TRANSFORMAÇÃO DIGITAL NO SUBSETOR CIENTÍFICO-TÉCNICO-PROFISSIONAL: DIMENSÕES E INTER-RELAÇÕES EM UM ESTUDO DE CASO ECOSSISTÊMICO

DIGITAL TRANSFORMATION IN THE SCIENTIFIC-TECHNICAL-PROFESSIONAL SUBSECTOR: DIMENSIONS AND INTERRELATIONSHIPS IN AN ECOSYSTEMIC CASE STUDY

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Objetivo do estudo
Este estudo analisa como as dimensões da transformação digital — Quem, Por quê, Onde, Como e O quê — se manifestam e se inter-relacionam no subsetor Científico-Técnico-Profissional do mercado editorial brasileiro, considerando sua complexidade institucional, as interdependências do ecossistema e as relações

Relevância/originalidade
O estudo avança a pesquisa sobre transformação digital ao superar perspectivas lineares centradas no nível da empresa e explicar a transformação como um processo ecossistêmico assimétrico, relacional e condicionado institucionalmente. Além disso, introduz o conceito do livro como um ativo âncora institucional.

Metodologia/abordagem
Foi realizado um estudo de caso ecossistêmico único, de abordagem qualitativa, interpretativa e abdutiva As evidências empíricas compreendem quinze entrevistas semiestruturadas em profundidade com atores do ecossistema editorial, trianguladas com fontes documentais Os dados foram analisados utilizando a metodologia Gioia e as

Principais resultados
Os resultados revelam uma transformação digital assimétrica, caracterizada por uma reconfiguração organizacional desigual, pela coopetição baseada em plataformas entre editoras concorrentes e pela mudança nos modelos de valor O livro perde centralidade econômica relativa, mas mantém sua legitimidade e seu valor reputacional,

Contribuições teóricas/metodológicas
O estudo conceitua a transformação digital assimétrica como uma condição estrutural do ecossistema, amplia a compreensão da coopetição ao incorporar respostas coletivas mediadas por plataformas, propõe o conceito de ativo âncora institucional e expande a perspectiva das capacidades dinâmicas ao identificar capacidades

Contribuições sociais/para a gestão
Os resultados orientam editoras e organizações intensivas em conhecimento na combinação de investimentos tecnológicos com coordenação interorganizacional, capacidades relacionadas a metadados, estratégias de plataforma e legitimidade institucional Os gestores devem abordar a transformação digital como um processo relacional que envolve tecnologia, identidades

Palavras-chave: Transformação Digital, Coopetição, Ecossistemas de negócios, Lógicas institucionais, Capacidades dinâmicas

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Study purpose
This study analyzes how the dimensions of digital transformation—Who, Why, Where, How, and What—manifest and interrelate within the Scientific-Technical-Professional subsector of the Brazilian publishing market, considering its institutional complexity, ecosystem interdependencies, and platform-mediated relationships.

Relevance / originality
The study advances digital transformation research by moving beyond linear firm-level perspectives and explaining transformation as an asymmetric, relational, and institutionally conditioned ecosystem process. It also introduces the concept of the book as an institutional anchor asset.

Methodology / approach
A qualitative, interpretive, and abductive single ecosystemic case study was conducted. Empirical evidence comprises fifteen in-depth semi-structured interviews with publishing ecosystem actors, triangulated with documentary sources. Data were analyzed using the Gioia methodology and the five analytical dimensions.

Main results
Findings reveal an asymmetric digital transformation characterized by uneven organizational reconfiguration, platform-based coopetition among competing publishers, and changing value models. The book loses relative economic centrality while retaining legitimacy and reputational value that support emerging digital services and platforms.

Theoretical / methodological contributions
The study conceptualizes asymmetric digital transformation as a structural ecosystem condition, extends coopetition toward platform-mediated collective responses, proposes the institutional anchor asset concept, and expands dynamic capabilities by identifying adaptive capabilities distributed across organizational boundaries and shared infrastructures.

Social / management contributions
The findings guide publishers and knowledge-intensive organizations in combining technological investment with interorganizational coordination, metadata capabilities, platform strategies, and institutional legitimacy. Managers should address digital transformation as a relational process involving technology, organizational identities, partnerships, and competing institutional demands.

