



From Chaos to Clarity: Using Digital Tools, Heuristic Methods, and Process Simplification to Improve Efficiency in Landscaping and Outdoor Services

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ABSTRACT

Service organizations involved in landscaping and outdoor services have to function in an environment of uncertainty and variability, with factors like demand, which is subject to many variations (i.e., seasonal, daily), weather affects what can be done, employees are mobile and may be in various geographic locations, and all of these factors contribute to an inefficient service operation. Because of this, the workflows associated with these types of organizations are typically disjointed, and most decision-making tends to be reactive rather than proactive. Although digital technology has been implemented at a high rate across service industries, the use of technology alone does not ensure clarity in operation or improvements in performance. The purpose of this paper is to explore how the integration of three concepts: digital tools, heuristic decision-making methods and process simplification can provide for improved operational efficiencies for landscaping and outdoor service organizations. A qualitative approach was used through literature synthesis in order to compile knowledge from studies related to digital transformation, service operations, decision making, and process optimization, in order to create a conceptual model of process and decision making for field-based service organizations. It has been named The Yatsiuk Operational Clarity Framework. The results suggest that operational clarity will exist when digital tools are used in conjunction with simplified workflows and explicit decision rules that enable timely and contextual decisions for managers. The paper provides a practical application of current research related to digital transformation and its relationship to the operational challenges of landscaping and outdoor service organizations.

KEYWORDS

landscaping services, outdoor services, operational efficiency, digital transformation, heuristic decision-making, process simplification.

Introduction

Landscaping & Outdoor Services are a vital component of the Service Economy and are generally understudied. Landscaping & Outdoor Services offer a wide array of time sensitive, labor intensive and environmentally based services and products that require the direct involvement of human labor, the environment and time. Since these services take place in an open and ever-changing work setting (i.e., outdoors) that is subject to weather and site variations as well as varying levels of customer demand, many landscapers and outdoor service providers struggle with consistent and efficient operation of their businesses. Common operational issues include scheduling conflicts, poor route utilization, service quality variability, and poor communication between upper-level management and field crews.

Historically, the operational coordination of landscaping and other outdoor services have been done manually through informal communication and/or through the experienced judgment of the supervisor or owner/manager of the organization. Although the above methods will be satisfactory for a relatively small number of clients, they do not lend themselves to larger organizations with a wider variety of services and/or those who wish to operate in multiple locations. The existing body of research in service operations also identifies that the heavy reliance on tacit knowledge and ad-hoc decision making contribute to inefficiency, lack of scalability and increased vulnerability to disruptions (Chin et al., 2023; Fernandez-Vidal et al., 2022).

The theme of digital transformation is becoming prominent in the fields of operations and service management. There are several digital tools available that can help solve coordination and efficiency problems, such as scheduling platforms, mobile workforce apps, performance dashboards, and decision support tools (Keskin & Çiçekli, 2023; Spanaki et al., 2025). Empirical evidence shows that digital transformation capabilities can positively affect operational performance if implemented correctly (Yu et al., 2022); however, numerous studies suggest that technology adoption alone, without complementary organizational and process changes, may not yield significant performance improvements (Burton et al., 2024; Leso et al., 2023).

There is a growing amount of research that indicates that digital transformation is not merely a technological innovation, but also a social-technological development that requires organizational culture, leadership, decision-making practices, and workflow designs to change (De Bem Machado et al., 2022; Fernandez-Vidal et al., 2022). The same type of complexity issue exists in service industries, particularly in SME's, which lack formal processes and clearly defined decision criteria. Therefore, digital tools in service industries can amplify the complexity problem rather than resolve it. This is particularly true for landscaping and outdoor services where operational variability is inherent and real-time decisions are unavoidable.

