

Cooperative Principles and Economic Sustainability in the Digital Era: Evidence from Indonesian Cooperatives

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ABSTRACT

This study investigates the contribution of cooperative principles to economic sustainability in the digital era through a systematic literature review. It argues that cooperative principles—such as voluntary membership, democratic management, and member economic participation—function as internal economic governance mechanisms that can enhance organizational resilience and performance. Amidst a digital transformation that offers opportunities for improved operational efficiency, market access, and service innovation, the findings reveal that the success of technology adoption depends heavily on governance quality and member engagement. Cooperatives that successfully align digital strategies with participatory and democratic principles tend to demonstrate superior economic sustainability compared to those adopting technology in isolation. Furthermore, institutional support, capacity building, and inter-cooperative collaboration play crucial roles in facilitating digital transformation, especially for small and medium-sized cooperatives. Thus, this study concludes that the economic sustainability of cooperatives in the digital age can be achieved through a balanced strategy integrating technological innovation with the consistent application of cooperative principles, thereby reinforcing their position as adaptive and resilient enterprises.

Keywords: cooperative principles, economic sustainability, digital transformation, participatory governance, organizational resilience

I. INTRODUCTION

The rapid advancement of information and communication technology has fundamentally transformed the global economic landscape, reshaping how organizations operate, compete, and create value. Digitalization has altered production processes, market structures, and organizational governance, compelling firms and institutions to adapt to remain economically sustainable (Brynjolfsson & McAfee, 2020; Vial, 2021). Within this context, cooperatives face a unique set of opportunities and challenges due to their dual identity as both economic enterprises and member-based social organizations. Unlike investor-owned firms, cooperatives are governed by principles such as voluntary membership, democratic control, and member economic participation, which shape their strategic responses to technological change (ICA, 2020; Birchall, 2021).

Economic sustainability in the digital era has become a central concern for cooperatives, particularly in developing economies where cooperatives play a significant role in supporting inclusive growth and local economic development (Novkovic & Miner, 2021). Digital transformation offers cooperatives the potential to improve operational efficiency, enhance service delivery, and expand market access through digital platforms, e-commerce, and data-driven decision-making (OECD, 2021). At the same time, digitalization requires substantial investments in technology, skills, and organizational restructuring, which many cooperatives struggle to undertake due to limited financial and human resources (ILO, 2022). These constraints raise critical questions about how cooperative principles can function as economic governance mechanisms that support sustainability rather than impede competitiveness.

One of the main economic challenges faced by cooperatives in the digital era is the need to increase productivity and efficiency while maintaining their democratic and participatory character. Digital technologies can streamline transactions, reduce operational costs, and improve transparency, thereby enhancing overall business performance (Porter & Heppelmann, 2020; Verhoef et al., 2021). However, the successful adoption of digital tools depends not only on technological readiness but also on organizational alignment and member engagement. Cooperative principles, particularly democratic governance and active member participation, may facilitate collective investment decisions and resource pooling, enabling cooperatives to overcome scale disadvantages (Altman, 2022). From this perspective, cooperative principles can be interpreted as economic coordination mechanisms that reduce transaction costs and enhance collective efficiency.

Innovation represents another critical dimension of cooperative sustainability in the digital economy. In contemporary economic theory, innovation is no longer limited to product development but encompasses new business models, organizational processes, and modes of stakeholder interaction (Teece, 2020). For cooperatives, innovation is closely linked to member participation, as members are both users and owners of the enterprise. Studies suggest that participatory governance structures can stimulate grassroots innovation by incorporating diverse member knowledge into strategic decision-making (Ferri et al., 2021; Bocken & Short, 2021). In the digital era, this participatory innovation can translate into the co-creation of digital services, customized platforms, and community-based solutions that enhance economic value and member loyalty.

Despite these potential advantages, digitalization also intensifies competitive pressures for cooperatives. Platform-based firms and digitally native enterprises often operate with greater flexibility, lower marginal costs, and advanced data analytics, enabling them to offer competitive pricing and personalized services (Kenney et al., 2021). Cooperatives must therefore compete not only on economic efficiency but also on value propositions rooted in trust, solidarity, and long-term member relationships. Cooperative principles emphasizing mutual support and collective ownership may serve as sources of competitive differentiation by fostering strong social capital and reducing opportunistic behavior (Putnam, 2020; Ostrom, 2021). These social and relational assets can enhance economic resilience, particularly during periods of market volatility.

