

Digital Transformation in Publishing Activities for Scientific Training and Research in Vietnam: Challenges and Opportunities



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ABSTRACT

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In recent years, the Vietnamese publishing industry has made significant efforts to advance digital transformation. Accordingly, the digital transformation activities have developed positively, evidenced by the growth of online book distribution, presence on e-commerce platforms, and expanding electronic publishing activities. Electronic publishing has emerged as a leading driver of industry development, most visibly through the substantial increase in the number of electronic publications. This study examines the practical dimensions of digital transformation in Vietnam's current publishing landscape by analyzing activities at representative publishing institutions and identifying training requirements within the sector during this period of digital change. Through a SWOT analysis framework, the study identifies the opportunities, challenges, and emerging trends of digital transformation in publishing activities that serve education and scientific research in Vietnam. Despite notable progress, significant challenges persist, including inadequate technological infrastructure, skills deficits, human resource shortages, cultural resistance to change, and unresolved copyright concerns. To address these barriers, the paper proposes strategic recommendations emphasizing organizational innovation, human resource development, technological infrastructure enhancement, data management improvement, and cross-sector industry collaboration. The findings provide practical guidance for policymakers, publishers, and stakeholders seeking to cultivate a sustainable and competitive digital publishing ecosystem in Vietnam.

1. INTRODUCTION

Digital transformation in the publishing industry refers to the systematic application of digital technologies in managing, producing, and distributing books and other published materials [1]. It encompasses not only the digitization of traditional print documents but also the development of modern platforms for content management, distribution, and accessibility [2]. In the broader context of the Fourth Industrial Revolution and the disruptive effects of the COVID-19 pandemic, Vietnam's publishing sector faces both substantial challenges and unprecedented opportunities to restructure itself toward comprehensive digitalization.

Digital transformation may be understood as the application of the continuous and rapid innovation of digital technologies to solve organizational and societal problems [3]. It involves the integration of digital technologies across all functional areas of an organization, fundamentally altering operational models and delivering greater value to users and customers. Digital transformation is thus "a comprehensive and fundamental change in how individuals and organizations live, work, and produce, grounded in digital technologies." Moreover, it represents a cultural shift that compels

organizations to continuously challenge existing assumptions, embrace experimentation, and develop tolerance for calculated risk and failure.

This transformation fundamentally changes how information is stored, transmitted, and accessed, enhancing interactivity, speed, and accuracy in publishing activities. The proliferation of digital platforms—including PDF formats, HTML-based systems, and electronic content management systems—has facilitated the widespread adoption of e-books and online learning materials, thereby expanding knowledge accessibility for education and scientific research communities [4]. Smith [5] demonstrated how digital transformation influences firm performance in the U.S. service industry. His findings indicate that the adoption of digital technologies such as cloud computing, big data analytics, and artificial intelligence has led to improved operational efficiency, enhanced customer experiences, and stronger competitive positioning for service organizations.

More recent scholarship has focused on the strategic dimensions of digital transformation. Successful digital adoption in publishing requires a fundamental shift in organizational culture, enhancement of staff competencies, and development of innovative business models [6]. Prior

research consistently emphasizes the critical role of leadership commitment and sustained investment in digital infrastructure [7]. The importance of digital transformation in educational publishing is particularly evident in its direct linkage to improvements in teaching and learning outcomes. Digital publishing not only expands access to educational resources but also supports the modernization of pedagogical approaches and research methods [7]. In the context of developing economies such as Vietnam, unique challenges arise, including limited technological infrastructure, insufficient digital literacy, and institutional resistance to change among traditional publishers. Government policy support and industry-wide collaboration are identified as key enablers for overcoming these systemic barriers.

E-book publishing is currently experiencing exceptionally rapid global growth. Only a few years ago, e-books were considered a niche medium for technology enthusiasts; today, in numerous markets, e-books have surpassed printed books in terms of revenue and readership, becoming mainstream reading formats. In Vietnam, e-books have gained broader public recognition only in recent years, yet they have already opened significant new horizons for the publishing industry. With the advancement of digital technology radically transforming reading habits, many observers view e-books as a fundamental revolution in both the publishing domain and broader reading culture.

