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Strategic Management of Product Value in Multi-Sided Digital Marketplaces Under Artificial Intelligence Integration

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Abstract

This article analyzes how artificial intelligence changes the strategic management of product value in multi-sided digital marketplaces. The relevance of the topic stems from the rapid diffusion of generative and analytical AI across business functions and from the growing need to redesign product work around data, governance, and cross-functional coordination. The purpose of the study is to clarify how AI shifts product management from execution-heavy routines toward higher-order decisions concerning system behavior, marketplace balance, and value capture. The article uses source analysis, comparative interpretation, conceptual synthesis, and analytical generalization. The materials combine recent studies on product management, platform economics, marketplace value co-creation, human-centered AI design, responsible AI governance, and large-scale reports on enterprise AI adoption. The analytical section shows that AI compresses drafting, coordination, and first-pass analysis, while expanding the strategic significance of instrumentation, boundary-resource design, exception handling, governance, and ecosystem alignment. The findings apply to product teams operating in platform businesses that must coordinate buyers, sellers, data, models, and institutional constraints within one evolving decision system.

Keywords: multi-sided digital marketplace, product value management, artificial intelligence, product management, platform governance, data instrumentation, human-AI collaboration, value co-creation, responsible AI, digital platforms.

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Introduction

The strategic problem of product management in digital marketplaces has changed. In earlier platform growth cycles, managerial effort was concentrated around feature scoping, backlog prioritization, stakeholder synchronization, and incremental optimization of conversion surfaces. Under widespread AI adoption, those layers remain present, yet they no longer define the center of managerial leverage. Multi-sided marketplaces now operate through interacting decision systems that connect demand formation, seller participation, ranking logic, trust mechanisms, data pipelines, and governance requirements. In that environment, product value is shaped less by isolated feature delivery and more by the quality of orchestration across interdependent human and machine processes.

The urgency of this topic follows from two parallel developments. First, AI has become a mainstream organizational capability rather than a peripheral experiment. Second, digital marketplaces face greater structural complexity because they mediate interactions among heterogeneous participant groups whose incentives rarely align automatically. Product teams, therefore, confront a dual shift: they must govern AI-enabled workflows while preserving marketplace liquidity, fairness, trust, and durable value capture.

The purpose of the article is to determine how artificial intelligence restructures the strategic management of product value in multi-sided digital marketplaces. The study addresses three tasks. The first task is to identify how AI changes the object of product management work in marketplace settings. The second task is to clarify the mechanisms by which product value is created, stabilized, and appropriated in AI-enabled multi-sided environments. The third task is to formulate managerial implications for data instrumentation, human oversight, governance design, and cross-functional coordination.

The scientific novelty lies in linking three lines of inquiry that are often treated separately: recent work on the transformation of product management, research on value creation in multi-sided platforms, and organizational guidance on responsible and human-centered AI. The article treats marketplace product management as a problem of strategic system design rather than as a sequence of feature decisions, which allows a more precise reading of how AI changes leverage, accountability, and value logic in platform businesses.

2. Materials and Methods

The source base was selected to capture the intersection of AI economics, product-management transformation, and platform value creation. A. Agrawal, J. Gans, and A. Goldfarb [1] explain AI through the economics of prediction and judgment and show why organizational redesign follows from cheaper prediction rather than from automation alone. F. Angelini, M. Castellani, and L. Zirulia [2] analyze platform investment and seller competition in two-sided markets, clarifying how platform quality and market structure interact. T. Doligalski [3] develops a typology of multi-sided platforms and virtual communities and formalizes distinct logics of value creation. Google PAIR [4] provides a product-development framework for human-centered AI, connecting user needs, explainability, feedback, and error handling. K. Grigoryan, L. Martin, J. Lamarz, T. Fichtler, B. Hohn, L. Asmar, A. Kühn, and R. Dumitrescu [5] map product management tasks and roles and highlight the centrality of data in product decision-making. V. V. Jensen, A. Alami, A. R. Bruun, and coauthors [6] examine organizational expectations toward AI tools and the persistence of those expectations after practical adoption. McKinsey Global Institute [7] estimates the productivity effects of generative AI across business functions and identifies workflow redesign as a prerequisite for realizing value. Microsoft [8] codifies responsible AI requirements through domains, goals, and impact assessment. Stanford Institute for Human-Centered Artificial Intelligence [9] provides recent macro-level evidence on AI diffusion, investment, and governance. T. Wulfert, G. Strobel, and H. Hoang [10] study boundary resources in e-commerce ecosystems and explain how they enable value co-creation among marketplace participants.

The study applies source analysis to extract the conceptual positions of the selected authors, comparative analysis to align marketplace and AI-management perspectives, synthesis to connect platform value logic with product work, conceptual structuring to organize the analytical model of AI-enabled marketplace management, and analytical generalization to formulate practical conclusions for product teams. These methods were chosen because the article's goal is explanatory rather than experimental: the task is to reconstruct the evolving strategic architecture of product value management under AI integration.