Heuristic decision-making could help organizations manage the complexity of their outside service provider's (landscaping) operational tasks. Heuristics provide an effective means to assist managers and supervisors when they have limited or no data/information upon which to base their decisions in uncertain situations (Rajagopal et al., 2022; Molina-Abril et al., 2025). Using heuristics allows decision makers to rapidly and effectively make decisions regarding their operation on a daily basis, including how to set service orders, assign labor, and determine job priority, rather than replacing managerial decision making with automation (Liu & Lai, 2025). As a complementary tool to digital decision support systems, heuristic approaches can provide flexible and contextually based guidance to decision-makers when algorithmic optimizations are either not possible or impractical.

Process simplification also plays a key role. Process simplification refers to the intentional elimination of non-essential steps and redundant decision points within organizational processes. Research has shown that simplified processes enhance transparency, reduce the amount of error propagation, and create a solid foundation for the success of digitalization efforts related to operations and performance management (Aldoseri et al., 2023; Cosa & Torelli, 2024). For field-based services,

which are characterized by high cognitive loads placed on employees, process simplification is a prerequisite for the adoption of technology as well as the consistent execution of the adopted technology.

Based on the preceding discussion, the objective of this paper is to investigate how the combined application of digital tools, heuristic decision-making and process simplification can increase the operational efficiency of landscaping and outdoor service companies. The purpose of this paper is to develop a conceptual framework that integrates the current state-of-the-art in the areas of digital transformation and operations management into a coherent, practice-focused model that reflects the realities of landscaping and outdoor service companies.

Literature Review

Digital Transformation in Service and Operations Management

Digital Transformation, or Digitalization, has become one of the main research themes in Service Management and Operations Management, because of the increasing presence of digital technologies in organizational processes, in making decisions, and in creating value. The transformation encompasses changes in strategy, organization, culture, and operational routines (Fernandez-Vidal et al., 2022; Keskin & Çiçekli, 2023), but it is not limited to the introduction of new technologies. Due to the characteristics of service industries such as the high level of human interaction, the high variability of the service production process and the need for real time coordination, digital transformation is especially important in the context of service operations (Chin et al., 2023).

In recent years, there have been numerous studies demonstrating that digital transformation enhances the operational efficiency of firms through improvements in the transparency of information, in the coordination and in the timeliness of responses. Yu et al. (2022) have shown that digital transformation capabilities have a positive effect on operational performance, specifically, when digital tools are integrated into an organization's core operational procedures (Yu et al., 2022). Similar results were found by Spanaki et al. (2025), who demonstrated that data-driven digital transformation enables more adaptive and efficient operations in both service and supply chain contexts (Spanaki et al., 2025). These findings demonstrate that digital tools can provide more informative and timely decision-making in uncertain and complex environments.

Organizational and Cultural Dimensions of Digital Transformation

Although a strong technological platform is an important part of the digital transformation process, it is only one of many aspects. The culture, structure and leadership of an organization significantly affect how successful the adoption and sustainability of digital strategies will be. As stated in a recent research study of SMEs by Leso et al. (2023), the commitment of leadership, level of cultural transparency and the ability to be flexible with the organizational structure determine the success of the digital transformation project (Leso et al., 2023). When new technologies are introduced without any accompanying changes to organizational structures and processes, the likelihood of digital transformation remaining fragmented or superficial is high.

The importance of top management in strategically leading the digital transformation was also shown in the research conducted by Fernandez-Vidal et al. (2022). Senior managers' perceptions of digital technologies and their strategic intent have a significant influence on the selection, implementation and embedding of digital tools into the daily routine of the organization (Fernandez-Vidal et al., 2022). For landscaping and outdoor service firms, which are typically small owner-managed businesses with strategic decisions and daily operations being very closely related, this finding is especially important.