Keywords: Digital transformation, Coopetition, Business ecosystems, Institutional logics, Dynamic capabilities

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1 Introduction

Digital transformation has attracted substantial attention in management, information systems, and strategy (Hanelt et al., 2021; Verhoef et al., 2021; Vial, 2019). Dominant frameworks, however, frequently conceptualize it as a progressive firm-level phenomenon in which organizations advance from digitization toward broader organizational transformation (Matt et al., 2015; Westerman et al., 2014). Such perspectives provide limited explanation of transformation trajectories in knowledge-intensive and institutionally complex fields, where technological change interacts with multiple and potentially conflicting institutional logics (Greenwood et al., 2011; Thornton et al., 2012).

In these contexts, technological adoption does not necessarily translate proportionally into organizational reconfiguration or value creation. Significant technological advances may coexist with persistent organizational, strategic, and institutional constraints, producing asymmetric digital transformation trajectories (Aguiar et al., 2023; Peukert & Reimers, 2022). Moreover, transformation increasingly occurs through interorganizational relationships mediated by digital platforms. Although the coopetition literature explains how organizations simultaneously cooperate and compete (Bengtsson & Kock, 2000; Gnyawali & Ryan Charleton, 2018), limited attention has been devoted to coopetition as a collective response to technological disruption in institutionally complex ecosystems. Recent research therefore calls for greater attention to the processual and contextual dynamics of coopetition in digital environments (Dagnino & Ritala, 2025; Klimas et al., 2024; McGrath et al., 2025).

These gaps converge into a central theoretical challenge: understanding how digital transformation unfolds when multiple institutional logics, heterogeneous organizational capabilities, and platform-mediated relationships simultaneously shape strategic responses. The Scientific-Technical-Professional (STP) subsector of the Brazilian publishing market provides a relevant empirical setting for examining this phenomenon. Focused on academic and professional content, the subsector has faced accumulated economic, technological, and institutional pressures, including declining print revenues, changing consumption patterns, the expansion of digital formats and subscription models, and the growing influence of platforms (Cerlalc, 2021; Mello, 2012; PublishNews, 2025). At the same time, it operates at the intersection of academic, governmental, market, and technological logics involving publishers, educational institutions, industry associations, regulators, and digital infrastructures.

Despite this context, existing studies tend to examine digital transformation, ecosystems, platforms, dynamic capabilities, institutional logics, and coopetition separately, providing limited understanding of how these dimensions interact. Accordingly, this study addresses the following research question: **How do the dimensions of digital transformation (Who, Why, Where, How, and What) manifest and interrelate in the Scientific-Technical-Professional subsector of the Brazilian publishing market?** The study therefore aims to analyze how these dimensions manifest and interrelate within the STP subsector. A qualitative, exploratory–interpretive and abductive approach was adopted through a single ecosystemic case study (Timmermans & Tavory, 2012). Empirical evidence comprises fifteen in-depth semi-structured interviews with publishing leaders, platform representatives, industry experts, and institutional actors, triangulated with documentary sources. Data were analyzed using the Gioia methodology (Gioia et al., 2013), while the Who, Why, Where, How, and What dimensions provided the analytical structure for examining the phenomenon.

The study contributes to digital transformation research in three ways. First, it conceptualizes digital transformation as an asymmetric and institutionally conditioned process rather than a linear technological trajectory. Second, it demonstrates how platform-based coopetition operates as a mechanism through which competing actors collectively respond to technological disruption while reconciling conflicting institutional logics. Third, it identifies the book as an institutional anchor asset, whose economic centrality declines while its legitimacy and reputational value continue to support emerging service-, subscription-, and platform-based business models.

2. Literature Review

2.1 Digital Transformation and Strategic Reconfiguration

Digital transformation extends beyond the digitization of activities and involves changes in organizational strategies, processes, capabilities, and business models (Verhoef et al., 2021; Vial, 2019). Rather than representing the simple conversion of analog resources into digital formats, it constitutes a continuous process of organizational reconfiguration mediated by technological integration and adaptation to dynamic environments (Matt et al., 2015; Westerman et al., 2014). Its development therefore involves technological, organizational, strategic, human, and institutional dimensions whose interaction influences organizations' ability to create and capture value (Mugge et al., 2020; Verhoef et al., 2021).

Such transformation, however, does not occur uniformly. In institutionally complex environments, technological advances may coexist with incomplete organizational, cultural, and strategic changes, producing asymmetric transformation trajectories (Aguiar et al., 2023; Peukert & Reimers, 2022). The dynamic capabilities perspective helps explain these differences by emphasizing organizations' ability to sense opportunities and threats, seize them, and reconfigure resources in changing environments (Teece, 2007; Teece, 2018). In digital contexts, these capabilities increasingly extend beyond organizational boundaries because resources, knowledge, and technological infrastructures are distributed across networks of interdependent actors.

