From Digital Capability to Community-Mediated Digital Agency: A Conceptual Framework for Sustained Digital Participation Among Mature Women

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ABSTRACT

Digital capability does not necessarily provide mature women with meaningful opportunities to influence how technologies are used within voluntary community organisations. Although community-based learning and organisational support may strengthen digital competence, the conditions through which capability becomes purposeful action and sustained participation require clearer conceptual explanation. This paper develops an agency-centred conceptual framework examining the relationship between digital capability, community-mediated digital agency and sustained digital participation among mature women. Building on a published Community Informatics–Based Digital Capability Framework developed for the Trefoil Guild Melaka, the study uses a theory-informed conceptual synthesis integrating digital capability, relational agency, community informatics, sociotechnical systems and community data governance. Community-mediated digital agency is specified through four proposed dimensions: purposeful choice, supported action, contribution and voice, and control over digital participation. Six theoretical propositions explain how capability may provide resources for agency; how supportive community relationships, sociotechnical alignment and trustworthy data governance may enable or constrain its exercise; how agency may contribute to sustained participation; and how participation may generate feedback for collective learning and organisational adaptation. The framework distinguishes technical competence from meaningful influence and recognises that assisted technology use may preserve agency when members retain control over decisions. It also challenges the assumption that frequent or uninterrupted digital engagement necessarily represents meaningful inclusion. The contribution lies in clarifying agency as a proposed explanatory link between capability and participation, rather than introducing digital agency as an entirely new concept. As a conceptual study, the paper reports no original empirical data or validated relationships. Its proposed dimensions and propositions provide a basis for qualitative, comparative and longitudinal investigation of how mature women exercise digital agency within community organisations.

Keywords: Digital capability; community-mediated digital agency; sustained digital participation; mature women; community informatics.

INTRODUCTION

Digital competence does not necessarily provide individuals with meaningful influence over the activities in which technologies are used. Within voluntary community organisations, members may be able to communicate online, manage documents and complete digital tasks while having limited opportunities to determine procedures, contribute to decisions or control the sharing of information. Others may participate meaningfully through peer assistance despite having less technical experience. These differences suggest that digital

capability, digital agency and sustained participation should be examined as related but distinct concepts. Research on digital learning and agency in later life supports attention to the social relationships and organisational circumstances through which technological resources are exercised [1, 2, 3].

Background and Research Context

Digital capability development within the Trefoil Guild Melaka has been conceptualised through the integration of community learning, sociotechnical alignment and transparent data practices. These interconnected elements position digital capability as an outcome shaped by social and organisational conditions, with digital agency and sustained organisational participation identified as anticipated benefits [4]. Complementing this capability-oriented framework, a community information systems architecture addresses the organisational and technical arrangements needed to support inclusive participation, align digital systems with existing workflows and promote responsible information management [5]. Together, these two conceptual approaches establish a foundation for examining how digital capability and supportive community arrangements may enable meaningful digital agency and sustained participation within voluntary community organisations.

These studies establish important foundations for understanding digital capability and community information systems. They do not, however, fully separate the possession of capability from the exercise of agency or specify how different expressions of agency may contribute to continued participation. This distinction matters because the ability to perform digital activities does not necessarily provide members with meaningful choice or organisational influence. Equally, receiving assistance does not necessarily diminish agency when members retain control over their intentions and decisions.

The Conceptual Problem

The central conceptual problem concerns the conditions under which digital capability may be exercised as meaningful agency and how that agency may contribute to sustained digital participation. Capability provides resources for engagement, but the opportunity to use those resources purposefully depends partly on community relationships, organisational arrangements and the design and governance of digital systems.

These considerations indicate the need for an explanation that distinguishes individual resources from the social and organisational opportunities through which those resources are exercised. Digital capability concerns what members are equipped to do; digital agency concerns their opportunities to choose, act and influence; and sustained participation concerns continuing involvement in activities that remain meaningful to them. The relationships among these constructs require conceptual clarification before they can be examined empirically.

Aim and Objectives

The aim of this paper is to develop a conceptual framework explaining how digital capability may be translated into community-mediated digital agency and how that agency may contribute to sustained digital participation among mature women in voluntary community organisations.

1. To distinguish digital capability, community-mediated digital agency and sustained digital participation as related but analytically separate constructs.

2. To integrate digital capability, digital agency, community informatics, sociotechnical systems and community data governance into a framework that explains the conditions under which digital resources may be exercised meaningfully.

3. To formulate theoretical propositions concerning the relationships among digital capability, community-mediated digital agency, sustained participation and the enabling or constraining roles of community relationships, sociotechnical alignment and trustworthy data governance.

Conceptual Contribution and Scope

The principal contribution of this study is an agency-centred extension of the Community Informatics–Based Digital Capability Framework developed for the Trefoil Guild Melaka. The earlier framework recognises digital

agency and organisational participation among its anticipated benefits, while the present study distinguishes capability from agency and specifies the conditions under which capability may be exercised through meaningful participation [4].

Community-mediated digital agency is proposed as an explanatory construct comprising purposeful choice, supported action, contribution and voice, and control over digital participation. Six theoretical propositions connect digital capability, community enabling conditions, agency, sustained participation and potential organisational feedback. Figure 1 presents the study's conceptual positioning, while Figure 3 develops these relationships into an integrated framework.



Arrows indicate proposed conceptual relationships rather than empirically established causal effects.

Figure 1. Conceptual positioning of the study

Source: Authors' conceptualisation, extending [4].

The Trefoil Guild Melaka provides the contextual foundation rather than a source of new empirical findings. The proposed dimensions and relationships remain unvalidated, and their applicability beyond the intended organisational context requires investigation.

