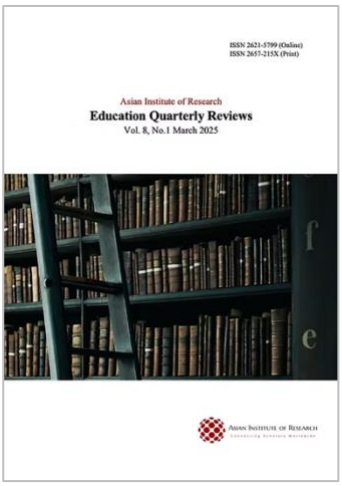

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Preservation of Cultural Identity in Digital Ecosystems

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Abstract
The rapid progression of globalization and digitalization presents both significant opportunities and various challenges for the preservation and sustainability of cultural identities. While digital ecosystems offer innovative tools and methods for maintaining, disseminating, and revitalizing cultural identity in the digital environment, they also carry risks such as cultural homogenization and the digital divide. This article examines the preservation of cultural identity within the context of digital ecosystems and provides a comprehensive analysis of the impact of digital tools on cultural identity in light of the existing literature. It discusses how digitalization supports and preserves cultural diversity. Additionally, it offers strategic recommendations for preventing digital homogenization and closing the digital divide. In conclusion, it emphasizes the contributions of the conscious and strategic use of digital ecosystems to the strengthening and sustainability of cultural identities.

Keywords: Digital Ecosystem, Cultural Identity, Cultural Heritage, Digital Preservation

1. Introduction

Globalization and digitalization have led to profound changes in the economic, social, and cultural dynamics of societies in recent years, presenting both significant opportunities and various challenges for the preservation and sustainability of cultural identities (Appadurai, 1996; Castells, 2010). The rapid development and widespread use of digital technologies offer innovative tools and methods for preserving, disseminating, and revitalizing cultural heritage in digital environments, while also introducing critical risks such as cultural homogenization, the digital divide, and data security (Sussan & Acs, 2017; Noble, 2018).

Digital ecosystems are defined as continuously evolving, self-organizing structures in which software applications, digital platforms, data flows, users, and other digital entities interact (Briscoe, 2009). These structures play an important role in the digitization and broad dissemination of cultural content. For example, digital archiving techniques protect cultural objects against physical deterioration by storing them in digital formats, while virtual reality (VR) and augmented reality (AR) applications enable the re-creation of cultural sites and events within digital environments (Manovich, 2013; Champion, 2016). In addition, artificial intelligence–supported analyses and blockchain technologies facilitate the examination, verification, and secure sharing of cultural content (Rosenblatt & Dykstra, 2003; Lessig, 2004).

However, the process of digital transformation also brings the risk of cultural homogenization. Under the influence of global digital platforms, local and unique cultures may become increasingly similar, leading to a reduction in cultural diversity and the erosion of local identities (Appadurai, 1996; Castells, 2010). This situation makes it more difficult for societies to preserve their distinctive cultural practices and identities, thereby threatening the richness of cultural diversity. Moreover, the inequalities in access to technological infrastructure, known as the digital divide, raise the issue that some communities may not be adequately represented in digital spaces (Noble, 2018). These inequalities disadvantage communities that lack or have limited access to digital technologies, making it more challenging for them to protect and disseminate their cultural heritage in digital environments.

The aim of this study is to objectively and comprehensively evaluate the impact of digital ecosystems on cultural identities, to reveal the potential of digital technologies in preserving cultural heritage, and to contribute to the existing literature in this field. Furthermore, by providing strategic recommendations for future research, it seeks to help develop policies and practices that balance the positive and negative effects of the digitalization process on the sustainability of cultural identities. In conclusion, it is foreseen that through the conscious and strategic use of digital ecosystems, cultural identities can be strengthened, and cultural diversity can be preserved and sustained. A review of the literature shows that Briscoe and De Wilde (2006) examined the influence and evolution of digital ecosystems on service-oriented architectures. Nachira, Dini, and Nicolai (2007) presented a comprehensive analysis of the development and future of digital business ecosystems in Europe. Iansiti and Levien (2004) focused on strategic management and leadership within digital ecosystems. Ghazawneh and Henfridsson (2013) analyzed the balance between third-party contributions and platform control in digital platform ecosystems. Parker, Van Alstyne, and Choudary (2016) discussed how digital platforms are transforming the economy and how to benefit from this transformation. Adner (2006) worked on aligning innovation strategies with digital ecosystems, and Basole (2009) made significant contributions by visualizing and analyzing interfirm relationships in mobile digital ecosystems. Although these studies address different dimensions of digital ecosystems, no research has been encountered concerning the preservation of cultural identity in digital ecosystems. Therefore, this study is expected to contribute to the literature.

