

The Impact of Prepositioned Warehouse Layout on Consumers' Purchase Decisions in Instant Retail: A Case Study of Meituan Flash Buy

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Abstract

Driven by the dual forces of the digital economy and consumption upgrading, instant retail has evolved into a mainstream consumption model. As the core infrastructure of instant retail, prepositioned warehouses (PWs) significantly influence platform operational efficiency and consumer experience. However, existing research has largely focused on PW operations optimization, with limited exploration of how PW layout shapes consumers' purchase decisions. Taking Meituan Flash Buy as a case study and employing a literature-based research approach, this paper develops a theoretical model with customer perceived value as a mediator and platform service quality as a moderator. The findings reveal that PW density, delivery timeliness, and inventory adequacy positively affect purchase decisions, whereas service radius exerts a negative effect. Customer perceived value mediates these relationships, and platform service quality plays a positive moderating role. While Meituan Flash Buy demonstrates advantages in its PW network configuration, further refined operations management is warranted. This study enriches relevant theories and offers practical insights for instant retail platforms seeking to optimize PW layouts and enhance user stickiness.

Keywords

instant retail, front warehouse, purchasing decision, perceived value, service quality

1. Introduction

The rapid iterative advancement of the digital economy, coupled with the comprehensive upgrading of national consumer demand, has emerged as the dual-core driving force behind the transformation of the new retail industry. These forces have fundamentally reshaped consumers' daily shopping scenarios and habits, propelling instant retail beyond the boundaries of traditional retail. Once a supplementary business format, instant retail has evolved into a mainstream consumption model that accommodates the fragmented, on-demand needs of the general public. Against this backdrop of industrial evolution, prepositioned warehouses—leveraging their core advantages of proximity to end consumers, rapid order response, and high last-mile delivery efficiency—have transcended the time constraints inherent in traditional supermarkets and

warehousing distribution. Consequently, they have become the essential infrastructure for instant retail platforms to achieve “minute-level delivery” services.[1]

The spatial siting of prepositioned warehouses, their service coverage, delivery timeliness, and

dynamic inventory management capabilities constitute core elements in the operational development of instant retail platforms. These factors not only directly determine operational efficiency, cost control, and market competitiveness but also—through their influence on consumer experience—profoundly shape shoppers’ purchase choices, usage satisfaction, and repurchase intentions [2]. A review of the extant literature reveals that current research on prepositioned warehouses has predominantly focused on operational and technical dimensions such as location optimization, delivery route planning, and inventory scheduling, primarily addressing platform efficiency concerns. However, few studies have systematically examined, from a consumer perspective, the deeper mechanisms through which prepositioned warehouse layout affects consumers’ purchase decisions. Moreover, the interactive moderating roles of two critical variables—consumer perception and platform service quality—have been largely overlooked, leaving a notable gap in understanding the underlying mechanisms. To address this gap, this study constructs a theoretical model with customer perceived value as a mediating variable and platform service quality as a moderating variable, systematically analyzing the specific pathways and intrinsic mechanisms through which prepositioned warehouse layout influences consumers’ purchase decisions. Using Meituan Flash Buy as a representative case, the study further conducts an optimization analysis, thereby contributing to filling the identified research lacunae.

2. Research Objective

This study systematically reviews the relevant literature and research findings in the domain of instant retail and prepositioned warehouse (PW) layout, both domestically and internationally. A comprehensive and systematic synthesis is conducted around key research areas, including the core dimensions of PW configuration, the logic underlying consumers’ purchase decisions, the mediating mechanism of customer perceived value, and the moderating role of platform service quality. Moving beyond the limitations of prior studies that predominantly focus on single operational dimensions, this research integrates PW network spatial layout, platform service systems, and consumer behavior, with a particular emphasis on the intrinsic relationship between PW layout and consumers’ purchase decisions. It clearly delineates the causal pathways and boundary conditions governing the interactions among these variables.

