country relationships. B to C, 12 articles have a C to C relationship.

## 5.4 Factors that Influence Digital Collaboration
### 5.4.1    Variables of Digital Collaboration

Table 1. Variables of Digital Collaboration

| No | Related Variables | Terms/indicators used | Number of Articles | Sample of RecentAuthors |
|---|---|---|---|---|
| 1 | Business and Digital Marketing | • Factors Inhibiting Business Decisions <br> • Digital Platforms and Marketing Activities <br> • Business Performance and Digital Marketing Obstacles <br> • Recommendations for Stakeholders | 200 | [20],[21],[22], |
| 2 | Digitalization and Construction Technology | • Architectural and Construction Digitalization Concept | 77 | |
| 3 | FinTech and Financial Inclusion | • Articles and Abstracts Related to FinTech | 7 | FinTech and Financial Inclusion |
| 4 | Networks and Technology | • Network Size and Geographic Distance | 34 | Networks and Technology |
| 5 | Business Collaboration and | • Formal and Informal Institutions | 14 | Business Collaboration and Performance |

| No | Related Variables | Terms/indicators used | Number of Articles | Sample of Recent Authors |
|---|---|---|---|---|
| | Performance | | | |
| 6 | Digital Transformation of Education | • Digital and Collaboration Skills | 157 | Digital Transformation of Education |

Research in Business and Digital Marketing encompasses various aspects that hinder business decision-making processes, digital platform-based marketing activities, obstacles to business performance, and strategic recommendations for stakeholders. A total of 200 articles analyze the significance of digital marketing in business development and the challenges associated with its implementation. The area of Digitalization and Construction Technology is explored in 77 articles, focusing on the digital transformation within the architecture and construction sectors, with particular emphasis on adopting Industry 4.0 and emerging technological trends. FinTech and Financial Inclusion are addressed in 7 articles, discussing the drivers of fintech growth, benefits, and barriers to digital financial platforms. This includes the role of financial inclusion factors such as access to services, infrastructure, income, education, and regulatory frameworks.

The field of Networks and Technology is examined in 34 articles, which assess the impact of network size, geographic distance, and technological maturity on enhancing business operations, particularly in facilitating digital collaboration and transformation. In the context of Business Collaboration and Performance, 14 articles investigate the influence of formal and informal institutions, business relationships, and the implementation of enterprise collaboration technologies on organizational performance. Lastly, the Digital Transformation of Education is studied in 157 articles, focusing on developing digital skills and collaboration capabilities and using communication tools to shape student behavior, underscoring the critical role of digital transformation in advancing educational processes and outcomes.

### 5.4.2. Determinant Variables of Digital Collaboration

Table 2. Proxies of Explanatory Variables

| No | Related Variables | Number of Detail Variables | Number of Articles |
|---|---|---|---|
| 1 | Digital Collaboration Effectiveness | 3 | 127 |
| 2 | User Satisfaction | 14 | 130 |
| 3 | Knowledge Sharing | 14 | 63 |
| 4 | Communication Effectiveness | 10 | 99 |
| 5 | Impact on Team Performance | 12 | 181 |
| 6 | Adoption and Utilization of Collaboration Technologies | 11 | 90 |

Digital transformation is an organization using digital technology to change or improve

operations, products, services, and business models. Six factors influence digital transformation, including Digital Collaboration Effectiveness or digital collaboration with 127 articles; user Satisfaction or customer satisfaction 130 articles; knowledge Sharing with 63 articles; Communication Effectiveness, Impact on Team Performance and Team collaboration 181 articles; adoption and Utilization of Collaboration Technologies or what is known as the adaptation and use of collaborative technology as many as 90 articles. More details are in Table 4.

Table 3. Related Variables and Number of Articles

| No | Related Variables | Variable Name | Number of Articles |
|---|---|---|---|
| 1 | Digital Collaboration Effectiveness | Innovation | 11 |
| | | Efficiency | 62 |
| | | Productivity | 54 |
| 2 | User Satisfaction | Ease of Use | 13 |
| | | Functionality | 4 |
| | | Response Time | 1 |
| | | Reliability | 19 |
| | | Customization Options | 1 |
| | | Training and Onboarding | 38 |
| | | Integration Capabilities | 1 |
| | | Security and Privacy | 34 |
| | | Communication Features | 1 |
| | | Feedback Mechanisms | 2 |
| | | Mobile Accessibility | 11 |
| | | Scalability | 3 |
| | | Support Services | 1 |
| | | User Interface (UI) Design | 1 |
| 3 | Knowledge Sharing | Communication Channels | 1 |
| | | Cultural Factors | 4 |
| | | Incentives and Recognition | 1 |
| | | Trust and Psychological Safety | 1 |
| | | Team Diversity | 1 |
| | | Information Accessibility | 1 |
| | | Leadership Support | 15 |
| | | Social Networks | 2 |
| | | Technology Acceptance | 1 |
| | | Knowledge Management Systems | 1 |
| | | Feedback Mechanisms | 3 |
| | | Collaborative Culture | 15 |
| | | Security Concerns | 15 |
| | | Privacy Concerns | 2 |
| ]4 | Communicationn | Frequency of Communication | 4 |