Another important focus of the article is to address in detail the risks and challenges posed by digital ecosystems. To prevent cultural homogenization, it is recommended to support local cultural content on digital platforms. To bridge the digital divide, strategies such as protecting cultural content through copyright, developing digital ethics, and implementing digital literacy education programs are suggested. Additionally, measures to ensure data security and privacy may be essential for protecting cultural data in digital environments.

2. Method

This study, prepared within the context of qualitative research methodology, was designed using the literature review model. A literature review is a model that systematically examines the existing body of knowledge on a specific topic or research question. This model enables the researcher to conduct an in-depth analysis of existing studies in the field, gain insights into current theories and findings, and identify gaps or deficiencies in the research area. Literature reviews form the theoretical foundation of the research and provide a framework for new studies (Webster & Watson, 2002). In this model, the researcher first selects literature relevant to the study's purpose and analyzes it systematically. The scope of the literature review can be broad or narrow, depending on the aim and scope of the study. The findings of the literature review not only present the researcher with the current body of knowledge on the subject, but also make recommendations for future research and offer critiques of existing studies (Okoli & Schabram, 2010).

In this study, a comprehensive literature review was conducted with the aim of preserving cultural identity within the context of digital ecosystems. As part of the literature review, a robust conceptual framework was developed to examine and analyze the topic in detail. This framework is designed to systematically evaluate fundamental elements such as the concept of the digital ecosystem, how cultural identities can be sustained in digital environments, the role of digital tools in this process, and the challenges encountered. Created through the synthesis of existing theoretical approaches, the conceptual framework offers a multidisciplinary perspective for understanding the effects of digital technologies on cultural identity. In this way, the positive and negative impacts

of digitalization on cultural identities are thoroughly analyzed, and strategic recommendations guiding future research can be developed.

3. Results

3.1. The State of the Development Process of Digital Ecosystems

The term "digital ecosystem" is used in various senses in academic literature and practical applications (Fiorina, 2000). Digital ecosystems are generally defined as structures based on existing internet infrastructures, providing a framework that encompasses the manner in which companies present their e-business solutions to customers. These structures include future-oriented developments intended to support business ecosystems, alongside the integration of Information and Communication Technologies (ICT) into e-business processes. Particularly with the adoption of ICT, digital ecosystems have taken on a critical role in the digitalization and optimization of business processes. In addition, digital ecosystems hold a significant place within the scope of "Artificial Life" research. In this context, digital ecosystems are employed to model certain aspects of biological and other complex systems. However, the similarities between digital ecosystems and biological ecosystems can be limited. Thus, careful use of language and concepts is required when defining and employing the concept of digital ecosystems (Ray, 1993; Moore, 1996; Denning & Metcalfe, 1997; Grand & Cliff, 1998; Cliff & Grand, 1999).

The concept of the "digital ecosystem" emerged by adapting the concept of the "ecosystem," initially defined in the 1930s by British botanists Arthur Roy Clapham and Arthur George Tansley, from the natural world to the digital world. While Tansley's definition of an ecosystem emphasizes the complex relationships among biodiversity and environmental factors, digital ecosystems reinterpret these interactions among digital components. Digital ecosystems are defined as continuously evolving, self-organizing structures in which software applications, digital platforms, data flows, users, and other digital entities interact (Tansley, 1935; Sussan & Acs, 2017).

According to Sussan and Acs (2017), the ecosystem concept originally emerged in the biological sciences to examine the complex interactions between living organisms and their environments. Over time, the flexibility and comprehensiveness of this concept allowed it to be adapted to various disciplines. By embracing an ecosystem approach in fields such as education, entrepreneurship, health, finance, and e-commerce, the dynamics of these sectors began to be understood more effectively. Examples include:

In education, the concept of learning ecosystems encompasses the interactions among students, teachers, families, technological tools, and educational materials. This approach aims to enrich individual learning experiences and make education more personalized. Integrating digital technologies makes learning processes more accessible and flexible, enabling students to progress at their own pace and in line with their interests.

In the field of entrepreneurship, the ecosystem approach examines the relationships among entrepreneurs, investors, mentors, educational institutions, and government policies. These ecosystems create an environment that fosters innovation and supports the growth of new ventures. Access to resources, knowledge sharing, and collaborative opportunities increase the likelihood of entrepreneurial success.

In the health sector, digital health ecosystems create a network among patients, healthcare providers, insurance companies, and technological solutions. This ecosystem enables secure patient data sharing, telemedicine services, and personalized treatment plans. As a result, the quality and efficiency of healthcare improve, costs decrease, and patient satisfaction rises.