CONCEPTUAL DEVELOPMENT APPROACH

Conceptual framework development requires clear distinctions between related constructs and theoretically defensible explanations of their relationships. In the context of digital participation, the distinction between possessing digital capabilities and exercising meaningful agency is particularly important because technological competence does not necessarily provide opportunities for choice, influence or organisational contribution. A theory-informed conceptual approach allows these relationships to be examined through the integration of complementary perspectives while maintaining explicit boundaries between theoretical propositions and empirical findings [4, 6].

Research Design

The study adopts a theory-informed conceptual research design to examine the relationship between digital capability, community-mediated digital agency and sustained digital participation among mature women in voluntary community organisations. Its purpose is to develop an explanatory framework by clarifying the boundaries between related constructs, integrating complementary theoretical perspectives and identifying relationships that warrant empirical investigation. Conceptual research is particularly relevant where established bodies of scholarship address connected phenomena but leave important distinctions or explanatory relationships insufficiently specified [6].

Literature-Informed Conceptual Synthesis

The conceptual synthesis draws on five interconnected areas of scholarship: digital capability in later life, digital agency, community informatics, sociotechnical systems and community data governance. These areas were selected for their relevance to different elements of the explanatory problem rather than treated as separate bodies of literature requiring exhaustive coverage.

Research on digital capability provides the basis for understanding the skills, confidence, adaptability and information literacy associated with technology engagement. Evidence concerning older adults' digital engagement indicates that participation is influenced by personal circumstances, social relationships and opportunities for meaningful technology use, rather than access alone [7]. Digital literacy also requires attention to the complexity of everyday tasks and the settings in which competence is developed and exercised [8].

This approach constitutes a selective, literature-informed conceptual synthesis rather than a systematic or scoping review. It does not claim exhaustive retrieval of relevant publications, formal quality appraisal or reproducible study selection. The strength of the synthesis rests instead on the explicit roles assigned to the theoretical perspectives, the consistency of construct definitions and the plausibility of the proposed relationships.

The literature was interpreted through three questions: what each perspective explains about digital participation; where its explanatory boundaries lie; and how it contributes to distinguishing capability, agency and sustained participation. Particular attention was given to conceptual overlap. For example, social support may facilitate capability development, but assistance does not necessarily produce agency if members have little control over the decisions being made. Similarly, a technically accessible platform may support task completion without providing opportunities for organisational contribution or influence.

Framework Development and Conceptual Integration

Framework development proceeded through the analytical differentiation of the principal constructs and the specification of relationships between them. Three elements form the central conceptual sequence: digital capability as a resource for engagement, community-mediated digital agency as the exercise of meaningful choice and action, and sustained digital participation as continuing involvement in community activities.

Three sets of conditions are incorporated into the framework. Supportive community relationships concern peer assistance, encouragement and shared learning. Sociotechnical alignment concerns the compatibility of digital tools, organisational procedures and members' capabilities. Trustworthy data governance concerns transparency, proportionality and accountability in information practices. These conditions are conceptually distinct because each may influence the exercise of agency through a different process.

Scope and Methodological Boundaries

The framework is developed for mature women participating in voluntary community organisations, with the Trefoil Guild Melaka providing its contextual point of departure. Earlier conceptual studies concerning this organisation identify community learning, sociotechnical alignment, inclusive information systems and responsible data practices as relevant considerations for digital capability development and organisational participation [4, 5]. These studies inform the present framework but do not establish how individual members experience or exercise digital agency.

The proposed relationships are intended to explain how digital capability may be exercised through meaningful choice, supported action, contribution and control within community arrangements. Their potential relevance beyond the Trefoil Guild Melaka depends on the presence and configuration of comparable participation opportunities, support relationships and organisational responsibilities. Differences in membership composition, digital infrastructure, decision-making authority and information governance may influence how these relationships operate. Research on older adults' digital engagement indicates that opportunities for technology use and participation are shaped by social circumstances and support arrangements, reinforcing the need for contextual interpretation [2, 9].

No original survey, interview, observation, experiment or statistical analysis was undertaken. The four proposed dimensions have not been validated as measurement factors, and the six theoretical propositions remain untested. Consequently, the framework offers a basis for context-sensitive empirical investigation rather than evidence of causal relationships or generalisable outcomes across community organisations.

THEORETICAL FOUNDATIONS

Meaningful digital participation depends on more than the possession of technological skills. The opportunities available to individuals are also shaped by social relationships, organisational expectations, system design and the conditions governing information use. Digital capability and digital agency consequently represent related but distinct aspects of participation: capability concerns the resources available for digital engagement, whereas agency concerns the ability to exercise choice and influence through those resources. Within voluntary community organisations, these processes are embedded in collective practices that may either expand or restrict members' opportunities to participate [2, 4].

Digital Capability in Later Life

Digital capability encompasses the knowledge, practical competence, confidence and adaptability required to engage with digital technologies in ways that are relevant to everyday activities. Its development is not adequately explained by access to devices or the acquisition of basic operational skills alone. Digital engagement among older adults is influenced by personal circumstances, prior experience, perceived usefulness and the social environments in which technologies are encountered [7]. The ability to complete familiar digital tasks may also differ from the capacity to navigate unfamiliar applications, evaluate information or respond to changing technological requirements.

Digital competence develops unevenly because opportunities for learning and practice are not distributed equally. Digital literacy programmes may improve task-specific confidence without necessarily addressing the wider circumstances that shape continued participation. Recent work on digital education for older adults highlights the importance of learning approaches that respond to participants' existing knowledge, everyday needs and changing technological environments [10]. Digital inclusion therefore requires attention to both individual competence and the conditions under which that competence can be maintained and applied.

Digital Agency and Relational Autonomy

Digital agency concerns the capacity and opportunity to pursue meaningful purposes, exercise choice and influence digitally mediated activities. Although digital competence provides resources for undertaking technological tasks, the exercise of agency also depends on the social and organisational circumstances in which decisions are made. Research involving older adults indicates that digital engagement may involve negotiated choices, assistance from others and responses to institutional expectations, rather than exclusively independent technology use [2, 3].