The rapid development of information technology in recent years has exerted a profound influence on social life and the economy broadly, including the publishing industry. The volume of published products continues to increase, and electronic publications have entered the market in growing numbers. However, digital transformation in Vietnam's publishing industry still encounters considerable obstacles, including inadequate infrastructure, managerial limitations, entrenched traditional mindsets within publishing houses, and a shortage of personnel with expertise in digital technologies [8]. Consequently, there is an urgent need to develop comprehensive and coordinated strategies at both the national and industry levels to effectively harness the benefits of digital transformation.

In the education sector, digital transformation is concentrated primarily in two domains: education management and the innovation of teaching, learning, assessment, and research methodologies. The digitalization of educational publishing materials plays a vital role in enhancing educational quality and aligning traditional education models with the modern digital platforms employed globally. Digital transformation is an inevitable and strategic imperative for Vietnam's publishing industry. By strategically leveraging available opportunities and systematically overcoming existing challenges, the sector is well-positioned for significant and sustained growth.

2. LITERATURE REVIEW

Digital transformation has become a pivotal force reshaping the global publishing industry [9, 10]. It encompasses the adoption and integration of digital technologies to fundamentally alter how publishing content is created, produced, distributed, and consumed. This section reviews key academic and industry studies addressing the stages, impacts, challenges, and opportunities of digital transformation in publishing.

Digital transformation has evolved through several distinct stages [11], beginning with the digitization of data, advancing to the digitalization of business processes, and eventually expanding to encompass interactions with business partners and customers. Digitization refers to the conversion of analog information into digital formats, such as scanning printed documents into PDFs. This initial phase of data digitization constitutes the foundational stage of digital transformation. At a more advanced level, organizations leverage digitized data to establish digital workflows and processes, thereby enhancing efficiency in production, distribution, and overall operations.

Digital transformation, however, extends beyond data digitization and process automation [1]. It involves the strategic use of digital technologies by publishers to fundamentally redesign business models and stakeholder interactions, with particular emphasis on customer experience and organizational culture. This broader transformation aims to meet the evolving demands of the digital society by fostering innovation and organizational agility across the entire publishing value chain.

Globally, digital transformation in publishing has gained significant momentum in countries with mature publishing ecosystems [12], such as Germany, the United States, the United Kingdom, Japan, and Canada. The COVID-19 pandemic accelerated this transformation by severely disrupting traditional print book distribution due to lockdowns and social distancing requirements. During these periods, demand for reading materials surged, yet physical distribution channels faced critical limitations, prompting publishers to accelerate the transition toward digital formats including e-books, audiobooks, and virtual reality books. These formats offer readers rapid and convenient access at any time and location via digital applications.

Statistical evidence underscores this structural industry shift: according to the Association of American Publishers, e-book revenues increased by 20.4% and audiobook revenues by 23.7% in the first two months of 2021 compared to the same period in 2020. In Germany, a major global book market, e-book sales grew by 16.2% and audiobooks by 24.5% in 2020 relative to 2019 [13]. E-book market trends across several countries further illustrate this growth trajectory. In the United States, e-book revenues tripled within a single year, rising from \$53.5 million in Q1 2009 to \$165 million in Q1 2010. In the United Kingdom, despite a 5.4% decline in printed book sales between 2017 and 2018, the digital book market grew significantly, with audiobook sales surging by 43% in 2018 and the overall digital market expanding by 4.5% to £653 million. In China, with 98% mobile internet penetration and 84% of users reading digital books, the e-book market has grown explosively since 2013, becoming one of the largest worldwide. South Korea's e-book revenues nearly tripled from \$197.5 million in 2010 to an estimated \$583.8 million in 2013 [14].

Cuong et al. [15] proposed a comprehensive digital transformation framework comprising seven dimensions, drawing on an extensive review of relevant literature [16]. Their work clarifies the critical distinctions between data digitization, process digitalization, and comprehensive digital transformation. It further documents the initial achievements of digital transformation in Vietnam's publishing industry and emphasizes the key organizational factors necessary for effective transformation, including business strategy, organizational structure, human resource capacity, customer

orientation, technology adoption, institutional culture, and measurable performance outcomes.