In the financial world, financial ecosystems encompass relationships among banks, fintech companies, regulatory institutions, and customers. This structure accelerates the digitalization of financial services, encouraging developments in innovative payment systems, digital currencies, and blockchain technologies. Financial inclusion increases, providing individuals and businesses with access to a wider range of services.

In the e-commerce sector, the ecosystem approach involves the interactions among sellers, buyers, logistics service providers, payment systems, and marketing platforms. This ecosystem facilitates global trade, offers consumers more choices, and enables businesses to access new markets. The integration of technologies such as data analytics and artificial intelligence enhances the customer experience and improves operational efficiency (Sussan & Acs, 2017).

According to Sussan and Acs (2017), the expansion of digital ecosystems constitutes a new paradigm in the digital economy and entrepreneurship. In their view, digital ecosystems form the foundation of innovative business models and value creation processes. With the rapid advancement of technology, these ecosystems blur the boundaries of traditional sectors and redefine competition on a global scale.

In recent years, as technology and the internet have developed rapidly, the concept of the "digital ecosystem" has become more pronounced. Digital ecosystems are not merely the result of bringing together digital components, but rather emerge from the interactions among these components. These interactions encompass dynamic processes such as data sharing, collaboration, and competition. Key characteristics of digital ecosystems include complexity, interdependence, scalability, and sustainability. They possess the ability to self-organize and maintain stability, continuing to operate reliably despite external interventions (Briscoe, 2009; Li, Badr & Biennier, 2012; Tiwana, 2013).

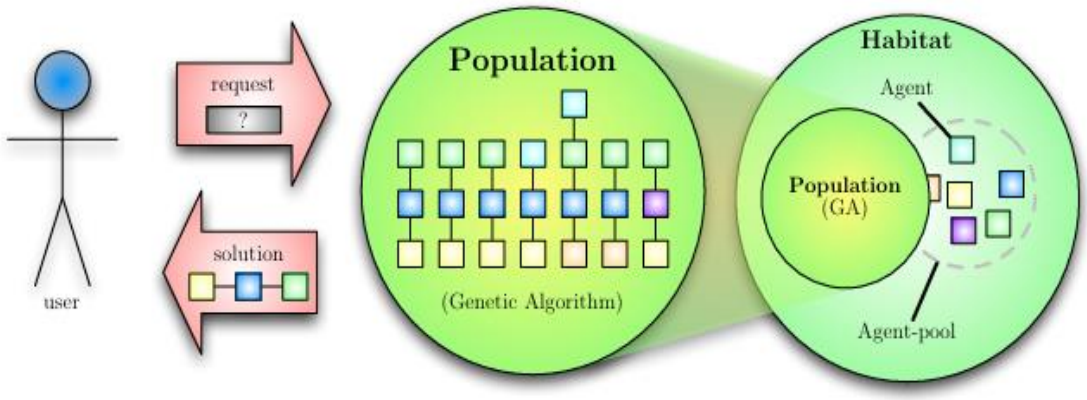

Figure 1: Operation of Digital Ecosystems (Briscoe, 2009).

This figure illustrates the workflow from a user to a solution within a digital ecosystem. The diagram consists of four main sections:

- User: The user sends a request to the system. This request is a semantic definition related to the service or application the user requires.
- Request and Solution: The user's request is represented by a symbol, and the corresponding solution is indicated as the output generated by the system. The solution is obtained using a genetic algorithm.
- Population: The population area represents the community of agents (software units) created in response to the user's request. This population utilizes genetic algorithms (GAs) to strive for an optimal solution. Each square within the population represents an agent, and different colors likely signify the various functions or states of the agents.
- Habitat: The habitat is the environment where the population is created and evolves. Here, there is an "Agent-pool," which is a repository of available agents. This pool contains all potential agents within the habitat, and specific agents are selected based on the needs of the population.

Overall, this visual depicts how user requests are processed within a digital ecosystem, how software agents dynamically evolve, and how a configuration is structured to produce solutions tailored to the user's needs. The operations at each stage and their integration clearly demonstrate the flow and functionality within the system (Briscoe, 2009).

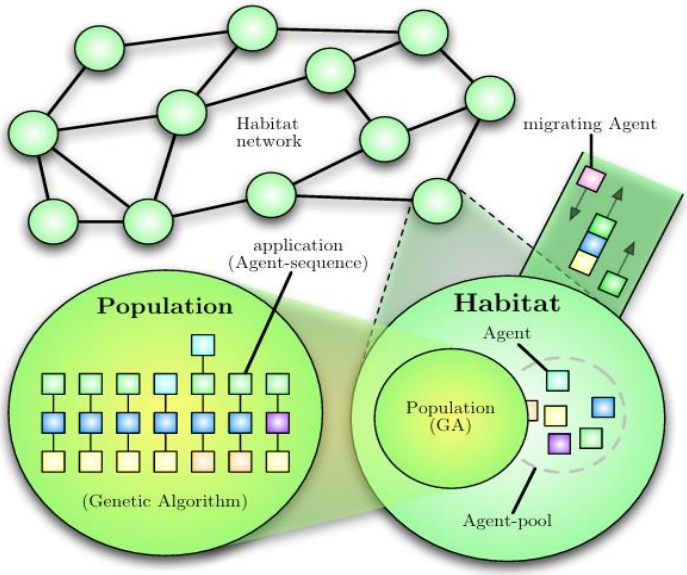

Figure 2: Network Structure Between Habitats in a Digital Ecosystem (Briscoe, 2009).

