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Comics as Heritage: Theorizing Digital Futures of Vernacular Expression

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Abstract

This paper investigates digital comics—particularly webcomics and webtoons—as emerging forms of cultural heritage, analyzing their exponential global influence alongside the limitations of traditional heritage frameworks in systematically preserving them. The UNESCO heritage model, rooted in concepts of physical fixity and authenticity, is shown as inadequate for born-digital works like comics, which derive meaning from technological infrastructure, dynamic platforms, and ongoing community interaction rather than static material forms. Drawing on heritage futures and digital materiality theories, the authors argue that digital comics exemplify "temporal authenticity," evolving through continual transformation and algorithmic curation. The paper details how platform recommendation systems and analytics directly shape which comics achieve cultural visibility and preservation, while community-driven initiatives—such as The Flashpoint Archive—demonstrate effective models for holistic, grassroots digital preservation beyond institutional reach. Ultimately, the study calls for new theoretical and practical approaches to heritage, recognizing digital comics as both cultural artifacts and dynamic, platform-specific vernacular expressions.

Keywords: digital comics; cultural heritage; webtoons; digital materiality; community preservation

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1. Introduction

When the webcomic platform SmackJeeves, a free webcomic service allowing users to upload and organize their own webcomics, closed in 2020, over 15 years of digital comics vanished overnight. This comprised thousands of works by independent creators, along with their communities, comments, and cultural conversations. This loss exemplifies a critical gap in heritage studies: born-digital cultural forms, like webcomics and webtoons, represent some of the most innovative storytelling of the 21st century, yet they remain invisible to traditional heritage frameworks that are designed for physical artifacts and institutional archives.

This article argues that born-digital comics—webcomics, webtoons, and their platform ecosystems—constitute a distinct category of vernacular heritage that challenges three fundamental assumptions of traditional heritage theory: that cultural significance requires institutional validation, that preservation means maintaining original forms, and that heritage value exists independently of community practice. Through analysis of community preservation efforts and platform-specific aesthetics, we demonstrate that digital

comics' preservation requires a general framework that prioritizes community agency, embraces technological dependency, and recognizes dynamic transformation as a heritage characteristic rather than a threat to authenticity.

This analysis addresses three central questions: First, how do community-driven preservation practices challenge traditional heritage authority while achieving professional preservation standards? Second, what preservation approaches can maintain digital comics as living heritage that exists through platform ecosystems, community engagement, and technological mediation? Third, how does the vernacular heritage framework developed for digital comics address broader challenges of preserving born-digital cultural materials that derive meaning from community practice rather than institutional validation?

We develop this argument through four stages. Part I establishes theoretical foundations critiquing institutional heritage frameworks through heritage futures theory, digital materiality studies, and participatory culture research. Part II establishes digital comics as vernacular heritage practice, developing a typology of print, digitized, and born-digital comics, while examining how community-led preservation networks and platform ecosystems create new forms of cultural heritage through technological mediation and social reading practices. Part III presents two detailed case studies that demonstrate digital comics' heritage challenges and community responses: *Homestuck* as transmedia heritage that generates what we term 'distributed heritage' across multiple platforms and media forms, challenging traditional preservation frameworks organized around single media types, and the SmackJeeves platform closure that exemplifies digital heritage loss and community preservation efforts. Part IV proposes a general methodological framework that maintains platform ecosystems rather than extracting individual works, offering models for broader born-digital heritage challenges.

This research contributes to heritage studies by theorizing how digital cultures create and preserve cultural value through technological mediation rather than despite it, while addressing cultural phenomena that transcend traditional archival categories and institutional boundaries. For digital humanities, it offers methodological frameworks for platform-specific preservation that maintain interactive and social characteristics of born-digital materials. More broadly, this analysis provides conceptual tools for understanding heritage formation in networked, participatory, and technologically mediated cultural contexts that increasingly define contemporary cultural production.

Digital comics have achieved unprecedented global reach and cultural influence. Korean webtoon platforms recorded over 21.45 billion page views in 2019, while webcomics like *Homestuck* and *Lore Olympus* have generated transmedia franchises spanning multiple platforms and industries. Yet traditional heritage institutions struggle to recognize these materials as culturally significant, let alone preserve them systematically. The UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage (1972) proves inadequate for born-digital cultural expressions that exist through technological assemblages, evolve through community engagement, and derive meaning from ongoing transformation rather than historical fixity.

Comics studies has established the medium's sophisticated interplay of graphic and textual storytelling across disciplines from film studies to psychology, but the field still lacks robust theoretical frameworks for understanding digital comics as legitimate cultural heritage deserving systematic preservation. Besides some notable exceptions, mainly through the concerted efforts published in the comics studies journal *Comicalités*, the role of digital comics as heritage remains under-theorized, with a lack of categorical definitions—which are so important in any operation of heritage classification—that can account for the increasing diversity in formats, materials and styles that characterize the medium's digital evolution. This theoretical gap becomes increasingly problematic, as digital comics

represent one of the most significant developments in sequential art since the medium's inception, fundamentally challenging traditional boundaries between creator and audience, local and global culture, and material and immaterial heritage forms. However, digital heritage—cultural materials created in and dependent on digital technologies—challenges these distinctions by existing simultaneously as tangible (requiring physical infrastructure) and intangible (accessible only through technological mediation), while operating across all three traditional categories.

The oversight of digital comics as heritage extends beyond simple institutional neglect to reveal deeper epistemological limitations in heritage theory itself. Traditional heritage frameworks, developed primarily around physical artifacts and monumental sites, prove inadequate for addressing the complex temporalities, technological dependencies, and participatory cultures that define digital comics. Webtoons—digital comics specifically designed for online reading using vertical scrolling formats optimized for mobile devices—represent a particularly significant development, creating global cultural phenomena that transcend national boundaries while remaining largely invisible to traditional heritage institutions.

Unlike traditional heritage forms that rely on institutional recognition and physical permanence, webcomics emerge from grassroots communities, exist through technological assemblages, and create cultural memory through dynamic, evolving practices. These characteristics demand theoretical frameworks that move beyond authenticity paradigms toward more sophisticated understandings of how digital cultures create, preserve, and transmit cultural value. The challenge lies not simply in expanding heritage categories to include digital materials, but in developing entirely new approaches that recognize community agency, technological mediation, and temporal fluidity as constitutive features of contemporary heritage formation.