2.2 Ecosystems, Platforms, and Coopetition

Digital transformation also reshapes traditional value chains into ecosystems in which multiple actors interact through simultaneous relationships of cooperation, complementarity, and competition (Nambisan et al., 2019; Verhoef et al., 2021). Value creation in these environments depends not only on individual organizational capabilities but also on coordination and resource complementarities among ecosystem participants. Digital platforms are central to this process because they mediate interactions, organize information flows, and establish governance mechanisms that influence participation and value appropriation (Gawer & Cusumano, 2014; Jacobides et al., 2018). Consequently, platforms operate not merely as distribution channels but as sociotechnical infrastructures capable of redistributing power, visibility, and access to strategic resources.

Within these arrangements, platform-based coopetition emerges when competing organizations cooperate through shared digital infrastructures while maintaining rivalry in other dimensions of value creation (Bengtsson & Kock, 2000; Gnyawali & Ryan Charleton, 2018). Recent studies emphasize that coopetition is dynamic and processual, as relationships are continually renegotiated according to technological, institutional, and competitive conditions (Dagnino & Ritala, 2025; Klimas et al., 2024; McGrath et al., 2025). From this perspective,

coopetition may evolve from a firm-level strategy into a collective mechanism for adaptation in highly interdependent ecosystems.

2.3 Institutional Logics and Complexity

The institutional logics perspective explains how values, beliefs, rules, and socially constructed meanings shape organizational behavior (Friedland & Alford, 1991; Thornton et al., 2012). Organizational fields may be characterized by the simultaneous presence of multiple institutional orders, including market, state, professional, and technological logics. When these orders impose divergent or conflicting demands, organizations face institutional complexity (Greenwood et al., 2011; Scott, 2014). Under such conditions, strategic responses depend on continuous negotiation among different sources of legitimacy rather than adherence to a single dominant logic. Digital transformation intensifies this complexity by introducing platform- and data-oriented logics based on scalability, visibility, engagement, and algorithmic mediation. These new requirements coexist with established professional, academic, governmental, and market expectations, generating tensions that can accelerate some dimensions of transformation while constraining others.

2.4 Asymmetric Digital Transformation

Integrating these perspectives, this study conceptualizes digital transformation as a multidimensional, relational, and institutionally conditioned phenomenon. Asymmetric digital transformation refers to a process in which significant technological advances coexist with incomplete strategic, organizational, or institutional reconfigurations, generating uneven patterns of value creation and capture (Aguiar et al., 2023; Peukert & Reimers, 2022). This asymmetry results from the interaction of three elements: institutional complexity, which exposes actors to multiple and potentially conflicting demands; digital platform mediation, which restructures access, interdependencies, and power relationships; and heterogeneous dynamic capabilities, which produce different capacities to respond to technological and institutional change. Within this configuration, platform-based coopetition can operate as a mechanism through which actors share infrastructures and coordinate responses while continuing to compete for content, users, and value appropriation.

To operationalize this perspective empirically, the study examines five interdependent dimensions of digital transformation: Who, referring to the actors and their positions within the ecosystem; Why, representing motivations and institutional pressures; Where, encompassing the spaces of interaction and digital mediation; How, referring to organizational and interorganizational reconfiguration processes; and What, representing the resulting changes in value, strategies, and practices. Together, these dimensions provide an analytical framework for examining digital transformation as a recursive process shaped by institutional complexity, platform mediation, and ecosystem interdependence.

3. Methodology

3.1 Research Approach and Strategy

This study adopts a qualitative, interpretive, and abductive approach to examine digital transformation as a relational and institutionally embedded phenomenon. Abductive reasoning enables iterative movement between empirical evidence and theoretical concepts, allowing unexpected patterns, tensions, and contradictions to inform theoretical interpretation (Timmermans & Tavory, 2012). The research strategy consists of a single ecosystemic case

study focused on the Scientific-Technical-Professional (STP) subsector of the Brazilian publishing market. The case is theoretically relevant because it represents a critical and revelatory setting characterized by high institutional complexity and the coexistence of academic, governmental, market, and technological logics (Yin, 2018). The unit of analysis is the STP subsector as an organizational field, while the units of observation comprise publishing houses, digital platforms, industry experts, and institutional actors. This ecosystem-level perspective enables the analysis of interdependencies and collective dynamics rather than isolated organizational responses.