This figure illustrates the network structure between habitats within a Digital Ecosystem and how the interacting components operate. The main components in the visual and their functions can be explained as follows:

- Habitat Network: This network represents various interconnected habitats. Each circle symbolizes a habitat, and the connections between these habitats indicate the flow of components and information. The movement of components between these habitats facilitates the sharing of information and resources throughout the ecosystem.
- Migrating Agent: This represents a component migrating from one habitat to another. Migrating agents can collect information from different habitats and transport it to other habitats. This process increases diversity and promotes inter-habitat collaboration, thereby enhancing the ecosystem's overall adaptability and innovation capacity.
- Component-sequence: This is a sequence of components specifically arranged to perform a certain task. The component sequence is structured in response to a specific need within the habitat and utilizes genetic algorithms to address this need.
- Population: The population refers to a collection of components brought together to perform a specific task. This population is selected from the component pool within the habitat and optimized using a genetic algorithm. The colors of the population likely represent different functions or characteristics of the components.
- Habitat: Habitat refers to the specific environment where components reside and interact. The component pool contains all components available within this habitat that could potentially be part of a population. The habitat also provides a framework for the development and optimization of components.

Overall, this visual serves as an effective illustration of how components are organized within digital ecosystems, how they migrate between habitats, and how they interact within the overall system. It also highlights the dynamic nature of information flow and resource utilization within the system. In this context, a digital ecosystem is a system where various digital tools, applications, and services operate in an interconnected manner. This can be likened to a natural forest, where trees, animals, and plants coexist, support each other, and maintain the ecosystem's balance. Similarly, in a digital ecosystem, computer programs, websites, mobile applications, and devices (such as phones, tablets, and computers) collaborate. These connections facilitate information sharing, enhance operational speed and efficiency, and enable the emergence of new ideas. For example, a smartphone application can integrate with social media accounts, cloud storage services, and online shopping sites. Collectively, these integrations work together to provide users with an enhanced digital experience (Briscoe, 2009; Tiwana, 2013).

The infrastructure of digital ecosystems is often supported by advanced technologies such as cloud computing, big data analytics, and the Internet of Things (IoT). These technologies enhance data processing capacity, enable faster and more effective decision-making processes, and ensure that ecosystem components interact with one another more efficiently. For example, cloud computing infrastructure allows digital ecosystems to store and process large volumes of data, while artificial intelligence algorithms extract meaningful insights from these data, contributing to a smarter and more predictable ecosystem (Briscoe & Marinos, 2009; Giusto et al., 2010; Hashem et al., 2015; Hassan, 2018).

Platforms play a significant role in the creation of digital ecosystems. Platforms serve as fundamental structures that enable various components of a digital ecosystem to interact with each other. For instance, Apple's iOS platform or Google's Android platform act as bridges among application developers, users, and service providers, thereby supporting the integrity and functionality of the ecosystem. Such platforms promote the growth and diversification of digital ecosystems, allowing for the emergence of new business models and innovative solutions (Evans, 2016; Parker et al., 2016).

Users are among the most important actors in digital ecosystems. Beyond simply consuming digital services, users contribute to the ecosystem's development by providing feedback and engaging with it. User needs and expectations play a decisive role in the evolution of digital ecosystems. Therefore, user-centered design and user experience management are critical for the success of digital ecosystems (Schaffer, 2004; Norman, 2013).
In conclusion, digital ecosystems can be described as dynamic structures that emerge as the digital-world reflections of biological ecosystems and continually evolve alongside technological developments. These ecosystems arise from the interaction of complex, interdependent digital components, and they stand out as self-organizing, scalable, and sustainable. In this context, digital ecosystems are considered significant structures capable of adapting to today's rapid technological changes and offering innovative solutions across various sectors.

