Mechanisms of Generative AI on Digital Platforms:

A Framework for Value Creation and Stakeholder Interaction

Prepared by: Andrew Goheen

CIS 3600 – 100 – Systems Analysis and Design

Haworth College of Business

Western Michigan University

Dr. Smriti Srivastava

1st December 2025

Abstract

Generative artificial intelligence (GenAI) fundamentally reshapes digital platforms and stakeholder value creation. This analysis identifies four key mechanisms driving this transformation: *intelligent automation, democratization, hyper-personalization, and collaborative innovation*. Intelligent automation converts boundary resources into active mediators of value creation. Democratization lowers participation barriers for non-experts. Hyper-personalization enables dynamic content adaptation at scale. Collaborative innovation positions AI as an active partner in human-AI value co-creation. Drawing from leading information systems literature, these mechanisms reveal how GenAI challenges traditional platform governance while creating unprecedented opportunities for scale, access, and innovation. This framework advances platform ecosystem theory by explaining GenAI's transformative impact.

Introduction

Digital platforms have become dominant organizational forms, with seven of the world's twelve largest companies operating on platform business models. These range from e-commerce marketplaces like Amazon to social media networks like X to mobile app ecosystems like Apple’s App Store. Generative artificial intelligence represents a turning point in platform evolution. Unlike conventional AI focused on pattern recognition, this technology can understand context, learn from examples, and generate novel outputs across text, code, images, and video. Since ChatGPT's introduction in late 2022, major platform providers have integrated such capabilities into core offerings. These developments fundamentally reshape platform

dynamics from how value is created to who participates in value creation to how governance and quality control are managed.

This integration introduces novel opportunities and challenges that existing platform theory has not properly addressed. Traditional platform governance has managed the tension between autonomy and control through input controls, output controls, and boundary resources like APIs and SDKs. However, these distinctive characteristics, the lack of standardization, tendency toward hallucinations and bias, and requirement for novel complementor (*companies selling products that add value to another company's products*) skills, continue to challenge conventional platform governance. Platform owners and their decision makers must navigate how to integrate this technology as a boundary resource while maintaining integrity and managing quality.

Literature Review

Recent research demonstrates generative AI's transformative impact on digital platforms. Wessel et al. (2025) identify four mechanisms: intelligent automation, democratization, hyper-personalization, and collaborative innovation, through which GenAI reshapes platform value creation, providing the direct framework for this analysis. Mayer et al. (2025) examine GenAI as a boundary resource through an educational platform case study, revealing governance evolution from initial resistance to distributed tuning between owners and complementors.

Engert et al. (2025) analyze self-organization versus top-down control in platform ecosystems, highlighting governance tensions applicable to GenAI integration. Complementing these, Papagiannidis et al. (2025) synthesize responsible AI governance principles, identifying quality control and ethical challenges critical for GenAI deployment. Yang et al. (2024) apply

affordance-constraint theory to AI in professional services, emphasizing skill development needs and democratization challenges.

Theoretical Gap: While individual studies address GenAI mechanisms, governance evolution, or ethical challenges, no framework synthesizes these streams to explain how GenAI simultaneously transforms platform operations while challenging traditional governance assumptions. This analysis addresses this gap by integrating the four mechanisms with boundary resource and *generativity theories* (the capacity of a platform to produce unbounded growth of new components/interactions that expand product boundaries or ecosystem participation.)

Digital Platforms and Platform Governance

Digital platforms facilitate interactions and value creation among stakeholders, platform owners manage governance, complementors extend functionality, and end users generate network effects. IS scholarship examines platforms through engineering (modular artifacts), economic (multi-sided markets), and organizational (meta-organizations) perspectives.

Platform governance balances complementor autonomy and control to ensure quality, quantity, and frequency of contributions. Traditional mechanisms include gatekeeping, rating systems, and boundary resources (APIs, SDKs, guidelines) that standardize interfaces while enabling innovation.

However, generative AI challenges boundary resource assumptions. Unlike standardized tools, GenAI thrives on diversity and multimodality, creating quality validation issues (hallucinations, biases) and requiring new complementor skills (prompt engineering/vibe coding). Platform owners must adapt governance to maintain control while preserving GenAI's generative potential.

Intelligent Automation

Intelligent automation transforms boundary resources from passive interfaces into active, intelligent mediators of value creation. Rather than presenting standardized, predetermined functions that complementors must learn through explicit documentation, AI-enabled resources actively assist complementors by understanding intentions from natural language inputs, suggesting appropriate solutions, and adapting recommendations based on feedback. This technology can enhance API functionality by interpreting natural language requests and generating appropriate API calls, dramatically lowering technical barriers. It can also automate routine content moderation by analyzing user-generated content patterns and flagging problematic materials for human review. By automating routine tasks, it frees complementors to focus on higher-value creative activities. For platform owners, this creates opportunities to scale operations without proportional infrastructure increases. However, it introduces job displacement risks for participants whose responsibilities involve routine tasks.

Democratization

Democratization lowers barriers to platform participation by enabling individuals without specialized expertise to access sophisticated capabilities. Such technology democratizes participation by abstracting away technical barriers through natural language interfaces. Non-programmers can use coding assistants to generate code; non-designers can leverage image generation tools to create visual content. By lowering entry barriers, democratization expands the potential complementor base, increasing diversity of perspectives and skills. However, it introduces challenges. Lower barriers can reduce average contribution quality if quality control

mechanisms are not adjusted. This disrupts existing power dynamics and intensifies competition. Additionally, democratization raises equity questions about who gains access to such capabilities.