Knowledge management has emerged as another key enabler of successful digital transformations. Robust mechanisms for knowledge sharing between employees and departments were identified by De Bem Machado et al. (2022) as necessary to fully leverage the capabilities of digital technologies within the context of Industry 4.0 (De Bem Machado et al., 2022; Gupta & Jauhar, 2023). Additionally, the combined use of AI and knowledge sharing best practices was found to enhance the performance

of an organization through improved learning, coordination and decision making quality (Olan et al., 2022). Therefore, digital tools must be supported by processes that enable the capture and dissemination of knowledge, especially for organizations that operate in field environments, such as those discussed here, where a large amount of the expertise involved in delivering services is tacit and distributed among multiple teams and employees (Al Naqbi et al., 2024).

Decision-Making, Heuristics, and AI-Supported Operations

Decision-making in uncertain situations is a defining characteristic of service operations, particularly in field-based services. Recent literature increasingly acknowledges that complex optimization models are not always suited for the dynamic nature of operational environments. Heuristic decision-making—i.e., based on simplified rules and experiential judgement—is thus presented as a practical alternative (Molina-Abril et al., 2025).

Molina-Abril et al. (2025) reviewed the use of heuristics and machine learning in strategic decision-making in SMEs, emphasizing the relevance of heuristics in situations where data availability is low or decisions must be taken quickly. This hybrid approach is aligned with the operational realities of landscaping services, in which managers must combine algorithmic recommendations with situational awareness (Nayyar et al., 2023; Rajagopal et al., 2022).

Liu and Lai (2025) contributed to this debate by studying the combination of decision-support tools for efficient operations management. They demonstrated that decision-support systems are most effective when they improve, rather than replace, managerial reasoning. This confirms the view that heuristics are complementary to digital tools, providing structure and consistency while maintaining flexibility.

Process Simplification and Performance Management

The majority of academics acknowledge that process simplification is one of the first steps toward operational efficiency. It differs from process expansion, which involves adding new activity, or from excessive formalization, which adds too much detail to existing processes. Process simplification reduces unnecessary complexity, clarifies roles and responsibilities, and defines standardized procedures for repeatable activities. Aldoseri et al. (2023) present a road map for the integration of automation and process optimization and emphasize that automation should be used after process simplification, not before. Their work highlights the danger of creating an electronic version of a poor understanding of or inefficient process.

Cosa and Torelli (2024) provide an overview of the evolution of Performance Measurement Systems in the context of Digital Transformation and conclude that the most suitable Performance Measurement Frameworks for service-oriented businesses will have to be flexible and simple (Cosa & Torelli, 2024). The use of simpler metrics and streamlined workflow allow for greater adaptability to change and reduce the administrative burden associated with performance tracking.

Operationally, the simplification of business processes is required to create the structural conditions for effective digitalization (Nayyar et al., 2023). In the absence of clear definitions of workflows and decision-making, digital tools may add additional layers of complexity. As a result, the insight provided in this regard is particularly important for the landscape and outdoor service industries; while tasks performed in the industry are repetitive, they are also very susceptible to variations in the external environment.

Landscaping, Horticulture, and Outdoor Services as an Applied Context

While there are few studies specific to landscaping operations, the body of work from the broader horticulture, agriculture and forestry fields provide insight into the digitalization of both outdoor and field-based activities. For instance, Poenaru et al. (2025) have researched the advancements in robotics, AI, etc., within the horticulture industry with an emphasis on the increasing reliance of digital tools in managing biological processes and environmental variability in horticultural production.

Gund et al. (2025) also studied the application of digital twins in agricultural production and illustrated how this technology can aid in better planning, monitoring and decision making in complex systems operating outdoors. Additionally, Foppert et al. (2025) researched new designation methods in

silvicultural operations; indicating that structured decision-support systems can greatly improve the efficiency and reduce the cost associated with managing complex treatment regimes.

While these studies were conducted in adjacent sectors as opposed to directly studying landscaping, they study operational environments that are similar to those found in many landscaping and outdoor services companies. Specifically, the need for quick coordination of employees, the prevalence of labor-intensive tasks, and the significant environmental variability experienced in both sectors makes the findings of these studies applicable to the landscaping environment.

