



# Accounting for digital intangible assets: A systematic review of recognition, measurement, and disclosure challenges

Karina Nurani Febriani, Elly Astuti, Elana Era Yusdita

Department of Accounting Education, Faculty of Teacher Training and Education, Universitas PGRI Madiun  
Jl. Setia Budi No. 85 Madiun, East Java 63118, Indonesia

## ABSTRACT

This study employs a Systematic Literature Review (SLR) following the PRISMA framework to examine the classification of intangible assets, their association with firm value, and challenges in their accounting treatment. The analysis is based on Scopus-indexed articles published between 2019 and 2024, applying criteria such as research-based content, active DOI, full-text availability, English language, and topic relevance. From an initial pool of 200 articles, 64 met all selection criteria. The findings suggest that intangible assets play a crucial role in firm value within a knowledge-driven digital economy. These assets include intellectual capital, social capital, and digital resources such as data and algorithms, which support innovation, operational efficiency, and long-term competitiveness. However, current accounting practices face limitations in recognizing, measuring, and disclosing these assets, particularly those related to digital transformation. This study contributes by integrating traditional and digital perspectives on intangible asset accounting and highlighting their strategic importance. Methodologically, it demonstrates a structured and replicable SLR approach combining bibliometric and thematic analysis. Practically, the findings provide insights for companies, investors, and practitioners in managing and reporting intangible assets, while emphasizing the need for more adaptive accounting standards to reflect the evolving nature of digital assets.

**Keywords:** Accounting standards, Digital economy, IAS 38, Intangible assets, Intellectual capital, Systematic literature review  
**JEL Classification:** M41, O34, G32

©2026 AFRE (Accounting and Financial Review)

This is an open access article distributed under the CC BY-SA 4.0 license  
(<https://creativecommons.org/licenses/by-sa/4.0/>)

## Article Info:

Received: 2025-06-21 | Revised: 2026-02-10 | Accepted: 2026-03-14 | Published: 2026-03-28

**How to cite:** Febriani, K. N., Astuti, E., & Yusdita, E. E. (2026). Accounting for digital intangible assets: A systematic review of recognition, measurement, and disclosure challenges. *AFRe (Accounting and Financial Review)*, 9(1), 48-70.  
<https://doi.org/10.26905/afre.v9i1.16803>

## 1. Introduction

Intangible assets are critical in today's business environment, serving as strategic resources within economic value despite their abstract nature. Defined as identifiable non-monetary assets without material substance (Ikatan Akuntan Indonesia, 2021), their key characteristics are identifiability, absence of physical form, and classification as non-financial assets (Kieso et al., 2018). Managing intangible assets remain a challenging issue for firms, particularly regarding identifiability. Expenditures that cannot be identified should be recognized as expenses when incurred. Ownership is often obtained through internal development or business combinations, which adds to the complexity of recognition and management (Martani et al., 2016).

Accordingly, the significance of intangible assets has surged in the digital era. Firm value relies not only on tangible assets such as property and equipment but also on several key strategic resources, including copyrights, patents, goodwill, trademarks, and digital data are now leveraged to gain competitive advantage. For instance, trademarks act as identifiers and quality signals, fostering customer loyalty (Torremans, 2020). Despite their importance, many firms focus on tangible asset management, thereby overlooking the strategic opportunities offered by intangible assets.

The importance of effective intangible asset management is underscored by legal cases. Grand Indonesia Mall, as a case in point, was held liable for copyright infringement after using a sketch of “Tugu Selamat Datang” as its logo without authorization, resulting in a Rp1 billion penalty (Harruma, 2022). Likewise, in 2021, Gen Halilintar infringed the copyright of “Lagi Syantik” song by altering the lyrics, re-recording the song, and distributing it without permission, which led to a Supreme Court fine of Rp300 million (Harruma, 2022). These cases illustrate that poor management of intangible assets may significantly impact business sustainability and reputation.

To further analyze intangible assets in the digital era, academic perspectives can be applied, including those from accounting, valuation, and institutional theory. From an accounting perspective, intangible assets pose conceptual challenges in recognition, measurement, and reporting due to their non-physical nature and the difficulty of reliable identification. Standards such as IAS 38 and PSAK 19 tend to be conservative and are not fully capable of capturing the true economic value of digital assets such as data, algorithms, and intellectual capital. This creates a gap between accounting value and actual economic value. However, Prospect Theory (Kahneman & Tversky, 1979) suggests that financial statements continue to play a crucial role in shaping stakeholders’ decisions, as they reflect firm performance and associated risk considerations.

From an academic perspective, valuing intangible assets remains a distinct challenge. While several asset valuation methods exist, including historical cost, replacement cost, net realizable value, present value, and general price-level approaches (Riahi-Belkaoui, 2004), they are proven difficult to apply to intangible assets due to the unpredictability of their cash flows (Nazimok & Ozarnov, 2025; Nwabekee et al., 2023). Based on recent trends, firm value increasingly depends on intangible assets’ capacity to generate future economic benefits (Maramygin & Yakovlev, 2025). Resources such as innovation, branding, and big data make substantial contributions to firm value but are often underrepresented in financial statements. Thus, a more reliable valuation approach is necessary to capture their strategic impact.

Related to valuation, institutional theory adds nuance by emphasizing that accounting practices are influenced by institutional pressures, such as regulations, professional norms, and industry practices (DiMaggio & Powell, 1983). The limitations in recognizing intangible assets reflects institutional isomorphism, as firms often adhere to existing standards even when those standards do not represent the realities of the digital economy. Integrating these perspectives clarifies that intangible asset accounting challenges encompass not only technical concerns but also economic valuation and institutional forces, indicating the need for a holistic approach.

The digital era presents unique opportunities and challenges in managing intangible assets. For example, big data has become a strategic asset supporting data-driven decision-making (Xiong et al., 2022), yet its use raises ethical and privacy risks that can damage corporate credibility. Additionally, employees’ IT skills and negotiation abilities in IT projects have been shown to boost operational efficiency and productivity (de Morais et al., 2021; Saunders & Brynjolfsson, 2016). When managed properly, these digital assets provide a sustainable source of competitive advantage.

In line with the evolving challenges and opportunities, previous studies have examined intangible assets through systematic literature reviews (SLRs). Firmansyah et al. (2024) reviewed the period 1990–

2023, focusing on publication trends. [Fadhilah et al. \(2026\)](#) analyzed 2021–2026, emphasizing the auditor's perspective and the ISA 500 framework. [Buonomo et al. \(2020\)](#) explored nonprofit organizations from 2005 to 2020. [Cosa et al. \(2023\)](#) developed an intellectual capital measurement model spanning 1985–2023 and determined that no universally accepted approach exists. However, no prior study has directly addressed the classification of intangible assets in the digital era, the types that influence firm value, or accounting practices during periods of radical transformation, particularly during the COVID-19 pandemic (2019–2024).

Furthermore, prior studies demonstrate that effective management of intangible assets enhances firm performance. [Buonomo et al. \(2020\)](#) and [Cosa et al. \(2023\)](#) reported that intangible assets substantially contribute to competitiveness. However, these investigations are restricted to the nonprofit sector and do not adequately address their function in the business sector, particularly in a digital environment characterized by complexity and dynamism.

Concluding the preceding discussion, this study reviews the literature on intangible asset accounting to develop a comprehensive understanding of its theoretical and practical dimensions, focusing on how intangible assets are classified in the digital era, which types of intangible assets are associated with firm value, and how intangible asset accounting is practiced in the contemporary business environment. The urgency of this study lies in the need to optimize intangible asset management to enhance firms' competitiveness. By identifying best practices, this study aims to support more strategic and effective asset management in addressing current business challenges.

## 2. Methodology

This study employed a Systematic Literature Review (SLR) approach based on the PRISMA protocol and SLR guidelines ([Kitchenham, 2004](#)), which emphasize systematicity, transparency, and replicability to minimize subjective bias and enable independent verification. The procedures were adapted from [Hoque \(2014\)](#) and [Murti \(2022\)](#), as they provide a structured integration of the identification, screening, and analysis stages, in line with standard SLR principles that require a sequential protocol to enhance the consistency and validity of results (Figure 1).

To support data quality and comprehensiveness, this study utilized the Scopus database as the primary source. Scopus was selected due to its broad coverage of peer-reviewed journals and conference proceedings, its accessibility for replication purposes, and its recognized reliability compared to other databases such as Web of Science, which may have more limited coverage in certain contexts ([Pranckut, 2021](#)). The use of Scopus also aligns with SLR requirements for high-quality and representative data sources.

To ensure methodological precision and reduce human-related errors, several software tools were integrated into the process. Publish or Perish was used for initial data collection; Covidence, a web-based systematic review tool, facilitated AI-based screening; VOSviewer supported bibliometric mapping; and Atlas.ti enabled qualitative thematic analysis. The application of these tools ensured objective measurement and automation in line with SLR standards. In addition, strict inclusion and exclusion criteria were applied to maintain relevance to intangible assets and reflect recent developments, consequently preventing selection bias and ensuring representativeness.