3.2 Data Collection

Primary data were collected through fifteen in-depth semi-structured interviews conducted between November and December 2025 with actors occupying different positions in the publishing ecosystem. Participants were selected through purposive theoretical sampling complemented by snowball sampling to capture heterogeneous perspectives on the transformation of the subsector. Interviews were conducted online, recorded with participants' consent, transcribed in full, and systematically reviewed. The interview protocol was structured around the five analytical dimensions—Who, Why, Where, How, and What—while remaining sufficiently flexible to capture emergent themes consistent with the abductive research design. These dimensions were articulated with the theoretical perspectives of institutional logics, digital platforms, business ecosystems, and dynamic capabilities. All interview excerpts presented in the article were originally collected in Portuguese and translated into English by the authors, preserving their original meaning.

Table 1

Characterization of Interviewees

Group	Codes	Profile	n
Publishing Groups	E2, E4, E8, E13, E15	CEOs, editor, and marketing executive	5
Digital Platforms and Infrastructures	E6, E10, E14	Platform CEOs and digital-market executive	3
Field Experts/Observers	E1, E3, E7, E9	Consultants and publishing-sector experts	4
Sectoral/Institutional Coordination	E5, E11, E12	Association representatives and sector specialists	3
Total			**15**

Note. Authors' elaboration based on interviews conducted in 2025.

Documentary evidence complemented the interviews and supported data triangulation. The corpus included industry reports, market studies, specialized media, public interviews, statistical databases, and institutional publications produced by organizations such as the Brazilian Book Chamber (CBL), the National Union of Book Publishers (SNEL), Nielsen BookData, the Regional Center for Book Development in Latin America and the Caribbean (Cerlalc), the International Publishers Association (IPA), and the World Intellectual Property Organization (WIPO). These sources were used to contextualize participants' accounts, identify sectoral trends, and triangulate evidence concerning digitalization, consumption, and publishing-market performance.

3.3 Data Analysis

Data analysis followed the Gioia methodology (Gioia et al., 2013) combined with abductive reasoning (Dubois & Gadde, 2014; Timmermans & Tavory, 2012). Interview transcripts and documentary evidence were organized and coded using ATLAS.ti, complemented by Excel spreadsheets for coding control and analytical refinement. The analysis proceeded through three stages. First, first-order concepts were generated while preserving informants' terminology and interpretations. Second, these concepts were compared and organized into theoretically informed second-order themes. Third, relationships among the themes were examined to identify aggregate dimensions capable of explaining the emerging patterns of digital transformation. The process was iterative, involving continuous movement between empirical evidence, coding categories, and theoretical constructs. Pattern stabilization was observed after the sixth interview; nevertheless, all fifteen interviews were analyzed to capture variations among actors and strengthen interpretive robustness.

Table 2
Data structure of digital transformation in the STP subsector

Empirical Code (1st Order)	Emergent Theme (2nd Order)	Aggregate Dimension
Joint Platform	Shared Infrastructure	**Coopetition**
Partnership Among Competitors		
Collective Action		
Separation of Access × Content		
Collective Access Model	Governance and Legitimation of Cooperation	
Sectoral Response to Crisis		
Legitimation of the Model		
Shared governance		
Institutional Mediation	Sectoral Governance	**Institutional Coordination**
Protection of Diversity		
Public–Market Mediation		
Data Infrastructure	Data-Driven Coordination	
Environmental Monitoring		

Incremental Change	Incremental Transformation	**Asymmetric digital transformation**
Platformization of Access		
Shared Infrastructure		
Structural Inertia	Institutional Constraints	
Digital as Transposition		
Incremental Adjustment	Limited Adaptive Capacity	**Dynamic capabilities**
Managerial limits		

Note. Author's own elaboration (2026).

Interpretation subsequently involved three interconnected movements: description of informants' meanings, comparison of convergent and divergent perspectives, and theorization through the literature on institutional logics, digital transformation, ecosystems, platform-based coopetition, and dynamic capabilities. This process enabled the construction of a traceable analytical chain connecting empirical evidence to theoretical interpretation.

3.4 Research Rigor

Methodological rigor was supported through data triangulation, systematic coding, analytical traceability, and iterative comparison between empirical evidence and theory. The combination of interviews and documentary sources enhanced credibility, while the Gioia methodology provided transparency between first-order concepts, second-order themes, and aggregate dimensions. The abductive process further strengthened analytical consistency by allowing theoretical interpretations to be continuously confronted with empirical evidence. Finally, the critical and revelatory case design supports analytical rather than statistical generalization to contexts characterized by institutional complexity and ecosystem interdependence (Yin, 2018).