3.2. The State of the Construction and Representation of Cultural Identity in Digital Ecosystems

Cultural identity is a concept that reflects the values, norms, beliefs, and practices of the culture to which individuals belong (Du Gay & Hall, 1996). This identity takes shape through individuals' interactions with their social environments and exhibits a dynamic structure over time (Hall, 1990). Preserving cultural identity is of great importance for the sustainability of social diversity and cultural heritage (Anderson, 1983). When societies maintain their cultural identities, it not only strengthens the sense of belonging on both individual and collective levels, but also encourages the development of intercultural dialogue and understanding. Moreover, the preservation of cultural identity in the process of globalization functions as a balancing element against the risks of cultural homogenization and assimilation (Appadurai, 1996; Berry, 1997). The sustainability of cultural heritage is not solely about preserving the past; it is also critical for ensuring that the values and accumulated knowledge are passed on to future generations (UNESCO, 2003). In this context, the preservation of cultural identity is an indispensable factor for maintaining social cohesion and sustaining the richness of cultural diversity (Giddens, 1991).

The construction and representation of cultural identity in digital ecosystems has become an important field of research with the rapid advancement of technology in modern societies. This is because digital platforms offer extensive opportunities for individuals to express and redefine their cultural identities (Marwick & Boyd, 2011). Tools such as social media, blogs, online forums, and digital artworks enable users to share their cultural experiences and represent these experiences digitally (Ketelaar, 2008). In this process, digital environments allow cultural identity to emerge in a flexible and multilayered manner, permitting individuals to present various components of their identity simultaneously (Nakamura, 2007). However, there is also a risk of homogenization in digital representation; global digital platforms can lead to the widespread adoption of certain cultural norms and values, ultimately weakening local cultural diversity (Poster, 2006; Couldry, 2012; Manovich, 2013). Furthermore, the construction of cultural identity in digital spaces involves structural barriers, such as digital inequalities and access issues faced by users as they shape their identities through digital tools (Noble, 2018). In this regard, the construction and representation of cultural identity in digital ecosystems presents both opportunities and

challenges, playing a significant role in the sustainability and diversity of cultural identity (Jenkins, 2011; Papacharissi, 2010).

3.2.1. The State of the Digitization of Traditional Cultural Elements

The digitization of traditional cultural elements is important for preserving cultural heritage and transmitting it to future generations. Cultural heritage is one of the most valuable elements expressing the identities and histories of societies. Ensuring its preservation and sustainability is not only carried out through physical methods, but also through digital technologies. Digitization contributes to the long-term preservation of cultural elements, facilitates access to them, and promotes their recognition on a global scale. Digital archiving techniques make it possible to convert historical documents, manuscripts, artworks, and other cultural objects into digital formats, protecting them from physical deterioration. As these cultural objects are stored digitally, they remain preserved for the long term and are safeguarded from the risk of physical damage. UNESCO's World Digital Library project aims to increase the accessibility of materials from different cultures by digitizing them (Ketelaar, 2008; UNESCO, 2015a). Such projects enable digitized cultural elements to reach wider audiences worldwide and foster cultural awareness.

Another significant advantage of the digitization process is that it makes cultural objects more accessible for academic research. Digital archives allow researchers and students to easily access cultural materials, contributing to more comprehensive analyses in cultural studies (Parry, 2007). Digitization not only involves preserving cultural heritage, but also making it more effectively usable in the academic world. This process serves the purpose of presenting cultural heritage to broader audiences for research and educational use, facilitating the transmission of cultural knowledge.

Moreover, digitization makes it possible to present cultural heritage in interactive and user-friendly formats. Digital platforms go beyond the passive viewing of cultural heritage, enabling users to actively engage with it (Manovich, 2013). Users who interact with digitized cultural content can add their own comments, share their experiences, and thus contribute to the continuous reinterpretation of cultural heritage. This can help cultural heritage gain a dynamic structure and be embraced by societies.

The digitization process also increases the global sharing of cultural heritage and enhances interaction between different cultures. As cultural heritage reaches large audiences through digital platforms, it contributes to the preservation of cultural diversity and the development of global awareness and understanding. This allows cultural elements to become part of the common heritage of the global community, rather than remaining confined to the local level. Digitized cultural elements enable people in different geographical regions to recognize this heritage and respect cultural diversity. However, the digitization process also brings certain challenges. Ensuring the accuracy and authenticity of digital content, digital rights management, and inequalities in access are among the important issues that must be carefully addressed in this process (Appadurai, 1996; Warschauer, 2004; Parry, 2007).

3.2.2. The State of the Impact of Digitalization on Local Cultures

Digitalization emerges as a multidimensional phenomenon in terms of its effects on cultures. The rapid spread of digital technologies enables local cultures to reach wider audiences and actively participate in global cultural interactions. Social media platforms, digital archiving systems, and online media increase the visibility of local cultural elements and contribute to their recognition on a global stage. However, this increased visibility brought about by digitalization also entails that local cultures must adapt to global norms. This situation raises the risk that local cultures may lose their distinctiveness, leading to cultural homogenization (Appadurai, 1996; Tomlinson, 1999; Ketelaar, 2008).