The data collection process began by retrieving articles from Scopus using Publish or Perish with the "intangible assets" as primary keyword and a publication period spanning from 2019 to 2024 to capture recent developments. The retrieved articles were then screened in Covidence using predefined criteria, including Scopus-indexed journal status, classification as academic articles, availability of

an active DOI, full-text accessibility, English language, and relevance to the study objectives. Further validation of journal quality was conducted using Scopus and Scimago Journal & Country Rank, which classifies journals into quartiles (Q1–Q4) or “unknown” categories based on established metrics. Additionally, Scispace was utilized to efficiently review abstracts and methodological sections of the articles.

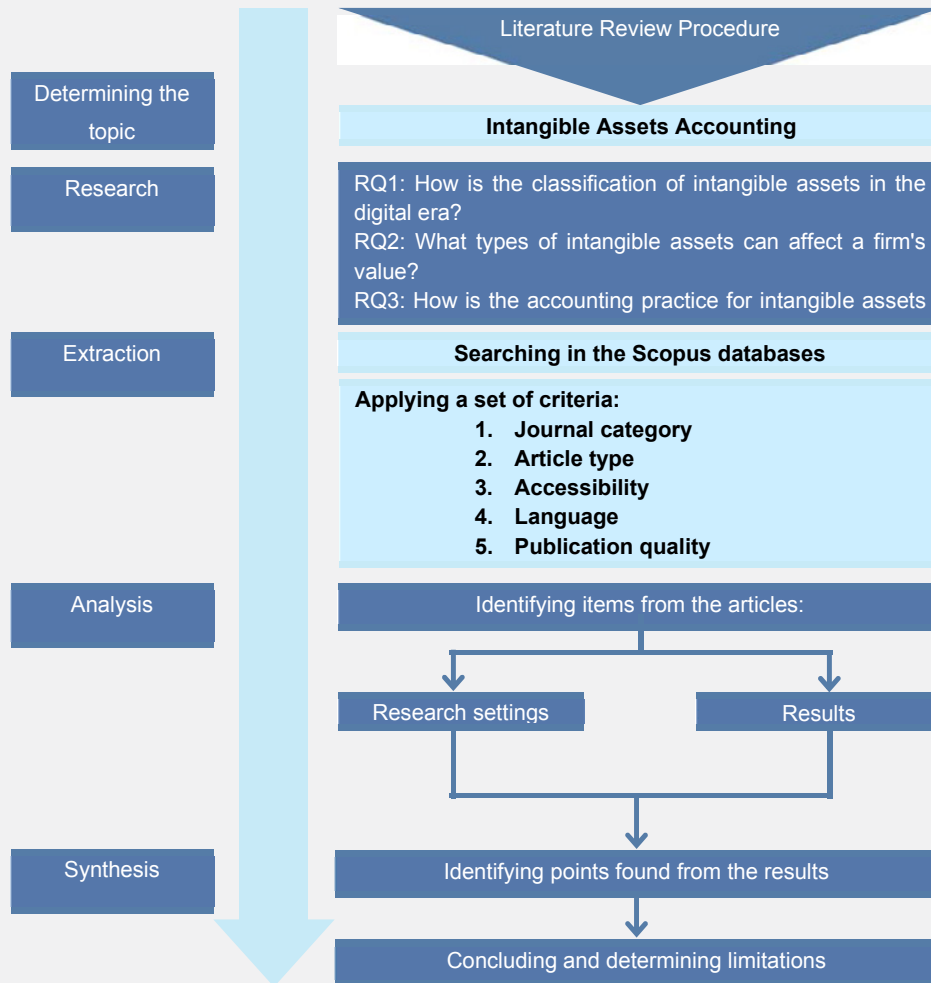


Figure 1. Literature review process (Source: Hoque, 2014; Murti, 2022)

The first stage of screening involved evaluating titles and abstracts to ensure alignment with the topic. Articles that did not reflect the variables under study, applied irrelevant methodologies, or lacked full-text accessibility were excluded. From an initial pool of 200 articles, 64 met all selection criteria. A detailed overview of this screening process is presented in Figure 2. The selected articles were subsequently analyzed to gain deeper insights into trends on intangible assets. Two main analytical tools were employed: VOSviewer to map keyword relationships across studies, and Atlas.ti to analyze the distribution of frequently occurring terms within full-text articles. This combined analysis provided a comprehensive understanding of key concepts and interrelationships within the literature on intangible asset accounting.

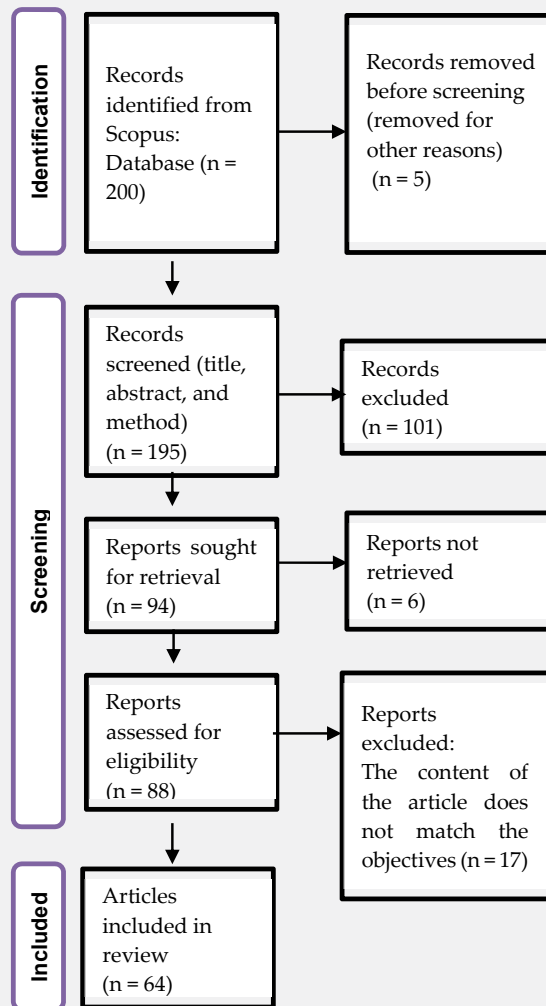


Figure 2. Sample selection using PRISMA flowchart

The systematic approach aims to produce a comprehensive and in-depth review of intangible asset management in the digital era. The findings are expected to contribute not only to the theoretical development of intangible asset but also to provide practical insights for firms seeking to enhance competitiveness through more strategic asset management.

### 3. Results

#### Frequency Distribution of Articles by Year of Publication and Quality of Publication

Figure 3 shows the frequency distribution of articles by year of publication and publication quality. The 64 articles are reviewed, with publication date ranging from 2019 to 2024. Overall, articles published in Q1 journals accounted for the majority of publications in this study, confirming that intangible assets are more frequently discussed in high-quality journals.

In 2020, there was a significant increase in publications in Q1 journals, which potentially reflecting increased attention to intangible asset-related issues at the beginning of the decade. However, the trend

showed a decline in the following years. In contrast, journals are categorized as Q2 and Q3. Slight variations in the number of publications were shown, but no consistent pattern found.

Notably, there are no articles found in Q4 journals during the study, suggesting that the topic of intangible assets attracts researchers' attention and is published in higher-quality journals. This finding also reflects a more serious academic focus, especially in journals with a global reputation.

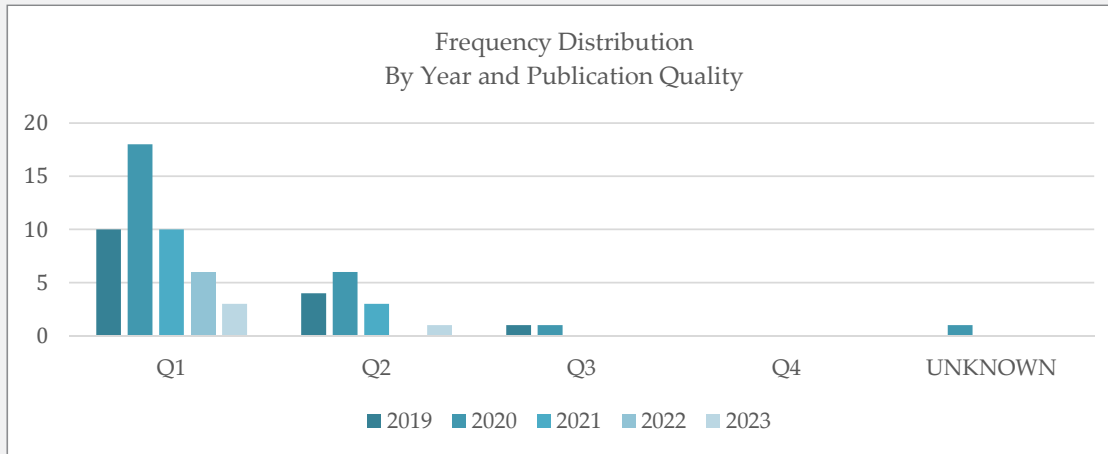


Figure 3. Frequency distribution of articles by year of publication and quality of publication