Relational autonomy provides a basis for understanding agency as compatible with interdependence. Assistance may expand an individual's opportunities for action when it supports intentions and decisions that remain their own. Conversely, assistance may constrain agency when another person determines the purpose, content or outcome of an activity without meaningful consultation. Research on older adults' information and communication technology support demonstrates that available assistance does not necessarily correspond to recipients' needs, reinforcing the importance of examining how support is provided and experienced [9].

The distinction between assistance and decision substitution is particularly relevant to voluntary community organisations. A member may exercise agency when another person helps complete an online registration while she determines the information provided and authorises submission. The same task offers weaker evidence of agency when a helper makes those decisions on her behalf. Accordingly, community mediation is compatible with digital agency when social support enables members to pursue their purposes while preserving meaningful opportunities to decide, question, approve or decline. This interpretation does not assume that apparent agreement always represents autonomous choice, particularly where unequal authority or limited alternatives constrain members' decisions.

Community Informatics and Collective Participation

Community informatics places digital technologies within the social relationships, shared purposes and organisational practices of communities. Its relevance extends beyond providing access to information systems

because community members participate in determining how technologies are understood, adopted and used. Digital engagement is consequently influenced by collective expectations, opportunities for collaboration and the extent to which technologies support activities considered meaningful by members. Community-oriented digital participation is increasingly understood in relation to empowerment and the organisational conditions that support involvement. Recent research on electronic participation identifies the relevance of community empowerment and the social and technical arrangements through which participation is enabled [11]. This perspective supports examining digital participation as a collective process rather than reducing it to individual technology adoption.

Community relationships can therefore function as both enabling and constraining conditions. Peer assistance may increase the range of activities available to members, while unequal responsibilities or informal dependence on technologically confident individuals may concentrate decision-making authority. The relevance of community informatics to the proposed framework lies in its capacity to locate agency within collective arrangements and to recognise that meaningful participation depends on opportunities for contribution as well as access to technological resources. Research on social ties and digital literacy among older adults in Italy also identifies interpersonal relationships as relevant to learning and navigating technological change [12].

Sociotechnical Systems and Organisational Alignment

Research examining stakeholder involvement in the design of digital public services for older adults demonstrates the relevance of incorporating users' perspectives into technology development [13]. More recent work on digital technology design in ageing societies similarly identifies inclusion and contextual conditions as important design concerns [14]. Although these studies address settings beyond voluntary community organisations, they support the need to examine the relationship between system design and the circumstances of intended users.

Community Data Governance, Trust and Participation

Community data governance concerns the rules, responsibilities and practices through which information is collected, stored, accessed, shared and retained. Governance arrangements may influence participation because members' willingness to contribute information depends partly on their understanding of its intended use and the extent of control available to them. Privacy-related concerns have been identified as relevant to older adults' intentions to discontinue technology use [15], although such findings should not be interpreted as evidence that governance arrangements alone determine sustained participation.

Integrating the Theoretical Perspectives

The five theoretical perspectives perform complementary explanatory functions. Digital capability identifies resources for engagement, while digital agency concerns their exercise through meaningful choice and influence. Community informatics locates these processes within collective relationships and organisational purposes. Sociotechnical systems thinking addresses the compatibility of technological arrangements with members' responsibilities, while community data governance concerns the information-related conditions affecting informed choice and control. Table 1 summarises these distinct roles. Their integration provides the theoretical basis for examining community-mediated digital agency as a conditional link between capability and participation, extending the earlier capability-oriented framework without treating the proposed relationships as empirically established [4].

Table 1. Theoretical perspectives and their roles in the proposed framework

Theoretical perspective	Principal concern	Explanatory role in the present study
Digital capability	Competence, confidence, adaptability and information literacy	Identifies individual resources available for digital engagement
Digital agency	Meaningful choice, purposeful action, influence and control	Explains how individuals may exercise capability within available opportunities

Community informatics	Collective purposes, relationships, peer support and participation	Locates agency within community practices and organisational relationships
Sociotechnical systems	Compatibility between technologies, users, responsibilities and workflows	Explains how technological and organisational arrangements may enable or constrain action
Community data governance	Consent, transparency, information access, accountability and control	Explains information-related conditions affecting informed choice and participation

Source: Authors' conceptual synthesis, informed by [2, 3, 4, 5, 7, 13].

FROM DIGITAL CAPABILITY TO COMMUNITY-MEDIATED DIGITAL AGENCY

The translation of digital capability into meaningful participation depends partly on the opportunities available for members to exercise choice, undertake activities and influence organisational arrangements. This section distinguishes capability from agency, defines community-mediated digital agency and specifies its proposed dimensions and enabling or constraining conditions.

Distinguishing Digital Capability from Digital Agency

Digital capability encompasses the competence, confidence, adaptability and information literacy available to individuals for undertaking digitally mediated activities. Digital agency concerns whether individuals can exercise these resources through meaningful choices and actions within the opportunities and constraints of their social and organisational environments. The distinction is consequential because technological proficiency may enable task completion without providing influence over the purposes, procedures or outcomes of participation. Conversely, individuals with limited technical proficiency may exercise agency through assisted activities when they retain meaningful decision-making authority [2, 3].

Defining Community-Mediated Digital Agency

Community-mediated digital agency is defined in this study as the capacity and opportunity of individuals to exercise meaningful choice, undertake purposeful action, contribute to collective activities and retain appropriate control over digitally mediated participation within community relationships and organisational arrangements. The term community-mediated identifies the social and organisational circumstances through which agency is enabled, negotiated or constrained; it does not imply that the community exercises agency on behalf of individual members.