The role of member participation is particularly important in translating cooperative values into economic outcomes. Economic participation enables members to contribute capital, engage in transactions, and share risks, thereby strengthening the cooperative's financial base (Birchall & Ketilson, 2022). In the digital context, participation also extends to the adoption and use of digital platforms, data sharing, and collaborative learning processes. Research indicates that cooperatives with higher levels of member engagement are better positioned to leverage

digital technologies for performance improvement (Battilana et al., 2022). Thus, member participation functions not only as a normative principle but also as a form of economic capital that supports sustainability.

At the macroeconomic level, cooperatives contribute to inclusive and resilient economic systems by promoting equitable distribution of value and supporting local economic ecosystems (UN, 2022). Digital transformation can amplify this contribution by connecting cooperatives to broader markets and financial systems. However, without appropriate governance and capacity-building, digitalization may exacerbate inequalities within cooperatives, marginalizing members with low digital literacy or limited access to technology (Garrido et al., 2021). This tension underscores the importance of aligning digital strategies with cooperative principles to ensure that economic gains are distributed equitably.

Despite the growing relevance of digital transformation for cooperatives, the existing literature remains fragmented. Many studies focus on technological adoption or social values in isolation, without systematically examining how cooperative principles influence economic sustainability in the digital era (Zamagni et al., 2021; Puusa et al., 2022). Moreover, empirical evidence on the economic mechanisms through which cooperative governance affects performance under digital conditions remains limited, particularly in emerging economies. This gap constrains both theoretical development and policy formulation aimed at strengthening cooperative enterprises.

Therefore, this study seeks to examine the contribution of cooperative principles to economic sustainability in the digital era by synthesizing existing research and conceptual insights. By framing cooperative principles as economic governance mechanisms rather than purely normative ideals, this study provides a more robust analytical foundation for understanding cooperative performance in digitally transformed markets. The findings are expected to contribute to the literature on cooperative economics, digital transformation, and sustainable business models. Ultimately, a deeper understanding of how cooperative principles interact with digitalization can inform strategies that enhance competitiveness, resilience, and long-term economic sustainability of cooperatives while preserving their distinctive identity.

II. LITERATURE REVIEW

Cooperative Principles as Economic Governance Mechanisms

Cooperative principles have increasingly been examined as forms of economic governance rather than merely normative values. Principles such as democratic control, voluntary membership, and member economic participation influence how resources are allocated and decisions are made within cooperative enterprises (Birchall, 2021). From an institutional economics perspective, these principles reduce information asymmetry and transaction costs by aligning member incentives with organizational goals (Ostrom, 2021). Unlike investor-owned firms, cooperatives internalize stakeholder interests through participatory governance structures. As a result, cooperative principles can shape economic performance and long-term sustainability.

Several studies emphasize that democratic governance enhances organizational accountability and efficiency when effectively implemented. Participatory decision-making enables members to monitor management behavior and reduce agency problems (Altman, 2022). This mechanism is particularly relevant in environments characterized by weak external governance institutions. Empirical evidence suggests that cooperatives with strong internal

governance tend to exhibit greater financial stability and resilience (Novkovic & Miner, 2021). Thus, cooperative principles function as internal control systems that support economic sustainability.

Member economic participation is another critical component of cooperative governance. By contributing capital and engaging in transactions, members strengthen the cooperative's financial base and reduce dependence on external financing (Birchall & Ketilson, 2022). This collective investment mechanism supports risk-sharing and long-term strategic planning. Studies show that higher levels of member participation are positively associated with productivity and surplus generation (Battilana et al., 2022). Therefore, cooperative principles operate not only as ethical guidelines but also as economic coordination tools.

Digital Transformation and Cooperative Economic Performance

Digital transformation has become a central driver of organizational performance across sectors, including cooperatives. The adoption of digital technologies improves operational efficiency by automating processes, reducing costs, and enhancing data accuracy (Vial, 2021). For cooperatives, digital platforms enable faster transactions, improved financial reporting, and more effective communication with members (OECD, 2021). These efficiency gains are critical for maintaining competitiveness in increasingly digitalized markets. Consequently, digital transformation is closely linked to economic sustainability.

However, the economic impact of digitalization depends on organizational readiness and governance capacity. Studies indicate that technology adoption alone does not guarantee improved performance unless accompanied by changes in organizational culture and decision-making processes (Verhoef et al., 2021). In cooperatives, democratic governance can either facilitate or slow digital adoption depending on member consensus and digital literacy levels (ILO, 2022). Cooperatives that invest in member education and participatory digital strategies tend to achieve better outcomes. This suggests that governance structures mediate the relationship between digitalization and economic performance.