2. Part I: Theoretical Foundations

2.1. Beyond UNESCO Frameworks

Traditional heritage frameworks prove fundamentally inadequate for born-digital cultural expressions like webcomics and webtoons. The UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage (1972) establishes heritage value through criteria of "outstanding universal value, authenticity, and integrity"—concepts that assume cultural materials exist as fixed objects that are preservable in original states [1]. Cultural heritage typically encompasses physical artifacts and intangible attributes passed between generations, including customs, practices, artistic expressions, and values. The UNESCO framework divides heritage into tangible culture (buildings, monuments, artifacts), intangible culture (folklore, traditions, belief systems), and natural heritage (landscapes with cultural significance).

However, digital heritage—cultural materials created in and dependent on digital technologies—challenges these distinctions by existing simultaneously as tangible (requiring physical infrastructure) and intangible (accessible only through technological mediation). Born-digital materials like webcomics operate across all three traditional categories while fitting comfortably within none. Platform dependencies render digital comics vulnerable to technological obsolescence, demonstrating how traditional reactive preservation approaches fail for materials that exist only through technological assemblages.

Youn argues that technology's impact on archives has not been analyzed sufficiently within heritage in terms of archival studies [2]. Digital cultural heritage requires alignment with FAIR principles for data management: materials must be findable, accessible, interoperable, and reusable for future generations. Yet current heritage frameworks lack methodological approaches for materials that derive meaning from ongoing transformation,

community engagement, and technological mediation rather than historical authenticity or institutional recognition [3].

2.2. Heritage Futures and Community-Driven Preservation

Cornelius Holtorf's heritage futures theory provides crucial theoretical grounding by reconceptualizing heritage as "*frequently updated manifestations* of changing perceptions of the past over time," (our highlight), prioritizing "which heritage, as our legacy to the generations to come, will benefit future societies the most." [4]. This future-oriented approach validates digital comics' dynamic nature by asking not whether they can be preserved in original forms, but how they can continue generating cultural value through ongoing transformation. Digital comics exemplify heritage futures theory through their temporal complexity. Webcomics exist simultaneously in multiple temporalities: the immediate present of reader interaction, the ongoing present of creator updates, the platform present of algorithmic curation, and the preservation future of cultural memory. Unlike traditional heritage objects that are frozen in historical time, digital comics maintain what we term "temporal authenticity"—preserving cultural meaning through ongoing transformation rather than static preservation.

Community-led preservation models demonstrate this future-oriented approach through what Maaheen Ahmed and Benoît Crucifix term "rogue archives"—dynamic preservation practices that challenge conventional institutional frameworks while recognizing memory as a driving force in creative processes [5]. Abigail De Kosnik's foundational work shows how digital media users create informal archives outside traditional frameworks, blurring lines between "archive" and "repertoire" to create unfixed forms of cultural memory [6]. These archives reveal individual emotional connections, while serving as community engagement nodes, functioning as what Aleida Assmann describes as "lost-and-found offices" for culturally significant but institutionally overlooked materials.

Community preservation networks exhibit sophisticated organizational structures that parallel professional preservation standards while maintaining responsiveness to community needs and values. These networks develop distributed preservation infrastructure, establish community-controlled content policies, and implement preservation practices that emphasize accessibility and cultural sensitivity alongside institutional frameworks.

2.3. Digital Materiality and Platform Ecosystems

Sarah Pink's digital materiality theory positions technological assemblages as constitutive of digital heritage meaning rather than mere delivery mechanisms. Digital materiality emerges through "relational and emergent" processes, challenging binary distinctions between material and immaterial heritage forms [7]. Webcomics exist meaningfully only through technological configurations. For instance, the vertical scrolling format of webtoons enables different temporal pacing and narrative structures from traditional page layouts, while creating specific preservation challenges and several approaches that convert webtoons to static PDFs fundamentally alter reading experiences by removing scroll-based revelation timing that constitutes aesthetic identity. The material–digital assemblages that constitute webcomics include server infrastructures, mobile applications, user interface designs, community features, and algorithmic systems that collectively enable cultural expression and reception.

Platform algorithms participate directly in heritage formation through recommendation systems, trending calculations, and community formation mechanisms that shape what content becomes visible, influential, and preserved. These algorithmic processes do not simply organize existing culture, but actively participate in cultural formation by determining discoverability within platform ecosystems. Aggregator platforms like Mangakakalot [8]

exemplify this heritage curation function through sophisticated recommendation interfaces that categorize works by genre, completion status, popularity rankings, and "similar to" algorithms that connect readers to related content based on reading history and community engagement patterns. These recommendation systems operate as heritage curation mechanisms, identifying culturally significant works not through expert designation but through algorithmic analysis of engagement patterns, thematic similarities, and community behaviors, effectively determining which digital comics achieve cultural visibility and influence within online reading communities.

This framework supports preservation strategies that maintain entire platform ecosystems rather than extracting individual works. Digital comics' heritage value emerges through technological mediation, requiring approaches that preserve algorithmic functions, social features, and community dynamics alongside creative content. Extracting webcomics from platform contexts—converting them to format-neutral files—fundamentally alters cultural significance by removing interactive features and technological affordances that define their aesthetic and cultural functions.

2.4. Critical Heritage Studies and Institutional Gatekeeping

Laurajane Smith's concept of "Authorised Heritage Discourse" (AHD) describes hegemonic discourse favoring "monumentality and grand scale, innate artefact/site significance tied to time depth, scientific/aesthetic expert judgement, social consensus and nation building." The AHD privileges expert knowledge while marginalizing community voices and vernacular expressions, operating through naturalized assumptions that systematically exclude minority and popular culture forms [9].