The defining feature of the construct is the preservation of meaningful influence over participation. Community relationships may provide knowledge, assistance and opportunities for collective action, but these resources support agency only insofar as members can pursue their own purposes and influence relevant decisions. This distinction is consistent with recent research demonstrating that digital inclusion may involve negotiated participation and that externally imposed expectations of technology use can restrict individuals' autonomy [2, 3].

Community-mediated digital agency therefore differs from technical independence, social support and participation frequency. Independent task completion does not necessarily establish agency when meaningful choice is absent, while assisted participation may express agency when members retain decision-making authority. The proposed construct concerns the quality of opportunities to choose, act, contribute and exercise control, rather than the amount of assistance received or the frequency of technology use.

Proposed Dimensions of Community-Mediated Digital Agency

Community-mediated digital agency is conceptualised through four related dimensions: purposeful choice, supported action, contribution and voice, and control over digital participation. Each dimension identifies a distinct analytical aspect of agency within community activities. The dimensions may occur together in practice, but their conceptual boundaries can be clarified by distinguishing decisions about participation, the

accomplishment of activities, influence over collective arrangements and authority over participation boundaries.

Figure 2 presents these proposed dimensions as components of a context-specific construct. Their analytical separation is intended to guide empirical investigation rather than establish that they constitute independent or validated measurement factors.

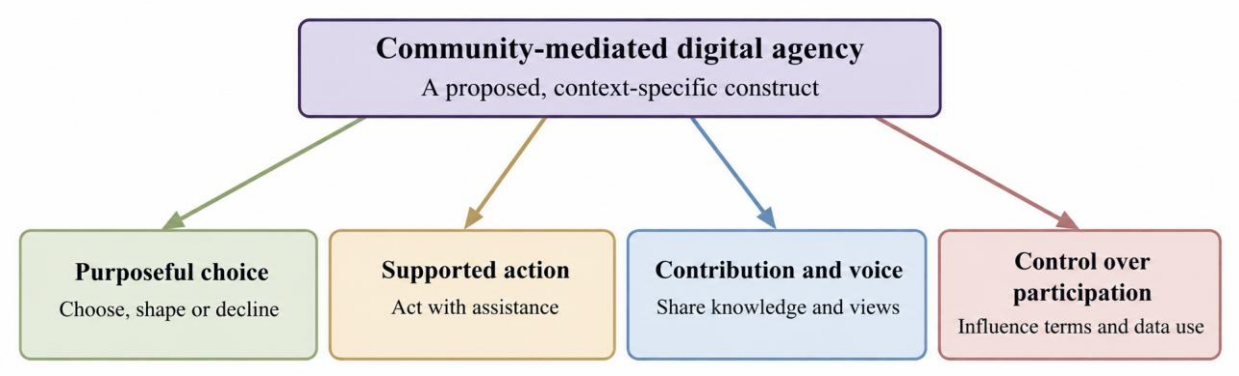


Figure 2. Proposed dimensions of community-mediated digital agency

Source: Authors' conceptualisation, informed by [2, 3, 4] and related research.

Purposeful choice

Purposeful choice concerns the opportunity to make informed decisions about whether, why, when and how to participate in digitally mediated community activities. It includes selecting suitable communication methods, determining preferred forms of involvement and declining activities that do not correspond to personal priorities. The defining consideration is whether participation reflects a meaningful decision rather than compliance with an expectation to use technology. Research on digital inclusion among marginalised groups demonstrates the importance of examining how institutional expectations shape individuals' opportunities to participate on their own terms [3]. Differentiated engagement with digital tools among older Chinese migrants further illustrates why selective use may reflect everyday purposes rather than a uniform expectation of adoption [16].

Purposeful choice may be examined through members' explanations of their decisions, the alternatives available to them and their opportunities to accept or decline particular activities. However, the expression of a preference alone does not establish agency when available options are severely constrained.

Supported action

Supported action concerns the accomplishment of an intended digital activity through assistance while the member retains meaningful influence over its purpose, execution and outcome. Its defining feature is the relationship between assistance and the member's capacity to act, rather than technical independence or the absence of support. Research involving older adults indicates that digital participation may depend on community assistance and opportunities to navigate technological barriers, while support arrangements do not always correspond to users' needs [2, 9].

Supported action may be observed when a member directs a volunteer in preparing a digital document, checks its contents and authorises its submission. Assistance becomes decision substitution when the helper determines the activity's purpose or outcome without meaningful member involvement. The analytical focus is therefore on how assistance affects the member's opportunity to accomplish an intended action.

Contribution and voice

Contribution and voice concern opportunities to share knowledge, express views and influence collective decisions about digitally mediated community activities. This dimension extends beyond individual task

accomplishment by addressing whether members can shape organisational practices and participate in decisions affecting shared responsibilities.

Potential manifestations include proposing changes to online communication procedures, identifying difficulties with digital registration processes or contributing to decisions about the use of community information systems. The presence of a consultation mechanism does not necessarily establish meaningful voice; the relevant question is whether members have a genuine opportunity to express views and whether those views can influence collective consideration or decisions.

Control over digital participation

Control over digital participation concerns the authority to establish, negotiate and maintain the terms and boundaries of digital involvement. It includes decisions about personal information disclosure, access to organisational records, the sharing of photographs or documents, and the continuation or withdrawal of participation in particular activities. This dimension addresses the conditions under which participation takes place rather than the practical accomplishment of a specific task.

Control may be examined through members' opportunities to grant or withhold consent, question information-sharing arrangements, modify participation preferences or withdraw from activities without disproportionate consequences. Formal options are insufficient evidence of control when members cannot understand or exercise them meaningfully. Research on enforced digital inclusion illustrates the importance of distinguishing participation from autonomy under institutional expectations [3].

Conceptual boundaries between the dimensions

The distinction between supported action and control over digital participation requires particular attention. Supported action concerns how a chosen activity is accomplished with assistance, whereas control concerns who determines the terms and boundaries of involvement. A member who receives help uploading a photograph may demonstrate supported action by directing and approving the upload, while exercising control by deciding whether the photograph may subsequently be shared, retained or removed.