For local artists and cultural actors, digital platforms offer the opportunity to showcase their work and gain international recognition. While this allows them to reach a global audience, it also creates the necessity to comply with global cultural norms and expectations. Popular culture spreading through social media, in particular, makes

it more challenging to protect local cultural practices and languages. The fact that digital content is often produced in more widely used and universal languages causes local languages and cultural expressions to become marginalized (Nakamura, 2008). This threatens the diversity of local cultures and sets the stage for cultural homogenization.

For example, promoting local folk dances and music on digital platforms allows these cultural elements to reach a global audience. However, the need to meet certain standards for these genres to achieve commercial success in digital environments can lead to the disappearance of traditional elements and the commercialization of local cultural values (Pieterse, 2004). Adapting cultural products to appeal to a broader audience may mean compromising their authenticity and rendering cultural heritage superficial. In this context, digitalization can usher in the universalization and commercialization of local cultural forms of expression.

This impact of digitalization on local cultures creates a series of challenges in terms of preserving cultural identity. While taking advantage of the benefits of the digitalization process, it is of great importance to take measures against the risk of cultural homogenization that arises during this process. Strategic approaches must be developed regarding how to use digital platforms in a way that preserves cultural diversity and maintains the authenticity of local cultural expressions. Although digitalization presents great opportunities for promoting and preserving local cultures, effectively utilizing these opportunities requires attention to the accuracy, authenticity, and ethical use of digital content. In this regard, global and local digital policies must be developed to ensure that local cultures are accurately represented in the digital environment and to reduce the risk of cultural homogenization. UNESCO's recommendations for preserving cultural diversity provide an important roadmap for supporting and protecting local cultural expressions on digital platforms (UNESCO, 2001; Jenkins, 2011).

For the sustainability of cultural diversity, ethical principles should be adopted in the process of promoting local cultures in digital media, and the necessity for these cultural elements to conform to global cultural norms should be minimized. Digitalization can be a powerful tool for local cultures to gain global visibility; however, this process must be carefully managed from the perspective of preventing the loss of local cultural authenticity and preserving cultural diversity.

3.3. The State of New Approaches to Preserving Cultural Heritage: Digital Storytelling and Virtual Reality

The rapid development of digital technologies has created new opportunities for the preservation of cultural heritage and its transmission to future generations. In particular, digital storytelling and virtual reality (VR) technologies offer innovative approaches for reaching broader audiences and enabling interactive experiences of cultural heritage. Digital storytelling combines text, visuals, sound, and interactive elements to help users form a profound connection with cultural narratives. By going beyond the boundaries of traditional storytelling, this method encourages active user participation and allows them to emotionally and intellectually engage with cultural content (Robin, 2008).

Virtual reality technologies further enrich digital storytelling by allowing users to experience cultural spaces and activities in virtual environments (Champion, 2016). Virtual museums and historical sites created with VR technology enable users to overcome physical limitations and access cultural heritage from different parts of the world (Jerald, 2015). For example, virtually touring an ancient city or historical structure in three dimensions not only provides a visual experience but also helps users better understand the historical context through interactive elements.

Augmented reality (AR) technologies also play an important role in preserving and promoting cultural heritage. AR applications add digital information to real-world environments, allowing users to experience cultural elements around them in a more enriched way (Bower, 2017; İçten & Bal, 2017). For instance, a person visiting a historical building can instantly view its past appearance, construction process, or related historical events through their smart device.

Digital storytelling and VR/AR technologies offer wide-ranging applications in the fields of education and tourism. Educators can use digital storytelling to help students learn about cultural topics more effectively (Jenkins, 2011). VR-supported educational materials allow students to experience historical events or cultural rituals as if they were actually present. In the tourism sector, these technologies enhance the appeal of cultural sites by providing visitors with richer and more personalized experiences.

However, some important considerations must be taken into account for the successful implementation of digital storytelling and VR/AR technologies. First and foremost, ensuring the accuracy and authenticity of the content is critical. Collaboration with experts is necessary to prevent the dissemination of incorrect or misleading information during the representation of cultural heritage in digital environments. Additionally, user privacy and data security should be taken into consideration, especially in protecting personal data collected by VR and AR applications (Noble, 2018; Aydın, 2020; Ergen, 2020).

Digital inequalities are another issue that must be addressed. Since not all users have access to these technologies, there are obstacles to the widespread reach of digital storytelling and VR/AR applications. Therefore, efforts should be made to reduce the digital divide through infrastructure investments and improving digital literacy levels.

