



Techno-Structural Empowerment: Digital Governance and Institutional Reform for Women's Cooperatives in Malaysia

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Abstract

This conceptual paper introduces *techno-structural empowerment* (TSE), a novel framework integrating digital governance and institutional theory to enhance women-led cooperative performance in Malaysia. Synthesizing structural empowerment theory, institutional theory, and digital governance literature, the study proposes a model linking institutional pressures (coercive, normative, mimetic) and digital enablers (e-governance tools, data systems) to cooperative outcomes, mediated by TSE. The study will employ a mixed-methods approach: (1) Qualitative case studies (6–8 cooperatives) to explore institutional and digital barriers, and (2) Quantitative surveys (200 cooperatives) analyzed via structural equation modeling (SEM) to validate framework relationships. Data collection will include interviews with board members and digital readiness assessments. The framework advances empowerment theory by bridging structural, institutional, and digital perspectives. It offers policymakers actionable tools, such as gender-responsive digital reforms (e.g., MyDigital Blueprint revisions) and institutional quotas. As the first study theorizing this intersection in Malaysia, it lays groundwork for empirical testing and gender-inclusive development strategies.

Keywords: *techno-structural empowerment, women cooperatives, digital governance, institutional theory*

1. Introduction

The cooperative movement is a key force in promoting inclusive economic participation and community development. In Malaysia, women-led cooperatives play a vital role in empowering marginalized groups through access to resources, training, and collective decision-making (Andrew et al., 2024). Despite supportive policies, these cooperatives often underperform due to institutional inefficiencies, digital exclusion, and structural barriers (Jeong, 2022). The emergence of digital governance offers new opportunities to strengthen cooperative performance through tools such as digital identity systems, mobile finance, and e-governance platforms (Balaji, 2025). However, such technologies remain underutilized, especially in rural women's cooperatives due to gaps in infrastructure, digital literacy, and inclusive design. This paper introduces the concept of techno-structural empowerment, combining structural empowerment theory and digital governance to enhance cooperative outcomes. Grounded in institutional theory, it argues that effective empowerment requires not only rules and incentives but also robust digital systems and inclusive data practices.

2. Problem Statement

Despite decades of gender-inclusive policies and cooperative development initiatives in Malaysia, women-led cooperatives particularly in rural states continue to face systemic barriers that undermine their sustainability and impact. While programs such as the National Cooperative Policy 2011–2020 (Suruhanjaya Koperasi Malaysia, 2011) and MyDigital Blueprint (Malaysia Digital Economy Corporation, 2011) aim to promote economic inclusion, they have failed to address the intersection of structural inequities and digital exclusion. For instance, only 23% of rural women-led cooperatives have adopted digital tools like e-payments or cooperative management apps, compared to 61% of urban cooperatives (Department of Statistics Malaysia, 2022). Similarly, the Jalinan Digital Negara (JENDELA) initiative, which targets rural connectivity, has reached just 34% of women's cooperatives in East Malaysia (Malaysian Communications and Multimedia Commission, 2023), leaving them excluded from digital marketplaces and financial systems. These gaps stem from two interrelated issues. Firstly, institutional failures. Policies such as the Cooperative Societies Act 1993 lack gender-responsive enforcement mechanisms. For example, only 12% of cooperative board members in Malaysia are women (Malaysia Digital Economy Corporation, 2011), perpetuating male-dominated decision-making that sidelines digital investment. Secondly, Technological Exclusion. National digitalization efforts prioritize urban centers and male-dominated sectors. A report found that 76% of rural women lack access to training on digital tools, exacerbating disparities in e-governance participation (World Bank, 2022). Without interventions, Malaysia risks contravening its Shared Prosperity Vision 2030 and SDG 5 (gender



equality) commitments. This dual challenge, institutional rigidity, and digital marginalization demand a new framework to bridge the gap between policy intent and grassroots realities.

3. Literature Review

This literature review examines the theoretical foundations and empirical insights surrounding structural empowerment, institutional theory, digital governance, and gendered technology adoption, each of which underpins the proposed concept of techno-structural empowerment.