The dimensions are therefore analytically distinguishable without being mutually exclusive. A single activity may involve purposeful choice, supported action, contribution and control. Their empirical distinctiveness, possible overlap and relative importance require investigation through members' accounts, observed interactions and organisational practices before any measurement structure can be established.

Conditions Enabling or Constraining Agency

Community-mediated digital agency is shaped by the opportunities and constraints associated with supportive community relationships, sociotechnical alignment and trustworthy data governance. These conditions influence different aspects of participation and should not be interpreted as sufficient evidence that agency is present.

Supportive community relationships may expand opportunities for purposeful action through peer assistance, encouragement and shared learning. Their contribution depends on whether assistance responds to members' needs and preserves meaningful decision-making authority. Support that replaces members' decisions may facilitate task completion while restricting agency [2, 9].

Sociotechnical alignment concerns the compatibility of digital systems, organisational workflows and members' capabilities and responsibilities. Accessible tools and suitable procedures may reduce practical barriers to participation, but improved usability does not necessarily provide opportunities to influence organisational decisions. Agency therefore depends partly on whether technological arrangements support members' intended activities and involvement in relevant decisions [13].

Trustworthy data governance concerns the transparency, accountability and practical accessibility of arrangements for collecting, accessing, sharing and retaining information. Such arrangements may support informed participation when members can understand information practices, question decisions and exercise

appropriate control. Formal policies alone do not establish meaningful agency if members lack genuine opportunities to make or influence information-related decisions [5].

Together, these conditions clarify why similar levels of digital capability may be associated with different opportunities to exercise agency. Their proposed influence is conditional and requires empirical investigation.

From Agency to Sustained Participation

Sustained digital participation refers to continuing and meaningful involvement in digitally mediated community activities over time. It does not require uninterrupted technology use, participation in every available activity or exclusive reliance on digital communication. Members may remain meaningfully involved through selective engagement, supported participation or combinations of digital and non-digital practices.

The relationship between agency and continued participation is not necessarily linear. Changes in health, family responsibilities, organisational commitments, technological requirements and personal preferences may affect participation independently of agency. Members may also choose to reduce or discontinue digital involvement without experiencing a loss of agency. Voluntary withdrawal can itself represent meaningful choice when alternatives remain available.

Conceptual Boundaries and Contextual Transferability

Community-mediated digital agency is distinguished from digital capability, technology adoption and sustained participation by its emphasis on meaningful choice, purposeful action, contribution and control. Digital capability represents resources for engagement, whereas agency concerns the opportunities available to exercise those resources. Technology adoption and frequency of use describe engagement but do not necessarily establish meaningful influence. Sustained participation concerns continuing involvement in activities valued by members, including participation undertaken with appropriate assistance.

The proposed dimensions are not assumed to operate identically across voluntary community organisations. Their conceptual relevance may extend to settings in which members undertake shared responsibilities, rely on social support and participate in decisions about digitally mediated activities. However, their practical expression may vary according to organisational purposes, membership characteristics, available resources and decision-making arrangements. For example, supported action may involve informal peer guidance in one organisation but structured assistance from designated volunteers in another. Similarly, contribution and voice may occur through committee decisions, collaborative activities or informal consultation.

The Trefoil Guild Melaka provides a relevant conceptual setting because the earlier capability and information systems frameworks address community learning, organisational workflows and information governance within a voluntary organisation [4, 5]. These features inform the present framework but should not be treated as evidence that all voluntary organisations possess equivalent arrangements.

Transferability therefore concerns the potential applicability of the framework's conceptual relationships under different organisational conditions, rather than the direct replication of particular practices. The distinction between supported action and control over participation remains analytically relevant across settings, although the activities through which these dimensions are expressed may differ. Empirical research is required to determine whether the four dimensions are sufficiently distinct, whether additional dimensions are necessary and how organisational differences affect the proposed relationships.

THE PROPOSED CONCEPTUAL FRAMEWORK AND THEORETICAL PROPOSITIONS

The proposed framework connects individual digital resources with the community and organisational conditions affecting their exercise. Figure 3 presents the integrated relationships, while six theoretical propositions specify their expected operation and potential empirical implications.

Structure and Logic of the Framework

Figure 3 organises the framework around digital capability, community-mediated digital agency, sustained digital participation and three community enabling conditions. The relationships are conditional rather than automatic: similar levels of capability may correspond to different opportunities for agency depending on organisational arrangements.

