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Digital Reconfiguration of Matching Practices in Platform-Based Logistics Enterprises: A Routine Perspective

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Abstract: In low-frequency, high-risk business-to-business (B2B) platform logistics, the matching of transportation resources with customer demand relies heavily on the experiential judgment of operational personnel. While such reliance ensures flexibility, it also poses challenges, including difficulties in information integration, high cross-departmental coordination costs, and limited traceability of decision-making processes. Existing studies have primarily examined the formation mechanisms of organizational routines or the effects of digitalization on organizational action patterns. However, there is a lack of systematic analysis of how digital systems gradually embed into experience-dependent B2B logistics matching, reconfiguring specific workflows and collaboration practices. Adopting an organizational routines perspective, this study conducts a single-case study of a maritime petrochemical logistics platform. It examines how the progressive embedding of a digital system reconfigures matching practices by integrating dispersed information, generating system-generated plans, and establishing a shared informational basis. This process reshapes the sequence of actions, the locus of judgment, and collaboration modes, stabilizing experiential judgment while enhancing traceability and transmissibility. The findings provide an empirical account of the intervention path of digital technology in experience-dependent platform logistics, offering insights for digital transformation in comparable operational contexts.

Keywords: Platform-based logistics; Matching practices; Organizational routines; Digital reconfiguration; Experiential dependence; Case study

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1. Introduction

In platform-based logistics enterprises, matching transportation resources with customer demand constitutes a sequential process involving order processing, plan formulation, and execution coordination. This matching process is often constrained by incomplete information and stringent fulfillment requirements, making it difficult to fully formalize [1]. This is especially the case in B2B logistics, where orders are typically low-frequency, high-

value, and subject to strong contractual constraints. For instance, a single maritime petrochemical shipment can involve millions of RMB and must adhere to strict schedules, port protocols, and safety regulations. Consequently, matching extends beyond capacity allocation to encompass judgments regarding client relationships, contract compliance, and risk assessment, making experiential judgment a central operational logic.

Over time, practices related to "how to match" are repeatedly enacted, gradually stabilizing into recognizable patterns. Frontline staff develop tacit, coordinated actions for information acquisition, judgment formation, and collaboration, enabling the firm to operate in complex and uncertain contexts. For example, in handling a petrochemical shipment, a logistics agent may reference historical shipping schedules, carrier reliability, and cargo stability while coordinating in real time with port operations, warehousing, and customer service. Such stable yet highly situated patterns of action are conceptualized as organizational routines, repetitively performed, recognizable patterns of interdependent actions enacted by multiple actors, encompassing both ostensive (abstract) and performative (enacted) dimensions [2].

As business scales and platform complexity increase, this mode of operation faces mounting pressures. While experiential judgment remains indispensable for managing uncertainty, such as sudden schedule changes or supply chain disruptions, its highly individualized nature complicates information integration, cross-departmental coordination, and process traceability [3]. For instance, in the early phase reliant on personal judgment, information flowed via phone calls or instant messaging, leading to discrepancies in understanding across departments. New employees require extended observation and training before contributing effectively to decision-making.

In response, digital systems have been introduced to support matching processes. Firms consolidate data on orders, capacity, and historical records, aiming to enhance coordination and reduce risk. In practice, however, digitalization does not replace experiential judgment; rather, systems are gradually embedded within existing practices, invoked selectively in specific operational contexts, and interwoven with established action patterns [4]. This gradual embedding enables continuous adjustment and incremental reconfiguration of matching routines.

While prior research has discussed routine evolution and the effects of digital technologies on organizational action, there is a scarcity of systematic analysis of the micro-level processes through which digitalization influences experience-dependent B2B logistics matching. Addressing this gap, this study adopts a case-study approach to analyze how the continuous embedding of a digital system reshapes the execution sequence, judgment locus, and collaboration modes, elucidating the interplay between experiential judgment, organizational coordination, and digital technologies.