In digital contexts, AHD exclusions manifest through preservation policies that prioritize institutional websites and professional productions while neglecting community-created content and experimental digital expressions. The British Library's Digital Comics Project, while representing progress, focuses primarily on "professional" UK webcomics conforming to traditional artistic standards, while excluding fan-created content, meme-comics, and experimental digital narratives emerging from online communities. This selectivity reproduces AHD preferences for expert-approved expressions while marginalizing the grassroots digital culture that represents some of contemporary culture's most innovative heritage creation. Jen Aggleton's work on "Defining Digital Comics: A British Library Perspective" underscores the importance of context-specific definitions and policies when dealing with digital comics, acknowledging the fluidity of digital media and the need for definitions that can adapt to the evolving landscape of digital comics while considering both formalist and sociocultural features [10]. These insights resonate with John Carman's analysis in "Archaeology and Heritage: An Introduction" that demonstrates how heritage systems operate through power relations, determining which expressions achieve recognition and preservation support. Institutional heritage systems historically support cultural elitism, privileging Western, elite expressions while marginalizing vernacular and minority forms. Digital comics communities function as heritage communities under the Faro Convention definition: people who value specific cultural heritage aspects and wish to sustain and transmit them through public action [11].

Critical heritage theory also addresses power relations that are inherent in heritage designation. Institutional heritage systems have historically supported cultural elitism and social exclusion, privileging Western, male, elite cultural expressions while marginalizing vernacular, minority, and popular culture forms [11]. The Association of Critical Heritage Studies, founded in 2010, explicitly challenges these hierarchies through its manifesto stating that "the old way of looking at heritage—the Authorised Heritage Discourse—

privileges old, grand, prestigious, expert approved sites, buildings and artefacts that sustain Western narratives of nation, class and science." [12].

2.5. Participatory Culture and Community Authority

Henry Jenkins' participatory culture theory [13] emphasizes community-driven cultural creation, explicitly identifying fan-created content and user-generated media as legitimate cultural expressions deserving of preservation. Participatory culture challenges traditional distinctions between producers and consumers, creators and audiences, professional and amateur production. In digital comics contexts, readers become creators through fan art, comments influence narrative development, and community feedback shapes creative decisions. Webcomic communities exemplify participatory culture through collaborative creation, active preservation efforts, cultural curation, and knowledge transmission practices. Community archives often exceed institutional collections in comprehensiveness, accessibility, and cultural sensitivity while maintaining professional preservation standards through community expertise. The Internet Archive's preservation of Flash-based cultural content involved coordinating thousands of volunteers, developing specialized tools, and creating comprehensive archives that rival institutional programs.

Community interaction systems enable collaborative heritage formation, where readers participate directly in cultural creation through feedback, discussion, and creative response. These systems create "participatory heritage", where cultural significance emerges through community engagement rather than expert designation. Platform features constitute heritage infrastructure enabling collective cultural memory formation and community identity development around digital comics. The legitimacy of community-driven preservation extends beyond inclusion to cultural competency and preservation quality. Community preservationists possess deep cultural knowledge about materials they preserve, understanding contexts, significance, and preservation needs that external institutions might miss. This cultural expertise informs sophisticated preservation and curation practices that often exceed institutional standards in community responsiveness and cultural sensitivity.

2.6. Posthuman Heritage and Algorithmic Actors

What happens to heritage theory when algorithms, rather than human curators, determine which cultural works become visible, influential, and preserved? Fiona Cameron's posthuman heritage theory represents cutting-edge development, incorporating non-human actors into heritage frameworks [14]. This approach recognizes algorithms as significant heritage actors, understanding digital platforms as heritage-making infrastructures and analyzing how AI systems participate in cultural preservation and interpretation. Posthuman theory moves beyond anthropocentric heritage definitions to include technological actors as legitimate heritage participants, fundamentally challenging traditional boundaries between human and non-human agency in cultural formation. Cameron's concept of "eco-curating" considers digital heritage as imbricated in planetary life, recognizing technological systems as ecological actors that participate in cultural formation through complex assemblages of human and non-human agencies. This framework supports the understanding of digital comics platforms as more-than-human heritage systems where algorithms, infrastructures, and human communities collaborate in cultural creation and preservation processes.

Digital comics platforms function as hybrid assemblages of human creators, readers, algorithms, and infrastructure that collectively constitute heritage-making systems. Recommendation algorithms operate as heritage curation mechanisms, identifying culturally significant works and connecting readers with relevant content based on engagement patterns, thematic similarities, and community behaviors. These algorithmic processes

do not simply organize existing culture but actively participate in cultural formation by shaping what becomes visible, influential, and preserved within digital comics' ecosystems.

Platform analytics generate heritage data about reading patterns, cultural preferences, and community formation processes that document how digital cultures develop and change over time. This data constitutes a form of heritage documentation that captures cultural practices and community behaviors that would otherwise remain invisible to traditional preservation approaches. Comment systems create social heritage networks that preserve cultural knowledge through collective engagement, enabling communities to develop shared interpretive frameworks and cultural memory practices around digital comics.

This theoretical framework supports arguments for preserving entire platform ecosystems rather than extracting individual works. Digital comics' heritage value emerges through technological mediation, requiring preservation approaches that maintain algorithmic functions, social features, and community dynamics alongside creative content. Platform preservation involves documenting API structures, user interface designs, community features, and algorithmic behaviors that shape cultural meaning. This ecosystem approach recognizes that platform closure represents a form of cultural death that traditional preservation models cannot address. When platforms like Adobe Flash were discontinued in 2020, thousands of interactive webcomics became permanently inaccessible, despite having active readerships, demonstrating how digital heritage depends on maintaining technological ecosystems rather than simply archiving content files.

The posthuman approach also recognizes how AI systems increasingly participate in heritage curation and interpretation. Machine learning algorithms analyze vast archives of digital comics to identify patterns, influences, and cultural trends that would be impossible for human researchers to detect. These AI-mediated heritage processes raise important questions about algorithmic bias, representation, and cultural interpretation, while also offering new possibilities for understanding cultural formation at scale. The challenge lies in developing heritage approaches that harness AI capabilities while maintaining community agency and cultural sensitivity.