4. Results

4.1 Who: Actors and Role Reconfiguration

The Who dimension reveals an ecosystem in which traditional organizational roles are being reconfigured unevenly. Executive leadership, particularly CEOs, emerges as a central strategic agent responsible for technological investments, business-model decisions, and the reconciliation of innovation with established editorial identities. Editorial teams are likewise incorporating competencies associated with digital products, technological integration, marketing, and data, although the pace of this transition differs substantially among organizations.

At the organizational level, publishers increasingly move from an identity centered on producing physical books toward managing broader educational ecosystems involving content, platforms, and services. This identity shift is explicitly recognized by sector actors: *"Nowadays,*

a publishing house is almost becoming a technology company in a certain sense […] All of them have to become EdTechs" (E1). Digital platforms simultaneously become central mediators among publishers, educational institutions, and users, influencing access, distribution, and content use. Institutional actors, including industry associations and regulatory bodies, remain relevant by mediating issues involving public policy, copyright, and technological change. The resulting configuration is therefore characterized by distributed agency: publishers, platforms, and institutional actors perform complementary but sometimes conflicting roles in shaping transformation.

4.2 Why: Pressures, Motivations, and Legitimacy

Digital transformation in the STP subsector is driven predominantly by economic, technological, and institutional pressures. The structural contraction of the print-based model and the search for economic sustainability have encouraged publishers to expand digital formats, platforms, subscriptions, and alternative production models. Changes in user behavior, particularly among students seeking convenience, speed, and digital access, further weaken the centrality of traditional print-based consumption. These pressures are reinforced by logistical costs and the need for more flexible production and distribution arrangements.

Institutional change emerges as a particularly relevant trigger. The relaxation of requirements for physical books in university libraries altered the conditions under which publishers and higher education institutions organized access to academic content. As one CEO explained, *"The greater penetration of digital books in the revenue composition of STP publishers in Brazil was driven by a regulatory change"* (E4). He further noted that, as requirements for physical collections declined, digital formats gained importance and production increasingly shifted toward print-on-demand rather than inventory-based models.

This regulatory pressure converged with a broader decline in the traditional university textbook market. From an industry-level perspective, the contraction was not perceived as episodic: one sector leader reported a sustained decline in the STP segment over approximately fifteen years, followed only recently by stabilization supported by digital formats. Piracy and, more recently, artificial intelligence further intensify these pressures by challenging established mechanisms of authorship, distribution, and monetization. Consequently, transformation is driven less by a deliberate technological vision than by the need to respond to accumulated environmental pressures. The Why dimension therefore indicates a predominantly reactive and incremental trajectory shaped by the pursuit of economic sustainability and institutional legitimacy.

4.3 Where: Spaces, Platforms, and Arenas of Interaction

The Where dimension demonstrates a shift from predominantly physical spaces of production and distribution toward platform-mediated ecosystems. Bookstores and university libraries continue to perform relevant functions, but digital platforms, virtual libraries, and marketplaces increasingly structure access to academic and professional content. Publisher consortia and shared digital infrastructures are particularly important because they consolidate content from competing organizations into collective access models, while global marketplaces concentrate direct commercialization and increase dependence on external intermediaries.

This transformation also makes data and metadata critical infrastructures for content discovery and visibility. As one platform representative emphasized, *"The online buyer needs metadata—there's no one else to provide it. Metadata is essential in any sale"* (E10). Algorithmic mediation increasingly substitutes traditional mechanisms of recommendation and distribution, while content becomes fragmented across learning systems, digital platforms, and

multiple formats. At the same time, social media, audiovisual platforms, and AI-based tools compete directly for users' attention. The ecosystem thus becomes hybrid: digital arenas dominate access and intermediation, while physical and institutional spaces remain important for legitimacy, diversity, and public-policy articulation.

4.4 How: Processes, Strategies, and Organizational Response

The How dimension captures the processes through which actors respond to these pressures. Publishers increasingly combine traditional editorial activities with educational services, digital platforms, data management, and automation, moving toward an EdTech-oriented logic in which books become components of broader educational solutions. Operational changes include reduced physical inventories, greater use of print-on-demand, cloud-based infrastructures, metadata management, remote work, and the incorporation of artificial intelligence into editorial processes.

The empirical evidence also indicates that digital transformation extends beyond internal organizational change. Publishers increasingly respond through collective arrangements that allow them to share technological infrastructure, expand scale, and reduce the costs associated with isolated digital development. A sector leader explained that *"the main collaboration was the consortium formed by the leading STP publishers, which came together to create a digital library. If each national publisher had followed its own path, the cost structure would have been very difficult"* (E5).