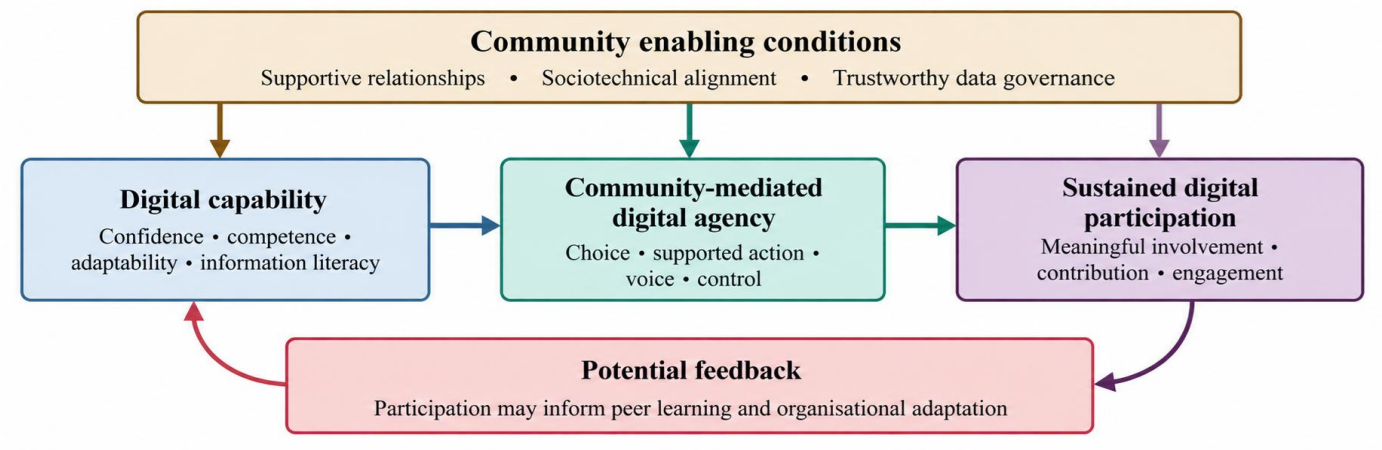


Figure 3. Integrated conceptual framework linking digital capability, community-mediated digital agency and sustained digital participation

Source: Authors' conceptualisation, adapted and extended from [4, 5], with theoretical support from [1, 2, 3, 15].

The framework extends earlier conceptual work on digital capability and community information systems by specifying agency as a distinct explanatory construct and introducing a potential feedback relationship from participation to collective learning and organisational adaptation [4, 5]. The arrows represent theoretical expectations rather than validated causal effects.

The arrows in Figure 3 represent proposed relationships rather than empirically established causal effects. Community enabling conditions may influence both capability development and the opportunity to exercise agency. Agency may contribute to sustained participation when members can pursue meaningful activities and influence the conditions of involvement. Participation may subsequently create opportunities for collective learning and organisational adaptation, although such feedback depends on whether member experiences are recognised and acted upon.

Community Enabling Conditions

Supportive community relationships, sociotechnical alignment and trustworthy data governance occupy distinct but complementary positions within the framework. Relationships concern the quality of assistance and opportunities for collaborative action; sociotechnical alignment concerns the compatibility of systems and organisational procedures; and data governance concerns the conditions for informed information-related decisions.

These conditions are proposed to influence opportunities for agency rather than serve as direct indicators of its presence. Their expected relationships are specified in P2–P4, while their practical significance may vary across organisational settings.

Theoretical Propositions

The proposed framework distinguishes digital capability as a resource for engagement, community-mediated digital agency as the meaningful exercise of that resource, and sustained digital participation as a possible outcome. Six propositions specify the relationships among these constructs and the conditions under which they may operate. P1 and P5 establish the central explanatory pathway, P2–P4 identify contextual influences, and P6

introduces a possible feedback relationship. Each proposition is accompanied by observable expectations intended to guide future empirical investigation rather than represent findings from the present study.

Proposition 1 (P1): Digital capability provides resources for community-mediated digital agency, but its translation into agency depends on opportunities and constraints within the community and organisational environment.

Digital competence, confidence, adaptability and information literacy may equip members to undertake technological activities without necessarily providing opportunities to determine their purposes or influence their outcomes. Organisational responsibilities, access arrangements and decision-making practices may therefore help explain why individuals with comparable capabilities experience different opportunities for agency. Recent research on older adults' digital experiences demonstrates the importance of examining autonomy and social circumstances alongside technological competence [2, 3].

Empirical support for P1 would involve identifying situations in which capability facilitates purposeful action when organisational opportunities are available, but similar capability is associated with restricted agency where such opportunities are limited. The proposition would be challenged if capability consistently translated into comparable agency regardless of differences in organisational opportunities and constraints.

Proposition 2 (P2): Supportive community relationships may strengthen the translation of digital capability into community-mediated digital agency when assistance preserves members' meaningful choice and involvement in decisions.

Peer guidance, encouragement and shared learning may expand the range of digital activities members can undertake. However, assistance supports agency only when members retain meaningful influence over the intended activity and its outcome. Support that substitutes another person's decisions may facilitate task completion without increasing the member's agency. Research on older adults' digital support highlights the importance of examining whether available assistance corresponds to users' needs and preferences [2, 9].

Empirical support for P2 would involve observing that assistance preserving members' decisions enables purposeful action or participation that would otherwise be difficult. The proposition would be challenged if decision-preserving support showed little relationship with agency, or if assistance that routinely displaced members' decisions nevertheless produced comparable opportunities for meaningful choice and influence.

Proposition 3 (P3): Sociotechnical alignment may strengthen community-mediated digital agency by increasing the compatibility of digital systems and organisational procedures with members' capabilities, responsibilities and participation needs.

Accessible digital tools and compatible workflows may reduce practical barriers to undertaking community activities. Their contribution to agency, however, depends on whether improved arrangements enable members to pursue intended purposes or influence relevant procedures. Greater efficiency or task completion alone does not establish increased agency. Research on older adults' involvement in digital public service design supports attention to the relationship between technological arrangements and users' perspectives [13].

Empirical support for P3 would involve observing that improvements in system accessibility or workflow compatibility expand members' opportunities to initiate activities, make relevant decisions or influence procedures. The proposition would be challenged if such improvements consistently enhanced task completion without producing discernible changes in meaningful choice or influence.

Proposition 4 (P4): Trustworthy community data governance may strengthen community-mediated digital agency by supporting informed choice, appropriate information access and meaningful control over digital participation.

Transparent and accountable information practices may enable members to understand how personal or organisational information is collected, accessed, shared and retained. Their contribution to agency depends on whether members can exercise informed choices and question or influence relevant practices. Formal policies

are therefore insufficient evidence of control when their provisions are inaccessible or cannot be acted upon. Privacy-related concerns have been associated with older adults' intentions to discontinue technology use, highlighting the relevance of information practices to digital participation [15].

Empirical support for P4 would involve observing that understandable and actionable governance arrangements are associated with members' ability to grant or withhold consent, manage information access or challenge inappropriate sharing. The proposition would be challenged if transparent arrangements provided no meaningful increase in members' opportunities for informed choice or control.