3. Part II: Digital Comics as Heritage Practice

3.1. Comics' Heritage Typology: From Print to Born-Digital

Understanding digital comics as heritage requires a distinction to be made between categories that reflect production origins and preservation requirements. **Print Comics** represent traditional heritage: physical comic books and graphic novels fitting established frameworks, as demonstrated by major institutional collections like Michigan State University's 350,000-item Comic Art Collection and the Library of Congress, that boasts the largest publicly available comic book collection in the United States, with more than 12,000 titles and 140,000 issues, including a wide range of comic genres and styles. In the same vein, the Library of Congress have several web archives that focus on webcomics and vernacular digital culture more broadly (https://www.loc.gov/collections/webcomics-web-archive/about-this-collection/ (21 July 2025) and https://www.loc.gov/collections/small-press-expo-comic-and-comic-art-web-archive/ (21 July 2025) and https://www.loc.gov/collections/web-cultures-web-archive/about-this-collection/ (21 July 2025). Beyond this, the Internet Archive would seem to be the biggest repository of web comics. Carol Tilley's research documents how these materials have gradually achieved institutional recognition and systematic preservation support [15]. However, these institutional collections largely refer to print, digitized, and microfilmed comic series, excluding webcomics, webtoons, or works distributed through platforms and social media like DeviantArt, ArtStation or Instagram and dedicated webtoon reading applications.

Digitized Comics constitute converted print materials that benefit from established preservation frameworks, while presenting format and access challenges. **Born-Digital Comics**—webcomics, webtoons, and platform-specific sequential art—represent the most theoretically challenging category, existing only through technological assemblages and requiring entirely new preservation approaches that align with FAIR principles for data management: materials must be findable, accessible, interoperable, and reusable for future generations.

The application of the FAIR principles to digital comics, webtoons, and webcomics in libraries is a nuanced process that requires a careful balance between intellectual property rights and the principles of open access. The literature on copyright law and intellectual property provides a foundational understanding of the legal framework within which libraries must operate when handling digital content [16]. These frameworks are essential for ensuring that the findability, accessibility, interoperability, and reusability of digital comics are managed in a way that respects the rights of creators, while also serving the needs of library patrons.

To ensure findability, libraries can create robust metadata for digital comics that includes titles, authors, publication dates, and subject classifications, making them easily discoverable in library catalogs. Accessibility can be addressed by providing digital comics in formats that are compatible with various devices and assistive technologies, thereby accommodating users with disabilities. Interoperability involves using standardized data formats and protocols to allow digital comics to be integrated with other library systems and services. Lastly, reusability can be promoted by providing clear licensing information that specifies how digital comics can be used by patrons, including any restrictions imposed by copyright law.

This rough typology reveals how institutional preservation efforts focus primarily on print and digitized materials while neglecting born-digital comics that represent the most innovative developments in contemporary sequential art. Current heritage discourse around comics primarily addresses how museums utilize comics for heritage dissemination [17] and storytelling to connect communities with heritage [18], rather than recognizing born-digital comics as heritage forms requiring systematic preservation. Born-digital comics challenge heritage theory because they derive meaning from platform-specific characteristics, community interaction, and technological mediation, rather than material permanence or institutional recognition.

3.2. Digital Comics as Vernacular Heritage

Digital folkloristics frameworks establish webcomics as contemporary folklore—vernacular expressions emerging from community practices rather than institutional mandates. The DIGIFOLK project (2021) investigates "digital folklore as a form of critical heritage production," positioning digital media as sustaining "folk culture" through evolving vernacular expressions that are fundamental to online interaction [19]. This theoretical framework validates digital comics as legitimate cultural expressions that are worthy of preservation, while providing methodological approaches for understanding their heritage value.

Webcomics exhibit classic folklore characteristics: collective creation through creator–audience interaction, cultural transmission through sharing and recommendation networks, variation through fan art and remix culture, and function as repositories of community values and experiences. Unlike traditional folklore requiring ethnographic documentation, digital comics create their own archives through platform systems, community wikis, and fan preservation efforts, enabling self-documenting cultural processes that maintain comprehensive records of cultural development and community engagement.

The scale of vernacular heritage creation in digital comics is unprecedented. Korean webtoon platforms achieved 21.45 billion page views in 2019, with Naver Webtoon commanding 65% of the market share, demonstrating massive global engagement with user-generated content [20]. Fan translation networks (scanlators) operating across multiple languages create informal cultural exchange systems that bypass traditional publishing gatekeepers [21], while platforms like Tapas host over 100,000 creator-generated series with more than 75,000 creators, the majority being independent rather than professional studios [22]. This grassroots cultural production extends to remix culture, where fan art communities on platforms like DeviantArt create vast archives of derivative cultural expression, with webcomics inspiring extensive fan art, character designs, and creative reinterpretations that document community engagement with digital comics culture.

The vernacular nature of webcomics challenges traditional distinctions between high and low culture, professional and amateur production, and local and global cultural expression. Digital platforms enable creators from diverse backgrounds to reach global audiences without institutional mediation, creating participatory culture where cultural authority derives from community engagement rather than institutional approval. As Korean webtoon aesthetics increasingly migrate into the French comics craft—where webtoons are becoming dominant—tensions emerge between the serialized, vertically scrolling format and traditional bande dessinée conventions, raising questions about authorship, format adaptability, and the preservation of national comic identities in a rapidly globalizing digital marketplace. This cultural exchange creates new forms of vernacular expression that combine local and global cultural elements through digital mediation, demonstrating the need for new forms of institutional representation that transcend culture-specific frameworks.

The international, multilingual nature of webcomics platforms demonstrates how digital folklore operates across cultural boundaries while maintaining local characteristics. Korean webtoons reflect Korean cultural values and aesthetic preferences while reaching global audiences and influencing international digital comics development. Chinese manhua platforms like Kuaikan Manhua [23] demonstrate different approaches to creator–audience interaction and monetization, while platforms like Kugali [24], operating between Lagos and London, showcase how digital comics enable cultural expression that bypasses traditional publishing gatekeepers.

3.3. Community-Led Preservation Networks

Community preservation models often demonstrate superior cultural competency and often exceed institutional preservation in scope and sustainability. Archive of Our Own (AO3) [25], a nonprofit fan fiction and fan art repository launched in 2008, exemplifies successful community preservation: it is entirely volunteer-run, with sophisticated tagging systems, active preservation efforts, and community ownership over content curation. The platform maintains over 10 million works with 99.9% uptime, demonstrating how community investment can achieve preservation standards that exceed those of many institutional archives. The scale of community preservation is remarkable: AO3 hosts over 15 million works across more than 71,000 fandoms, operating on approximately USD 350,000 in annual costs that is funded entirely through community donations. The platform's technical sophistication rivals professional systems, maintained by over 1000 volunteers who support a site receiving around 230 million page views weekly. Its sophisticated tagging system enables precise content discovery that often exceeds the metadata capabilities of institutional digital collections [26].