This mechanism is corroborated by another ecosystem participant, who described the arrangement more explicitly: *"Four competitors came together, each one with 25% of Minha Biblioteca. They put their catalogs there, attentive to the digitalization movement and to what was happening in the market"* (E13). The evidence therefore shows that cooperation did not eliminate competition; rather, competing publishers pooled access infrastructure while continuing to differentiate themselves through content, authors, brands, and market positioning. These transformations also require organizational reskilling and greater integration between editorial, technological, marketing, and data-related functions. However, actors differ substantially in their capacity to implement these changes, generating incremental rather than uniform transformation. Platform-based cooperation thus represents both an adaptive response to technological costs and an ecosystem-level governance mechanism, constituting the empirical foundation for platform-based coopetition.

4.5 What: Outcomes, Value, and Revenue Models

The What dimension reveals a reconfiguration of value creation and revenue models. The book progressively shifts from being the primary economic product toward becoming part of broader service-, subscription-, licensing-, and platform-based offerings. Revenue models consequently move from unit sales toward access-based structures, particularly through digital platforms and institutional licensing. Digital content expands while the print market contracts, indicating a partial recomposition rather than complete substitution of traditional revenue sources.

This transition remains asymmetric. Digital growth has not fully compensated for the historical decline of print, while technological investments and scale requirements create new economic dependencies. At the same time, content becomes increasingly modular and integrated into digital learning environments. The book therefore acquires a dual role: although its direct economic centrality declines, its editorial legitimacy continues to support new products, services, and relationships. This shift is evident in the account of one publishing executive: *"If the company's revenue was once 65% from publishing, today it is only 15%. So,*

for me, editorial activity has become much more of a reputational function" (E4). This finding provides the empirical basis for conceptualizing the book as an institutional anchor asset.

4.6 Convergences, Tensions, and Contradictions

Cross-dimensional analysis reveals that digital transformation in the STP subsector is characterized by simultaneous convergence and contradiction. Actors converge around the need for digital infrastructures, flexible production models, metadata, platforms, and new access mechanisms, but tensions remain regarding organizational identity, platform dependence, copyright, technological costs, and changing consumption patterns.

Table 3

Convergences, Tensions, and Contradictions of Digital Transformation in the STP Subsector

Category	Convergences	Tensions	Contradictions
Business Model	Migration toward digital-first, POD, subscription, and platform models	EdTech orientation versus traditional editorial identity; platform concentration	The book loses economic centrality but retains reputational and legitimating value
Technology and AI	AI and metadata enhance scale, efficiency, and discoverability	Copyright, authorship, technological investment, and uncertainty	Technologies reduce production costs while potentially threatening the authorial base
Consumption and Education	Digital platforms expand access to technical and educational content	Competition for attention and changing reading practices	Access to information increases while deep-reading practices weaken
Intellectual Property	Collective institutional responses to digital piracy	Generative AI challenges traditional copyright and remuneration mechanisms	Piracy destroys appropriable value while simultaneously indicating market demand

Note. Authors' elaboration based on interview data (2026).

The comparative evidence indicates an asymmetric digital transformation: B2B production and distribution mechanisms, particularly virtual libraries and shared infrastructures, display substantial consolidation, while B2C monetization, copyright protection, and the preservation of authorial value remain contested. This asymmetry suggests that technological advancement does not eliminate institutional tensions; rather, it redistributes them across the ecosystem.

Taken together, the evidence indicates that asymmetry operates at two interconnected levels. First, organizations differ in their capacity to mobilize technological, financial, and relational resources. Digital infrastructure itself requires significant investment; as one sector leader emphasized, digital production, specialized professionals, and supporting technologies are not inexpensive and only become economically advantageous after sufficient scale is achieved. Second, the five dimensions do not evolve at the same pace. Changes in Where, particularly the consolidation of digital platforms and shared infrastructures, appear more advanced than changes in What, where sustainable monetization and value appropriation remain unresolved. Similarly, changes in How, through automation, POD, data management, and interorganizational cooperation, coexist with persistent tensions in Who, as publishers negotiate between traditional editorial identities and emerging EdTech-oriented roles.

The interviews further suggest that this unevenness should not be interpreted simply as technological backwardness. In some organizations, the digitization of the book itself is perceived primarily as a change of format, whereas more substantive transformation occurs when editorial content is recombined into courses, services, platforms, and new relationships

with authors and users. E4, for example, distinguished between the relatively straightforward shift from printed to digital books and the more complex transformation from books into online educational services, which involves new channels, formats, and relationships with authors. Asymmetry therefore reflects different depths of organizational reconfiguration rather than merely different levels of technological adoption.