Problem Statement

The purpose of this paper is to explore how the integration of digital tools, heuristic decision-making methods, and process simplification can enhance operational efficiency in landscaping and outdoor service organizations, and to develop a conceptual framework (Yatsiuk Operational Clarity Framework) that enables the transition from fragmented, reactive operations to structured, transparent, and efficient performance.

Methods and Materials

This study utilizes a qualitative research methodology that includes both a systematic and critical review of relevant peer-reviewed literature and applied operational frameworks that relate to the management of landscaping and outdoor service organizations. The primary goal of the methodology is to develop a conceptual operational efficiency model that integrates digital tools, heuristic decision-making methods, and process simplification methods to mitigate the effects of operational fragmentation and inefficiencies in field-based service operations (See Figure 1). The author of this research article used their own personal experiences working in the fleet and crew management areas for Sunshine Landscape Solutions to provide the basis for the analytical perspective; and specifically, provided a structured analysis of the results of more than 180 landscape and outdoor services projects that the company has completed over several years (operational seasons).

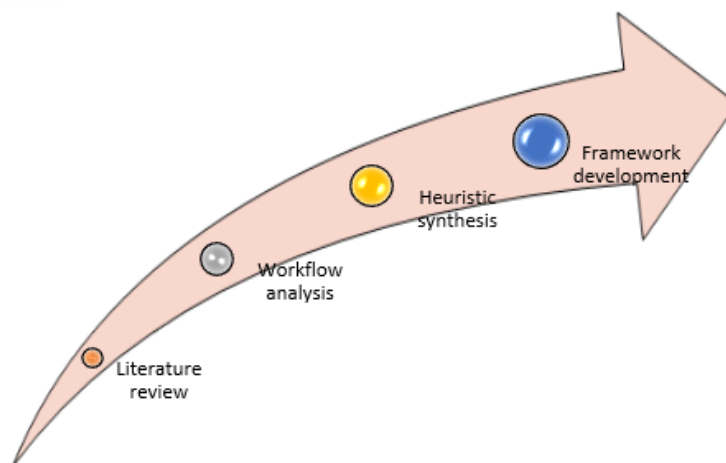


Figure 1. Conceptual research process underlying the development of the operational efficiency framework

The author uses this knowledge of personal experiences, as a “practitioner”, as a lens to view the frequency of operational inefficiencies, decision bottlenecks, and coordination failures; and has categorized them in order to identify patterns and common themes.

Simplifying processes was identified as a primary means of achieving operational efficiencies in each phase of the project process. Specifically, the creation of a simple on-site risk assessment tool that evaluates environmental conditions, equipment availability, and labor capabilities allowed field supervisors to quickly determine a course of action that would not require central management’s approval to implement. This resulted in approximately a 25% decrease in idle time for crews, which

primarily occurred due to the elimination of unnecessary delays from repeated hazard assessments, task sequencing, and equipment relocation. Additionally, the implementation of standardized job initiation and job completion procedures reduced administrative overheads and enhanced scheduling predictability for teams located throughout various geographic locations.

The authors' proposed methodological framework provides benchmarks for operational performance for companies involved in the provision of landscape and outdoor services by integrating digital support, heuristic decision-making, and streamlined workflow components into a single framework for optimizing efficiency. The authors' proposed methodological framework differs significantly from the typical cost-oriented and/or productivity-oriented frameworks that are commonly employed in the landscaping industry. Instead, the authors propose an approach to providing operational performance metrics that reflect the degree to which companies optimize the reliability of the service they provide to clients, client satisfaction, and overall service quality. Therefore, in addition to assisting in promoting operational excellence in the landscaping industry, the authors propose a methodological framework for demonstrating the potential positive impact of structured efficiency interventions on both the well-being of end-users and the quality of service provided in field-based service environments.