Proposition 5 (P5): Community-mediated digital agency may contribute to sustained digital participation when members can exercise meaningful choice, undertake purposeful action, contribute to collective activities and retain appropriate control over their involvement.

Agency may support continuing participation when members can pursue personally meaningful purposes and influence community activities. However, sustained participation also depends on health, family responsibilities, organisational commitments and preferences. Frequent technology use is not necessarily evidence of agency, and voluntary reduction of digital involvement may itself reflect meaningful choice. Research on enforced digital inclusion demonstrates the importance of distinguishing continued technology use from autonomous participation [3].

Empirical support for P5 would involve identifying circumstances in which opportunities for meaningful choice, supported action, contribution or control precede or accompany continuing involvement in valued community activities. The proposition would be challenged if sustained meaningful participation occurred consistently without discernible agency, or if greater agency showed little relationship with participation after relevant contextual circumstances were considered.

Proposition 6 (P6): Sustained digital participation may generate feedback that supports collective learning, capability development and organisational adaptation when members' experiences are recognised and incorporated into community practices.

Continuing participation may create opportunities to exchange knowledge, identify difficulties and suggest changes to digital procedures. Such experiences contribute to collective learning or organisational adaptation only when they are communicated, considered and incorporated into subsequent practices. The relationship is therefore conditional on organisational responsiveness rather than participation frequency alone. Earlier conceptual work concerning community informatics and information systems for the Trefoil Guild Melaka provides a foundation for examining these organisational processes [4, 5].

Empirical support for P6 would involve tracing how members' participation experiences lead to identifiable changes in peer learning, digital capability development, organisational workflows or information practices. The proposition would be challenged if participation continued over time without meaningful feedback being recognised or incorporated, or if observed organisational changes could not plausibly be connected to members' experiences.

Consolidated Propositions and Framework Interpretation

Table 2 consolidates the six theoretical propositions and identifies illustrative patterns that may guide future empirical investigation. The propositions form a conditional explanatory framework rather than a deterministic sequence. Digital capability may exist without meaningful agency, and participation may continue without providing members with opportunities for choice or influence. Supportive relationships, sociotechnical alignment and trustworthy governance may affect these relationships differently across organisational settings.

Table 2. Theoretical propositions and illustrative empirical expectations

Proposition	Principal relationship	Illustrative observable expectation
P1	Digital capability → agency, conditional on organisational opportunities	Comparable capability may correspond to different agency opportunities under different organisational

		arrangements.
P2	Supportive relationships → capability–agency relationship	Decision-preserving assistance may expand purposeful action without transferring decision authority to helpers.
P3	Sociotechnical alignment → agency	Better-aligned tools and workflows may expand opportunities for meaningful action and influence.
P4	Trustworthy data governance → agency	Understandable and actionable information practices may support informed consent and control.
P5	Agency → sustained participation	Meaningful choice, action, contribution and control may accompany or precede continuing valued involvement.
P6	Sustained participation → Collective learning and organisational adaptation	Member experiences may be incorporated into subsequent learning, workflows or governance practices.

Source: Authors' conceptual synthesis, informed by [1, 2, 3, 4, 5, 13, 15].

The observable expectations are intended to assist the development of qualitative, comparative and longitudinal research. They do not establish validated measures or causal relationships. In particular, the proposed relationship between agency and sustained participation requires attention to temporal ordering and the distinction between meaningful involvement and participation frequency. The feedback relationship in P6 similarly requires evidence that members' experiences are recognised and incorporated into subsequent organisational practices.

THEORETICAL CONTRIBUTIONS AND IMPLICATIONS

Section 6 examines the explanatory value and practical boundaries of the proposed framework. Its central argument is that digital inclusion cannot be adequately understood through technological competence or frequency of use alone. Opportunities for meaningful choice, supported action, organisational contribution and control depend on the circumstances in which digital activities take place. An agency-centred perspective consequently allows digital participation to be examined in relation to members' influence over community activities, rather than treating continued technology use as an inherently desirable outcome [2, 3].

Extending Digital Inclusion Beyond Capability and Technology Use

An agency-centred perspective extends digital inclusion research by directing attention towards the opportunities individuals possess to influence digitally mediated activities. Assessments based primarily on competence, access or frequency of use may overlook whether participation reflects meaningful choice or organisational expectations. Research on enforced digital inclusion demonstrates the importance of examining autonomy alongside continued technology use [3].

The framework consequently proposes that meaningful inclusion should be examined through the relationship between individual resources and opportunities for agency. This interpretation accommodates supported participation and recognises that voluntary withdrawal may express meaningful choice rather than exclusion.

Advancing Community Informatics Through an Agency-Centred Perspective

Community informatics provides a foundation for understanding digital engagement through collective purposes, social relationships and organisational practices. Earlier conceptual work concerning the Trefoil Guild Melaka addresses digital capability development and the design of integrated community information systems [4, 5].

The present framework advances this foundation by examining whether members can influence the activities and arrangements through which digital resources are exercised. Its contribution lies in specifying agency's proposed dimensions and conditional relationships, not in claiming that digital agency or organisational participation were absent from the earlier frameworks.

Agency as Relational, Supported and Context-Dependent

The proposed framework contributes to understanding digital agency by locating meaningful choice and action within community relationships rather than equating autonomy with independent technology use. Community assistance may expand opportunities for participation when members retain influence over their intentions and decisions. However, the availability of support does not establish agency where assistance substitutes another person's judgement for that of the member. Research on older adults' digital experiences and support arrangements reinforces the importance of examining the relationship between available assistance, individual preferences and the conditions of participation [2, 9].