Furthermore, drawing on the actual operational context and PW network practices of Meituan Flash Buy, this study identifies feasible pathways and actionable strategies for optimizing PW layout, thereby formulating evidence-based optimization approaches aligned with current industry development trends. Theoretically, this research effectively addresses a notable gap in the existing instant retail literature concerning the interface between PW layout and consumer behavior. It enriches and refines the analytical framework of factors influencing consumers’ purchase decisions and broadens the theoretical perspective on PW operational models. Practically, the findings offer scientific and actionable insights for PW network planning, spatial resource allocation, inventory scheduling, and service system upgrading on instant retail platforms. These insights support platforms in reducing costs, improving efficiency, and enhancing both consumer experience and user stickiness. As such, this study holds significant theoretical value and practical implications for advancing the standardized, refined, and high-quality development of the instant retail industry [3].

Research Objective 1: To identify the dimensions through which prepositioned warehouse (PW) layout in instant retail influences consumers’ purchase decisions.

Research Objective 2: To examine how—and in what capacity—customer perceived value functions in the process through which PW layout in instant retail affects consumers’ purchase decisions.

Research Objective 3: To investigate how—and in what capacity—platform service quality functions in the process through which PW layout in instant retail affects consumers’ purchase decisions.

3. Literature Review

3.1 Customer Perceived Value Theory

Customer perceived value (CPV) represents a core subjective evaluative metric in consumers' purchase decision-making. Specifically, CPV refers to the holistic psychological assessment formed by consumers after comprehensively and subjectively weighing the perceived benefits ("gains") derived from a product or service against the perceived sacrifices ("losses") incurred throughout the complete purchase and consumption experience [2]. In the context of instant retail, the theoretical essence of CPV aligns closely with the characteristics of time-sensitive consumption, wherein consumers' perceived value is primarily manifested across core dimensions such as time efficiency, shopping convenience, and service reliability. A scientifically and rationally designed prepositioned warehouse layout can effectively shorten delivery radii, compress fulfillment lead times, and substantially reduce consumers' temporal and cognitive effort costs. As a result, consumers perceive shorter waiting times and greater fulfillment reliability, which significantly enhances their shopping satisfaction and reinforces their immediate purchase intention and consumption propensity.

3.2 Supply–demand Matching in Retail Services Theory

The theory of supply–demand matching in retail services serves as the foundational theoretical framework guiding the layout of prepositioned warehouses (PWs) in instant retail. This theory emphasizes that the scale of resource deployment, spatial distribution, and integrated service capacity on the supply side of the retail market must be closely aligned with the spatial distribution of demand, consumption timeliness requirements, and service expectations on the consumer side [3]. In the context of instant retail, a PW fundamentally functions as the core responsive interface and service system that connects the supply side with end-consumer demand. When the location and coverage radius of PWs are well aligned with the spatial clustering of consumers and their demand patterns, efficient resource utilization and precise supply–demand matching can be achieved, thereby ensuring service quality. Conversely, imbalanced PW layouts may result in service blind spots, delays in delivery timeliness, and idle or wasted warehousing and labor resources, ultimately constraining platform operations and development.

3.3 Instant Logistics Services Theory

The theory of instant logistics services focuses on the fulfillment system within the instant retail context, with particular emphasis on how core elements such as delivery network coverage, order response speed, and product inventory availability critically determine overall service quality [1]. Within the fulfillment chain of instant retail, the prepositioned warehouse (PW) serves as a key physical node for the execution of instant logistics, undertaking the essential functions of product storage, rapid picking, and short-distance delivery. The PW's service radius, minute-level delivery timeliness, and dynamic inventory adequacy directly determine the platform's fulfillment capability, shape whether consumers can successfully obtain desired products within expected time windows, exert a substantial influence on user consumption experience, and ultimately play a critical role in consumers' real-time purchase judgments and decision-making behaviors.