3.1 Institutional Theory

Institutional theory offers a framework for understanding how external pressures *which are* regulatory (coercive), professional (normative), and mimetic shape organizational behavior (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). In the context of cooperatives, these pressures manifest through national laws (e.g., Malaysia's Cooperative Societies Act 1993), policy incentives, and professional expectations regarding governance models. While these forces aim to legitimize cooperative operations, they often reinforce gender-blind norms and centralized decision-making, leaving women's cooperatives marginalized or structurally disadvantaged (Irene et al., 2021). Isomorphic adaptation, without contextual or gender-sensitive consideration, risks formal compliance but functional exclusion (Beckert, 2010).

3.2 Digital Governance and Data Systems

Digital governance refers to the integration of digital technologies into public administration and organizational processes to enhance transparency, responsiveness, and accountability (Milakovich, 2021). Tools such as mobile cooperative apps, digital ID systems, blockchain for financial tracking, and e-governance portals have shown promise in improving institutional performance and civic participation (Efthymiou, 2025). However, women's cooperatives in Malaysia often lack the digital infrastructure, literacy, and tailored platforms required to benefit from these tools. Malaysia's digital transformation strategies (e.g., MyDigital, Jalinan Digital Negara) have yet to meaningfully integrate women's cooperatives into their design and outreach mechanisms. The digital divide particularly for rural and marginalized women, has emerged as a structural barrier to inclusion in both governance and economic systems (World Bank, 2022).

3.3 Structural Empowerment

Structural empowerment theory, as originally proposed by Kanter (Kanter, 1977), focuses on access to resources, information, support, and opportunities as essential levers for enabling agency within an organization. In the cooperative sector, particularly for women-led cooperatives, structural empowerment has been associated with enhanced participation, leadership, and sustainability (Bharti, 2021). However, many empowerment initiatives remain at the surface level which are limited to programmatic training or financial aid without addressing systemic exclusion from decision-making structures and institutional influence (Nicolas, 2025). Scholars argue that real empowerment must go beyond representation and focus on institutional access and control (Agarwal, 2001), a gap especially evident in under-digitized women's cooperatives.

3.4 Synthesis: Toward a Techno-Structural Empowerment Framework

Despite the relevance of these bodies of work, there is currently no integrated framework that explains how institutional pressures, digital governance, and structural empowerment interact to shape the performance of women-led cooperatives. Most studies address these domains in isolation, missing the synergistic impact they could have if designed to work together (Rashid et al., 2025; Wang, 2024; Liu et al., 2024; Dennerlein & Kirkman, 2023). This paper responds to this gap by proposing the techno-structural empowerment framework—a model that centers digital systems and institutional dynamics as co-drivers of structural empowerment for women's cooperatives. It combines digital tools (e-governance platforms, mobile finance) with institutional reforms (gender-responsive policies) to enhance women's structural empowerment by fostering digitally supported, systematically embedded agency. It advances beyond traditional empowerment models by emphasizing how technology can bridge gaps in access, participation, and decision-making while institutional reforms ensure these gains are sustainable and equitable (Ahmad & Islam, 2024). This framework contributes to the study by integrating previously disconnected theories—structural empowerment, institutional theory, and digital governance—into a cohesive model that explains how digital and institutional factors jointly shape cooperative performance. It also offers practical policy insights, such as advocating for gender-responsive digital tools and leadership quotas, and provides measurable indicators to assess empowerment outcomes. By shifting the focus from individual capacity-building to systemic, tech-enabled change, techno-structural



empowerment addresses critical gaps in Malaysia’s development agenda, aligning with SDG 5 (gender equality) and offering a scalable approach for women’s cooperatives in digital economies.

To ensure theoretical consistency, the proposed framework draws directly on foundational literature, as summarized in Table 1.