These developments reveal several interconnected industry trends accelerated by the pandemic: (i) e-books have captured an increasingly large share of the overall book market; (ii) physical book sales have declined, while digital content consumption—including audiobooks—has surged; and (iii) audiobooks represent the fastest-growing segment, reflecting broader shifts in consumer preferences toward on-demand and mobile-friendly content.

Multiple studies highlight the role of advanced technologies in accelerating digital transformation. Artificial Intelligence (AI) has been applied across automated editing, personalized content recommendation, and translation services, enhancing both productivity and user experience [5]. Blockchain technology is increasingly deployed to secure copyright management and enable transparent royalty distribution. Additionally, big data analytics supports market trend analysis and customer behavior profiling, allowing publishers to tailor content offerings more effectively.

Despite these technological advances, many publishers continue to face structural challenges. Limited digital infrastructure and a shortage of skilled personnel remain the most significant barriers in emerging markets such as Vietnam. Organizational resistance to change, rooted in deeply embedded print-centric institutional cultures, further impedes transformation efforts. Digital piracy and copyright enforcement challenges remain critical concerns that substantially undermine revenue potential and long-term sustainability [3].

3. METHODOLOGY

This study used secondary data collection to comprehensively analyze digital transformation in Vietnam's publishing sector for education and scientific research.

Secondary data were gathered covering the period from 2017 to 2022, sourced from official reports, industry publications, and academic studies.

1) Data analysis and synthesis

The collected data from both secondary and primary sources were systematically analyzed and synthesized to evaluate publishing activities related to educational and scientific research support. This process enabled an in-depth understanding of the current status, challenges, and development trends within the industry.

2) SWOT analysis

A SWOT analysis was applied to assess the internal strengths and weaknesses of publishing houses, alongside the external opportunities and threats posed by the Fourth Industrial Revolution. This framework facilitated the identification of strategic priorities for advancing digital transformation in Vietnam's publishing industry.

4. RESULTS AND DISCUSSION

4.1 Situation in digital transformation in the publishing industry in Vietnam

Digital transformation in the publishing industry is progressing rapidly, generating profound changes in training and scientific research activities. Several notable

developments characterize the current landscape.

1) Impressive growth of e-books and digital documents

Revenue from e-books and digital documents is growing rapidly, surpassing traditional books in many markets [17].

The number of individuals reading e-books and accessing digital documents has increased significantly, particularly among younger populations and the academic community. The range of available formats—including e-books, online scientific articles, open-access databases, and institutional repositories—continues to diversify, better meeting the varied needs of different user groups.

2) The evolution of online publishing platforms

The number of online publishing platforms has grown substantially, enabling authors to self-publish their work more easily and efficiently. These platforms have considerably expanded the geographic accessibility of published works, connecting authors and readers across global audiences [18]. Importantly, online platforms have facilitated direct author-reader interaction, thereby promoting creativity, knowledge exchange, and collaborative learning.

3) Integration of advanced technologies into publishing and distribution

Artificial intelligence is being applied across multiple stages of the publishing process, including automated manuscript editing, translation, data analysis, and content generation. Blockchain technology is increasingly used to ensure transparency and security in copyright management and royalty distribution. Big data analytics enables the analysis of reading behavior, content optimization, and personalization of user experiences [19, 20].

4) Impact on training and scientific research activities

Digital transformation has had a measurable impact on learning and research environments. Students and researchers can now rapidly access the latest and most diverse information from international sources [21]. Highly interactive digital learning materials have contributed to improved learning outcomes. Online platforms have fostered the emergence of open research communities, enabling scholars to connect, share findings, and collaborate more effectively [4, 22]. Researchers also benefit from expanded publication opportunities through digital channels.

In which, the top 5 leading units in using digital learning materials of Vietnam National University - Learning Information Center (VNU-LIC) were recorded as shown in Figure 1.