The Organization for Transformative Works, which operates AO3, demonstrates how community organizations maintain professional preservation standards while remaining responsive to community needs and values. Their approach includes distributed preser-

vation infrastructure, community-controlled content policies, and preservation practices that prioritize accessibility and cultural sensitivity over institutional authority. Community preservation models provide frameworks for addressing legal and ethical challenges of digital preservation. Fan archives navigate complex copyright environments through transformative use arguments, community ownership models, and non-commercial distribution practices that enable preservation without commercial exploitation [27]. These approaches offer models for heritage preservation that respect creator rights while ensuring cultural accessibility and preservation.

Another compelling case study in successful community-driven digital preservation is The Flashpoint Archive [28]. In response to Adobe's announcement of Flash's discontinuation, a global network of over 500 volunteers across more than 20 countries mobilized to safeguard the cultural legacy of Flash content. Through remarkable technical innovation, the project developed custom browser emulation tools capable of maintaining the original functionality of over 200,000 games and animations—an achievement surpassing the capabilities of most institutional efforts. Beyond mere content preservation, Flashpoint captures the full ecosystem of the Flash era, including community features and social interactions, ensuring a holistic archival approach. Navigating complex legal terrain, the initiative operates under fair use provisions and leverages community ownership models, exemplifying how grassroots coordination can preserve endangered digital heritage at scale [29].

The resilience of community preservation networks in AO3 and the Flashpoint Archive demonstrates their value as heritage infrastructure. While institutional archives may face funding cuts or policy changes, community archives often demonstrate remarkable persistence through platform closures, technological changes, and legal challenges.

3.4. Platform Ecosystems and Technological Heritage

Digital comics exist within complex platform ecosystems that function as heritage infrastructure through their roles in cultural creation, distribution, and preservation. Platform studies theory demonstrates how different platforms enable different forms of cultural expression through specific technical features, user interfaces, and community affordances. The vertical scrolling format of webtoons enables specific approaches to timing, revelation, and reader engagement that constitute distinct aesthetic forms, tied to mobile reading practices and platform technology, while infinite canvas—a concept introduced by webcomics theorist Scott McCloud to describe the virtually limitless space for storytelling of early forms of digital comics—is unbounded by the physical constraints of traditional print media. Community features such as comment systems, rating mechanisms, and social sharing create collaborative reading experiences, while algorithmic curation through recommendation systems participates in cultural formation by shaping content discovery and influence within platform environments.

Heekyoung Cho observes that webtoons represent "a sophisticated system that emerges from the unique fusion of comics and online platform technologies," leading to shifts in form, aesthetic, production methods, and reading practices, while redefining creator–audience relationships [30]. These platform-specific characteristics create what we might call "technological genres", where narrative and aesthetic conventions emerge from platform affordances rather than traditional generic categories.

The transmedia dimensions of digital comics extend beyond simple adaptation to fundamental changes in how cultural content circulates across platforms and media forms. Successful webtoons often spawn multiple simultaneous adaptations: animated series, live-action dramas, mobile games, merchandise lines, and social media campaigns that create integrated cultural experiences spanning multiple platforms. Rachel Smythe's *Lore Olympus*,

a contemporary retelling of the Hades and Persephone myth that became one of webtoon's most popular series, exemplifies this cultural amplification by generating fashion trends around Greek mythology aesthetics, influencing contemporary romance novel tropes, and creating communities of artists working in similar mythological reinterpretation styles. This cultural amplification demonstrates how digital comics generate broader cultural influence across multiple media, while global circulation through platform distribution and fan translation enables Korean webtoons to achieve international audiences and influence global digital comics development. The economic ecosystems created by successful series generate revenue streams across entertainment industries, and platform-specific aesthetics increasingly influence broader digital culture and design practices.

However, these multiple simultaneous adaptations create significant preservation challenges for traditional heritage institutions that are organized around single media types or industry boundaries. When *Lore Olympus* generates a fashion collection, a planned animated adaptation, fan-created TikTok content, and extensive social media discourse, no single preservation framework can capture this distributed cultural phenomenon. Comic archives preserve the original webcomic, television archives might capture the animated adaptation, fashion museums could document the clothing collaborations, and social media platforms hold the fan responses, but the integrated cultural meaning emerges through their interconnection across these separate institutional domains. This preservation challenge becomes particularly critical because comics often serve as the foundational source material for large intellectual property franchises that generate billions of dollars in revenue across entertainment industries. From the Marvel and DC universes to manga-based anime franchises, comics frequently function as the creative and legal foundation for vast transmedia empires, making their preservation essential, not only for cultural heritage but for understanding the origins of contemporary popular culture. Traditional preservation practices, limited by media-specific mandates and institutional boundaries, prove inadequate for maintaining the holistic cultural significance of transmedia heritage that transcends conventional archival categories.

3.5. Living Heritage and Social Reading

José van Dijck's mediated memory research demonstrates that digital platforms do not merely store memory but actively shape how communities remember and construct identity through technological mediation of cultural memory processes [31]. Digital platforms create new forms of collective memory that are dynamic, socially constructed through community interaction, maintained through continuous participation, and accessible across geographical boundaries.

Digital comics platforms enable new forms of social reading that constitute heritage practices through their role in community formation and cultural transmission. Unlike traditional reading practices that assume individual engagement with static texts, digital comics reading often involves real-time community interaction, creator–audience communication, and collaborative interpretation that shapes cultural meaning and community identity. These social reading practices constitute cultural heritage activities through their role in community formation, cultural interpretation, and knowledge transmission, while the communities that form around digital comics develop elaborate cultural practices, interpretive traditions, and preservation activities that constitute forms of living heritage deserving recognition and support. As Ilan Manouach demonstrates, comics readers become actively entangled in "a vast paratextual economy where reader reviews, comments, ratings and reading behavior patterns are translated into dynamic layers of rich metadata that are analyzed and integrated into statistical models and recommendation algorithms,"

fundamentally transforming how cultural heritage is created and preserved through digital participation [21].