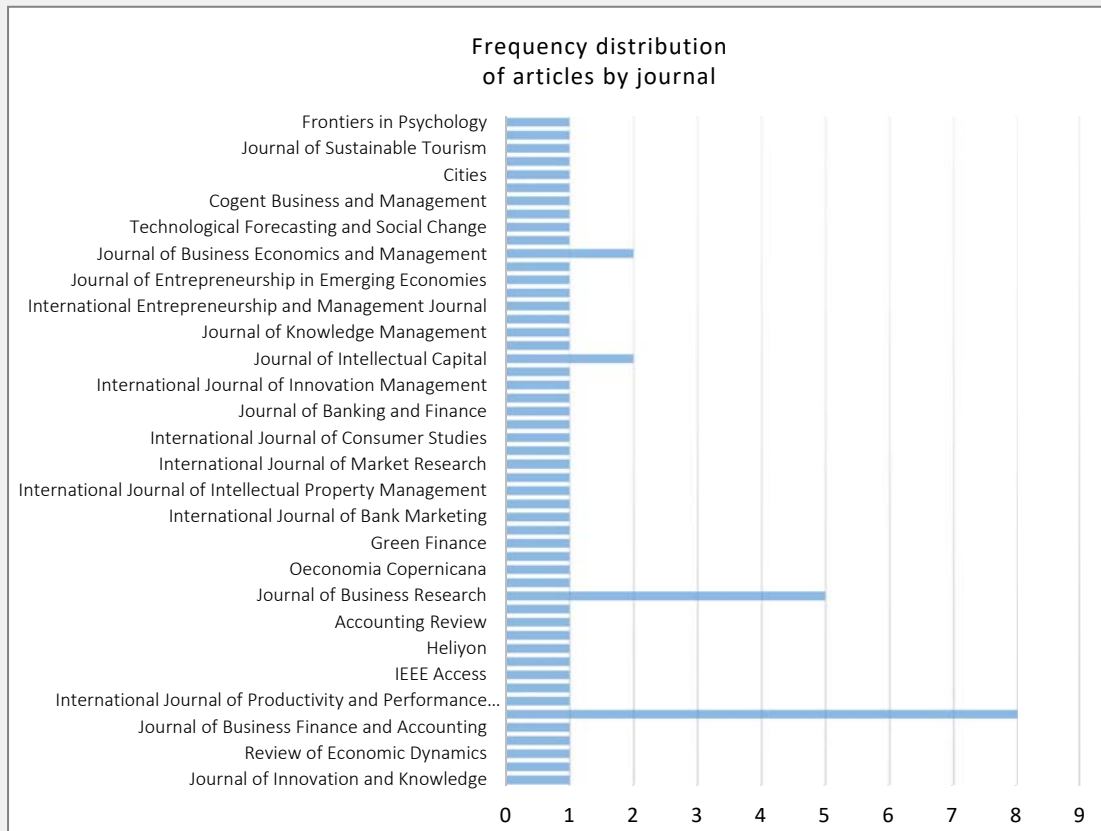


Figure 4. Frequency distribution of articles by journal

### Frequency Distribution of Articles by Journal

Figure 4 shows the frequency distribution of articles based on the journals that published intangible assets as one of the topics. Of the 64 articles reviewed, *Sustainability*, a journal published in Switzerland, has the highest number of publications, with 8 articles reflecting the journal's incredible attention to sustainability issues, including intangible asset management.

The Journal of Business Research ranked second, publishing 5 articles, indicating its focus on business practice-oriented research, including intangible assets. The third position is occupied by the Journal of Intellectual Capital and the Journal of Business Economics and Management, each with 2 articles. This reflects the relevance of intangible assets to the study of intellectual capital and business economics management.

This distribution shows that intangible asset-related research is published in journals across disciplines, strongly emphasizing sustainability, business research, and intellectual capital. These findings provide insight into the spread of the topic in the academic literature and the importance of intangible assets across various research contexts.

### Keyword Analysis

Keyword analysis of the 64 reviewed articles revealed the main terms frequently appearing in intangible asset accounting research. The visualization of the analysis results, shown in Figure 5, reflects the frequency of occurrence and the interrelationships among keywords. The size of the circles indicates the frequency of keyword usage, while the colors depict clusters that indicate a close relationship between terms based on their occurrence in the articles.

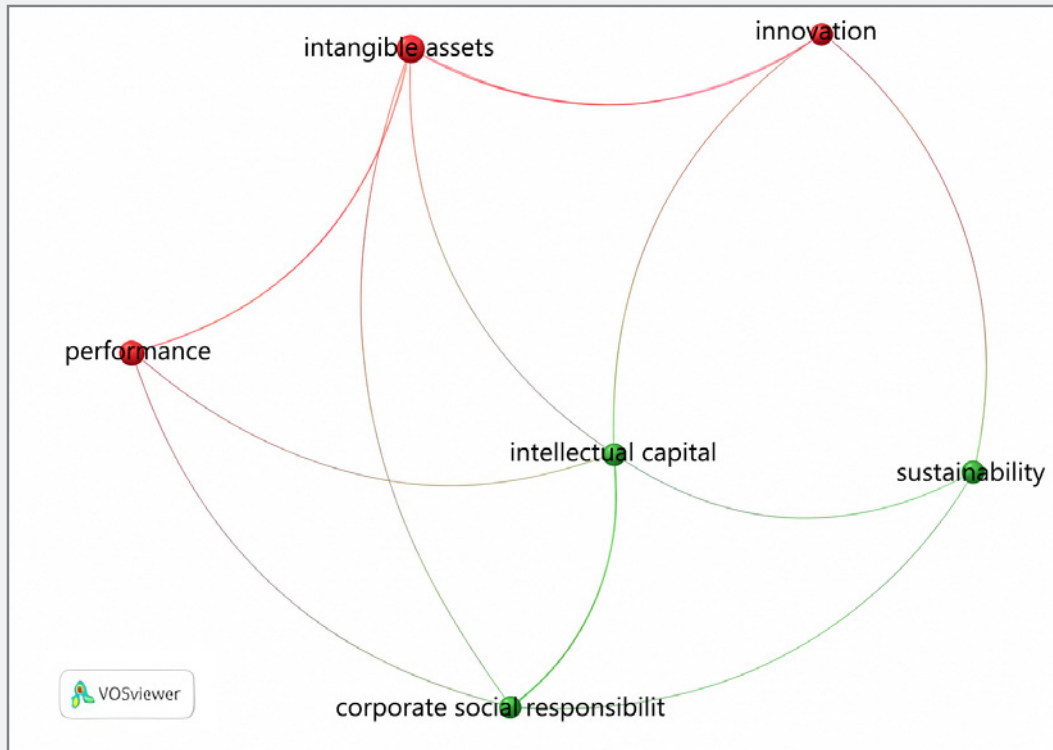


Figure 5. Keyword analysis

The keyword “intangible assets” is dominant, reflecting the primary focus on managing and measuring non-monetary assets that lack physical form but possess strategic value. In the digital economy, intangible assets are increasingly important, especially in driving digital transformation and business innovation. The term “innovation,” which often appears together with “intangible assets,” suggesting a direct relationship between the existence of assets such as intellectual capital, digital data, and patents and the ability of firms to innovate in the digital era (Castilla-Polo & Sánchez-Hernández, 2020; Gallardo-Vázquez et al., 2019).

In addition, the keyword “performance” focuses on the impact of intangible assets on firm performance. In the digital economy, performance is no longer measured solely in financial terms but also involves the ability to adapt to technological change, build competitive advantage, and create value through digital assets such as big data and information technology (Bertani et al., 2020; Xu & Liu, 2021). The close relationship between “performance” and “intellectual capital” underscores the importance of intellectual capital, which includes knowledge, skills, and innovation, as a key element in the success in the digital era.

The keyword “sustainability” is also an important focus in this study, highlighting the role of intangible assets in supporting sustainable business practices. Digitalization enables firms to leverage intangible assets, such as data and reputation, to develop more effective sustainability strategies (Buonomo et al., 2020). This is supported by the emergence of the term “corporate social responsibility” (CSR), which indicates the relationship between intangible assets such as goodwill and trademarks and public perceptions of CSR (Ramos-González et al., 2022). In the digital economy, CSR is increasingly important as firms are expected to be transparent and ethical in managing digital assets, including data privacy and environmental sustainability (Ahmad et al., 2023; Miotto et al., 2020).

The colors in the visualization indicate clusters that depict interrelated themes. For example, the close relationship between “intellectual capital,” “innovation,” and “performance” reflects the strategic role of intangible assets in supporting digital transformation and sustainable firm performance (Zaragoza-Sáez et al., 2023). The digitalization of the economy has accelerated the importance of intellectual capital and innovation as key drivers of firm success in an increasingly dynamic business environment (Brown et al., 2019).

These findings confirm that research related to intangible asset accounting is increasingly relevant in the era of economic digitalization. The relationship between the main keywords reflects the multidimensional attention to this topic, underscoring the importance of a holistic approach to intangible asset management to support corporate competitiveness and sustainability in the era of knowledge-based economy (Sardi et al., 2018).

### Full-Text Analysis

The results of the full-text analysis of the 64 articles using *Atlas.ti* provides an in-depth insight into the terms frequently used in intangible asset-related literature. The frequency of word occurrence in the articles is shown in Figure 6, where the word size reflects how often the word appears in the text. The larger the word size, the higher the frequency, reflecting its importance in the context.