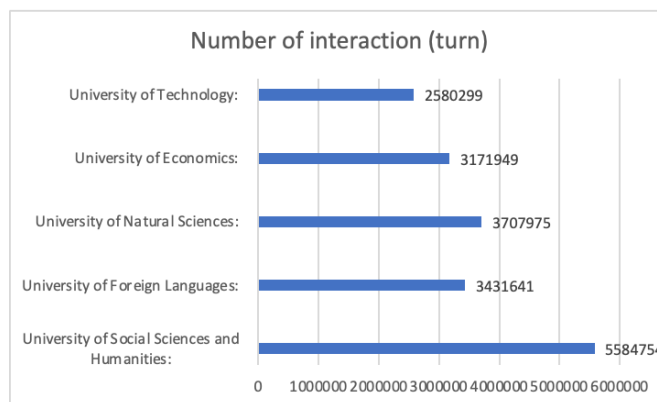


Figure 1. The top 5 leading units using digital learning materials of Vietnam National University - Learning Information Center (VNU-LIC)

Source: Department of Publishing, Printing and Distribution, Ministry of Information and Communications of Vietnam (2024)

This result is due to the relentless efforts of VNU-LIC for many years in meeting the learning material requirements of training units in VNU. The top 5 units with the highest number of learning materials are presented in Figure 2.

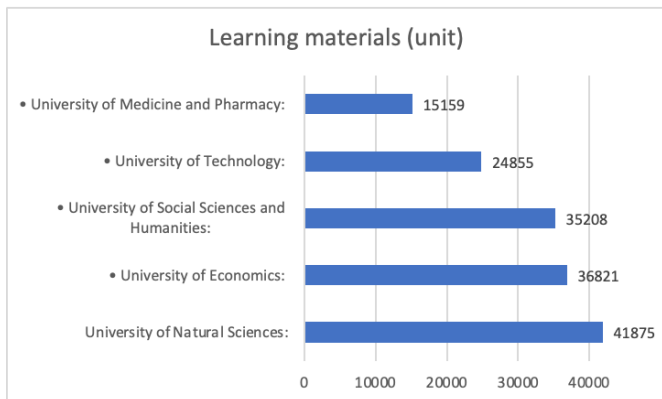


Figure 2. The top 5 leading units with the highest number of learning materials

Source: Department of Publishing, Printing and Distribution, Ministry of Information and Communications of Vietnam (2024)

At the national level, Vietnam had 31 e-publishing operations by 2024, accounting for 54% of the total number of publishers, with 27 e-publishing establishments collectively producing 4,000 to 4,500 books annually—representing over 12.5% of total annual book output. Audiobook and multimedia book revenues from the audio book market are estimated at approximately 120–130 billion VND, equivalent to around 3% of total industry revenue. In addition to full-length books, some organizations are developing book-summary products distributed through digital platforms.

4.2 SWOT analysis of digital transformation in publishing in Vietnam

4.2.1 Strengths

Rich Content Resources: Many publishers possess valuable archives of books, newspapers, and educational materials ready for digitization.

Creative Human Capital: A young and tech-savvy workforce including writers, editors, and designers.

Improved Tech Infrastructure: High internet penetration and widespread use of smartphones.

Government Support: National Digital Transformation programs (e.g., 2025–2030) promote digital publishing.

Youth increasingly prefer e-books, audiobooks, podcasts, and mobile-first formats.

4.2.2 Weaknesses

Despite these strengths, significant internal weaknesses constrain the pace of digital transformation.

Many traditional publishers lack in-house IT capacities and digital content management systems, limiting their ability to develop and distribute digital products independently. A print-first institutional culture continues to dominate strategic decision-making in numerous publishing organizations. Cross-sector collaboration remains limited, with few integrated ecosystems connecting publishers, technology companies, and distributors. Digital copyright protection is weak, with rampant piracy of PDF books and audiobooks directly undermining revenue streams. Furthermore, older reader segments remain less familiar with digital formats,

which slows overall market adoption.

4.2.3 Opportunities

The external environment presents several significant growth opportunities. Demand for e-learning content, audiobooks, and short-form reading formats is rising sharply, driven by changing consumer behaviors and the expansion of mobile connectivity. The digitization of Vietnamese content—spanning culture, education, and self-help—creates cross-border publishing opportunities with export potential to international markets. AI-driven personalization of reading experiences, utilizing user data to tailor content recommendations, offers a promising avenue for driving engagement and sales [10]. Strategic technology partnerships with platforms such as Tiki, TikTok, Spotify, and Amazon Kindle can significantly expand distribution reach. National and international funding programs for digital innovation and cultural preservation also provide access to financial resources for industry modernization.