3. Results

Artificial intelligence changes product management in the marketplace first by changing what counts as primary work. In conventional product organizations, a substantial share of managerial effort was consumed by writing requirements, preparing tickets, reconciling stakeholder requests, and conducting baseline analysis before decisions could be made. Recent evidence on product management tasks still shows a wide distribution of responsibilities across roles, stakeholders, and data dependencies, making the function structurally broad rather than narrowly administrative [5]. When generative AI enters this environment, drafting, summarization, and first-pass analytics become easier to scale. Yet reducing execution friction does not remove ambiguity. It shifts ambiguity upward, toward problem framing, sequencing,

rule setting, and intervention design. In a multi-sided marketplace, those decisions bear directly on which side is prioritized, which signals receive algorithmic weight, how exception cases are handled, and where value leakage begins [1; 5–7].

This shift is especially visible in marketplace settings, where value does not arise from a single user journey. Platforms must continuously coordinate heterogeneous participants, each with different expectations of quality, transparency, price, exposure, and recourse. Research on two-sided markets shows that platform investment affects size and quality under competitive conditions among sellers, while work on platform typologies demonstrates that value creation differs across platform forms and user-role configurations [2; 3]. E-commerce ecosystem research adds that boundary resources, such as rules, interfaces, and shared technical arrangements, shape how participants co-create value over time [10]. Product value management in such environments, therefore, extends beyond feature release. It concerns the maintenance of interaction architecture: ranking logic, data visibility, trust mechanisms, seller tooling, feedback channels, and governance checkpoints. AI intensifies this condition by multiplying the number of hidden dependencies between interface behavior, operational flows, and ecosystem outcomes [2; 3; 10].

For that reason, product management increasingly takes the form of system design. The relevant unit of analysis is no longer the discrete feature but the decision loop. AI lowers the cost of prediction and pattern extraction, yet strategic performance depends on how prediction is embedded into broader decision structures [1]. In marketplace products, such structures typically connect demand signals, seller actions, policy rules, and model outputs. A recommendation engine, a listing-quality score, a fraud classifier, or a pricing-support tool does not create value in isolation. Each operates within a broader framework of user incentives, marketplace liquidity, and downstream operational constraints. The product manager's work moves toward choosing which decisions should be delegated, which should remain reviewable, where confidence thresholds should be imposed, and how model behavior should be translated into intelligible marketplace actions [1; 4; 8].

The practical consequence is a redistribution of leverage from document production toward instrumentation. Data quality becomes part of the product surface rather than a hidden technical concern. The more a marketplace depends on ranking, matching, and adaptive interfaces, the more the value proposition depends on clean inputs, observable events, stable definitions, and shared semantic alignment across teams. Product management research already points to the breadth of data-supported roles within the function [5]. Enterprise evidence on AI adoption suggests that value from generative AI increases when organizations redesign workflows rather than overlaying AI on unchanged routines [7; 9]. In marketplace operations, that redesign takes a specific form: event schemas must be tightened, exception states must be visible, feedback loops must be designed deliberately, and cross-team data disputes must be resolved before model outputs can be trusted. The center of gravity moves from feature ownership toward stewardship of a reliable decision environment [5; 7; 9].

Human oversight acquires greater strategic weight under this configuration. Human-centered AI guidance emphasizes calibrated trust, explainability, feedback, control, and graceful failure as product-development concerns rather than as post hoc ethical corrections [4]. Microsoft's responsible AI framework reaches a similar conclusion from a governance angle by formalizing goals and requirements across accountability, transparency, fairness, reliability and safety, privacy and security, and inclusiveness [8]. In multi-sided marketplaces, these requirements are not abstract principles. They influence seller visibility, dispute handling, moderation thresholds, ranking consequences, and user perceptions of legitimacy. Product value weakens when participants experience opaque disadvantage, cannot contest outcomes, or encounter unstable edge-case behavior. AI, therefore, raises the strategic cost of poor governance while expanding the scale of automated decisions [4; 8].

A further transformation concerns the management of expectations. Evidence from software-development organizations shows that expectations toward AI tools vary across settings and often change after practical exposure; some anticipated gains do not persist because organizational compatibility and platform-specific limitations intervene [6]. This finding matters for marketplace product strategy because AI adoption often begins with inflated assumptions about acceleration. Generative systems can compress preparation, drafting, and baseline synthesis. They do not settle trade-offs among growth, fairness, monetization, trust, and long-term ecosystem health. Marketplace product leaders therefore create value less by maximizing raw AI usage and more by defining decision boundaries, accountability

paths, and review mechanisms for situations where model confidence, stakeholder interests, and platform goals diverge [6; 8].