These technologies enable cultural narratives to reach broader audiences, allow users to interactively connect with these narratives, and ensure that cultural identity remains dynamic (Papacharissi, 2010; Ergen, 2020). However, to fully realize this potential, issues such as content accuracy, ethical use, user privacy, and digital inequalities must be carefully addressed. By doing so, it will be possible for cultural heritage to remain vibrant and accessible through digital technologies.

3.4. The State of the Risk of Cultural Homogenization and Cultural Identity Loss in the Digitalization Process

While the digitalization process increases cultural interaction on a global scale, it also brings with it the risks of cultural homogenization and loss of cultural identity. As digitalization redefines boundaries and eliminates geographical distances, it fosters closer relationships between different cultures. However, as a result of this closer interaction, there arises the danger that local cultures may dissolve into global cultural currents (Sassen, 2002). Castells (2010) states that modern communication technologies strengthen global networks and that local traditions weaken under this global cultural pressure. This situation reduces cultural diversity and forces local identities to adapt to global norms.

Appadurai's (1996) theory of cultural dimensions also supports this process; digitalization and modern media tools lead to the convergence of different cultures and the erasure of unique cultural elements. Global popular culture, which rapidly spreads through digital media, risks causing local cultural elements to lose their authenticity. In this process, digital technologies not only bring cultures closer together but can also cause local cultures to dissolve within this new "global village." In this context, cultural identity loss emerges as both a threat and a result of the dual impact of digitalization and modern cultural interaction.

Cultural homogenization erodes local identities and cultural practices, making it more difficult for societies to preserve their unique identities (Appadurai, 1996; Pieterse, 2004). Popular culture disseminated through social media platforms marginalizes local traditions and languages, thereby increasing the danger of cultural identity loss (Castells, 2010). The spread of digital media and global communication networks, especially those centered around Western cultural norms and values, facilitates their worldwide dissemination, marginalizing local cultures and reducing their visibility (Said, 1978). Cultural homogenization weakens societal identities and diminishes individuals' sense of cultural belonging, leading to a decline in mutual understanding, tolerance among societies, and weakening of social solidarity (Bauman, 1998; Inglehart & Baker, 2000).

The loss of cultural identity can have negative psychological and social consequences, as it adversely affects how individuals and communities define themselves (Phinney, 1990). The extinction of local languages and traditional

practices hinders the transmission of cultural heritage to future generations and weakens cultural memory (Smith, 2006; Pieterse, 2004).

In the digitalization process, the commercialization of cultural content also emerges as a significant issue. The shaping of cultural values in line with economic interests in digital environments leads to the trivialization of these values and turns cultural heritage into a commercial commodity (Jenkins, 2011). The commercialization of cultural elements can result in compromising the originality of local cultures and the loss of cultural identity. The rapid development of digital media necessitates that local cultural expressions align with global standards, thereby threatening the authenticity of local cultures (Appadurai, 1996; Pieterse, 2004).

Another critical issue faced during the digitalization process is digital inequality. Access to digital technologies may vary significantly among different social groups, making it difficult to share cultural heritage equally in the digital environment. In particular, inadequate digital infrastructure in developing countries may prevent cultural heritage from being digitized and reaching large audiences. Digital inequalities lead to injustice in accessing cultural content and bring about problems such as insufficient representation of local cultures in digital environments (Noble, 2018).

For the protection of cultural diversity and the sustainability of local cultural expressions, the digitalization process must be carefully managed. Considering digitalization as merely a technological process is not sufficient; it may also be necessary to eliminate social inequalities and increase access to digital technologies. The correct and ethical representation of cultural content on digital platforms can help preserve the authenticity of local cultures and strengthen cultural identities. In this context, the proper and ethical use of digital technologies can be of great importance for the protection and sustainability of cultural heritage.

3.5. The State of Cultural Identity Protection Strategies and the Ethical and Legal Framework in the Digital Ecosystem

The widespread use of digital technologies has created new dynamics in the processes of producing, sharing, and preserving cultural content. In this context, developing effective strategies for preserving and strengthening cultural identity in digital ecosystems may be important. These include:

3.5.1. Increasing Digital Literacy

Digital literacy can be defined as providing individuals with the competence to perceive, analyze, evaluate, and produce communication in accordance with the processes presented by written and visual mass media channels (Potter, 2013). The diversification and increase in the number of mass media channels have led to a significant rise in the amount of information and messages delivered to individuals through these media. This increase also brings with it the problem of information pollution (O'Keeffe & Clarke-Pearson, 2011). Media and mass communication channels function as a process in which the information and messages intended for individuals are planned and structured in advance. In this process, individuals are deprived of their capacity for independent thought, reduced to the status of passive recipients (Avcı, 2010).