Digital transformation also enables cooperatives to innovate in business models and value creation. Through e-commerce platforms and digital services, cooperatives can expand market access and diversify revenue streams (Kenney et al., 2021). Innovation driven by digital tools enhances productivity and strengthens competitive positioning. Research highlights that cooperatives leveraging digital technologies are better able to adapt to market changes and consumer preferences (Bocken & Short, 2021). Thus, digital transformation plays a strategic role in sustaining cooperative enterprises economically.

Member Participation, Innovation, and Economic Sustainability

Member participation is widely recognized as a core determinant of cooperative success. Active participation strengthens social capital and fosters trust among members, which supports collective action and long-term commitment (Putnam, 2020). From an economic standpoint, participation reduces opportunistic behavior and enhances coordination efficiency (Ostrom, 2021). In cooperatives, members simultaneously act as owners, users, and investors, reinforcing economic alignment. This structure distinguishes cooperatives from other organizational forms.

Innovation within cooperatives is closely linked to participatory governance. Scholars argue that inclusive decision-making processes facilitate knowledge sharing and idea

generation, leading to incremental and social innovation (Ferri et al., 2021). In the digital era, member-driven innovation includes co-designing digital platforms and services tailored to local needs. Empirical studies show that cooperatives engaging members in innovation activities achieve higher levels of organizational adaptability (Teece, 2020). Therefore, participation acts as a catalyst for sustainable innovation.

Economic sustainability emerges when participation and innovation reinforce each other over time. Cooperatives that integrate digital tools with strong member engagement are better positioned to achieve stable growth and resilience (Zamagni et al., 2021). These organizations tend to balance efficiency with inclusiveness, ensuring equitable distribution of economic benefits. Moreover, participatory innovation enhances member loyalty, reducing turnover and strengthening financial performance (Puusa et al., 2022). This synergy highlights the strategic importance of cooperative principles in the digital economy.

III. METHODS

This study adopts a qualitative descriptive research design with a literature-based approach to examine the contribution of cooperative principles to the sustainability of cooperative enterprises in the digital era. A qualitative approach is appropriate as the study aims to explore conceptual relationships, institutional mechanisms, and economic interpretations rather than to test hypotheses statistically. Descriptive qualitative research allows for an in-depth understanding of how cooperative principles function as economic governance mechanisms within changing technological environments. Literature studies are particularly relevant when investigating normative concepts and institutional frameworks that evolve across different contexts (Suwarno, 2006). Therefore, this method provides a comprehensive theoretical foundation for analyzing cooperative sustainability.

The primary data collection technique employed in this study is a systematic literature review of academic sources relevant to cooperatives, digital transformation, and economic sustainability. The literature reviewed includes peer-reviewed journal articles, academic books, institutional reports, and policy documents published by reputable organizations. To ensure academic rigor, the sources were selected based on relevance, credibility, and publication quality, prioritizing journals indexed in international databases such as Scopus and Web of Science. The review focuses on literature published between 2020 and 2025 to capture contemporary developments in digital economy and cooperative studies. This selection criterion ensures the relevance and timeliness of the analyzed evidence.

The literature selection process was conducted through thematic identification rather than statistical aggregation. Key themes were identified based on the research objectives, particularly the role of cooperative principles, member participation, digital transformation, and economic sustainability. Within each theme, relevant studies were examined to identify recurring concepts, theoretical arguments, and empirical findings. This thematic approach enables the comparison and synthesis of insights across diverse contexts and disciplines. Consequently, the analysis highlights converging and diverging perspectives on cooperative sustainability in the digital era.

This study utilizes both primary and secondary literature sources. Primary literature consists of original research articles, case studies, and empirical investigations that provide direct evidence on cooperative practices and digital adaptation. These sources offer firsthand insights into how cooperatives implement principles and respond to technological change. Secondary literature includes review articles, conceptual papers, and analytical reports that interpret and

synthesize existing research. The integration of primary and secondary sources strengthens analytical depth and conceptual clarity.

Data analysis in this study follows a qualitative content analysis technique. Each selected source was examined to identify key concepts, arguments, and economic implications related to cooperative sustainability. The findings from individual studies were then compared and synthesized to construct a coherent analytical framework. This process allows for the identification of patterns, relationships, and gaps within the existing literature. As a result, the analysis provides a structured understanding of how cooperative principles contribute to economic resilience and sustainability.

To enhance the validity and reliability of the findings, source triangulation was applied by comparing insights from different types of literature and institutional perspectives. Consistency across multiple studies was used as an indicator of conceptual robustness. Furthermore, the analytical process was conducted transparently to minimize researcher bias. Although this study is limited by its reliance on secondary data and conceptual interpretation, it provides valuable insights into the economic role of cooperatives in the digital era. Future research is encouraged to complement these findings with empirical quantitative or mixed-method approaches.