5. Discussion

The findings advance the understanding of digital transformation in institutionally complex ecosystems through three interconnected arguments: platform-based coopetition as a mechanism of institutional reconciliation, asymmetric digital transformation as a structural condition, and the reconfiguration of the book as an institutional anchor asset. First, the results show that platform-based coopetition constitutes a central response to the structural pressures affecting the STP subsector. Rather than relying exclusively on vertical integration or isolated competition, rival publishers cooperate through shared digital infrastructures while preserving competition over content, authors, and market positioning. This arrangement extends the traditional understanding of coopetition (Bengtsson & Kock, 2000; Gnyawali & Ryan Charleton, 2018) by showing that cooperation may emerge not only from strategic complementarity but also from the need to respond collectively to technological and institutional disruption.

Three mechanisms help explain this configuration. The first is regulatory and economic pressure, which increases the costs of isolated responses and encourages collective infrastructure. The second is institutional reconciliation, since shared platforms enable market, academic, state, and technological logics to coexist within a common organizational arrangement (Greenwood et al., 2011; Thornton et al., 2012). The third is a relational mechanism, whereby existing interorganizational ties reduce barriers to cooperation and facilitate the construction of collective responses. In this sense, coopetition becomes a processual and ecosystem-level phenomenon rather than merely a firm-level competitive strategy, consistent with recent calls for a more contextual and dynamic understanding of coopetitive relationships (Dagnino & Ritala, 2025; Klimas et al., 2024; McGrath et al., 2025).

Second, the findings suggest that asymmetric digital transformation is not merely a temporary stage preceding full digital maturity, but a structural condition of the ecosystem. Technological advances coexist with incomplete organizational, strategic, and institutional reconfigurations. Digital platforms, virtual libraries, metadata systems, automation, and AI-based applications expand rapidly, while organizational identities, revenue structures, copyright arrangements, and consumption practices change at different speeds. This evidence challenges linear models that implicitly associate technological adoption with proportional organizational transformation and value creation (Verhoef et al., 2021; Vial, 2019).

The asymmetry results from the simultaneous influence of institutional logics that both enable and constrain transformation. Technological and market logics favor efficiency, scalability, data-driven coordination, and platformization, whereas academic, professional, and state logics preserve expectations regarding legitimacy, editorial quality, access to knowledge, and regulation. Organizations must therefore respond to heterogeneous and sometimes contradictory demands rather than converge toward a single digital configuration. Digital transformation becomes a negotiated and tension-filled process in which technological, organizational, and institutional dimensions evolve unevenly.

This finding also expands the dynamic capabilities perspective. Traditional approaches emphasize sensing, seizing, and reconfiguring at the organizational level (Teece, 2007; Teece, 2018), but the evidence suggests that some adaptive capabilities are increasingly distributed across the ecosystem. Shared platforms, collective governance arrangements, sectoral

associations, and technological infrastructures enable organizations to access resources and responses that would be difficult to develop independently. The findings therefore point to the emergence of collective or ecosystem-level dynamic capabilities, particularly in contexts characterized by high resource interdependence.

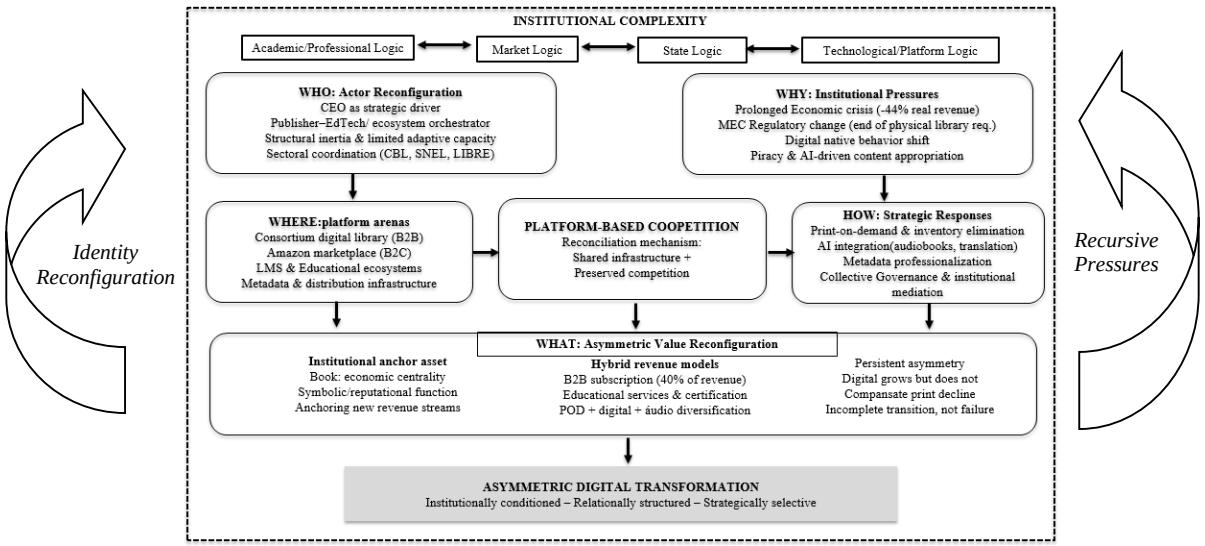
Third, the study identifies the reconfiguration of the book as an institutional anchor asset. Although the economic centrality of the printed book has declined in relation to services, subscriptions, platforms, and digital access models, its symbolic and reputational importance remains substantial. Editorial activity continues to provide legitimacy, expertise, authorship, and quality signals that support emerging educational services and digital products.