This research focused on four operational areas; scheduling, job performance, resource allocation, and communication between managers and field staff. The researchers chose these areas because they are a measure of how effectively the service is delivered, and have the greatest potential for being affected by factors such as time constraints, worker availability and work environment. An analysis of standard digital solutions used in the industry was performed to determine if the use of these solutions can assist with reducing operational uncertainty, increasing transparency in information, and simplify coordinating efforts.

Solutions include workforce scheduling software, customer relationship management (CRM) software and mobile task management software. After the identification of the heuristics from the literature review, the study evaluated the application of those heuristics to repetitive operational decision-making, such as priority determination of jobs, routing, and assignment of crew to job, staffing and sequencing of service delivery. The evaluation of the role of heuristics as an aid to practical decision-making was emphasized in this study as a supplement to digital decision-support tools and not as a replacement.

The main methodological approach was comparative qualitative analysis of traditional ad-hoc or manually-coordinated operational practices and digitally-supported, heuristics-driven, and process-simplified models found in the literature. The comparative analysis enabled the identification of the structural weaknesses inherent in fragmented and reactive workflows, including redundancies, delays in decision-making, propagations of errors, and over-reliance on tacit knowledge.

Based on the findings of the limitations presented in this comparative study, an operational conceptual framework has been developed that encourages the purposeful alignment of process architecture that has been simplified with a selection of digital tools and explicitly defined heuristic decision rules as a theoretical solution to transition from chaotic operational practice to structured efficiency in landscaping and outdoor service organizations. In contrast to specifying particular technologies to achieve this transition, the framework is focused upon developing coherence between process design, decision logic, and digital enabling as the foundation for sustainability in improving operational effectiveness in landscaping and outdoor service organizations.

Results and Discussion

Operational Chaos in Landscaping and Outdoor Services

Traditional operational control in landscaping and outdoor service organizations is challenged due to the inherent volatility in the weather, seasonal fluctuation in demand, geographically dispersed job sites and the mobility of the workforce (Figure 2), which create high levels of uncertainty. A variety of organizations attempt to address these challenges using reactive coordination, informal communication and managerial intuition. Although these methods provide short term flexibility, the literature indicates that they often generate inefficiencies, poor consistency

in service quality and reduce the ability of the organization to scale (Chin et al., 2023; Fernandez-Vidal et al., 2022).

Chaos in the operation of landscaping services generally does not emerge from a lack of effort or expertise. Chaos is generated by fragmented workflows and non-structured decision-making processes. Scheduling changes, last-minute route reassignments, and crew reassignment are examples of the common responses to daily disruption. However, these responses are typically made without the use of standard rules or clear and transparent information flows. Consequently, the operational knowledge of the organization remains tacit and localized, increasing the dependence of the organization on the presence of specific employees and raising the potential for error propagation (De Bem Machado et al., 2022; Leso et al., 2023).

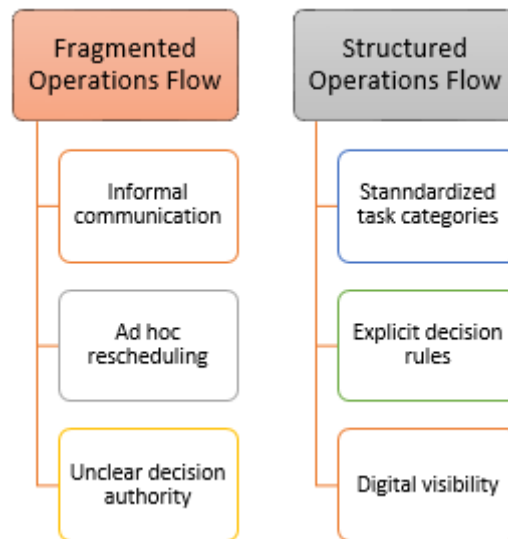


Figure 2. Fragmented vs. Structured Operations Flow

Digital Tools as Enablers, Not Solutions

Digital tools alone cannot alleviate operational inefficiency. The reviewed literature provides consistent evidence that digital tool initiatives, although promising to deliver automated, optimized and real-time visibility of organizational operations, will only realize their effectiveness to the degree that they are integrated into the organizational processes (Burton et al., 2024; Keskin & Çiçekli, 2023). Many digital tools used in landscaping and outdoor service organizations such as scheduling platforms and mobile task applications, merely digitize existing operational practices and therefore fail to transform them. An example of this would be if a scheduling system did not utilize standardized job categories or priority rules, resulting in frequent rescheduling conflicts rather than clarity (Sklyar et al., 2025).