| No | Related Variables | Variable Name | Number of Articles |
|---|---|---|---|
| | Effectiveness | Clarity of Communication (Decisive Communication) | 3 |
| | | Medium of Communication | 1 |
| | | Use of Collaborative Tools | 44 |
| | | Effective Meetings | 1 |
| | | Cultural Sensitivity | 12 |
| | | Information Accessibility | 1 |
| | | Conflict Resolution | 4 |
| | | Leadership Communication | 19 |
| | | Perceived Trust in Communication | 10 |
| 5 | Impact on Team Performance | Task Completion Time | 5 |
| | | Accuracy of Deliverables (Accuracy of Work Results) | 1 |
| | | Project Milestone Achievement | 2 |
| | | Team Satisfaction | 7 |
| | | Innovation and Creativity (Innovation and Creativity) | 95 |
| | | Employee Engagement | 19 |
| | | Meeting Deadlines | 5 |
| | | Effective Communication | 28 |
| | | Adaptability to Change | 1 |
| | | Task Allocation and Coordination | 8 |
| | | Employee Morale | 1 |
| | | Task Complexity Handling | 8 |
| 6 | Adoption and Utilization of Collaboration Technologies | Adoption Rate | 1 |
| | | Ease of Use (User-Friendliness) | 2 |
| | | Perceived Usefulness | 1 |
| | | Technical Support | 17 |
| | | Compatibility with Existing Systems | 1 |
| | | Leader Support | 15 |
| | | Organizational Culture | 2 |
| | | Perceived Innovation | 13 |
| | | Implementation Costs | 31 |
| | | Scalability | 3 |
| | | Data Privacy Compliance | 4 |

Technological innovation, efficiency, and productivity determine digital collaboration. User satisfaction is influenced by various components such as ease of use, functionality, response time, reliability, customization options, training and onboarding, integration capabilities, security and privacy, communication features, feedback mechanisms, mobile accessibility, scalability, support services, and user interface (UI) design. Knowledge sharing is shaped by communication channels, cultural factors, incentives and recognition, trust and psychological safety, team diversity,

information accessibility, leadership support, social networks, technology acceptance, knowledge management systems, feedback mechanisms, collaborative culture, and concerns related to security and privacy.

## 6 Conclusion and Further Study

This study analyzed 384 Scopus articles using the Systematic Literature Review method to examine digital collaboration in business, management, and accounting. Key factors influencing digital collaboration performance include effectiveness, user satisfaction, knowledge sharing, communication effectiveness, team performance impact, and technology adaptation. Digital collaboration's success is driven by innovation, efficiency, ease of use, and user interface design. Knowledge sharing is enhanced by trust, leadership support, and feedback mechanisms, while communication effectiveness depends on media, assertiveness, and conflict resolution. Team performance benefits from accurate work, meeting deadlines, and adaptability.

Technological development plays a crucial role in digital collaboration across sectors. In business, it facilitates innovation and joint efforts, while in education, it has supported online learning during the COVID-19 pandemic. Digital collaboration also fosters changemaker attributes in students and enhances innovation in industries like construction. Current trends include digital collaboration tools, mobile technology, and visualization, which enable knowledge distribution and innovation across distances. The literature indicates that digital collaboration platforms are knowledge multipliers in large-scale projects and are crucial for industries like manufacturing and healthcare.

However, the study acknowledges several limitations, such as potential exclusions in the scope of the literature and the search methodology. Additionally, variability in technology adoption challenges the generalization of the results. To address these gaps, future research should explore digital collaboration's impact on specific sectors like manufacturing and healthcare, examine emerging technologies, and build a comprehensive framework for understanding key factors such as security and privacy. Practical guidelines for implementing and managing digital collaboration are also needed. Further research should focus on specific industries to provide detailed insights into unique challenges and explore how the latest digital collaboration technologies can improve efficiency and effectiveness across various sectors.

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