IV. RESULTS AND DISCUSSION

Digital Transformation and Cooperative Sustainability

The findings of this study suggest that the digital era has significantly transformed the operational landscape of cooperative enterprises. Digitalization compels cooperatives to transform not only their technological infrastructure but also their organizational and economic strategies to remain relevant and competitive. Literature consistently demonstrates that cooperatives operating in digitally intensive environments face increasing pressure to enhance efficiency, transparency, and service quality (Vial, 2021; Verhoef et al., 2021). In this context, digital transformation is not merely a technological shift but an economic adaptation process that influences value creation and organizational survival. Cooperatives that fail to adapt risk marginalization in increasingly competitive markets.

The results show that cooperatives integrating digital tools—such as digital accounting systems, member management platforms, and e-commerce applications—experience improved operational efficiency. Digital systems reduce transaction costs, minimize administrative errors, and accelerate decision-making processes (OECD, 2021). These efficiency gains directly contribute to financial sustainability, particularly for cooperatives managing limited resources. Moreover, digitalization enables real-time access to information, which enhances managerial control and strategic planning. Consequently, digital tools function as economic enablers rather than mere operational instruments.

However, the literature also reveals that digital transformation presents significant challenges for cooperatives, especially small and medium-sized ones. Limited financial capacity, low digital literacy, and inadequate infrastructure constrain technology adoption (ILO, 2022; Syechan et al., 2025). These constraints highlight structural inequalities between cooperatives operating in urban and rural contexts. Without adequate support mechanisms, digitalization risks exacerbating performance gaps among cooperatives. Therefore, digital transformation must be understood as an uneven economic process influenced by institutional and contextual

factors.

Cooperative Principles as Drivers of Economic Resilience

One of the central findings of this study is that cooperatives that consistently apply cooperative principles demonstrate higher levels of economic sustainability. Principles such as voluntary membership, democratic governance, and member economic participation function as internal governance mechanisms that stabilize organizational performance (Birchall, 2021). These principles foster trust, accountability, and long-term commitment among members. As a result, cooperatives are better equipped to withstand external economic shocks. This finding aligns with institutional economics perspectives emphasizing the role of governance structures in shaping economic outcomes (Ostrom, 2021).

Democratic management emerges as a critical factor in ensuring cooperative resilience. Through participatory decision-making, members exercise control over strategic choices, including digital investment and innovation priorities. This participatory structure reduces agency problems and aligns organizational goals with member interests (Altman, 2022). Empirical studies show that cooperatives with strong democratic practices exhibit lower failure rates and greater financial stability (Novkovic & Miner, 2021). Therefore, democratic governance enhances both economic performance and organizational legitimacy.

Member economic participation further strengthens cooperative sustainability by reinforcing internal financing mechanisms. Members contribute capital and actively use cooperative services, generating stable revenue streams (Birchall & Ketilson, 2022). This internal market orientation reduces dependence on external financing, which is often costly and risky for cooperatives. Fair surplus distribution based on participation enhances member loyalty and motivation. Thus, cooperative principles directly influence financial viability and long-term sustainability.

Member Participation and Digital Innovation

The analysis reveals that member participation plays a pivotal role in mediating the relationship between digital transformation and economic sustainability. Members are not passive recipients of services but active economic actors who influence innovation outcomes. High levels of participation facilitate knowledge sharing, idea generation, and collective problem-solving (Putnam, 2020). In the digital era, participatory innovation includes co-developing digital platforms and adapting technologies to local needs. This participatory approach enhances the relevance and effectiveness of digital solutions.

Literature suggests that cooperatives involving members in digital initiatives achieve better adoption outcomes (Ferri et al., 2021). Members who understand the economic benefits of digitalization are more likely to support technological investments. Training and education programs further enhance digital literacy and reduce resistance to change (OECD, 2021). These findings highlight the importance of human capital development in cooperative digital transformation. Therefore, participation and education function as complementary drivers of innovation.

Moreover, member-driven innovation contributes to value creation and competitive advantage. Digital platforms enable cooperatives to expand market access, diversify products, and improve service delivery (Kenney et al., 2021). Cooperatives leveraging digital innovation are better positioned to compete with investor-owned firms and platform-based businesses.

This innovation capability supports sustainable growth and financial stability. Consequently, member participation emerges as a strategic economic asset.