Conversely, when digital tools are utilized in conjunction with simplified processes, they can improve transparency and coordination. Studies on data-driven digital transformation demonstrate that the realization of operational benefits occurs when digital systems facilitate clearly articulated routines and decision points (Spanaki et al., 2025; Yu et al., 2022). In the context of landscaping, the studies suggest that digital tools should be viewed as execution and monitoring mechanisms and not as autonomous decision makers.

Heuristic Decision-Making as a Practical Operational Mechanism

Heuristic decision-making is a critical component in the management of the operational reality of landscaping services. Unlike algorithmic optimization models that require stable data and predictable conditions, heuristics provide flexible decision rules that are particularly useful in uncertain and time-constrained environments (Molina-Abril et al., 2025).

In addition to providing the necessary guidelines for decision-making in time-constrained and uncertain environments, heuristics also play an important role in structuring the decision-making process in landscaping operations. Examples of recurring decisions, such as task prioritization, routing, and crew assignment, that are facilitated by the utilization of explicit heuristic rules include

the prioritization of geographically clustered jobs, the assignment of crews based on specialized skills as opposed to availability alone, and the sequencing of services based on weather sensitivity. Heuristics do not replace the necessity for managerial judgment; rather, they provide a structured approach to decision-making that reduces the cognitive burden associated with decision-making.

Additionally, studies show that heuristics might enhance digital decision support tools by translating analytical results into useful recommendations (Liu & Lai, 2025; Rajagopal et al., 2022). In reality, this means that information is presented by digital systems, and heuristic rules offer guidance for interpretation and action (Table 1).

Table 1. Examples of Heuristic Rules in Landscaping Operations

Operational Decision	Heuristic Rule	Intended Effect
Task prioritization	Prioritize weather-sensitive tasks	Reduced rework
Crew assignment	Match skill specialization first	Higher quality
Routing	Cluster jobs geographically	Reduced travel time

Process Simplification as the Foundation of Operational Clarity

Simplifying workflows and processes decreases the possibility of miscommunication, lowers the number of handoffs needed within an organization, and makes it easier to create uniform execution rules. According to Aldoseri et al. (2023), automated and digitally enabled solutions should be implemented after, not before, a clearly defined process design. This concept is particularly applicable in the context of landscaping services, which have historically relied upon accepting variations in process designs as necessary and unchangeable rather than as opportunities for systematic improvement.

While simplification represents a rigid process design, it does not require such rigidity. In fact, it is possible to define standard operating procedures for recurrent tasks while allowing for the controlled flexibility needed to accommodate exceptions. Research regarding flexible performance management systems has indicated that simple, yet adaptive, process designs allow for greater adaptability due to the clarity provided as to what elements of the process can be changed and what elements cannot be altered (Cosa & Torelli, 2024).

Additionally, the use of simplified process designs allows for easier training and on-boarding of employees. By minimizing employee reliance upon tacit knowledge, organizations become less reliant upon individual experience and therefore more resilient to workforce turnover (Leso et al., 2023; Olan et al., 2022).

A Conceptual Framework: From Chaos to Clarity

Purpose and Scope of the Framework. The proposed Yatsiuk Operational Clarity Framework (YOPC) provides a means for explaining how landscaping and outdoor service organizations can increase their operational efficiencies by transitioning from a fragmented and reactive approach to managing their business to a structured and cohesive approach to operational control. The Yatsiuk Operational Clarity Framework combines research and concepts from digital transformation, service operations management, and decision-making literature to identify the key challenges associated with field-based service environments and to provide a generalized explanatory model of the core mechanisms that contribute to operational clarity. As a result, the framework tackles the requirement for integrated strategies that synchronize digital tools with human decision-making and organizational procedures (Fernandez-Vidal et al., 2022; Keskin & Çiçekli, 2023).