Hyper-Personalization

Hyper-personalization enables dynamic, individual-level adaptation of platform content and experiences at scale. This technology enables sophisticated, context-aware personalization through its ability to process rich, multimodal user interaction data. Context-aware data synthesis allows platforms to dynamically interpret and combine multiple streams of user data. Real-time content generation enables creation of new, individualized content on demand. Scalable adaptation maintains personalization quality across millions of users simultaneously. Spotify's AI DJ integrates user listening history and preferences to generate individualized playlists. Netflix generates tailored thumbnail artwork by analyzing viewing patterns. Amazon generates unique product descriptions for each user. Such personalization strengthens user engagement and platform lock-in. However, it introduces significant challenges regarding privacy, data collection, filter bubbles, algorithmic bias, and potential manipulation.

Collaborative Innovation

Collaborative innovation extends platform generativity theory by introducing human-AI innovation. Rather than treating the technology as a tool, it becomes an active participant in value creation through continuous feedback loops between human inputs and AI-generated outputs. Continuous evolution allows platforms to build upon and improve interactions over time. GitHub Copilot refines code suggestions based on developer feedback. Collaborative creativity enables active participation in creative processes. Adobe Firefly's system can iterate on

design concepts with users, understanding design intent and building upon human creative direction. From a platform perspective, such innovation substantially expands generativity by enabling complementors to accomplish goals they could not achieve independently. However, it raises important questions about intellectual property attribution and the role of human creativity when AI participates in generation processes.

Implications and Governance Evolution

For platform owners, the four mechanisms offer unprecedented opportunities alongside novel governance challenges. While GenAI enables scaling through automation, democratization, hyper-personalization, and collaborative innovation, its inconsistent outputs demand sophisticated quality control beyond traditional boundary resources. Owners must invest in complementor training, clear usage policies, and intellectual property guidelines.

Complementors gain lowered participation barriers and reduced routine tasks, but face intensified competition, job displacement risks, and dependency on evolving platform tools.

GenAI fundamentally challenges boundary resource theory, which emphasizes standardization. Its generative nature creates tension: how can owners maintain control while preserving creative potential? Educational platform research reveals evolving governance—from restrictive control to distributed tuning where owners and complementors negotiate features through iterative resistance and accommodation.

Key governance needs include: sophisticated quality assurance (automated + human review), skill development programs, addressing bias, misinformation, IP (Intellectual Property) challenges, and labor displacement. Governance increasingly reflects negotiated compromise rather than unilateral control.

Conclusion

Generative artificial intelligence fundamentally reshapes how digital platforms create value and interact with stakeholders. This paper developed a framework identifying four key transformative mechanisms: intelligent automation, democratization, hyper-personalization, and collaborative innovation. These mechanisms reshape fundamental platform dynamics including value creation mechanisms, architectural considerations, governance approaches, and stakeholder relationships.

The mechanisms present substantial opportunities and significant challenges for platform owners, complementors, end users, and society. Platform owners must develop new governance mechanisms addressing the technology's distinctive characteristics. Complementors face expanded opportunities through lowered barriers and intensified challenges through increased competition. End users benefit from improved experiences while facing privacy and manipulation concerns. Society must address job displacement, algorithmic bias, environmental sustainability, and the many other ethical dilemmas which follow.

Platform integration of such technology demonstrates that platform evolution is actively contested and negotiated among stakeholders and decision makers with different interests and resources. **Inclusive governance approaches engaging multiple stakeholders will be critical.** By pursuing these research directions while maintaining focus on ensuring such platforms operate responsibly and equitably, information systems scholars can contribute to shaping digital platforms that harness this transformative potential while minimizing risks to stakeholders and society.

References

- Engert, M., Hein, A., Maruping, L. M., Thatcher, J. B., & Krcmar, H. (2025). Self-organization and governance in digital platform ecosystems: An information ecology approach. *MIS Quarterly, 49*(1), 91-122. https://doi.org/10.25300/MISQ/2024/18413

- Mayer, A. S., Kostis, A., Strich, F., & Holmström, J. (2025). Shifting dynamics: How generative AI as a boundary resource reshapes digital platform governance. *Journal of Management Information Systems, 42*(2), 400-430. https://doi.org/10.1080/07421222.2025.2487312

- Papagiannidis, E., Mikalef, P., & Conboy, K. (2025). Responsible artificial intelligence governance: A review and research framework. *Journal of Strategic Information Systems, 34*, 101885. https://doi.org/10.1016/j.jsis.2024.101885

- Wessel, M., Adam, M., Benlian, A., Majchrzak, A., & Thies, F. (2025). Generative AI and its transformative value for digital platforms. *Journal of Management Information Systems, 42*(2), 346-369. https://doi.org/10.1080/07421222.2025.2487315

- Yang, J., Amrollahi, A., & Marrone, M. (2024). Harnessing the potential of artificial intelligence: Affordances, constraints, and strategic implications for professional services. *Journal of Strategic Information Systems, 33*, 101864. https://doi.org/10.1016/j.jsis.2024.101864