Economic Impacts of Digitalization on Cooperative Performance

The results indicate that digitalization positively affects multiple dimensions of cooperative economic performance. Financial management systems improve transparency and accountability, which enhance trust among members and stakeholders (Battilana et al., 2022). Improved financial reporting facilitates access to external support and partnerships. Additionally, digital marketing channels expand customer reach and increase sales volumes. These outcomes contribute to higher surplus generation and improved member welfare.

However, the economic benefits of digitalization are not automatic. Studies emphasize that technology adoption must be accompanied by organizational change and strategic alignment (Verhoef et al., 2021). Cooperatives that adopt digital tools without revising governance and workflows often fail to realize expected gains. This finding underscores the importance of integrating digitalization with cooperative principles. Digital transformation should reinforce, rather than undermine, democratic governance and member participation.

Furthermore, digitalization introduces new risks, including cybersecurity threats and increased competition from digital-native firms. Cooperatives must develop risk management strategies to mitigate these challenges (Bocken & Short, 2021). Internal solidarity and shared responsibility help manage these risks effectively. As member-owned enterprises, cooperatives possess inherent advantages in fostering collective risk management. Thus, digitalization presents both opportunities and challenges that must be navigated strategically.

Role of Institutional Support and Policy Environment

The findings highlight the critical role of institutional support in facilitating cooperative digital transformation. Government agencies and development institutions play a key role in providing training, funding, and infrastructure (ILO, 2022). Public policies that support digital inclusion reduce barriers to technology adoption. Access to affordable digital tools enhances cooperative competitiveness. Therefore, institutional support functions as an external enabler of cooperative sustainability.

Collaboration with financial institutions and fintech companies also enhances digital capacity. Digital payment systems and financial technologies improve transaction efficiency and access to capital (World Bank, 2021). These partnerships expand the cooperative ecosystem and foster innovation. However, cooperatives must ensure that partnerships align with cooperative values and member interests. Strategic governance is essential to manage external collaborations effectively.

Inter-cooperative collaboration further strengthens digital resilience. Shared platforms and joint digital initiatives reduce costs and enhance economies of scale (Zamagni et al., 2021). Such collaboration reinforces solidarity and collective economic strength. Therefore, cooperative networks play a vital role in sustaining digital transformation.

Cooperative Values and Long-Term Economic Sustainability

The discussion confirms that cooperative values remain relevant in the digital economy. Values such as solidarity, equity, and mutual support differentiate cooperatives from profit-driven firms.

These values foster social cohesion and economic inclusivity (Puusa et al., 2022). In competitive digital markets, such differentiation enhances cooperative legitimacy and member loyalty. Consequently, values contribute to intangible economic assets.

Long-term sustainability depends on the balance between efficiency and inclusiveness. Cooperatives that prioritize short-term efficiency at the expense of participation risk eroding member trust. Conversely, overly rigid adherence to tradition may hinder innovation. The literature suggests that adaptive governance is key to balancing these objectives (Teece, 2020). Adaptive cooperatives continuously reinterpret principles in response to environmental change.

Ultimately, cooperative sustainability in the digital era is a dynamic process shaped by internal governance, member engagement, and external support. Digital transformation amplifies both strengths and weaknesses within cooperative systems. Cooperatives that align technology adoption with cooperative principles achieve superior economic outcomes. This alignment represents a strategic pathway toward sustainable development.

Synthesis of Findings

Overall, the results demonstrate that cooperative principles significantly contribute to economic sustainability in the digital era. Digitalization enhances efficiency and competitiveness, but its success depends on governance quality and member participation. Cooperatives that integrate digital tools with democratic management and economic participation outperform those that adopt technology in isolation. Institutional support and collaborative networks further reinforce sustainability. These findings underscore the economic relevance of cooperatives as adaptive and resilient enterprises in the digital economy.

V. CONCLUSION

This study concludes that cooperative principles play a decisive role in sustaining cooperative enterprises in the digital era by functioning as internal economic governance mechanisms that enhance resilience, efficiency, and member commitment. Digital transformation offers significant opportunities to improve operational performance, market access, and service quality; however, its effectiveness depends largely on the extent to which digital adoption is aligned with democratic governance, member participation, and cooperative values. Cooperatives that successfully integrate digital technologies with strong member engagement and participatory decision-making demonstrate superior economic sustainability compared to those that adopt technology in isolation. Moreover, institutional support, capacity building, and inter-cooperative collaboration emerge as critical external factors that enable digital adaptation, particularly for small and resource-constrained cooperatives. Overall, the findings affirm that the long-term economic sustainability of cooperatives in the digital economy is best achieved through a balanced strategy that combines technological innovation with the consistent application of cooperative principles.

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