The resulting transformation can be summarized as a reorientation of product value management from feature administration toward orchestration of marketplace decision systems. Figure 1 condenses that movement.

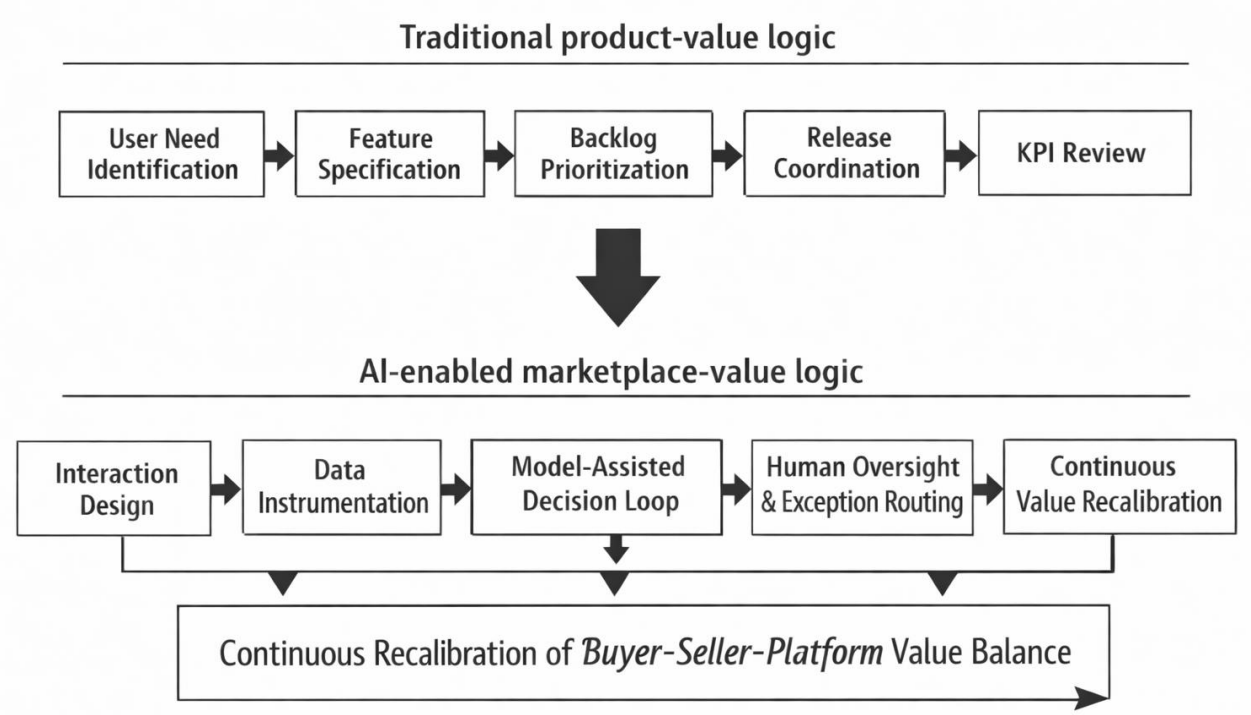

Fig. 1. Repositioning of product value management in AI-enabled multi-sided digital marketplaces (adapted from [1; 4; 5; 8; 10])

Figure 1 shows that AI compresses the procedural middle of product work more strongly than its strategic layers. In marketplace environments, the product manager's leverage moves upward toward judgment and downward into infrastructure-like questions of data, controls, and system behavior. It extends outward as well, because value outcomes depend on coordination among engineering, analytics, policy, trust and safety, legal, operations, and commercial teams rather than on a single delivery stream.

4. Discussion

The analytical results suggest that AI does not reduce the need for product management in digital marketplaces; rather, it shifts the layer at which product judgment creates value. The strongest interpretation is that marketplace product work is becoming less procedural and more constitutional. The manager increasingly defines the rules governing interaction, visibility, prioritization, and recourse. That interpretation connects the economics of AI with platform studies. If cheaper prediction expands the range of machine-assisted decisions [1], then the real strategic question becomes how those decisions are embedded within platform architectures that remain conflictual and asymmetric by design [2; 3]. Product management in marketplaces, therefore, approaches institutional design: it must structure incentives and protections across actors that never experience the product from the same position.

This reading helps explain why product-management research and platform research speak to each other more directly than they often appear to. The former details task complexity, stakeholder breadth, and data dependence [5]. The latter clarifies that marketplace value is co-produced through interaction structures, investment choices, and boundary resources [2; 10]. When AI enters, these strands converge. Product value no longer resides only in customer-facing functionality. It resides in the

quality of mediated coordination across data, model outputs, seller behavior, demand-side experience, and governance procedures. Table 1 synthesizes this shift.

