

RESEARCH IN PROGRESS

FRUGAL DIGITAL

TRANSFORMATION FOR RESILIENT

FOOD BANKS: A MULTIPLE-CASE

STUDY OF DISTRIBUTED

NONPROFITS

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In the context of accelerating technological advancement, digital transformation is becoming a major strategic issue. Yet, it remains understudied in non-profit organizations. Food banks, operating in distributed networks with limited resources, clearly illustrate this gap. Despite their crucial social role, they struggle to leverage the potential of information systems and technology to improve the coordination and efficiency of their operations. This research-in-progress paper draws on the framework of Frugal Information Systems (Frugal IS) guided by the principles of IT (Information Technology) for Good, to examine how simple and inclusive digital solutions can strengthen coordination, improve social value creation, and enhance the resilience of food banks. Adopting a qualitative approach based on a multiple case study within the “Moissons du Québec” network, we aim to formulate recommendations for community organizations seeking to reconcile operational efficiency and social value through digital transformation.

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1 Introduction

In today's era, marked by an unprecedented acceleration of technological advancements (Omol, 2024), the importance of digital transformation has become almost universally acknowledged. This evolution is transforming the way organizations operate worldwide (Ashrafi et al., 2025; Carroll et al., 2023; Omol, 2024; Wessel et al., 2025). This largely explains why information systems researchers are focusing so intently on the study of digital transformation, approaching the subject from multiple perspectives (Wessel et al., 2025).

A perspective that has been neglected is one that foregrounds human realities (Ashrafi et al., 2025; Carroll et al., 2023), prioritizes societal over purely economic outcomes (Wessel et al., 2025), and accommodates diverse organizational contexts (Grover & Niederman, 2021). From this perspective, it is essential to examine how a human-centered, societally oriented, and context-sensitive approach to digital transformation is enacted within specific organizational structures.

Indeed, in 2023, 2.33 billion people faced food insecurity, including 733 million suffering from chronic hunger (FAO, 2024). Food banks play a key role by redistributing surplus food to vulnerable populations, while also reducing food waste (Martins et al., 2019), which contributes to 8–10% of global greenhouse gas emissions (UNEP, 2021).

However, food banks face several operational and logistical challenges (Rivera et al., 2023; Wu & Tai, 2024). Difficulties exist in information sharing between different food banks, which are generally charitable organizations, a gap in digital literacy between volunteers and partner companies, and significant food losses (Wu & Tai, 2024). Furthermore, inefficient logistics management and increasing public demand exacerbate these problems (Martin et al., 2022). While digital transformation is widely studied in IS research (Ashrafi et al., 2025; Wessel et al., 2025), most work focuses on for-profit organizations, leaving nonprofits largely overlooked (Cipriano & Za, 2025). This gap matters because food banks address food insecurity and reduce waste, key goals for sustainability and resilience (FAO, 2024; UNEP, 2021), yet operate under severe resource constraints and distributed structures that make conventional approaches impractical (Grover & Niederman, 2021). Current literature offers little guidance on how frugal, inclusive, and socially oriented IS

solutions can improve coordination, efficiency, and adaptive capacity in such settings (Radjou, 2024; Watson et al., 2013). Closing this gap is essential for designing digital practices that align operational performance with social value and sustainability objectives.

Our research focuses on digital transformation in the internal operations of food banks. We aim to answer the following research question:

How can digital transformation guided by Frugal IS and IT for Good principles enhance coordination, social value and resilience in distributed nonprofit organizations?

To answer this question, we use a qualitative multiple-case study (Eisenhardt, 1989) of four food banks in the “Moissons du Québec” network. Data collection combines 12 interviews across four food banks, observations, and document analysis for triangulation. Thematic analysis (Braun & Clarke, 2006) guides interpretation, consistent with an inductive approach. Our research contributes to IS research in three ways. Theoretically, it bridges Frugal IS, IT for Good, and stakeholder theory to explore digital transformation in distributed nonprofit organizations, a context often overlooked in the literature. Empirically, it offers insights from a multiple-case study of food banks, revealing how frugal digital practices shape coordination, social value, and resilience under resource constraints. Practically, it proposes design-oriented recommendations to help community organizations implement inclusive, low-cost technologies that support sustainable and socially valuable operations.