3.4 A Review of Research on Prepositioned Warehouse Layout and Consumer Behavior

Existing research has confirmed that the core indicators of prepositioned warehouse (PW) layout—namely, layout density and service radius—exert a significant direct influence on consumer purchase behavior. Zhuang and Yang [4] demonstrate that a higher density of PWs within a given area enhances consumer accessibility and spatial reachability, thereby improving perceived shopping convenience and effectively stimulating purchase intention. Conversely, an excessively large service radius of PWs lengthens delivery distances and increases delivery times, thereby diminishing consumer confidence. Moreover, delivery timeliness stability and product inventory adequacy have also been identified as critical drivers of consumer repurchase behavior [5]. However, most current studies remain focused on the operational level of platforms, overlooking the mediating pathway of consumer subjective perception and lacking systematic analysis of the underlying mechanisms that operate within consumers.

4. Key Finding

4.1 Positive Effects of Prepositioned Warehouse Density, Delivery Timeliness, and Inventory Availability on Consumers' Purchase Decisions

Through a systematic review of relevant domestic and international literature, this study finds that the characteristics of prepositioned warehouse (PW) layout serve as important antecedents influencing consumers' purchase decisions. Specifically, a higher density of PWs—reflected in more comprehensive service coverage and more balanced spatial distribution within a given area—effectively enhances consumer accessibility and reach efficiency, thereby significantly strengthening consumers' immediate purchase intentions. Furthermore, platform delivery timeliness and inventory assurance capabilities play equally critical roles. Shorter delivery times and higher levels of product inventory availability more precisely align with consumers' instant and urgent demand characteristics, effectively mitigating negative issues such as stockouts and fulfillment delays, and thus exert a significantly positive promoting effect on consumers' purchase decisions. The above logical framework and core conclusions are robustly supported by existing studies, including those of Zhuang and Yang [4] and Yi and Liu [5].

4.2 Negative Effect of Service Radius on Consumers' Purchase Decisions

Extant research indicates that the appropriate delineation of the service radius of prepositioned warehouses (PWs) is a critical prerequisite for ensuring service quality in instant retail and significantly influences consumers' consumption experience and decision-making behavior. When the PW service radius is excessively large, delivery distances increase accordingly, and platform order response and overall fulfillment times are prolonged, leading directly to a substantial decline in the stability and timeliness of logistics services. For consumers who prioritize time-sensitive consumption experiences, fulfillment delays markedly diminish their shopping enjoyment and sense of instant gratification, reduce user trust and perceived credibility in the platform's services, and ultimately exert a significantly negative inhibitory effect on consumers' purchase intentions and decisions [4].

4.3 The Mediating Role of Customer Perceived Value Between Prepositioned Warehouse Layout and Purchase Decisions

Synthesizing the theoretical analyses presented above, it can be inferred that the core characteristics of prepositioned warehouse (PW) layout—including key dimensions such as layout density, delivery timeliness, and inventory assurance levels—do not directly affect consumers' purchase decisions. Rather, they exert an indirect influence on consumers' consumption choices and decision-making behaviors by shaping their holistic perceived value regarding shopping convenience, service timeliness, and fulfillment reliability. This underlying mechanism aligns with the core research logic proposed by Li et al. [6], which posits that customer perceived value drives online purchase decisions, and follows the classic research pathway of “external contextual characteristics → user subjective perception → consumer behavioral decisions.” Furthermore, this study extends and adapts the perceived value theory from traditional online consumption to the specific context of PW-based instant retail, thereby refining the decision-making formation mechanism within time-sensitive consumption scenarios.

4.4 The Positive Moderating Role of Platform Service Quality in the Relationship Between Prepositioned Warehouse Layout and Purchase Decisions

Synthesizing the findings from the extant literature, it is evident that platform service quality plays a significant boundary moderating role in the context of instant retail consumption. The multidimensional service elements encompassed by platform service quality—including interface user friendliness, customer service response efficiency, and after sales support systems—effectively amplify the positive influence of prepositioned warehouse (PW) layout on consumers' purchase decisions. When overall platform service quality is high, the timeliness and experiential advantages conferred by a well-designed PW layout are further accentuated, thereby strengthening consumers' positive perceptions and rendering the beneficial effects of PW network configuration more pronounced. This logic is robustly supported by prior research. Notably, Yi and

Liu [5] and Yang et al. [7] explicitly indicate that platform service quality exerts both a significant direct facilitating effect and a moderating enabling effect on consumer behavior in instant retail.