The word “performance” appears 2,965 times, making it the most dominant term in the articles reviewed. This shows that research on intangible assets focuses heavily on their impact on firm performance. In the digital era, firm performance no longer depends solely on physical assets but on utilizing intangible assets such as intellectual capital and innovation to create sustainable value (Xu & Liu, 2021). The study by Yao et al. (2019) shows that intellectual capital significantly improves productivity and financial performance, especially in knowledge-based sectors.



financial performance, primarily through increasing efficiency, productivity, and market value (Sulistyo & Ayuni, 2020; Xu & Liu, 2021).

These findings underscore the importance of intangible assets in creating corporate value in the digital age. With technological advancements, firms must maximize their intangible assets' potential and integrate them into business strategies to enhance competitiveness and sustainability. Effective management of intangible assets such as data, intellectual capital, and social reputation strengthens firm value in an increasingly complex global market (Ramos-González et al., 2022).

### Classification of Intangible Assets

Intangible assets are classified into social, intellectual, digital, and cultural dimensions, which collectively represent strategic resources within the Resource-Based View (RBV) framework. The shift from an economy based on tangible assets to one based on knowledge, innovation, and reputation suggests that a firm's value is increasingly determined by its ability to manage non-physical, complex, and difficult-to-imitate resources. From an RBV perspective, these characteristics reflect the attributes of valuable, rare, inimitable, and non-substitutable (VRIN), which form the basis of sustainable competitive advantage.

Social capital plays a foundational role in this landscape. Collaboration, trust, and workplace fairness have increased organizational productivity and efficiency (Ko, 2021) while facilitating sustainable internal operations through enhanced trust and cohesion (Ievdokymov et al., 2020). Moreover, cultural capital represented by traditions, values, and shared norms supports long-term legitimacy and public trust (Arcos-Pumarola et al., 2023; Miotto et al., 2020).

Traditional intangible assets such as research and development (R&D), software, trademarks, entertainment products, original artworks, and mineral exploration remain pivotal in enabling innovation and corporate sustainability (Demers et al., 2021; McGrattan, 2020). Among these, R&D is recognized as a primary driver of innovation, enabling firms to develop novel offerings with competitive advantages (Wataya & Shaw, 2019), supported by expert knowledge, project infrastructure, and software libraries (Loyarte-López et al., 2020). Additionally, algorithms and artificial intelligence are increasingly integrated into firms' digital strategies (Bertani et al., 2021).

Human capital and intellectual property (IP) also underpin intangible value creation. Personnel's capacity to generate discoveries, brands, designs, and knowledge-based outputs significantly influences firm innovation (Denoncourt, 2020; Li, 2019). IP rights such as patents, trademarks, and corporate design strengthen corporate image and legal competitiveness (Guo-Fitoussi et al., 2019), while brand equity and customer satisfaction further support market positioning (Golovkova, 2019; Seo et al., 2020a).

High-profile examples such as Apple's and Pfizer's patents, Coca-Cola's and Amazon's brand strength, Walmart's supply chain, and Southwest Airlines' business model illustrate the real-world impact of intangible strategic assets (Lim, 2020). Moreover, goodwill, copyright, software, organizational branding, and licenses contribute to corporate value (Nakatani, 2021; Orhangazi, 2019). Theoretical contributions by Baruch Lev highlight the value of discoveries, human capital, customer relationships, organizational infrastructure, and reputation in shaping goodwill (Popescu, 2020). These are further supported by knowledge transfer mechanisms, trust-building, and organizational culture, key aspects of structural and spiritual capital (Saeidi et al., 2021).

Intellectual capital is central to this classification, encompassing patents, trademarks, copyrights, and goodwill assets that catalyze innovation, enable effective knowledge management, and facilitate strategic market adaptation (Ansong & Boateng, 2019; Dana et al., 2021). Furthermore, competencies in

human resources, customer relationship management, and organizational design underpin competitive differentiation (Ramos-González et al., 2022; Sardi et al., 2018; Zaragoza-Sáez et al., 2023).

Digital technologies have added new categories to the intangible asset spectrum, including deep learning algorithms, AI tools, digital platforms, and big data infrastructures (Ajakwe et al., 2022; Bertani et al., 2020). The ability to leverage data for predictive analytics and strategic decision-making has become a primary source of market competitiveness (Castilla-Polo & Sánchez-Hernández, 2020).

Reputation and CSR further enhance intangible value. Intangible factors such as corporate social responsibility and organizational image are critical for building stakeholder trust and societal legitimacy (Ahmad et al., 2023; Ramos, 2021). These attributes strengthen brand loyalty and support sustainable market performance (Wong & Zhang, 2022; Zhang & Ouyang, 2021). Complementary elements, such as advertising, market research, and branding, reinforce intangible brand equity (Škare & Soriano, 2021), while tangible cues, such as logos, slogans, and visual identifiers, support it (Trappey et al., 2020).

The classification of intangible assets indicates that, within the RBV framework, competitive advantage is determined not only by resource ownership but also by the ability to effectively manage, integrate, and exploit those resources. The interaction between social, intellectual, digital, and cultural dimensions forms a portfolio of strategic resources that enables firms to improve operational efficiency, strengthen market position, and achieve sustainability in an increasingly competitive global business environment.

### **Intangible Assets and Firm Value**

Intangible assets play a strategic role in generating firm value through two main mechanisms: internal development and external acquisitions. Internally, the development of intangible assets, such as research and development (R&D), intellectual capital, and human resource competencies, has been shown to directly enhance innovation capacity, operational efficiency, and competitive position. R&D activities enable firms to create new products and services that sustain competitive advantage, while intellectual capital serves as a catalyst for strategic adaptation amid dynamic market changes (Bertani et al., 2020; Dana et al., 2021). Empirically, this effect varies by firm size: large firms experience greater productivity gains, while small firms tend to see workforce growth through effective management of intangible assets (Moretti & Biancardi, 2020).

Furthermore, the effectiveness of managing expenditures related to intangible assets, particularly selling, general, and administrative (SG&A) expenses, is positively associated with higher stock returns and overall financial performance. This confirms that such expenditures are not merely consumptive but represent strategic investments that generate future economic value (Banker et al., 2019; Demers et al., 2021). In the context of digital transformation, employees' digital competencies are a critical asset that supports innovation and technological integration within organizations (Bertani et al., 2021). Furthermore, the combination of human capital, advertising strategies, and sustained investment in R&D is a key driver of value creation in a knowledge-based economy (Seo & Kim, 2020b).

On the other hand, external acquisition of intangible assets further strengthens corporate value by acquiring strategic assets such as patents, trademarks, and goodwill. Ownership and protection of these assets, including through patent litigation, help maintain the exclusivity of innovations and preserve the competitive advantage (Kafouros et al., 2021). Furthermore, the acquisition of external assets enhances market perception and corporate reputation, which are key components of goodwill (Ni et al., 2020). A high level of goodwill reflects market confidence in the firm's ability to create long-term value, ultimately driving business growth and competitiveness (Ahmad et al., 2023; Wong & Zhang,

2022). The integration of innovative internal development and targeted external acquisitions generates strategic synergies that strengthen the market value and competitive position.

Human capital serves as a key dimension linking internal development and the acquisition of intangible assets. Employees' competencies, innovation, and technological capabilities not only support internal productivity but also enhance the firm's ability to attract external resources such as customers and strategic partners (Bertani et al., 2020). High human capital enables firms to generate relevant innovations and to adapt more effectively to technological changes (Muwardi et al., 2020). Additionally, a strong organizational culture, corporate reputation, and social capital play a crucial role in building trust and fostering sustainable relationships both within and outside the organization (Sallah & Caesar, 2020). Positive social capital and an adaptive organizational culture contribute to maintaining customer loyalty and strengthening the firm's position in a competitive market (Ramos-González et al., 2022; Zaragoza-Sáez et al., 2023).

Various empirical studies summarized in Table 1 indicate that the relationship between intangible assets and firm value has been examined using diverse methodological approaches. These studies employ techniques such as panel regression, the generalized method of moments (GMM), and structural equation modeling to examine the effects of variables such as R&D, intellectual capital, human capital efficiency, and goodwill on various corporate performance indicators, including profitability, stock returns, productivity, and market value. In addition to quantitative approaches, qualitative studies also confirm that understanding the composition of tangible and intangible assets, including organizational culture, significantly strengthens marketing capabilities and competitive advantage (Brown et al., 2019).