The real-time nature of social reading around serialized webcomics creates unique forms of cultural memory that capture community responses, interpretive development, and cultural conversation as it unfolds. Reader comments, fan theories, and community discussions document how cultural meaning develops through community engagement, providing heritage documentation of cultural reception and interpretation processes that traditional archives rarely capture. Fan translation communities demonstrate sophisticated heritage practices through their efforts to make digital comics accessible across linguistic and cultural boundaries, often exceeding professional translation in cultural sensitivity and community responsiveness, while creating comprehensive archives of translated content that preserve cultural accessibility across platform and technological changes [32]. These community-driven translation efforts constitute heritage infrastructure that enables cultural transmission while maintaining community agency over cultural interpretation and access.

The preservation challenges of social reading highlight the importance of ecosystem preservation approaches that maintain community features alongside creative content. Extracting webcomics from their social reading contexts fundamentally alters their cultural significance by removing the community interactions, real-time engagement, and collaborative interpretation that constitute much of their heritage value. Successful preservation approaches must account for these social dimensions while respecting community privacy and agency over their cultural practices and data.

4. Part III: Case Studies—Digital Comics Heritage in Practice

4.1. Case Study 1: Homestuck as Transmedia Heritage

Andrew Hussie's *Homestuck* (2009–2016) exemplifies how born-digital comics function as cultural epicenters generating complex transmedia heritage ecosystems that challenge traditional preservation frameworks. *Homestuck* began as a seemingly simple story about four teenagers playing a reality-altering video game called "Sburb" that accidentally triggers the apocalypse, forcing them to create a new universe while navigating complex time travel mechanics, alien civilizations, and interdimensional warfare. The narrative expanded to encompass multiple character perspectives, elaborate mythology involving twelve alien "troll" characters, and increasingly complex plot mechanics that incorporated reader suggestions, multimedia storytelling, and interactive elements that blurred boundaries between comic, game, animation, and collaborative fiction. The work's innovative integration of multimedia elements, community participation, and platform-specific technologies created new forms of digital storytelling that require sophisticated heritage approaches capable of maintaining both technical functionality and cultural meaning across multiple platforms and media types [33].

4.1.1. Technical Innovation and Platform Dependency

Homestuck pioneered the integration of Flash animations, interactive games, embedded music, and reader participation mechanisms within a webcomic format, creating a multimedia narrative experience impossible to replicate in traditional print media. The work's 8123 pages incorporated over four hours of Flash animation, thirty music albums, and interactive segments that required reader participation to advance the narrative [34]. These technological innovations demonstrate how digital comics can push the boundaries of sequential art through platform-specific affordances while creating preservation challenges that traditional heritage frameworks cannot address.

The work's technical architecture relied on multiple integrated systems: Flash Player for animations and interactive segments, embedded audio players for musical sequences,

hyperlinked navigation systems for non-linear storytelling, and server-side scripting for reader interaction mechanisms. This technological complexity created a multimedia narrative environment where story progression depended on reader participation, breaking traditional boundaries between creator and audience, while establishing new forms of collaborative storytelling that required technological mediation to function.

The work's dependence on Flash technology became a critical preservation issue when Adobe announced that "Adobe Flash Player will no longer be supported or distributed by Adobe" [35]. Unlike static webcomics that can be preserved through format conversion, *Homestuck*'s interactive elements and multimedia integration required maintaining the original technological assemblage to preserve cultural meaning. The crisis highlighted how born-digital heritage depends on technological ecosystems rather than individual files, requiring preservation approaches that account for software dependencies, interactive features, and multimedia integration as constitutive elements of cultural significance rather than technical obstacles to overcome.

4.1.2. Community Heritage Formation and Cultural Impact

Homestuck generated unprecedented levels of community engagement that created new forms of collective cultural memory, extending far beyond the original work. The comic's serialized publication over seven years fostered active fan communities that developed elaborate interpretive frameworks, specialized vocabulary, and cultural practices that became integral to the work's heritage significance. Fan communities created comprehensive wikis documenting plot details, character relationships, and cultural references; developed specialized terminology that entered broader internet discourse; and established conventions, fashion trends, and artistic movements inspired by the comic's aesthetic and thematic elements.

The work's cultural vocabulary includes terms like "shipping" (character relationship speculation), "trolls" (alien characters that influenced internet culture), and "classpects" (character classification system) that persist in online discourse years after the comic's completion. These linguistic innovations demonstrate how digital comics can generate cultural knowledge that transcends their original contexts, creating heritage value through community adoption and cultural transmission rather than institutional recognition.

The work's influence extended to fashion through distinctive character costumes that became convention staples, music through the creation of new subgenres inspired by the comic's soundtrack, and visual art through aesthetic movements that continue influencing digital culture. Fan conventions dedicated entirely to *Homestuck* drew thousands of participants, while fan-created music, art, and fiction generated cultural ecosystems that rival the original work in scope and influence.

The work's cultural impact generated what can be understood as "distributed heritage", where cultural significance emerges through community creation rather than institutional designation. Fan-created content including art, music, fiction, and multimedia projects created an extensive cultural ecosystem that demonstrates how digital comics can function as cultural catalysts that inspire ongoing creative production and community formation, requiring preservation approaches that account for community contributions as integral components of cultural heritage rather than secondary derivative works.

4.1.3. Preservation Response and Community Solutions

When Flash deprecation threatened *Homestuck*'s interactive elements, community developers created the Unofficial Homestuck Collection [36], demonstrating how community preservation can address technological challenges that institutional archives struggle to handle. The project developed custom emulation tools that maintain original functionality

while ensuring long-term accessibility, creating preservation infrastructure that exceeds most institutional capabilities through volunteer expertise and community commitment.

The preservation project involved reverse-engineering Flash animations to maintain interactive functionality, developing custom browser environments that support deprecated technologies, creating comprehensive metadata systems that document technical specifications and cultural contexts, and establishing distribution networks that ensure ongoing accessibility despite platform changes, with the goal to "to present *Homestuck* as it was originally released". This technical sophistication demonstrates how community preservationists often possess specialized knowledge about preserved materials that external institutions lack.

The Unofficial Homestuck Collection preserves not only the original work but also extensive community content, including fan art, music, and discussion archives that document the work's cultural development over time. This comprehensive approach recognizes that *Homestuck*'s heritage value emerges through community engagement rather than existing independently as an authored work, requiring preservation methodologies that maintain both original content and community contributions as integrated cultural phenomena.