4.2.4 Threats

At the same time, the external environment presents considerable threats. Global platforms including Amazon, Apple Books, and Google Play Books dominate digital publishing distribution with superior infrastructure and vast user bases [23–25]. Online piracy remains pervasive, with social media groups and informal networks distributing copyrighted content without authorization. Declining long-form reading habits, driven by the rise of short-form video and social media consumption, represent a structural challenge to the market for traditional books and even digital books. Digital transformation requires substantial upfront investment in infrastructure, staff training, and systems integration, presenting a significant financial barrier for many publishers. Finally, the absence of standardized file formats and the fragmentation of platform compatibility across publishers create technical obstacles that hinder interoperability and distribution efficiency.

4.3 Assessment of digital transformation levels among publishers in Vietnam

Currently, 12 publishers in Vietnam are certified to operate as electronic publishers [26]. A number of additional publishers, though not yet formally registered for electronic publishing, have been making substantial investments in digital technologies aligned with broader transformation goals—including the Women’s Publishing House and the Science and Technology Publishing House.

The stated industry objective for the coming period is the comprehensive application of technology in publishing, the development and distribution of electronic publications, and the advancement of digital transformation across the publishing, printing, and distribution subsectors. Associated goals include improving the quality of human resources, strengthening alignment between publishing activities and the demands of the Fourth Industrial Revolution, and promoting distribution through e-commerce platforms.

Statistical data illustrate the scale of the potential digital market. As of January 2021, approximately 68.72 million internet users resided in Vietnam, representing 70.3% of the national population. Research by We Are Social indicates that Vietnamese users spend an average of 6 hours and 47 minutes daily online, of which approximately 2 hours and 21 minutes

are devoted to social media platforms. Young people, in particular, exhibit higher rates and duration of internet usage than the national average. This demographic constitutes a critical target group for the publishing market, given their familiarity with and preference for digital content. Accordingly, digital transformation strategies oriented toward this consumer segment are essential and represent the future direction for publishing organizations.

In the field of electronic publishing, data management represents a particularly pressing operational challenge. The data holdings of publishing houses are large and heterogeneous—encompassing editorial documents, publishing contracts, manuscript files, image assets, video files, and personnel records—yet these are frequently not managed in a synchronized or centralized manner. In most cases, data remain distributed across individual staff computers due to the absence of centralized data management systems. This fragmentation creates significant inefficiencies in data storage and retrieval, consuming substantial time and effort and impeding overall operational progress. Similarly, inventory management for goods, imports, exports, and stock levels is often handled manually via spreadsheet software and is not integrated with accounting systems, resulting in difficulties in generating timely and accurate reports. Furthermore, many core professional and administrative functions—including editorial and publishing workflows, distribution management, human resources, and document control—lack dedicated management software.

4.4 Strategic recommendation

Building on the insights derived from the SWOT analysis and the assessment of the current state of digital transformation, the following strategic recommendations are proposed to accelerate the digital transformation of Vietnam's publishing industry.

1) Prioritize engaging and interactive digital formats

Publishers should emphasize the development and promotion of interactive and accessible content formats, including audiobooks, microlearning modules, and gamified content, to attract wider and more diverse audiences. Investment in user-centered design and mobile-first content delivery should be prioritized to align with the consumption preferences of younger and digitally native reader segments.

2) Promote cross-sector collaboration

Strategic partnerships between publishing houses, educational technology companies, and media organizations should be actively encouraged and facilitated. Such collaboration would enable publishers to leverage complementary institutional strengths, foster innovation in content and delivery, and expand market reach both domestically and internationally.

3) Enhance digital copyright protection

Significant investment in advanced digital rights management (DRM) technologies, including blockchain-based solutions, is warranted to combat the pervasive problem of digital piracy. Complementary strengthening of the legal and regulatory frameworks governing intellectual property rights in the digital environment is essential to protect publisher revenues and incentivize continued digital content development.