**Table 1.** Description of papers addressing the association between intangible assets and firm value

References	Sample	Study methodology	Dependent variable	Independent variables
(Moretti & Biancardi, 2020)	328 firms listed on the (London, Frankfurt, Paris, Milan and Madrid) Stock Exchange markets	Quantitative - The analysis uses panel regression with fixed effects and GMM-system estimators, controlling for firm heterogeneity and time trends	<ol style="list-style-type: none"> <li>1. Firm turnover at the end of each reference year</li> <li>2. Value of firm shares at the end of each reference year</li> <li>3. Number of firm's employees and full-time equivalents at the end of each reference year</li> </ol>	<ol style="list-style-type: none"> <li>1. Research and Development expenditure at the end of each reference year</li> <li>2. Value of Internally generated intangible assets at the end of each reference year</li> </ol>
(Demers et al., 2021)	1652 US firms, non-financial and real estate firms	Quantitative - The analysis uses regression with firms' buy-and-hold abnormal returns during Q1 and the full year	Stock returns during the COVID-19 pandemic	<ol style="list-style-type: none"> <li>1. Environmental, Social and Governance (ESG)</li> <li>2. Research and Development expenditure</li> <li>3. Expenditures on SG&amp;A</li> </ol>
(Xu & Liu, 2021)	746 Chinese manufacturing listed firms	Quantitative - The analysis uses descriptive statistics, correlation tests, Kruskal-Wallis' test, and regression analysis	<ol style="list-style-type: none"> <li>1. Firm profitability</li> <li>2. Corporate return</li> </ol>	Intellectual Capital

References	Sample	Study methodology	Dependent variable	Independent variables
(Muwardi et al., 2020)	127 employees in PT Permodalan Ekonomi Rakyat	Quantitative - The study used structural equation modeling	Firm Performance	<ol style="list-style-type: none"> <li>1. Intellectual Capital</li> <li>2. Job Satisfaction</li> <li>3. Employee Performance</li> </ol>
(Civelek et al., 2023)	1221 SMEs from Czechia, Slovakia, and Hungary	Quantitative - The study using a survey and ordinal logistic regression analysis.	<ol style="list-style-type: none"> <li>1. Bankruptcy Risk</li> <li>2. Financial Performance</li> <li>3. Financial Risk Management</li> </ol>	<ol style="list-style-type: none"> <li>1. Innovativeness</li> <li>2. Competitiveness</li> </ol>
(Bertani et al., 2020)	15 countries (Italy, Germany, Netherlands, United Kingdom, the United States, France, Sweden, Spain, Denmark, Portugal, Austria, Finland, Ireland, Greece, and Luxembourg) over a 22-year period (1995–2016)	Quantitative - The study employs a combination of empirical analysis and agent-based modeling	Total Factor Productivity	Investments in ICT, Software and Databases, and R&D
(Oppong & Pattanayak, 2019)	Indian Commercial Banks	Quantitative - Panel data techniques (fixed and random effects)	Bank productivity, measured via: <ol style="list-style-type: none"> <li>1. employee productivity (EP)</li> <li>2. asset turnover (ATO)</li> </ol>	IC efficiency through three components: <ol style="list-style-type: none"> <li>1. human capital efficiency (HCE)</li> <li>2. structural capital efficiency (SCE)</li> <li>3. capital employed efficiency (CEE)</li> </ol>
(Kafouros et al., 2021)	386 US IT industry firms from 2004–2014	Quantitative - Fixed effects panel regressions and Endogeneity tests	Firm profitability was measured using Return on Sales (ROS), profit before tax to sales ratio. Additional analyses explored effects on revenues and costs separately. Market share was estimated from Thomson One Banker data. Costs were measured using General and Administrative Expenses divided by sales.	<ol style="list-style-type: none"> <li>1. Patent Litigation Activity</li> <li>2. Intangible Assets</li> <li>3. Product Diversification</li> <li>4. Foreign Market Diversification</li> </ol>

## Accounting for digital intangible assets: A systematic review of recognition, measurement, and disclosure challenges

*Karina Nurani Febriani, Elly Astuti, Elana Era Yusdita*

References	Sample	Study methodology	Dependent variable	Independent variables
(Brown et al., 2019)	UK small and medium sized enterprise (SMEs)	Qualitative Approach Used to Explore Perceptions of SMES Owners / Managers	<ol style="list-style-type: none"> <li>1. Strong relationships exist between tangible/intangible assets and marketing sub-capabilities.</li> <li>2. Firms must understand the composition of their assets to leverage capabilities effectively.</li> <li>3. Cultural assets significantly contribute to performance management.</li> <li>4. Exploiting embedded culture and intangible components enhances customer engagement and competitive advantage.</li> <li>5. Fully exploiting these assets can lead to sustainable growth and improved business performance in retail SMEs</li> </ol>	
(Ahmad et al., 2023)	208 SMEs in Pakistan, operating in service, trading, and manufacturing sectors	Quantitative - The study used structural equation modeling	<ol style="list-style-type: none"> <li>1. Sustainable Competitive Performance</li> <li>2. Organizational Innovation</li> </ol>	<ol style="list-style-type: none"> <li>1. Intellectual Capital</li> <li>2. Corporate Social Responsibility</li> </ol>
(Sulistyo & Ayuni, 2020)	254 SME owners in Indonesia	Quantitative - The study used surveys, questionnaires, and employing structural equation modeling	<ol style="list-style-type: none"> <li>1. SME Performance</li> <li>2. Innovation</li> </ol>	<ol style="list-style-type: none"> <li>1. Impact of Entrepreneurial Orientation</li> <li>2. Social Capital</li> </ol>
(Tran & Vo, 2020)	227 Vietnamese listed firms across 12 sectors from 2011-2018	Quantitative - The study employs the Generalized Method of Moments (GMM)	Firm Performance	Human capital efficiency
(Sallah & Caesar, 2020)	Women Entrepreneurs in Ghana	The study uses a mixed-methods, exploratory sequential design <ol style="list-style-type: none"> <li>1. Qualitative phase: 9 interviews</li> <li>2. Quantitative phase: 211 questionnaires</li> </ol>	Growth	<ol style="list-style-type: none"> <li>1. Human capital</li> <li>2. Social capital</li> <li>3. Reputational capital</li> </ol>
(Banker et al., 2019)	All Firms Listed in the US	Quantitative - Panel Data Regression	Stock Price	<ol style="list-style-type: none"> <li>1. Selling, General and Administrative Expenditure (SG&amp;A)</li> <li>2. SG&amp;A Future Value</li> <li>3. Earnings</li> <li>4. R&amp;D</li> <li>5. Advertising</li> </ol>

References	Sample	Study methodology	Dependent variable	Independent variables
(Ni et al., 2020)	All Firms Listed in Taiwan Stock Exchange	Quantitative - The study uses panel data models and Petersen regression models for robustness	Firm Value	Specific Indicators to Measure Intellectual Capital: 1. Goodwill 2. Intangible Assets 3. R&D expense ratio 4. Average Operating Revenue per Employee
(Ramos & Casado-Molina, 2021)	Spanish banking sector listed on the IBEX35 stock market	Quantitative - Fixed effects panel regressions	Stock Market Value	1. Ethics Experience 2. Emotion 3. Attitude
(Graham et al., 2022)	1348 observations from North American executives at public and private firms	The study uses a mixed-methods: 1. Qualitative: Interview 2. Quantitative: survey	1. Outcome Business: 2. Firm value 3. Productivity 4. Compliance 5. Creativity	1. Cultural Values 2. Cultural Norms 3. Formal Institutions 4. Leadership
(Wong & Zhang, 2022)	US publicly traded firms	Quantitative - Panel Data Regression	Excess Stock Return	RepRisk Rating Changes
(Seo & Kim, 2020b)	Manufacturing Sector in Korea	Quantitative - The study employs hierarchical regression analysis	1. Profitability 2. Firm Value	1. Human Capital Intensity 2. Advertising Intensity 3. R&D Intensity

Overall, firms that strategically manage intangible assets through targeted internal development and effective external acquisitions tend to demonstrate higher profitability and sustainable financial performance. Investments in R&D, advertising, and entrepreneurial capital have proven capable of creating future economic value while strengthening a firm's strategic position amid increasingly intense competition (Sulistyo & Ayuni, 2020; Xu & Liu, 2021). Thus, in the context of a knowledge-based digital economy, intangible assets not only serve as operational supports but also become the primary drivers of sustainable corporate value creation (Ahmad et al., 2023; Ramos & Casado-Molina, 2021).

### Intangible Asset Accounting Practices

While intangible assets such as data, algorithms, and social capital are becoming key drivers of firm value, intangible asset accounting practices face challenges in reflecting its strategic value. Results show that the stock market only partially recognizes the value of assets generated by SG&A spending in predicting future earnings (Banker et al., 2019). This highlights the gap between the value created by intangible assets and their representation in financial statements. SG&A expenditures, while signaling potential future earnings, often do not meet the criteria for asset recognition as per IAS 38 or PSAK 19 and thus are not reflected in the financial statements (Demers et al., 2021).

International accounting standards such as IAS 38, adopted in PSAK 19 in Indonesia, provide a framework for intangible asset recognition. However, strict criteria such as the requirement that assets

are identifiable, have control, and provide future economic benefits are often barriers to recognizing increasingly complex digital assets (Dana et al., 2021). For example, in Turkey, adopting a two-book system, i.e., IASB-compliant financial statements and local regulations, provides flexibility to record intangible investments as assets if the reporting criteria are met (Ocak & Findik, 2019). Such an approach could inspire Indonesia to capture the value of unconventional intangible assets within a more flexible reporting framework.

In addition, the measurement and disclosure of intangible assets also face significant challenges in reflecting the actual value of abstract assets such as reputation. A UK study (Bennett & Gabriel, 2003) showed that judicious use of assets positively correlates with giving behavior. However, awareness of a charity's name is not always directly related to its practical use (Peng et al., 2019). In a business context, this suggests that reputation and social capital, while having a significant impact on firm value, are often difficult to measure or disclose in traditional frameworks such as IAS 38 or PSAK 19 (Miotto et al., 2020; Ramos-González et al., 2022).