4.5 Meituan Flash Buy: Concurrent Layout Advantages and Optimization Opportunities

Based on a systematic synthesis of the case study findings, Meituan Flash Buy, as a leading instant retail platform, exhibits distinctive developmental characteristics in its prepositioned warehouse (PW) deployment and operations. Leveraging its dense PW network and mature fulfillment system, the platform has established a prominent competitive advantage in terms of PW layout density and delivery response timeliness, thereby efficiently meeting consumers on demand needs. However, the platform still demonstrates notable deficiencies in the fine tuning of service radius, differentiated inventory allocation, and refined management practices, indicating considerable room for improvement and optimization. These findings are highly consistent with existing scholarly work, echoing both Wei's [8] concept of PW location optimization that incorporates consumer behavioral preferences and Wang's [2] core proposition that instant retail platforms must continuously enhance supply side supply–demand matching capabilities.

5. Discussion

5.1 Theoretical Contributions

This study further enriches the research landscape of instant retail by consolidating the intrinsic theoretical linkage between prepositioned warehouse (PW) layout and consumer purchase behavior. Moving beyond the limitations of single variable analyses, the study systematically introduces customer perceived value as a key mediating variable, thereby clarifying the transmission pathway through which the physical configuration of PWs influences purchase decisions via perceived value. In doing so, it effectively extends the applicability of perceived value theory and broadens its practical boundaries within the instant retail context. Collectively, this research establishes and refines a comprehensive analytical framework of “supply → perception → behavior,” offering a theoretical reference for subsequent academic inquiries into PW site selection and user operations in instant retail.

5.2 Practical Implications

Based on a synthesis of the reviewed literature and research findings, this study offers the following practical implications for platform enterprises. First, priority should be given to deploying prepositioned warehouses (PWs) in areas with concentrated consumer demand, while maintaining the service radius within three kilometers. Second, platforms should enhance inventory turnover rates and fulfillment response speed to strengthen customer perceived value. Third, service quality should be improved through interface user friendliness, customer service responsiveness, and after sales support, thereby amplifying the positive effects of PW layout.

5.3 Limitations and Future Directions

This study develops a theoretical model primarily based on the case of Meituan Flash Buy and a selection of existing literature, employing a narrative review approach. However, it has not yet conducted large scale empirical research, and thus lacks ample empirical data to test its conclusions. Moreover, the study does not account for the potential influence of consumer heterogeneity factors such as geographic location, age, or consumption habits on the findings. In addition, insufficient attention is paid to the application of emerging technologies such as dynamic layout optimization and intelligent scheduling in prepositioned warehouse (PW) deployment, as well as their subsequent effects on consumers' purchase decisions. Future research could adopt a combined approach of surveys and platform data to further validate the proposed model pathways. Furthermore, consumer typologies (e.g., high frequency versus low frequency users) may be introduced as grouping variables to explore heterogeneous effects.

6. Conclusion

This study systematically analyzes the mechanisms through which prepositioned warehouse (PW) layout in instant retail influences consumers' purchase decisions, yielding the following key findings. PW density, delivery timeliness, and inventory adequacy exert a significantly positive effect on purchase decisions, whereas service radius has a significantly negative effect. Customer perceived value mediates this relationship, and platform service quality positively moderates it. In the case analysis of Meituan Flash Buy, the findings indicate that while the platform's PW layout possesses competitive advantages overall, further refinement in operations management could enhance consumer purchase conversion. Collectively, this study provides both theoretical grounding and practical guidance for instant retail platforms seeking to optimize PW layouts and improve service quality.

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Conflicts of Interest

The authors declare no conflict of interest.

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