Table 1. Strategic reallocation of product-management attention in AI-enabled marketplaces [1; 4; 5; 7; 8]

Legacy concentration of effort	AI-enabled reallocation of effort	Strategic meaning for marketplace value
Requirements drafting and documentation	Problem framing and decision design	Value depends on defining what the system should optimize and when it should defer
Backlog grooming and delivery tracking	Instrumentation and signal quality	Marketplace performance depends on trustworthy events, labels, and definitions
Manual first-pass analysis	Interpretation of ambiguous signals	AI increases speed, while judgment filters noise from decision-relevant information
Isolated feature ownership	Cross-functional system orchestration	Buyer, seller, policy, and model concerns must be aligned within one operating logic
Post-release monitoring	Continuous governance and exception handling	Value stability depends on recourse, oversight, and controlled adaptation

Table 1 indicates that the function is not being replaced by automation. Its scarce contribution migrates toward the design of conditions under which automated and human actions remain economically coherent and institutionally defensible. That pattern aligns with enterprise evidence that AI begins to generate stronger returns when workflows are redesigned rather than superficially accelerated [7; 9]. For marketplaces, redesign means more than efficiency. It means shaping how actors enter the system, how they are evaluated, which forms of conduct are promoted, and how disputes are handled once algorithmic mediation becomes routine [4; 8; 9].

A second interpretive point concerns organizational entropy. The article's analytical format cannot empirically measure it here, yet the selected sources show sufficient convergence to treat it as a substantive managerial issue. AI introduces additional actors, review stages, and risk categories; platform businesses already operate through multiple sides and multiple feedback channels. Combined, these conditions increase coordination load. Research on AI-tool adoption warns that expected gains may fade when organizational fit is poor [6]. Responsible AI frameworks impose formal review obligations [8], while platform research shows that even seemingly technical resources, such as interfaces and rules, carry value-creation consequences [10]. The implication is that future PM leverage in marketplaces will be tied to the ability to reduce coordination loss between product, engineering, analytics, governance, and commercial functions. Table 2 captures the main tensions.

Table 2. Strategic tensions in AI-enabled multi-sided marketplace management
Compiled from [2; 3; 6; 9; 10]

Strategic tension	Why does it intensify in multi-sided marketplaces	Product-management implication
Growth versus fairness	One side's optimization can degrade outcomes for another side	Success metrics must be balanced across participant groups
Automation versus recourse	Scaled decisions generate more opaque edge cases	Human review paths and contestability need explicit design
Standardization versus local adaptation	Platform-wide rules meet heterogeneous seller and buyer conditions	Boundary resources should allow controlled variation without systemic drift
Speed versus institutional trust	Faster decisions can outpace explanation and accountability	Product releases require governance readiness, not only technical readiness
Data abundance versus signal reliability	More signals do not guarantee cleaner decision inputs	Instrumentation quality and shared semantics matter more than raw volume

Table 2 suggests that AI reinforces a long-standing truth about marketplaces: value cannot be governed by a single metric or by a single side of the exchange. Product strategy must keep the marketplace governable while preserving enough flexibility for experimentation and growth. This is where human-centered and responsible AI guidance becomes practically useful rather than merely normative. It offers design criteria for disclosure, explanation, feedback, and graceful failure that translate directly into marketplace trust and long-horizon retention [4; 8].

The article has several limitations. It is analytical and synthetic, so it does not test the proposed model against transaction data, ranking experiments, or longitudinal workflow evidence inside a marketplace firm. It therefore cannot quantify the relative weight of each strategic shift. The selected materials come from adjacent yet compatible literatures, which strengthens conceptual breadth but leaves room for future validation through case studies and comparative field research. Still, for the stated purpose, the analytical format is productive: it shows that product value management in AI-enabled marketplaces should be read as a problem of system constitution, data discipline, and governance choreography rather than as a problem of accelerated feature throughput alone.

5. Conclusion

The first task of the study was to identify how AI changes the object of product-management work in marketplace settings. The analysis shows that AI compresses drafting, coordination, and baseline analytical routines, while shifting managerial leverage toward problem framing, decision architecture, instrumentation, and exception governance.

The second task was to clarify the mechanisms through which product value is created and stabilized in AI-

enabled multi-sided environments. The article shows that value in such environments is produced through interaction structures that connect buyers, sellers, data, rules, and model-assisted decisions. Under these conditions, product value depends on the quality of decision loops, the design of boundary resources, and the maintenance of a workable balance among marketplace sides.

The third task was to formulate managerial implications. The study indicates that effective product leadership in AI-enabled marketplaces rests on four linked practices: disciplined data instrumentation, explicit human oversight over contested or low-confidence cases, governance mechanisms that preserve legitimacy across participant groups, and cross-functional coordination that reduces organizational fragmentation. Product managers move from feature supervision toward orchestration of evolving socio-technical systems in which economic performance and institutional trust are inseparable.

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