Framework Architecture. The three interrelated parts of the Yatsiuk Operational Clarity Framework - structural, cognitive, and executional - each address a distinct facet of operational complexity.

To ensure that efficiency gains are sustained, these components should be implemented in concert (Figure 3).

1. Simplified Process Architecture (Structural Component)

The structural part of this operational clarity framework focuses on the simplicity and standardization of organizational processes. A simple process architecture is a flow chart of all the different workflow

steps (from start to finish) and who is responsible for what in every step, and it reduces as much variability as possible in repetitive service functions.



Figure 3. Suggested Conceptual Framework with Key Outcomes

Research repeatedly demonstrates that the simplification of process architectures is a prerequisite to the successful adoption of digital transformation and automation initiatives. The digitization of poorly defined or overly complex processes frequently leads to increased inefficiencies and manager overloads rather than improvements (Aldoseri et al., 2023; Cosa & Torelli, 2024).

Simplifying a process architecture will increase transparency, the ability to duplicate the same process repeatedly and the potential for organizational learning. For example, an architect for a landscaping or outdoor service company would be able to create a process architecture for their company that would include standard service categories, a checklist for common tasks and specific pathways to escalate non-standard events.

2. Heuristic Decision-Making (Cognitive Component)

The cognitive part of the operational clarity framework deals with the cognitive issues of running operations by establishing how to formally utilize heuristics when making operational decisions. Heuristics are simplified decision-making rules that allow managers and supervisors to make effective decisions quickly under conditions of uncertainty, time sensitivity and limited information. The literature on decision-making has consistently shown the importance of heuristics in both strategic and operational decision-making, especially in small to medium-sized businesses and in dynamic service environments (Molina-Abril et al., 2025; Rajagopal et al., 2022).

Heuristics within the Yatsiuk Operational Clarity Framework are used to structure managerial judgment rather than replace it. Within the proposed framework, heuristics establish a mechanism to guide recurring operational decisions such as which tasks to prioritize, which crews to assign to which tasks, which route to take to accomplish those tasks and in what order to complete the tasks. Heuristics are a way of providing a mechanism to make the decision logic of organizations transparent and duplicable so that cognitive load can be reduced, consistency can be increased and coordination between levels of an organization can be improved.

3. Digital Tools as Operational Enablers (Executorial Component)

The executorial component of the framework examines the role of digital tools as operational enablers and monitors. Digital technologies provide the basis for implementing and executing simplified processes and heuristic decisions throughout geographically distributed field operations. Studies demonstrating the effectiveness of digital transformation in improving operational performance indicate that digital tools are most effective when they are aligned with organizational routines and decision structures (Spanaki et al., 2025; Yu et al., 2022). Conversely, digital

transformation efforts that are misaligned with organizational routines and decision structures will amplify process fragmentation and information overload (Burton et al., 2024).

Landscaping and outdoor service companies use digital tools like workforce scheduling software, mobile applications to manage tasks, and performance dashboards to coordinate, communicate and receive feedback in real-time. Digital tools are not intended to function independently as decision makers; they are designed to implement previously defined processes and decision rules.

Enabling Organizational Conditions. The success of the three main elements of the framework relies upon the existence of an array of enablers in the form of organizational conditions. There have been numerous previous studies that have identified the value of leadership commitment, organizational culture and knowledge sharing systems as being crucial in determining the outcome of a digital transformation (Leso et al., 2023; Olan et al., 2022).

In addition, flexible performance management systems will also contribute significantly to ensuring that the behaviors that are desired continue to be reinforced and that there is continued opportunity for ongoing improvement (Cosa & Torelli, 2024).