This finding adds an institutional dimension to business-model innovation. Existing research emphasizes the reconfiguration of resources and value propositions in response to technological change (Chesbrough, 2010; Teece, 2018), whereas the present evidence shows that an asset can lose direct economic centrality while retaining strategic importance through its legitimacy function. The book is therefore not simply replaced by digital services. Instead, its institutional capital is redeployed to sustain new forms of value creation and appropriation.

Taken together, these arguments indicate that the five analytical dimensions are recursively interconnected. Institutional and market pressures (Why) reshape the roles and identities of ecosystem participants (Who); actors respond through organizational and interorganizational strategies (How) that increasingly take place through platform-mediated environments (Where); these processes generate new configurations of value, revenue, and legitimacy (What). The outcomes, in turn, generate new pressures and strategic responses, creating a continuous cycle of transformation.

Figure 1

Asymmetric Digital Transformation in the STP: An Integrating Framework



Note. Authors' elaboration based on empirical findings (2026).

The proposed framework therefore conceptualizes digital transformation as a recursive, relational, and institutionally conditioned process rather than a unidirectional movement toward technological maturity. In the STP subsector, transformation results from the continuous interaction among institutional pressures, role reconfiguration, platform mediation, adaptive responses, and changing value models. This perspective helps explain why technologically

advanced ecosystems may simultaneously preserve traditional organizational identities, institutional arrangements, and legitimacy structures.

6. Final Considerations

This study analyzed how the dimensions of digital transformation—Who, Why, Where, How, and What—manifest and interrelate within the Scientific-Technical-Professional (STP) subsector of the Brazilian publishing market. The findings demonstrate that digital transformation does not unfold as a linear or homogeneous trajectory. Instead, it emerges as an asymmetric, relational, and institutionally conditioned process characterized by platform mediation, interorganizational interdependence, and the coexistence of traditional and digital value configurations.

The study offers three main theoretical contributions. First, it identifies platform-based coopetition as a mechanism through which competing organizations collectively respond to technological and institutional pressures while preserving rivalry over strategic resources. Second, it conceptualizes asymmetric digital transformation as a potentially structural condition in institutionally complex ecosystems, where technological, organizational, and institutional changes occur at different speeds. Third, it proposes the concept of the institutional anchor asset, showing how the book may lose relative economic centrality while continuing to provide legitimacy and reputational capital for service-, subscription-, and platform-based business models.

The study also extends the dynamic capabilities perspective by indicating that adaptation may occur beyond organizational boundaries. Shared platforms, collective infrastructures, and interorganizational governance arrangements suggest the emergence of ecosystem-level capabilities that enable actors to respond jointly to technological disruption.
From a managerial perspective, the findings highlight the importance of combining technological investment with interorganizational coordination, metadata capabilities, platform strategies, and the preservation of institutional legitimacy. For publishers and other knowledge-intensive organizations, digital transformation therefore requires not only technological adoption but also the ability to manage relationships, identities, and competing institutional demands.

The study is subject to limitations. The empirical evidence is concentrated primarily on established actors within the STP ecosystem and emphasizes the supply side of the market. The qualitative single-case design also limits statistical generalization, although it supports analytical generalization to other institutionally complex and knowledge-intensive settings. Future research could investigate smaller publishers, user and student perspectives, the evolution of platform-based coopetition over time, and the effects of generative artificial intelligence on authorship, copyright, value appropriation, and ecosystem governance. Overall, the findings suggest that the sustainability of digital transformation in the STP subsector depends less on replacing traditional structures than on continuously recombining technological innovation, institutional legitimacy, and interorganizational cooperation.

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