Table 1: Theoretical Foundations of Techno-Structural Empowerment

Framework Component	Theoretical Origin/Supporting Literature	Key Insights
Institutional Pressures	Institutional Theory (World Bank, 2022; DiMaggio & Powell, 1983; Beckert, 2010)	Organizations adapt to coercive (laws), normative (values), and mimetic (copying) pressures to gain legitimacy. In cooperatives, these pressures shape governance norms and access to state support.
Structural Empowerment	Empowerment Theory (Kanter, 1977); Women in Development (Aggarwal, 2001; Rowlands, 1977)	Empowerment requires access to information, resources, and decision-making power—beyond mere inclusion. Cooperatives must offer these through enabling environments.
Digital Governance Enablers	Digital Government (World Bank, 2022)	Tools like digital ID, e-payments, dashboards, and mobile apps improve service delivery, transparency, and participation—but must be gender-responsive to avoid deepening exclusion.
Techno-Structural Empowerment	Synthesis of the above theories (this study’s contribution)	A new construct linking digital tools and institutional reforms to structural empowerment outcomes—focused on digitally supported, systemically embedded women’s agency.
Women’s Cooperative Performance	Cooperative Studies & Development Metrics (International Cooperative Alliance, 2022; Shakir et al., 2020)	Performance should be measured not only by financial outcomes but also by leadership inclusion, market access, and participation in decision-making.

This paper aims to address the above gaps by pursuing the following objectives:

- RO1: To identify institutional and digital enablers that shape techno-structural empowerment.
- RO2: To identify the relationship between techno-structural empowerment and the performance of women’s cooperatives.

To fulfil these objectives, the study is guided by the following research questions:

- RQ1: How do institutional pressures and digital enablers shape techno-structural empowerment?
- RQ2: Is there a relationship between techno-structural empowerment and the performance of women’s cooperatives?

This study introduces the concept of techno-structural empowerment, expanding structural and institutional theory by integrating digital governance to address women’s empowerment in cooperatives. It offers a context-sensitive framework that responds to gaps in cooperative and gender research by positioning digital tools as enablers of institutional legitimacy and agency. Policy-wise, the framework supports Malaysia’s Shared Prosperity Vision 2030, MyDigital Blueprint, and relevant SDGs by guiding agencies like SKM and MDEC in developing gender-responsive digital strategies. Practically, it offers cooperative leaders a tool to assess digital readiness, participation gaps, and accountability, while laying the groundwork for empowerment indices tailored to women-led cooperatives. As a



conceptual paper, it has limitations. It lacks primary data and is specific to Malaysia, requiring empirical validation and cultural adaptation. It also assumes a baseline digital infrastructure that may not exist in rural areas. Future research should adopt participatory methods to capture deeper, lived empowerment experiences.

4. Conceptual Framework

The framework positions institutional pressures (coercive, normative, mimetic) and digital enablers (data systems, identity tools, mobile platforms) as inputs that shape techno-structural empowerment, which in turn mediates cooperative performance outcomes. When combined, these forces produce Techno-Structural Empowerment, a condition in which women gain meaningful access to systems, resources, leadership, and decision-making authority enabled by both policy and technology as illustrated in Fig. 1.

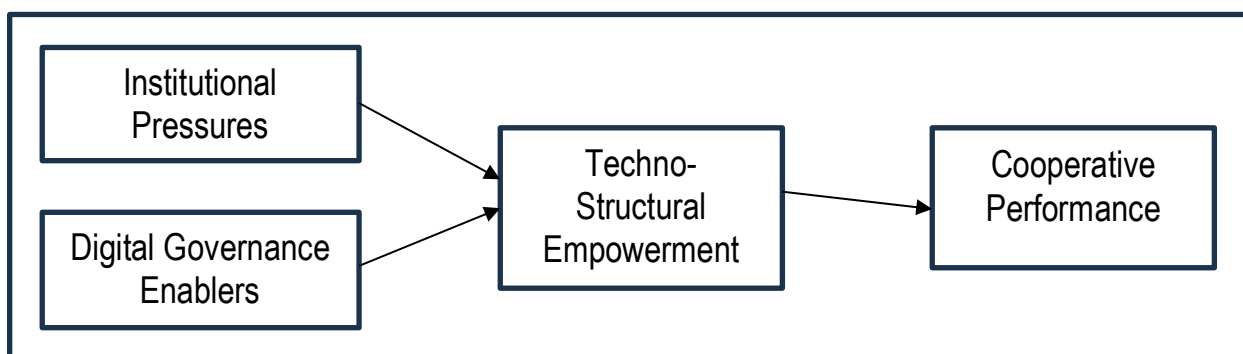


Fig. 1. Conceptual Framework

In doing so, it reconceptualizes empowerment not merely as participation, but as a digitally supported, institutionally legitimized agency.