2. Literature review

To analyze the digitalization of matching practices in platform-based logistics, existing research can be structured along three dimensions, corresponding to the core issues of experiential judgment, digital intervention, and routine evolution in low-frequency, high-risk contexts. This framework facilitates a separate understanding of the empirical basis of matching practices, the support provided by digital systems, and the dynamic characteristics of routine adaptation under complex operational conditions.

2.1. Organizational routines as a lens for understanding action patterns

Organizational routines are understood as repetitive, recognizable patterns of interdependent actions enacted by multiple organizational members, serving as a key unit linking individual agency and organizational structure.

Early research emphasized their role in maintaining organizational stability and efficiency, viewing routines as replicable behavioral templates [5]. Practice-oriented scholarship subsequently argues that routines are not static but are maintained, adapted, and reproduced through ongoing performance in specific situations [6].

Routines encompass both ostensive (abstract understanding of the pattern, e.g., prioritize reliable carriers) and performative (enacted, context-specific actions, e.g., manually comparing capacity information) dimensions. This perspective provides a foundation for analyzing experience-intensive practices, helping to reveal the implicit logic and action sequences embedded in operational routines.

2.2. The impact of digital intervention on experience-based routines

With the proliferation of digital technologies, scholars increasingly examine how digital systems influence organizational action. Research indicates that as digital tools become embedded into organizational practice, they exert micro-level effects on routines by reshaping information access, pacing of judgments, and responsibility delineation [7]. Studies show that system functionalities, data structures, and algorithmic recommendations can support decision-making, yet practitioners selectively engage these features depending on situational demands [8].

In experience-dependent operations, digitalization tends to influence routines by adjusting the sequence of actions and modes of collaboration rather than by standardizing or eliminating experiential judgment. Digital systems enhance visibility and traceability, but practitioners retain flexibility in applying their judgment. For instance, in ship-cargo matching, a digital system integrates historical schedules, real-time capacity data, and contract constraints to generate preliminary matching options. Practitioners then refine these proposals, making human-digital co-production the norm. This provides a theoretical lens for examining the processual impact of digitalization on platform logistics matching routines.

2.3. Routine adaptation in experience-dependent, high-stakes contexts

In low-frequency, high-risk contexts that are difficult to fully formalize, experiential judgment forms a critical basis for organizational action [9]. Research suggests that as operational scale increases and cross-departmental coordination intensifies, experience-dependent routines can reveal inefficiencies, such as rising costs for information integration and collaboration. Some studies note that organizations introduce rules, tools, or technology to support routine execution, but these interventions typically occur incrementally [10].

The matching practice examined here exemplifies such a context: decisions involve high-value orders, complex constraints, and reliance on practitioner expertise, while cross-role collaboration requires flexibility. Consequently, examining how routines adapt and stabilize following digital intervention becomes essential.

2.4. Research gap and contribution

In summary, prior literature provides a theoretical foundation for understanding the interplay between routines and digital technology, but it remains insufficient for explaining the micro-dynamics in highly experience-dependent B2B logistics matching. This study addresses this gap by treating the specific matching routine as the unit of analysis. Through a process-oriented case study, it investigates how a digital system gradually embeds into operational practice, influencing the sequence of actions, the locus of judgment, and collaboration modes, thereby driving incremental reconfiguration of the routine.

3. Research design

A qualitative single-case study approach is employed to explore the micro-level reconfiguration of matching routines under digitalization. This method is well-suited for answering "how" and "why" questions while capturing the progressive evolution of complex organizational phenomena in context [11].

The research subject is a B2B platform enterprise specializing in maritime petrochemical logistics. Its matching operations are characterized by high-value orders, complex operational constraints, and a strong reliance on the experiential judgment of frontline personnel. In recent years, the firm has progressively introduced a digital system to support matching processes. Importantly, the system has not replaced manual judgment but has been embedded within existing operational practices, providing a suitable context for observing routine adaptation and incremental reconfiguration.