4) Develop workforce competencies

Comprehensive and ongoing professional development programs focused on content digitization, digital marketing

strategies, data analytics, and emerging technologies should be implemented across the sector. Equipping publishing teams with relevant digital skills is a prerequisite for sustaining long-term competitiveness in an increasingly digital market environment.

5. CONCLUSION AND POLICY RECOMMENDATIONS

5.1 Conclusion

The application of information technology to publishing activities represents a strategic necessity for the Vietnamese publishing industry. It aims not only to transform operational processes but also to enhance the effectiveness of knowledge dissemination, preserve and develop the cultural heritage of Vietnam, and serve the digital learning and research needs of universities and other educational institutions—including Thai Nguyen University and its broader institutional network. Implementing and scaling electronic publishing and distribution has thus become both an urgent and pioneering task for the sector.

In broader terms, the Fourth Industrial Revolution and the digital transformation imperative, compounded by the disruptive pressures of the pandemic, constitute simultaneously a challenge and an opportunity for Vietnam's publishing industry. If publishers can effectively leverage available opportunities while systematically addressing structural challenges, a sustainable and prosperous digital publishing future is achievable. The industry has already demonstrated its capacity for adaptation and has achieved important initial results in the digital environment.

The publishing industry in Vietnam is undergoing significant structural change driven by the rapid advancement of digital technologies and evolving consumer behaviors. E-books, audiobooks, and digital platforms are gaining increasing popularity, particularly among younger generations and the academic community. However, the transition remains uneven and continues to face several persistent challenges: limited digital infrastructure—especially in smaller publishing organizations; a shortage of personnel trained in digital content creation and management; entrenched traditional mindsets favoring print; weak digital copyright protection leading to piracy-related losses; and fragmented and decentralized data management practices that hinder operational efficiency. Despite supportive government initiatives and the growth of e-commerce distribution platforms, many publishers struggle with the high costs of investment and the complexity of integrating new technologies into existing workflows.

5.2 Policy recommendation

To effectively advance digital transformation in publishing activities that support training and scientific research, publishing houses in Vietnam should focus on the following strategic areas:

5.2.1 Organizational innovation, regulatory reform, and human resource development

Publishing organizations should restructure their organizational apparatus and redefine departmental roles and responsibilities in alignment with the demands of the digital

era. Existing internal regulations and business processes should be revised and updated to support digital workflows, and new operational policies should be issued accordingly. Comprehensive training should be provided to ensure all staff acquire essential digital competencies and develop a robust understanding of digital transformation in both professional and managerial contexts.

5.2.2 Development of digital publishing platforms

E-book platforms should be enhanced by integrating additional capabilities including audiobook and video book publishing. Editorial production workflows should be optimized to increase efficiency and accuracy. Automated user support systems, such as AI-powered chatbots, should be implemented to improve customer service and facilitate user interaction.

5.2.3 Construction of Digital infrastructure and operational systems

Publishers should modernize their websites and develop interactive information systems to improve communication with authors—covering manuscript submission and publishing requests—and with readers, for customer support and order management. Social media channels should be integrated into promotional and distribution strategies to broaden reach. Comprehensive integrated management software should be developed covering editorial and publishing processes, human resources management, task management, KPI monitoring, document control, sales management, customer relationship management, and warehouse operations. Intelligent reporting tools to support data-driven decision-making should also be implemented.

5.2.4 Development of data infrastructure and analytics capabilities

Specialized systems to support the editing and management of publication content should be developed. Centralized data warehouses for inventory management, statistical data, and institutional knowledge should be established and made accessible across organizations. Advanced big data analytics and automated reporting platforms should be deployed to enable evidence-based decision-making and strategic planning.

5.2.5 Ensuring information security and completing the publishing process

Comprehensive measures must be implemented to secure digital systems and protect sensitive information throughout the digital transformation process and in ongoing operations, ensuring system integrity and resilience. The development of complete technical protocols for managing the publication and distribution of electronic publications—including the release, withdrawal, and reinstatement of digital content—should be finalized and standardized across the industry.

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