The urgency of reforming intangible asset accounting practices in the digital era is increasingly apparent. Financial statements cannot fully reflect a firm's potential without adequately recognizing the value generated by expenses such as SG&A or assets such as data and algorithms (Sulistyo & Ayuni, 2020; Xu & Liu, 2021). This can lead to undervaluation by the market and suboptimal decision-making by stakeholders. Accounting standards reform is needed to create a more inclusive framework, including flexible recognition mechanisms, alternative measurement methods, and more transparent disclosure of intangible assets that support firm value in the digital era (Ahmad et al., 2023; Kafouros et al., 2021).

As such, this reform is not only a technical necessity but also a strategic one to ensure the relevance of financial statements in supporting decision-making in the evolving digital economy. With PSAK 19 adopting IAS 38, Indonesia has the opportunity to pioneer the development of accounting practices capable of more accurately and strategically reflecting the new realities of the digital economy. By integrating flexible approaches and cutting-edge technology, this reform can strengthen Indonesia's position in global accounting practices (Bertani et al., 2020; Ramos & Casado-Molina, 2021).

#### 4. Discussion

The findings further confirm that intangible assets are critical drivers of competitive advantage and corporate value in a knowledge-driven digital economy. The literature shows their role is not only expanding in scale but also transforming in scope, encompassing intellectual, social capital, and digital assets such as data and algorithms. Despite the heightened importance, accounting practices remain insufficient in conveying their true economic value.

Key findings highlight a mismatch between the reporting of intangible assets and their influence on corporate valuation and investor choices. Studies by (Moretti & Biancardi, 2020) and (Ko, 2021) confirm that the contribution of intangible assets to corporate performance and value is often not optimally reflected in financial statements. This gap becomes even more complex when considered within the context of cross-country differences, where institutional factors and social norms influence perceptions and strategies for managing intangible assets (Görmar & Harfst, 2019; Graham et al., 2022). Thus, the issues are not solely technical, but also contextual and institutional.

The literature consistently identifies intellectual and social capital as fundamental components of intangible assets, driving innovation and sustainable performance. Studies by (Tran & Vo, 2020) and (Ur Rehman et al., 2022) demonstrate that their effects are dynamic and cumulative, underscoring the importance of longitudinal analysis on integrating human capital strategy, knowledge enhancement,

and accounting practices is essential to building corporate value (Manikas, 2019; Mansion & Bausch, 2020).

Digitalization is expanding the range of intangible assets to include newly emergent assets such as digital customer relationships, algorithms, and technology platforms. However, conventional accounting frameworks have not yet fully accommodated these dynamics. Studies by Arcos-Pumarola et al. (2023) and Arslan & Örüçü (2021) advised the development of more flexible and interdisciplinary frameworks. Meanwhile, expenditures on intangible activities, such as SG&A, are strategically and financially important (Banker et al., 2019), yet remain inadequately recognized in financial statements. This highlights the need to develop valuation models that better represent intangible investments (Kafouros et al., 2021; Kim & Jin, 2020; Lee, 2020).

Additional findings indicate that limitations in SME reporting for intangible assets are prominent in developing countries. These challenges reflect not just institutional barriers but also resource constraints in adopting intangible asset-oriented reporting (Civelek et al., 2023; Cordazzo & Rossi, 2020). Still, during digital transformation, SMEs must direct intangible assets as key sources of competitive edge.

Based on these overall findings, a more integrated approach for future studies directions emerges. First, the development of technology-based intangible asset measurement models, such as big data and predictive analytics, are substantial to bridge the gap between economic value and accounting reporting (Ajakwe et al., 2022; Ramos & Casado-Molina, 2021). Second, multinational studies are recommended to test the validity and generalizability of reporting models across various institutional contexts (Görmar & Harfst, 2019; Graham et al., 2022). Third, further exploration of the reporting and management of intangible assets in SMEs is needed, particularly amid digitalization pressures (Civelek et al., 2023; Cordazzo & Rossi, 2020). Fourth, the development of brand and reputation-based valuation models for financial assets relevant to investment decision-making (He & Calder, 2020; Ishaq, 2021).

In conclusion, this study's findings confirm that accounting for intangible assets requires conceptual and methodological adaptation to align with the dynamics of the digital economy. Expanding the scope of reporting, adjusting accounting standards, and developing more context-based approaches are crucial to ensuring that accounting information more accurately reflects firm's value and supports long-term value creation.

## 5. Conclusion

This study confirms that intangible assets are a key determinant of corporate value in the era of the knowledge-based digital economy. Various forms of intangible assets, ranging from intellectual and social capital to digital assets such as data and algorithms, serve as strategic resources that directly drive innovation, efficiency, and sustainable competitive advantage. The classification of intangible assets developed in this study indicates a conceptual shift from traditional dimensions toward more complex and integrated dimensions, reflecting the transformation of corporate value structures that increasingly rely on knowledge, technology, and reputation. This study identifies a clear gap between the economic significance of intangible assets and their representation in accounting practices. Although intangible assets are shown to contribute substantially to corporate performance and value, their recognition and reporting remain limited in reflecting their strategic impact, especially for dynamic digital assets. These findings emphasize that a comprehensive understanding of intangible assets requires both conventional accounting and broader perspectives to recognize their central role in corporate value creation.

The findings of this study have direct implications for accounting practices and strategic decision-making, particularly regarding the relevance of intangible asset information for stakeholders. Limitations

in recognizing and disclosing intangible assets, especially digital-based ones, may lead to information asymmetry and a gap between economic value and its representation in financial statements. Firms should pursue more comprehensive and transparent reporting, and regulators should consider greater flexibility within frameworks like IAS 38 and PSAK 19 to enhance adaptability for dynamic intangible assets. Additionally, this study's limitations in literature coverage, methodology, and geographic focus reveal the need to bridge the gap between conceptual and practical implementation.

Future studies are encouraged to prioritize empirical evidence and the development of a more comprehensive analytical framework. Data-driven studies are needed to validate the relationship between intangible assets and firm performance, while causal model development is essential to identify value-creation mechanisms, including mediating variables such as innovation, reputation, and organizational capabilities. Multinational studies can clarify institutional influences on reporting and promote harmonization of global standards. A multidisciplinary perspective that combines accounting, strategic management, and digital technology is vital for addressing the complexities of intangible asset management in the digital economy.

---

## References

- Ahmad, M., Wu, Q., & Khattak, M. S. (2023). Intellectual capital, corporate social responsibility and sustainable competitive performance of small and medium-sized enterprises: Mediating effects of organizational innovation. *Kybernetes*, 52(10), 4014-4040. <https://doi.org/10.1108/K-02-2022-0234>
- Ajakwe, S. O., Nwakanma, C. I., Kim, D. S., & Lee, J. M. (2022). Key wearable device technologies parameters for innovative healthcare delivery in B5G network: A review. *IEEE Access*, 10, 49956-49974. <https://doi.org/10.1109/ACCESS.2022.3173643>
- Ansong, E., & Boateng, R. (2019). Surviving in the digital era—business models of digital enterprises in a developing economy. *Digital Policy, Regulation and Governance*, 21(2), 164-178. <https://doi.org/10.1108/DPRG-08-2018-0046>
- Arcos-Pumarola, J., Paquin, A. G., & Sitges, M. H. (2023). The use of intangible heritage and creative industries as a tourism asset in the UNESCO creative cities network. *Heliyon*, 9(1), e13106. <https://doi.org/10.1016/j.heliyon.2023.e13106>
- Arslan, E. S., & Örüçü, Ö. K. (2021). MaxEnt modelling of the potential distribution areas of cultural ecosystem services using social media data and GIS: ES Arslan, ÖK Örüçü. *Environment, Development and Sustainability*, 23(2), 2655-2667. <https://doi.org/10.1007/s10668-020-00692-3>
- Banker, R. D., Huang, R., Natarajan, R., & Zhao, S. (2019). Market valuation of intangible asset: Evidence on SG&A expenditure. *The Accounting Review*, 94(6), 61-90. <https://doi.org/10.2308/accr-52468>
- Bennett, R., & Gabriel, H. (2003). Image and reputational characteristics of UK charitable organizations: An empirical study. *Corporate reputation review*, 6(3), 276-289. <https://doi.org/10.1057/palgrave.crr.1540206>
- Bertani, F., Raberto, M., & Teglio, A. (2020). The productivity and unemployment effects of the digital transformation: An empirical and modelling assessment. *Review of Evolutionary Political Economy*, 1(3), 329-355. <https://doi.org/10.1007/s43253-020-00022-3>
- Bertani, F., Ponta, L., Raberto, M., Teglio, A., & Cincotti, S. (2021). The complexity of the intangible digital economy: an agent-based model. *Journal of Business Research*, 129, 527-540. <https://doi.org/10.1016/j.jbusres.2020.03.041>