Data collection relied primarily on semi-structured interviews, internal documents, and non-participant observation. Interviewees included heads of IT and product departments, system managers, and operational supervisors. Interviews focused on the matching workflow, system usage, data management, and risk control. System demonstrations and on-site observations helped map key stages: from order generation and system-generated plan recommendation to matching, execution, and settlement, as well as the interaction between the digital system and other office communication tools. These methods enabled direct observation of the interplay between experiential judgment and digital system support, providing rich empirical evidence for analysis.

Data analysis followed the open-axial-selective coding process. Initial concepts such as "experiential judgment," "system-aided decision-making," and "cross-departmental coordination" were categorized into broader dimensions, including information acquisition, judgment formation, collaboration patterns, and system interaction. The central analytical thread, "how digitalization reconfigures the matching routine", was used to establish logical relationships among these dimensions, forming the foundation for the processual analysis presented in the following section.

4. The process of digital reconfiguration in matching practices

This section examines the operational processes of matching practices in the case enterprise, focusing on how the digital system's progressive embedding has altered routine execution. The analysis begins with actions following order entry and traces how repeated enactment stabilizes into reconfigured routines.

4.1. Pre-digital matching routine and emerging pressures

In the early phase, the matching routine was triggered after order entry and involved a series of judgments and collaborative actions concerning vessels, cargo, and related operational constraints. Although orders were digitized, the core matching work relied heavily on the experiential judgment of agents. Critical information was dispersed across roles, requiring agents to manually integrate details and communicate repeatedly to progress matching.

In this context, matching outcomes depended largely on an agent's ability to make timely judgments about capacity, client needs, and potential risks under incomplete information. Experience was essential, where personnel familiar with specific clients and routes could swiftly generate solutions and resolve issues through flexible communication. While effective at moderate business volumes, this approach relied on individual expertise rather than codified procedures.

As order volume and operational complexity increased, pressures on the routine emerged. More orders and constraints amplified the frequency of information exchanges across roles, extending the matching cycle.

Judgment expertise resided primarily in individuals, lacking a stable organizational repository, making knowledge transfer to new employees difficult.

These pressures manifested gradually. Agents recognized that relying on personal experience and ad-hoc communication was increasingly insufficient. The tension between the routine's experiential dependence and emerging process requirements became apparent, motivating deeper digital system integration.

4.2. Changes under digital intervention

4.2.1. Reconfiguration of information gathering

Previously, information relevant to matching was dispersed among individuals and departments. Agents actively sought order details, capacity data, and historical records via phone or instant messaging. This approach allowed situational flexibility but rendered information acquisition dependent on personal initiative and communication efficiency.

With digital system adoption, order-related information is aggregated and presented in a structured interface immediately upon order entry. Agents begin tasks by reviewing this consolidated data, supplementing with additional communication only as needed. Information gathering thus becomes system-mediated rather than the primary precursor to judgment.

This shift offers several advantages: centralized data reduces omissions and repetitive confirmation, providing a more complete basis for judgment. However, the structured presentation also shapes judgment patterns: data displayed in the system becomes the primary reference, potentially sidelining subtle experiential cues that require off-system communication. Over repeated enactment, a stable pattern emerges: agents routinely use system data as the foundation for matching, supplemented by targeted communication as situationally necessary. This sequence stabilizes as a key component of the reconfigured routine.

4.2.2. Forward-shifting of judgment within the workflow

Initially, judgment and execution were intertwined: agents adjusted matching plans continuously during implementation. The system now generates preliminary plans before execution, producing multiple feasible options based on historical data and preset rules. Agents select and refine these options, concentrating judgment in the pre-execution stage and clarifying subsequent execution steps.

This change enhances process clarity and provides all roles with a shared reference point. Yet shifting judgment forward does not eliminate uncertainty; rather, it relocates its recognition and management. Problems that previously arose during execution must now be anticipated during plan formation, demanding more comprehensive foresight. Over time, "checking the system proposal first" becomes a widely accepted norm, stabilizing judgment logic while allowing continuous adaptation to new uncertainties.