The community preservation effort operates through volunteer networks that are coordinated across multiple platforms, demonstrating resilience and adaptability that institutional preservation often lacks. When technical challenges arise, community developers respond rapidly with innovative solutions, while institutional archives might require months or years to address similar problems through bureaucratic processes.

4.1.4. Transmedia Heritage Implications

Homestuck's influence extends across multiple media and cultural domains, generating fashion trends, musical genres, and artistic movements that demonstrate how digital comics can function as cultural generators with broad social impact. The work's aesthetic influenced web design trends, its narrative techniques inspired experimental storytelling across media, and its community practices established models for participatory cultural creation that continue influencing digital culture development.

This transmedia heritage creation poses significant challenges for traditional preservation approaches that are organized around single media types or institutional mandates. *Homestuck*'s cultural significance cannot be preserved through comic archives alone but requires coordinated preservation across multiple domains, including web culture, fashion, music, and community practices. The case demonstrates how born-digital heritage often transcends traditional archival categories, requiring new preservation frameworks that are capable of maintaining cultural connections across institutional boundaries and media types.

The work's transmedia influence also raises questions about heritage attribution and ownership when cultural creation extends across multiple creators, platforms, and media forms. Traditional copyright frameworks struggle to address collaborative cultural creation, where community contributions become integral to heritage significance, requiring new legal and ethical frameworks for community-driven heritage preservation.

4.2. Case Study 2: SmackJeeves' Closure and Community Response

The closure of SmackJeeves in 2019 represents a paradigmatic case of digital heritage loss that demonstrates both the fragility of platform-dependent cultural materials and the limitations of traditional preservation approaches when applied to born-digital comics. The platform's shutdown resulted in the loss of over fifteen years of webcomics content, affecting thousands of creators and destroying extensive community archives, while revealing systemic problems in current digital preservation frameworks.

4.2.1. Platform Infrastructure and Cultural Ecosystem

Founded by Daniel Liebner, SmackJeeves operated from 2005 to 2020 as one of the largest webcomics hosting platforms, providing free hosting services, community features, and creator tools that enabled thousands of independent artists to publish and distribute their work online. The platform hosted over 40,000 comic series, ranging from amateur experiments to professional-quality series that had developed substantial readerships and cultural influence. Unlike commercial publishing platforms, SmackJeeves fostered a community-driven ecosystem, where creators and readers collaborated in content development, cultural interpretation, and community formation.

The platform's significance extended beyond simple content hosting to include comprehensive community infrastructure: it included comment systems that enabled real-time reader-creator interaction, rating mechanisms that helped readers discover new content, social features that connected creators and fans, forum systems that facilitated community discussion, and recommendation algorithms that shaped cultural circulation patterns. These technological features created social reading experiences that constituted integral components of the webcomics' cultural meaning and heritage value.

SmackJeeves also functioned as an educational platform where aspiring creators learned webcomics techniques, received feedback from experienced artists, and developed professional skills through community mentorship. The platform's community features enabled knowledge transmission between creators, cultural development through reader engagement, and collaborative creation processes that challenged traditional boundaries between professional and amateur cultural production.

4.2.2. Preservation Failure and Cultural Loss

The SmackJeeves closure demonstrated how platform-dependent cultural materials face unique preservation challenges that traditional heritage frameworks are ill-equipped to address. Despite advance warning of the platform's shutdown, preservation efforts were constrained by copyright restrictions, technical limitations, and lack of institutional support, resulting in widespread cultural loss that could have been prevented with appropriate preservation planning.

The closure timeline revealed systematic problems in digital preservation: the platform provided inadequate migration tools for creators seeking to preserve their work, copyright restrictions prevented comprehensive community preservation efforts, technical limitations made bulk downloading difficult or impossible, and institutional archives showed little interest in preserving materials they considered "amateur" or "non-professional" cultural content.

Community preservation efforts emerged organically but faced significant obstacles, including legal uncertainty about preservation rights, technical challenges in maintaining platform-specific features, resource limitations preventing comprehensive preservation, and time constraints that prevented thorough cultural documentation. These limitations resulted in the loss not only of individual works but also of community interactions, reader comments, creator–audience conversations, and cultural context that constituted integral components of the works' heritage significance.

The cultural impact of this loss extends beyond individual creators to affect broader digital culture development. Many creators lost years of work, community connections, and cultural documentation, while readers lost access to works that had influenced their cultural development and community formation. The loss also eliminated important historical documentation of early digital comics culture, community formation processes, and technological innovation that represented significant cultural heritage.

4.2.3. Community Response and Alternative Preservation Models

The SmackJeeves closure catalyzed community-driven preservation efforts that demonstrate alternative approaches to digital heritage protection, while revealing the limitations of reactive preservation strategies. Community preservationists attempted to create backup archives, mirror sites, and alternative hosting solutions, but faced significant technical and legal challenges that prevented comprehensive preservation of the platform's cultural content.

Some creators successfully migrated their work to alternative platforms, but lost community connections, reader engagement data, and cultural context that had developed over years of platform-based interaction. Others abandoned their webcomics entirely, unable to rebuild the community relationships and technological infrastructure that had sustained their creative practice. The migration process revealed how platform-dependent cultural creation requires not only content preservation but also community and technological ecosystem maintenance.

The crisis prompted discussions about creator rights, platform responsibility, and community preservation that continue influencing digital culture policy development. Creator communities developed new backup strategies, diversified their platform presence, and established mutual aid networks to support creators facing similar losses. These community responses demonstrate adaptive capacity, while highlighting the ongoing precarity of platform-dependent cultural creation.

4.2.4. Policy and Framework Implications

The SmackJeeves closure demonstrates how current digital preservation frameworks fail to address the temporal urgency, technological complexity, and community dynamics that characterize born-digital heritage. Traditional preservation approaches that prioritize institutional validation, stable formats, and individual works prove inadequate for preserving platform-dependent cultural materials that derive meaning from community engagement and technological mediation.

The case reveals the need for anticipatory preservation planning that addresses technological dependencies before crisis situations arise. This includes developing community-institutional partnerships for preservation planning, establishing legal frameworks that support community preservation efforts, creating technical infrastructure for platform migration and content preservation, and recognizing community-driven preservation as legitimate heritage activity deserving institutional support.