Adapted from DiMaggio and Powell’s (1983) isomorphism theory, it shapes the behavior of women’s cooperatives in Malaysia through three mechanisms: Coercive pressures (e.g., Akta Koperasi 1993, SKM regulations) compel compliance with formal policies, yet gender-neutral wording often fails to address structural barriers (Volodzkiene, 2025). Normative pressures (e.g., training norms, and professional standards) reflect societal expectations but may perpetuate inequities if women are excluded from leadership pipelines [28]. Mimetic pressures (e.g., emulating "successful" cooperatives) risk replicating gender-blind models unless inclusive practices are prioritized (Hagy, 2021). These institutional forces interact with digital governance enablers, which are critical for overcoming systemic gaps such as data systems (e.g., gender-disaggregated dashboards) ensuring visibility of women’s contributions and needs. Digital infrastructure (e.g., cooperative apps) bridges rural-urban divides, while e-governance tools (e.g., blockchain for accountability) reduce corruption and enhance trust (Sharma & Swadimath, 2025). Digital identity solutions (e.g., e-KYC) empower women with access to finance and markets, addressing exclusion rooted in documentation gaps (Sharma & Swadimath, 2025).

The interplay of institutional and digital factors fosters techno-structural empowerment, a mediator that redefines empowerment for the digital age such as real-time information access counters knowledge asymmetries, while digital participation (e.g., voting via electronic platforms) democratizes decision-making. Automated resource allocation (e.g., AI-driven grants) reduces bureaucratic bias, and national dashboard visibility ensures cooperatives are prioritized in funding (Saluja et al., 2023). Skill equity and leadership opportunities address intersectional barriers (e.g., rural women’s low digital literacy) (Shillcutt & Silver, 2019). Ultimately, these dynamics drive women’s cooperative performance, measured through membership growth/retention, signaling trust in the cooperative’s value. Leadership participation, reflecting dismantled glass ceilings. Financial viability (e.g., e-commerce adoption) and innovation capacity, enabled by institutional legitimacy and digital tools.

5. Methodology

This study adopts a mixed-method approach to validate the *Techno-Structural Empowerment Framework* (TSEF) for women’s cooperatives in Malaysia. In the qualitative phase, a sample of between 6 to 8 women-led cooperatives will be selected through stratified sampling (urban/rural and digital readiness) to achieve thematic saturation. The sample will be drawn from the list of women-led cooperatives that are available on the Malaysia Cooperative Commission’s



website. Semi-structured interviews with board and grassroots members explore institutional barriers (e.g.: policy gaps) and digital enablers (e.g.: e-governance tools) which will be analyzed via thematic analysis (NVivo) with intercoder reliability ($\kappa \geq 0.8$). In the quantitative phase, a survey will be conducted to collect responses from 200 cooperatives (95% confidence level, 5% margin of error) using an adapted scale UNDP's Digital Governance Index to measure institutional pressures, techno-structural empowerment, and performance (members' participation). To validate reliability, the data will be analyzed using Exploratory Factor Analysis and Confirmatory Factor Analysis. Then, to test the relationships between institutional pressures, digital enablers, and performance, Structural Equation Modeling will be used. The qualitative data contextualizes RQ1 (how institutional/digital factors interact) while the quantitative analysis tests RQ2 (empowerment-performance relationships). Operationalization leverages established metrics such as ICA's Cooperative Performance Index and custom scales (Cronbach's $\alpha \geq 0.7$), ensuring theoretical and methodological coherence. Before data collection, the researchers will obtain ethical approval from the Research Ethics Committee of Universiti Teknologi MARA to ensure informed consent, anonymity, and bias mitigation.

6. Conclusions

This paper introduces and formalizes the concept of techno-structural empowerment, expanding existing empowerment literature by linking structural empowerment theory, institutional theory, and digital governance. It advances the academic discourse by proposing that institutional effectiveness in the digital age must include not only formal structures and incentives but also technology-mediated systems, inclusive data infrastructures, and gender-responsive digital access. The framework bridges critical gaps in cooperative studies, which often overlook how digital exclusion and institutional rigidity jointly constrain women's empowerment.

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