These enabling conditions exist throughout all elements of the framework and they are responsible for influencing the extent to which the integrated and aligned mechanisms can be maintained over time.

Framework Dynamics and Expected Outcomes. The framework functions through the interaction of its three elements. The simplified process architecture results in less structural complexity, the heuristic decision-making results in less cognitive complexity and the digital tools result in less coordination and information complexity.

When the three elements are aligned, the mechanisms function together to convert operational uncertainty from a source of chaos to a controllable state of structured variability.

Anticipated outcomes are improved reliability of scheduling, increased reductions in operational friction, greater consistency of service and increased managerial control with less loss of adaptability.

Thus, the framework conceptualises operational clarity as the organization's ability to manage uncertainty in a systematic manner rather than eliminating it altogether.

Limitations and future directions

However, despite the above-mentioned contributions, the current study contains a number of limitations that need to be recognized. Firstly, the study is conceptual in nature and is based on a qualitative synthesis of the available literature as opposed to the collection of empirical data. Although the former is appropriate for the purpose of developing theory and constructing frameworks for integrating previously separate bodies of research, it limits the potential to evaluate the practical utility of the proposed framework in actual landscaping operations.

Secondly, although the framework was developed specifically for use in landscaping and outdoor services, the majority of the literature that was used to develop the framework originates from other service industries, operation management and other outdoor-related sectors (e.g., horticulture and forestry).

While these domains exhibit many operational similarities, they also contain some contextual differences that may affect the transferability of particular practices or tools. Therefore, the framework should be viewed as a model to guide rather than a prescription for organizations to follow.

Thirdly, the study did not distinguish greatly between organizational size, ownership and market conditions. Landscaping organizations range greatly in size, from small owner-operated businesses to large regional service providers. Therefore, future research could investigate how the proposed framework applies to different organizational contexts and levels of digital maturity.

Three areas of future research have therefore been identified. Firstly, empirical validation using case studies or field-based observation would provide invaluable insight into how well the framework operates in practice and how organizations are able to implement the various components of the framework over time.

Secondly, quantitative studies could investigate the relationship between process simplification, heuristic decision making and digital tool adoption and their combined effect on operational performance metrics.

Finally, future research could investigate the incorporation of emerging technologies, e.g., artificial intelligence and predictive analytics, within the framework while maintaining the balance between human judgement and algorithmic support.

Conclusion

The purpose of this study was to find ways to enhance operational efficiency in the delivery of landscape and outdoor services through the use of digital technology, heuristic decision-making methods and process simplification. The study has addressed the persistent problems of fragmentation, uncertainty and reactive co-ordination in field-based service environments by developing an academic framework which takes contemporary research on digitalization and operational management and transforms these into a practical model.

In addition, the results demonstrate that clarity of operation cannot emerge solely as a result of the introduction of new technologies. Clarity can only emerge when digital technologies are intentionally connected to simple process structures and explicit decision rules that enable the exercise of human judgement in uncertain conditions. In organizations delivering landscaping and outdoor services where there will inevitably be some degree of environmental variability and workforce movement, this connection between technologies and process structure enables organizations to manage complexity and not become overwhelmed by it.

Ultimately, by combining process simplification as a structural base; heuristic decision-making as a cognitive mechanism and digital technologies as a means of enabling execution of decisions, the suggested framework provides a comprehensive explanation of how service based organizations may move from a position of operational chaos towards one of structured efficiency. In doing so, the proposed framework also extends current literature relating to digital transformation by highlighting the importance of decision logic and process design in field-based service environments.

From a practical viewpoint, the outcomes of the study have implications for managers of landscaping and outdoor service providers who should consider clarity of processes and decision rules prior to investing significant funds in the development and implementation of new technologies. From a theoretical perspective, the proposed framework offers a basis for further empirical research on trajectories of digitalization in service-intensive and outdoor industries.

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