Platform closures disproportionately affect marginalized creators and experimental cultural forms that institutional archives often overlook. The platform hosted diverse voices, experimental techniques, and community-driven cultural creation that represented important cultural innovation, but lacked institutional recognition or commercial viability that might have attracted preservation attention.

The case demonstrates the urgent need for proactive digital heritage policies that recognize community agency, support creator rights, and address the systemic challenges facing platform-dependent cultural creation. This includes developing legal frameworks for community preservation, establishing institutional support for creator migration and backup services, and creating preservation infrastructure that maintains community features and cultural context alongside individual works.

5. Part IV: Toward a Framework for Digital Comics Heritage

5.1. Synthesis: Rethinking Heritage in the Digital Age

This analysis has demonstrated that born-digital comics fundamentally challenge three core assumptions of traditional heritage theory. First, the assumption that cultural significance requires institutional validation proves inadequate when community-driven

digital cultures generate billions of page views and create global transmedia franchises outside traditional gatekeeping structures. Second, the assumption that preservation means maintaining original forms fails when applied to digital comics that derive meaning from ongoing transformation, community engagement, and technological mediation. The SmackJeeves closure demonstrated how static preservation approaches fundamentally alter cultural significance by removing interactive features and social reading experiences. Third, the assumption that heritage value exists independently of community practice proves inadequate for digital comics cultures where meaning emerges through participatory engagement rather than expert designation. Fourth, and finally, this expressive ecosystem needs to be accounted for by traditional heritage institutions. Institutions ought to be devoting money and infrastructure to ensure the preservation of these complex systems of creation, interpretation, and interaction.

5.2. A General Framework for Born-Digital Comics Heritage

5.2.1. Technical Infrastructure and Living Heritage

Digital comics' preservation requires infrastructure capable of maintaining platform-specific functionality rather than simply storing content files. This includes platform emulation systems that preserve mobile interfaces, scrolling behaviors, and interactive features alongside content; expanded metadata schemas documenting technical specifications, community engagement patterns, and creator–audience interaction histories; and community archive integration that leverages community expertise while providing institutional technical infrastructure and legal support. Following Holtorf's framework, digital comics' preservation should support ongoing creation, community evolution, and cultural adaptation as well as other historical formats. This approach recognizes that cultural significance emerges through community engagement and cultural practice rather than historical authenticity. Community-driven preservation efforts demonstrate living heritage principles through their responsiveness to community needs, cultural changes, and technological developments.

5.2.2. Infrastructure and Knowledge Organization

Digital cultural heritage presents preservation requirements that must align with FAIR principles for data management. The extensive digitization of cultural collections and the rapid increase of born-digital materials have affected the global growth of digital humanities and digital cultural heritage fields [37]. Digital humanities have pioneered new collaborative spaces and infrastructures [38], with concepts such as "distant reading" [39] and "algorithmic reading" [40] offering fresh perspectives on human–machine interpretation relationships.

Born-digital archives present unique challenges in terms of preservation, access, and metadata management due to their digital-native nature, requiring specialized approaches to ensure long-term accessibility [41]. UNESCO has declared the preservation of digital heritage to be a matter of global importance, leading institutions worldwide to establish standards for digital artifact creation, documentation, and interpretation [42]. However, Barbara Reed observes persistent challenges in preserving born-digital artifacts due to omnipresent issues with storage media and platforms [43]. Clifford Lynch emphasizes that trust in digital preservation "is not necessarily an absolute, but often a subjective probability," which is particularly important for cultural heritage materials that are often personal files rather than institutional records [44].

5.3. Policy Recommendations

5.3.1. Institutional Reform and International Coordination

Heritage institutions require significant reform, including: community partnership development that provides technical infrastructure while respecting community authority; specialized technical infrastructure for platform emulation and community feature preservation; and staff training in digital culture analysis and platform-specific preservation techniques.

International heritage frameworks should explicitly recognize born-digital cultural materials as legitimate heritage deserving of systematic preservation support. This requires UNESCO framework expansion, cross-border preservation coordination addressing multiple legal jurisdictions, and cultural competency standards that respect diverse approaches to digital heritage.

5.3.2. Community Empowerment

Effective digital comics heritage preservation requires recognizing community preservation networks as legitimate heritage infrastructure. This includes direct funding for community archives demonstrating professional standards, technical resource sharing that respects community autonomy, and legal protection for community preservation efforts navigating complex copyright environments.

5.4. Future Research Directions

This analysis opens promising research directions, including algorithmic heritage studies examining how machine learning and automated curation participate in cultural memory formation; transmedia heritage theory addressing cultural significance across multiple media types; global digital culture preservation through comparative analysis across different cultural contexts; and community heritage methodology documenting sophisticated preservation practices developed by community networks.

5.5. Conclusion: Digital Comics as Heritage Paradigm

Digital comics represent a paradigmatic case for reimagining heritage theory in networked, participatory, and technologically mediated cultural contexts. The theoretical frameworks developed—heritage futures theory, digital materiality studies, critical heritage approaches, posthuman heritage theory, and participatory culture analysis—provide conceptual tools for addressing broader challenges of born-digital heritage preservation.

The case studies demonstrate how community-driven preservation can achieve professional standards while maintaining cultural sensitivity. The preservation methodologies proposed—platform ecosystem preservation, expanded metadata frameworks, and community-institutional partnerships—offer concrete approaches for maintaining born-digital cultural materials that depend on technological assemblages and community engagement.

Most significantly, this analysis demonstrates how digital comics function as "rogue archives" that preserve vernacular expression outside institutional frameworks while creating new forms of collective memory through platform-mediated communities. This challenges traditional distinctions between cultural creation and preservation, revealing how digital communities actively participate in heritage formation through ongoing cultural practice.

Digital comics heritage preservation offers a model for addressing broader challenges of cultural preservation in digital environments where technological dependency, community agency, and ongoing transformation characterize increasing portions of contemporary cultural production. The theoretical and methodological contributions extend beyond

comics studies to offer frameworks for heritage preservation in digital environments that recognize technological mediation and community agency as legitimate heritage characteristics rather than obstacles to traditional preservation approaches.

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