- Brown, D., Foroudi, P., & Hafeez, K. (2019). Marketing management capability: the construct and its dimensions: An examination of managers' and entrepreneurs' perceptions in a retail setting. *Qualitative Market Research: An International Journal*, 22(5), 609-637. <https://doi.org/10.1108/QMR-10-2017-0131>
- Buonomo, I., Benevene, P., Barbieri, B., & Cortini, M. (2020). Intangible assets and performance in nonprofit organizations: A systematic literature review. *Frontiers in Psychology*, 11, 729. <https://doi.org/10.3389/fpsyg.2020.00729>
- Castilla-Polo, F., & Sánchez-Hernández, M. I. (2020). Cooperatives and sustainable development: A multilevel approach based on intangible assets. *Sustainability*, 12(10), 4099. <https://doi.org/10.3390/su12104099>
- Castilla-Polo, F., & Sánchez-Hernández, M. I. (2020). The impacts of innovative and competitive abilities of SMEs on their different financial risk concerns: System approach. *Oeconomia Copernicana*, 14(1), 327-354. <https://doi.org/10.24136/oc.2023.009>
- Cordazzo, M., & Rossi, P. (2020). The influence of IFRS mandatory adoption on value relevance of intangible assets in Italy. *Journal of Applied Accounting Research*, 21(3), 415-436. <https://doi.org/10.1108/JAAR-05-2018-0069>
- Cosa, M., Pedro, E., & Urban, B. (2024). How to assess the intellectual capital of firms in uncertain times: a systematic literature review and a proposed model for practical adoption. *Journal of Intellectual Capital*, 25(7), 1-22. <https://doi.org/10.1108/JIC-05-2023-0096>
- Dana, L. P., Rounaghi, M. M., & Enayati, G. (2021). Increasing productivity and sustainability of corporate performance by using management control systems and intellectual capital accounting approach. *Green Finance*, 3(1), 1-14. <https://doi.org/10.3934/GF.2021001>
- de Moraes, M. O., Gomes, C. F. S., & Ribeiro, P. C. C. (2021). Intangible assets in information technology projects: Identification and evaluation. *Investigacion Bibliotecologica*, 35(86), 203-225. <https://doi.org/10.22201/iibi.24488321xe.2021.86.58311>
- Demers, E., Hendrikse, J., Joos, P., & Lev, B. (2021). ESG did not immunize stocks during the COVID 19 crisis, but investments in intangible assets did. *Journal of business finance & accounting*, 48(3-4), 433-462. <https://doi.org/10.1111/jbfa.12523>
- Denoncourt, J. (2020). Companies and UN 2030 sustainable development goal 9 industry, innovation and infrastructure. *Journal of Corporate Law Studies*, 20(1), 199-235. <https://doi.org/10.1080/14735970.2019.1652027>
- DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American sociological review*, 48(2), 147-160. [https://doi.org/10.1016/S0742-3322\(00\)17011-1](https://doi.org/10.1016/S0742-3322(00)17011-1)
- Fadhilah, N., Riyanti, N. S., & Saidina, J. (2026). Auditing the invisible: A systematic literature review on Intangible Asset Verification under ISA 500. *Jurnal Akuntansi Keuangan dan Perpajakan*, 2(4), 773-784.
- Firmansyah, E. A., Umar, U. H., & Musa, S. (2024). Accounting for intangible assets: A systematic review. *International Journal of Learning and Intellectual Capital*, 21(4), 448-464.
- Guo-Fitoussi, L., Bounfour, A., & Rekik, S. (2019). Intellectual property rights, complementarity and the firm's economic performance. *International Journal of Intellectual Property Management*, 9(2), 136-165. <https://doi.org/10.1504/IJIPM.2019.100213>
- Gallardo-Vázquez, D., Valdez-Juárez, L. E., & Lizcano-Álvarez, J. L. (2019). Corporate social responsibility and intellectual capital: Sources of competitiveness and legitimacy in

- organizations' management practices. *Sustainability*, 11(20), 5843.  
<https://doi.org/10.3390/su11205843>
- Golovkova, A., Eklof, J., Malova, A., & Podkorytova, O. (2019). Customer satisfaction index and financial performance: a European cross country study. *International Journal of bank marketing*, 37(2), 479-491. <https://doi.org/10.1108/IJBM-10-2017-0210>
- Görmar, F., & Harfst, J. (2019). Path renewal or path dependence? The role of industrial culture in regional restructuring. *Urban Science*, 3(4), 106. <https://doi.org/10.3390/urbansci3040106>
- Graham, J. R., Grennan, J., Harvey, C. R., & Rajgopal, S. (2022). Corporate culture: Evidence from the field. *Journal of Financial Economics*, 146(2), 552-593. <https://doi.org/10.1016/j.jfineco.2022.07.008>
- Harruma, I. (2022, June 23). *Contoh kasus hak cipta*. Kompas.Com. Retrieved from: <https://nasional.kompas.com/read/2022/06/23/01350081/contoh-kasus-hak-cipta?page=all>
- He, J., & Calder, B. J. (2020). The experimental evaluation of brand strength and brand value. *Journal of Business Research*, 115, 194-202. <https://doi.org/10.1016/j.jbusres.2020.04.035>
- Hoque, Z. (2014). 20 years of studies on the balanced scorecard: trends, accomplishments, gaps and opportunities for future research. *The British Accounting Review*, 46(1), 33-59.  
<https://doi.org/10.1016/j.bar.2013.10.003>
- Ievdokymov, V., Lehenchuk, S., Zakharov, D., Andrusiv, U., Usatenko, O., & Kovalenko, L. (2020). Social capital measurement based on "The value explorer" method. *Management Science Letters*, 10(6), 1161-1168. <https://doi.org/10.5267/j.msl.2019.12.002>
- Ikatan Akuntan Indonesia. (2021). *Pernyataan Standar Akuntansi Keuangan No. 19: Aset Tak Berwujud*. Ikatan Akuntan Indonesia.
- Ishaq, M. I. (2021). Multidimensional green brand equity: A cross-cultural scale development and validation study. *International Journal of Market Research*, 63(5), 560-575.  
<https://doi.org/10.1177/1470785320932040>
- Kafouros, M., Aliyev, M., & Krammer, S. M. (2021). Do firms profit from patent litigation? The contingent roles of diversification and intangible assets. *Research Policy*, 50(6), 104263.  
<https://doi.org/10.1016/j.respol.2021.104263>
- Kahneman, D., & Tversky, A. (2013). Prospect theory: An analysis of decision under risk. In *Handbook of the fundamentals of financial decision making: Part I* (pp. 99-127). <https://doi.org/10.2307/1914185>
- Kieso, D. E., Weygandt, J. J., & Warfield, T. D. (2018). *Intermediate accounting: IFRS edition, 3rd Edition* (3rd ed.). John Wiley and Sons.
- Kim, N. L., & Jin, B. E. (2020). Why buy new when one can share? Exploring collaborative consumption motivations for consumer goods. *International Journal of Consumer Studies*, 44(2), 122-130.  
<https://doi.org/10.1111/ijcs.12551>
- Kitchenham, B. (2004). *Procedures for performing systematic reviews*. Keele University.
- Ko, M. C. (2021). An examination of the links between organizational social capital and employee well-being: Focusing on the mediating role of quality of work life. *Review of Public Personnel Administration*, 41(1), 163-193. <https://doi.org/10.1177/0734371X19865996>
- Lee, D. (2020). Impact of organizational culture and capabilities on employee commitment to ethical behavior in the healthcare sector. *Service Business*, 14(1), 47-72.  
<https://doi.org/10.1007/s11628-019-00410-8>