The relational character of agency also introduces conceptual limitations. Community expectations may encourage participation while restricting opportunities to decline, and members may appear to consent when meaningful alternatives are unavailable. Similarly, technically confident members may complete assigned tasks without influencing organisational decisions, whereas less experienced members may exercise agency through consultation and supported participation. These possibilities challenge interpretations of digital inclusion that treat technology use or task completion as sufficient evidence of autonomy [3].

Community-mediated digital agency should therefore be interpreted through members' opportunities to determine purposes, direct assisted activities, contribute to collective decisions and establish boundaries around their involvement. These expressions may overlap, but each addresses a different aspect of meaningful participation. The framework's theoretical contribution lies in specifying the circumstances under which community mediation may preserve or constrain agency, rather than assuming that social assistance necessarily produces empowerment.

Integrating Sociotechnical Alignment and Data Governance

Research on involving older adults in digital service design highlights the importance of understanding users' perspectives when developing technological arrangements [13]. The community data integration architecture developed for the Trefoil Guild Melaka similarly identifies inclusive design, co-creation and workflow alignment as relevant considerations [5]. These perspectives support examining whether system design enables members to undertake activities and influence organisational processes rather than merely complete predetermined tasks.

Privacy concerns have been associated with older adults' intentions to discontinue technology use [15]. This evidence establishes the relevance of information-related concerns but does not demonstrate that formal governance procedures necessarily increase agency or sustained participation. Policies may offer limited practical protection when members cannot understand them, question their application or make informed decisions.

Implications for Voluntary Community Organisations

The framework directs voluntary community organisations towards the quality of members' involvement in digital activities. Capability development may be complemented by opportunities to choose appropriate forms of participation, undertake activities with decision-preserving assistance, contribute to organisational decisions and exercise control over information-related practices.

These considerations do not constitute interventions whose effectiveness has been demonstrated. Their practical value lies in identifying organisational questions that may inform future evaluation: whether assistance preserves members' decisions, whether workflows accommodate their responsibilities and whether information practices provide meaningful choices.

Implications for Future Research

Empirical investigation is required to determine whether community-mediated digital agency provides a sufficiently distinct and useful explanation of sustained participation across voluntary community organisations. The four proposed dimensions and six theoretical propositions require examination before their conceptual completeness, measurement properties or explanatory relationships can be established.

Qualitative studies could first investigate how members understand purposeful choice, supported action, contribution and voice, and control over participation. Interviews and observations would be particularly useful for examining whether assistance preserves members' decisions or substitutes the judgement of others. Such inquiry should consider both members' accounts and the organisational practices through which opportunities for agency are enabled or restricted. Research on older adults' experiences of digital assistance highlights the importance of examining support in relation to users' needs and circumstances [2, 9].

Comparative case studies could examine how the framework operates across organisations with different membership structures, participation responsibilities, technological resources and governance arrangements. Comparisons between informal peer-supported groups and organisations with more formal digital procedures may help identify which proposed relationships remain relevant and which depend on particular organisational conditions. These comparisons should assess contextual variation rather than assume that differences between organisations indicate stronger or weaker agency.

Longitudinal research could examine whether changes in digital capability and opportunities for agency precede changes in meaningful participation. It could also investigate the proposed feedback relationship by tracing whether members' experiences are recognised and incorporated into subsequent learning activities, digital workflows or governance practices. Such designs would provide stronger grounds for assessing the temporal relationships proposed in the framework without assuming that continued technology use necessarily reflects agency.

Subsequent measurement development should examine whether the four dimensions can be distinguished empirically, particularly supported action and control over participation. Indicators would require refinement through qualitative findings, assessment of construct overlap and validation across organisational settings. The Trefoil Guild Melaka should therefore be treated as a conceptual point of departure for future inquiry, not as an empirical sample from which the framework's transferability has already been demonstrated.

Implications for Interpreting the Framework

The framework is a set of conditional conceptual relationships, not evidence that capability inevitably produces agency or that agency ensures continued use. Assistance, accessibility and governance matter insofar as they preserve meaningful choice and influence. Voluntary reduction of digital activity can itself reflect agency. The six propositions and four dimensions remain open to empirical revision.

CONCLUSION

Digital capability provides resources for technological engagement, but the possession of these resources does not necessarily ensure meaningful choice, organisational influence or control over participation. Within voluntary community organisations, members may possess the skills required to undertake digital activities while remaining constrained by organisational procedures, unequal responsibilities or limited opportunities to contribute. Others may exercise meaningful agency through assisted activities when their preferences, decisions and intentions remain central to the process. These distinctions indicate that digital inclusion requires attention to how technological resources are exercised within community relationships, rather than to competence or frequency of use alone [2, 3].

This paper has developed a conceptual framework linking digital capability, community-mediated digital agency and sustained digital participation among mature women in voluntary community organisations. Building on the Community Informatics–Based Digital Capability Framework developed for the Trefoil Guild Melaka [4], the present study distinguishes agency from capability and specifies four proposed dimensions: purposeful choice, supported action, contribution and voice, and control over digital participation. These dimensions provide an analytical basis for examining whether members can exercise their capabilities in ways that reflect their intentions and allow them to influence collective activities.

The paper's contribution is a more explicit account of the relationship between capability, agency and participation within community settings. It does not claim to introduce digital agency as a new concept or to

establish empirically that the proposed relationships occur within the Trefoil Guild Melaka. The four dimensions and six theoretical propositions require investigation to determine their conceptual distinctiveness, explanatory value and applicability across different organisational contexts. Qualitative inquiry, comparative research and longitudinal studies could examine how members experience digital choice, assistance, contribution and control, and whether these experiences are associated with meaningful participation over time.

For voluntary community organisations, the framework directs attention towards the quality of members' involvement in digital activities. Opportunities to learn and use technology remain important, but they should be considered alongside members' ability to make decisions, contribute to shared responsibilities and retain appropriate control over their participation. Digital inclusion becomes more meaningful when technological competence is accompanied by opportunities to exercise agency within the communities to which individuals belong.

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