2 Theoretical Background

Frugal Information System: The concept of a Frugal Information System (Frugal IS) emerged in the information systems literature following the pioneering work of Watson et al. (2013). These authors define a frugal IS as “an information system that is developed and deployed with minimal resources to meet the pre-eminent goal of the client” (p. 2). This definition rests on two fundamental ideas: minimization of financial, human, and technical resources, and focus on a single priority objective. Performance is measured by the ability to meet essential needs in contexts of scarcity. Ahuja & Chan (2016) extend this perspective through Frugal IT Innovation

Capability (FITIC), emphasizing co-creation and collaborative ecosystems. Radjou (2024) highlights simplicity, efficiency, and creativity under constraints.

Proposition 1: Frugal IS supports simple and adaptable digital solutions that improve coordination and efficiency in food banks under resource constraints.

IT for Good: Although widely used in research, the concept of IT for Good remains relatively unformalized in scientific literature, with few benchmark studies. It is based on a vision of technology as a lever for creating social value, inclusion, cohesion, and sustainability, directing information systems toward the common good rather than economic performance alone. Barradas et al. (2019) illustrate this by showing how an information system for social tourism generates social value by improving access for marginalized older people. Similarly, Wessel et al. (2025) call for rethinking digital transformation to unlock new value propositions. Thus, digital technologies should not only enhance performance but also enable inclusive and sustainable social value, in line with IT for Good.

Proposition 2: IT for Good aligns digital transformation with social value, strengthening cohesion and coordination within organizations.

Digital Transformation in Distributed Nonprofits: Digital transformation is generally defined as a profound and continuous process of integrating digital technologies into organizational activities, structures, and models, transforming practices, relationships, and objectives (Ashrafi et al., 2025; Carroll et al., 2023; Wessel et al., 2025). The literature highlights issues such as distributed innovation (Ashrafi et al., 2025), the consideration of human dimensions (Carroll et al., 2023), and societal impacts (Wessel et al., 2025), but this research remains largely rooted in resource-rich and performance-oriented contexts, leaving the constrained environments of non-profit organizations largely unexplored (Cipriano & Za, 2025; Yang et al., 2025). Within this framework, food banks represent a particularly relevant field of study. As distributed organizations, they rely on the coordination of autonomous actors through digital infrastructures that facilitate interactions (Vergne, 2020). However, their digital transformation is not driven by massive technological investments (Martin et al., 2022; Ng et al., 2025), but by the need to coordinate dispersed operations in a context of scarcity (Rivera et al., 2023). This leads to a preference for accessible, adaptable, and inclusive digital solutions, thus revealing logics where coordination, frugality, and social value take precedence.

Proposition 3: In distributed food banks, digital transformation guided by frugal IS and IT for good enhances social value creation and strengthens organizational resilience.

3 Methods

In accordance with the framework of (Edmondson & Mcmanus, 2007), our study falls within an intermediate knowledge domain, making a qualitative approach particularly well-suited for producing rich and contextualized theoretical contributions. This choice is justified by the exploratory nature of the research question. We adopt a multiple case study strategy, as proposed by Eisenhardt (1989), to capture the diversity of practices, organizational contexts, and technological uses within the network of 18 food banks in Quebec, Canada. Four cases were purposefully selected to ensure variation in size, geographical location, and level of technological adoption.

Data collection: Three data sources were used. First, 12 semi-structured interviews were conducted with directors, logistics managers, coordinators, and volunteers across four food banks. Second, observations were carried out during in-person coordination meetings and logistics activities. Third, internal documents and external reports from the “Banques Alimentaires du Québec” and partners supported triangulation. Data collection continued until data adequacy was reached, ensuring sufficient depth and variation to support robust theoretical insights (Abdalla Mikhael & Robey, 2024).