4.2.3. Collaboration oriented around system-generated plans

Matching requires multi-role collaboration. Initially, coordination was situational and ad-hoc. As system-generated plans become the common starting point, different roles orient their work around the shared plan. This alignment reduces repetitive confirmation and enhances predictability. Collaboration becomes structured, yet agents still negotiate adjustments within the framework provided by the system. Over sustained use, collaboration around system proposals becomes standard, evolving into a stable component of the matching routine.

4.3. Gradual nature of digital reconfiguration

Overall, the digitalization of matching unfolds incrementally within routine operations. System introduction is accompanied by continuous practice adjustments, embedding influence through repeated enactment. The tension between experiential dependence and process constraints is rearticulated within this new operational structure.

At the operational level, matching transitions from experience-dependent actions to rule- and data-supported practices, preserving responsiveness while gaining stability. At the organizational level, cross-departmental enactments within the system iteratively refine processes and data fields, solidifying the routine. Technologically, system integration of historical, real-time, and risk information extends visibility and enhances judgment continuity, enabling human-computer collaboration.

The digital reconfiguration thus progresses gradually, maintaining reliance on situational judgment and relational coordination while enhancing stability and reproducibility, a clear manifestation of incremental transformation.

5. Discussion and implications

5.1. Reconfigured matching routines in a digital context

The process analysis above indicates that the introduction of the digital system did not result in a radical, discontinuous transformation of matching practices in the platform logistics firm. Instead, system functionalities were progressively invoked within operational contexts and adapted around existing experiential judgment logics.

The reconfiguration of the matching routine is manifested in three primary dimensions: the sequence of actions, the locus of judgment, and modes of collaboration. Notably, experiential judgment remains central to decision-making. This suggests that in experience-dependent operations, digitalization primarily functions by reorganizing the mode of action rather than replacing experience entirely. The system enhances stability, traceability, and shareability of previously tacit experiential knowledge, embedding it within organizational routines.

5.2. Theoretical implications

This study contributes to organizational digitalization literature by detailing how digital tools influence operational routines at the action level. Specifically, it demonstrates that in B2B platform logistics contexts, digital technology gradually reconfigures routine execution through incremental embedding, illustrating the co-evolution of technology and practice.

By focusing on a concrete matching routine, the study illuminates mechanisms through which digital systems as follows:

(1) Restructure information acquisition patterns;

(2) Shift the locus of judgment earlier in the workflow;

(3) Redefine collaboration around shared system-generated plans.

These findings advance theoretical understanding of how digital interventions interact with experience-based routines, showing that system adoption does not eliminate human judgment but transforms its enactment and coordination across organizational boundaries.

5.3. Practical implications

For platform logistics enterprises undertaking digital transformation of matching operations, the study provides

several actionable insights.

5.3.1. Technology as an enabler, not a substitute

Digital systems should not be viewed merely as replacements for experiential judgment. Instead, they function to support decision-making and coordination, ensuring that human expertise is effectively integrated with system capabilities.

5.3.2. Incremental embedding of system functions

Gradual integration of digital tools allows routines to adapt without disrupting existing operational patterns. Firms can maintain flexibility in handling complex, high-stakes orders while improving efficiency and traceability.

5.3.3. Human-computer collaborative practices

Digital intervention facilitates structured, transparent collaboration. By establishing common reference points, system-generated plans reduce uncertainty in coordination and enable multi-role collaboration, ultimately stabilizing operational routines. In practice, these strategies help firms balance responsiveness with reliability, achieving stable human-computer collaborative operations in highly experience-dependent contexts.

5.3.4. Limitations and directions for future research

As a single-case exploratory study, the generalizability of the findings is limited. Future research could adopt multiple-case comparisons across different logistics sectors (e.g., express delivery, full-truckload transportation) or other professional service industries. Such comparative analyses would help uncover variations in the pathways of routine digitalization, influenced by differing knowledge types, organizational power structures, and institutional contexts.

Disclosure statement

The author declares no conflict of interest.

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