- Li, Y., Song, Y., Wang, J., & Li, C. (2019). Intellectual capital, knowledge sharing, and innovation performance: evidence from the Chinese construction industry. *Sustainability*, 11(9), 2713. <https://doi.org/10.3390/su11092713>
- Lim, S. C., Macias, A. J., & Moeller, T. (2020). Intangible assets and capital structure. *Journal of Banking & Finance*, 118, 105873. <https://doi.org/10.1016/j.jbankfin.2020.105873>
- Loyarte-López, E., Barral, M., & Morla, J. C. (2020). Methodology for carbon footprint calculation towards sustainable innovation in intangible assets. *Sustainability*, 12(4), 1629. <https://doi.org/10.3390/su12041629>
- Manikas, A. S., Patel, P. C., & Oghazi, P. (2019). Dynamic capital asset accumulation and value of intangible assets: An operations management perspective. *Journal of Business Research*, 103, 119-129. <https://doi.org/10.1016/j.jbusres.2019.06.014>
- Mansion, S. E., & Bausch, A. (2020). Intangible assets and SMEs' export behavior: a meta-analytical perspective. *Small Business Economics*, 55(3), 727-760. <https://doi.org/10.1007/s11187-019-00182-5>
- Maramygin, M. S., & Yakovlev, D. S. (2025). The impact of intangible assets on the value of companies in modern realities. *Finance and Credit*, 31(10), 66–90. <https://doi.org/10.24891/ftxcp>
- Martani, D., Siregar, S. V., Wardhani, R., Farahmita, A., & Tanujaya, E. (2016). *Akuntansi keuangan menengah berbasis PSAK buku 1* (2nd ed.). Salemba Empat.
- McGrattan, E. R. (2020). Intangible capital and measured productivity. *Review of Economic Dynamics*, 37, S147-S166. <https://doi.org/10.1016/j.red.2020.06.007>
- Miotto, G., Del-Castillo-Feito, C., & Blanco-González, A. (2020). Reputation and legitimacy: Key factors for Higher Education Institutions' sustained competitive advantage. *Journal of Business Research*, 112, 342-353. <https://doi.org/10.1016/j.jbusres.2019.11.076>
- Moretti, F., & Biancardi, D. (2020). Inbound open innovation and firm performance. *Journal of Innovation & Knowledge*, 5(1), 1-19. <https://doi.org/10.1016/j.jik.2018.03.001>
- Murti, C. D. (2023). What is known about environmental cost accounting? Systematic literature review. *Journal of Accounting and Investment*, 24(1), 84-100. <https://doi.org/10.18196/jai.v24i1.16180>
- Muwardi, D., Saide, S., Indrajit, R. E., Iqbal, M., Astuti, E. S., & Herzavina, H. (2020). Intangible resources and institution performance: The concern of intellectual capital, employee performance, job satisfaction, and its impact on organization performance. *International Journal of Innovation Management*, 24(5), 1–21. [https://doi.org/10.1142/9781800610316\\_0018](https://doi.org/10.1142/9781800610316_0018)
- Nakatani, R. (2021). Total factor productivity enablers in the ICT industry: A cross-country firm-level analysis. *Telecommunications Policy*, 45(9), 102188. <https://doi.org/10.1016/j.telpol.2021.102188>
- Nazimok, A. A., & Ozarnov, R. V. (2025). Integrating digital assets into financial valuation theory and practice. *Theoretical and Applied Economics*, (4), 28-40. <https://doi.org/10.25136/2409-8647.2025.4.76434>
- Ni, Y., Cheng, Y. R., & Huang, P. (2021). Do intellectual capitals matter to firm value enhancement? Evidences from Taiwan. *Journal of Intellectual Capital*, 22(4), 725-743. <https://doi.org/10.1108/JIC-10-2019-0235>
- Nwabekee, U. S., Okpeke, F., & Onalaja, A. E. (2023). International Journal of Social Science Exceptional Research. *International Journal of Social Science Exceptional Research*, 2(6), 146–151. <https://doi.org/10.1108/JIC-10-2019-0235>

- Ocak, M., & Findik, D. (2019). The impact of intangible assets and sub-components of intangible assets on sustainable growth and firm value: Evidence from Turkish listed firms. *Sustainability (Switzerland)*, 11(19). <https://doi.org/10.3390/su11195359>
- Oppong, G. K., & Pattanayak, J. K. (2019). Does investing in intellectual capital improve productivity? Panel evidence from commercial banks in India. *Borsa Istanbul Review*, 19(3), 219-227. <https://doi.org/10.1016/j.bir.2019.03.001>
- Orhangazi, Ö. (2019). The role of intangible assets in explaining the investment–profit puzzle. *Cambridge Journal of Economics*, 43(5), 1251-1286. <https://doi.org/10.1093/cje/bey046>
- Peng, S., Kim, M., & Deat, F. (2019). The effects of nonprofit reputation on charitable giving: A survey experiment. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 30(4), 811-827. <https://doi.org/10.1007/s11266-019-00130-7>
- Popescu, C. R. G. (2020). Sustainability assessment: does the OECD/G20 inclusive framework for BEPS (base erosion and profit shifting project) put an end to disputes over the recognition and measurement of intellectual capital?. *Sustainability*, 12(23), 10004. <https://doi.org/10.3390/su122310004>
- Ramos-González, M. D. M., Rubio-Andrés, M., & Sastre-Castillo, M. Á. (2022). Effects of socially responsible human resource management (SR-HRM) on innovation and reputation in entrepreneurial SMEs. *International Entrepreneurship and Management Journal*, 18(3), 1205-1233. <https://doi.org/10.1007/s11365-020-00720-8>
- Ramos, C. M., & Casado-Molina, A. M. (2021). Online corporate reputation: A panel data approach and a reputation index proposal applied to the banking sector. *Journal of Business Research*, 122, 121-130. <https://doi.org/10.1016/j.jbusres.2020.08.061>
- Riahi-Belkaoui, A. (2004). *Accounting theory*. Thomson.
- Saeidi, P., Saeidi, S. P., Gutierrez, L., Streimikiene, D., Alrasheedi, M., Saeidi, S. P., & Mardani, A. (2021). The influence of enterprise risk management on firm performance with the moderating effect of intellectual capital dimensions. *Economic Research-Ekonomska Istraživanja*, 34(1), 122-151. <https://doi.org/10.1080/1331677X.2020.1776140>
- Sallah, C. A., & Caesar, L. D. (2020). Intangible resources and the growth of women businesses: Empirical evidence from an emerging market economy. *Journal of Entrepreneurship in Emerging Economies*, 12(3), 329-355. <https://doi.org/10.1108/JEC-12-2020-0209>
- Sardi, A., Garengo, P., & Bititci, U. (2019). Measurement and management of competences by enterprise social networking. *International Journal of Productivity and Performance Management*, 68(1), 109-126. <https://doi.org/10.1108/IJPPM-04-2018-0139>
- Saunders, A., & Brynjolfsson, E. (2016). Valuing information technology related intangible assets. *MIS Quarterly*, 40(1), 83–110. <https://doi.org/10.25300/MISQ/2016/40.1.04>
- Seo, E. J., Park, J. W., & Choi, Y. J. (2020). The effect of social media usage characteristics on e-WOM, trust, and brand equity: Focusing on users of airline social media. *Sustainability*, 12(4), 1691. <https://doi.org/10.3390/su12041691>
- Seo, H. S., & Kim, Y. (2020). Intangible assets investment and firms' performance: Evidence from small and medium-sized enterprises in Korea. *Journal of Business Economics and Management (JBEM)*, 21(2), 421-445. <https://doi.org/10.3846/jbem.2020.12022>
- Škare, M., & Soriano, D. R. (2021). A dynamic panel study on digitalization and firm's agility: What drives agility in advanced economies 2009–2018. *Technological Forecasting and Social Change*, 163, 120418. <https://doi.org/10.1016/j.techfore.2020.120418>

- Sulistyo, H., & Ayuni, S. (2020). Competitive advantages of SMEs: The roles of innovation capability, entrepreneurial orientation, and social capital. *Contaduría y Administración*, 65(1). <https://doi.org/10.22201/fca.24488410e.2020.1983>
- Torremans, P. L. C. (2020). *Intellectual property and human rights*. Kluwer Law International.
- Tran, N. P., & Vo, D. H. (2020). Human capital efficiency and firm performance across sectors in an emerging market. *Cogent Business & Management*, 7(1), 1738832. <https://doi.org/10.1080/23311975.2020.1738832>
- Trappey, C. V., Trappey, A. J., & Lin, S. C. C. (2020). Intelligent trademark similarity analysis of image, spelling, and phonetic features using machine learning methodologies. *Advanced Engineering Informatics*, 45, 101120. <https://doi.org/10.1016/j.aei.2020.101120>
- Ur Rehman, S., Elrehail, H., Alsaad, A., & Bhatti, A. (2022). Intellectual capital and innovative performance: A mediation-moderation perspective. *Journal of Intellectual Capital*, 23(5), 998-1024. <https://doi.org/10.1108/JIC-04-2020-0109>
- Wataya, E., & Shaw, R. (2019). Measuring the value and the role of soft assets in smart city development. *Cities*, 94, 106-115. <https://doi.org/10.1016/j.cities.2019.04.019>
- Wong, J. B., & Zhang, Q. (2022). Stock market reactions to adverse ESG disclosure via media channels. *The British Accounting Review*, 54(1), 101045. <https://doi.org/10.1016/j.bar.2021.101045>
- Xiong, F., Xie, M., Zhao, L., Li, C., & Fan, X. (2022). Recognition and evaluation of data as intangible assets. *Sage Open*, 12(2), 21582440221094600. <https://doi.org/10.1177/21582440221094600>
- Xu, J., & Liu, F. (2021). Nexus between intellectual capital and financial performance: An investigation of Chinese manufacturing industry. *Journal of Business Economics and Management*, 22(1), 217-235. <https://doi.org/10.3846/jbem.2020.13888>
- Yao, H., Haris, M., Tariq, G., Javaid, H. M., & Khan, M. A. S. (2019). Intellectual capital, profitability, and productivity: evidence from Pakistani financial institutions. *Sustainability*, 11(14), 3842. <https://doi.org/10.3390/su11143842>
- Zaragoza-Sáez, P. C., Claver-Cortés, E., Marco-Lajara, B., & Úbeda-García, M. (2023). Corporate social responsibility and strategic knowledge management as mediators between sustainable intangible capital and hotel performance. *Journal of Sustainable Tourism*, 31(4), 908-930. <https://doi.org/10.1080/09669582.2020.1811289>
- Zhang, Y., & Ouyang, Z. (2021). Doing well by doing good: How corporate environmental responsibility influences corporate financial performance. *Corporate Social Responsibility and Environmental Management*, 28(1), 54-63. <https://doi.org/10.1002/csr.2031>
-