Data analysis : We conducted a thematic analysis (Braun & Clarke, 2006) aligned with an interpretative and inductive stance. This approach is particularly well-suited to the in-depth exploration of the meanings that actors attribute to their practices, as well as to the progressive construction of analytical categories based on fieldwork.

4 Preliminary Findings

Our preliminary findings highlight several dynamics related to coordination, technology use, and organizational constraints in food banks.

First, our data shows that coordination relies heavily on informal mechanisms. Participants describe exchanges based on trust, interpersonal relationships, and tacit knowledge, rather than structured formal systems:

“...he knows from experience, mostly from habit... everyone knows how things work... we have enough experience in transportation here” (B3 INT3)

“...drivers with 15, 20, 25 years of experience in transportation... the telephone is sufficient” (B3 INT2)

“If we had it in stock, but it was more in our heads” (B1 INT1).

Second, our data reveals that the technological solutions adopted are mostly simple, adapted, and developed according to local needs. Participants frequently mention the use of unsophisticated or “homegrown” tools, compatible with their limited resources: *“...tailor-made...adapted to the needs of reality” (B1 INT3)*

Furthermore, the uses of digital technology are primarily geared towards supporting the social mission. Technologies are mobilized to improve food redistribution and reduce food waste, rather than to optimize economic performance.

“Digital technology contributes to strengthening the social mission” (B1 INT1)

“Feed as many people as possible... A platform where all surpluses could be stored” (B2 INT2).

Our data also show that organizational practices rely on hybrid systems combining digital tools and tacit knowledge, particularly in inventory management, as illustrated by these quotes:

“Because I was in the warehouse, I knew if I had enough for the organization. There was no inventory system” (B1 INT1)

“We don't have an inventory control system because we don't need one... we use a push system, we push the food... The organization doesn't choose what it wants.” (B3 INT3)

Finally, food banks appear as distributed structures, characterized by coordination between autonomous entities. However, digital transformation remains constrained by limitations in resources and skills, leading to gradual and pragmatic adoption processes.

5 Discussion

This ongoing research allow us to move beyond a purely technological interpretation of digital transformation. First, our data shows that coordination does not rely exclusively on digital tools, but on pre-existing social mechanisms. Technologies thus appear as support mechanisms for already established relational dynamics. Second, frugality emerges as an organizational logic that structures technological choices and promotes the appropriation of tools, in line with local capacities (Proposition 1). Third, unlike for-profit organizations, the use of digital technology here is driven by social mission. This confirms that digital transformation can be guided by logics of social value rather than by objectives of economic efficiency (Proposition 2). Furthermore, the observed hybrid systems suggest that digital transformation does not replace existing practices, but rather integrates with them, combining technologies and tacit knowledge. Finally, these results highlight a tension between network coordination and local autonomy. Digital transformation in these organizations appears as a situated, constrained, and progressively constructed process, rather than a linear and standardized change. These results support distributed food banks, digital transformation guided by frugal IS and IT for good help to strengthen social value creation and organizational resilience (Proposition 3).

6 Conclusion

This research highlights the role of frugal digital transformation in food banks as distributed organizations. The findings show that simple, tailored, and inclusive solutions support coordination, enhance operational efficiency, and facilitate the creation of social value. Beyond technology, digital transformation is embedded in social and organizational dynamics, where governance, volunteers, and resource constraints play a central role. By combining frugality, inclusion, and social mission, digital practices contribute to the resilience of the food system. Thus, this study

underscores the importance of designing technologies aligned with the realities and needs of non-profit organizations.

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Author Revision Statement

We hereby confirm that the manuscript entitled:

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submitted to the 30th Bled eConference has been carefully revised following the comments and recommendations provided by the reviewers.

We confirm that no substantial content has been altered beyond the scope of the reviewers' recommendations without proper justification.