A great deal of the information accessed through the media via digital tools can be biased, incomplete, misleading, or erroneous. The internet, in particular, harbors intense information pollution, making it increasingly difficult to find accurate and reliable information in this complex informational environment. Children’s eating and drinking habits, smoking and alcohol use, sexual preferences, and strategies for coping with anger and violence are significantly influenced by the information they acquire through television and other media. The conscious use of digital devices not only provides surface-level awareness but also offers the opportunity to analyze the deeper meanings that the underlying media channels attempt to convey. Digital literacy skills equip individuals with problem-solving abilities, research capabilities, the acquisition of new skills, collaborative learning, social interaction, and critical thinking (Gillen et al., 2018).

Digital literacy ensures that individuals possess the necessary knowledge and skills to use digital technologies effectively. In today's digital age, where information pollution is abundant, the ability of individuals to access accurate and reliable information depends on the effective development of these skills. Moreover, digital literacy allows individuals to move from a passive receiver role to active participants, thereby contributing to the cultivation of free individuals who can form their own thoughts and make decisions independently, without being directed by the media. Digital literacy programs help individuals develop their skills in producing, sharing, and evaluating digital content (Buckingham, 2007; Potter, 2013). Consequently, it may become possible to more consciously and effectively preserve and disseminate cultural content within the digital ecosystem.

3.5.2. Copyright and the Protection of Cultural Content

Technological developments brought about by the digital age have affected the production, distribution, and consumption of cultural content. With the spread of the internet and the proliferation of digital platforms, the accessibility of cultural works has increased. However, this has also introduced new challenges regarding copyright and the protection of content owners. Protecting digital content through copyright not only safeguards the rights of content owners, but also prevents unauthorized use (Lessig, 2004). In this context, Digital Rights Management (DRM) systems may offer effective tools for the protection and licensing of cultural content.

Digital Rights Management (DRM) is a set of technological systems used to protect the copyrights of digital content and prevent its unauthorized use. DRM applies various encryption and access control mechanisms to regulate how digital media products (e.g., music, film, e-books, and software) can be used. Thanks to these systems, content owners can prevent their works from being copied, shared, or reproduced without permission. By imposing certain usage conditions during the licensing and distribution of digital content, DRM ensures that works are used only by authorized users and under specified conditions. For example, limitations such as allowing an e-book to be opened only on a certain number of devices or rendering a film file inaccessible after it has been viewed can be applied through DRM (Rosenblatt & Dykstra, 2003; Çetin, 2024). In this way, it may become possible to protect cultural content in digital environments and guarantee the material and moral rights of content owners.

Examining the impact of digital technologies on copyright, Lawrence Lessig (2004) emphasizes that existing legal frameworks have failed to adapt to the requirements of the digital age. Lessig argues that since the digital environment makes it easy to copy and disseminate content, copyright systems must be reconsidered. This situation poses significant challenges in protecting content owners' rights. Similarly, Jessica Litman (2001) addresses the complexity of digital copyrights and the difficulties of effectively enforcing these rights within current legal frameworks. According to Litman, the innovations and flexibilities offered by the digital environment necessitate the updating of copyright laws. Both authors point to the need to rethink copyright in the digital age and note that updating legal regulations in this area is inevitable.

James Boyle (2008) and Yochai Benkler (2007) offer important perspectives on managing copyrights and protecting cultural content. Boyle claims that the excessive expansion of copyright laws narrows the public domain, thereby limiting freedom of cultural expression. In his view, having cultural works eventually become part of the public domain supports social creativity and innovation. Boyle argues that limiting the duration of copyright could increase social benefits by expanding access to cultural heritage.

Yochai Benkler, on the other hand, notes that information and cultural production in a networked society is increasingly taking on a more collaborative structure. Benkler suggests that rigid copyright enforcement might hinder these new forms of collaborative production. He recommends making copyrights more flexible and promoting open licensing models. Such approaches can pave the way for cultural innovation by facilitating creative collaboration.

Both thinkers agree that copyright laws must be aligned with contemporary social and technological realities. Their arguments indicate that copyright should strike a balance between protecting the rights of content creators and expanding society's access to cultural works. Such a balance has the potential to both encourage creativity and provide broad social benefits.

Jane C. Ginsburg (2017) and Peter B. Hugenholtz (1996) examine the impact of digital technologies on copyright from different angles. Ginsburg stresses that while new technologies make it easier to distribute works, they also increase the risk of copyright infringement. In this context, Ginsburg points out that international cooperation and harmonized legal regulations are essential for effective copyright protection in the digital environment. She suggests that international collaboration can bridge legal differences between countries, ensuring the protection of copyrights on a global scale.

Peter B. Hugenholtz, on the other hand, highlights the multifaceted nature of debates on the future of copyright in the digital environment. By bringing these debates together, Hugenholtz shows the existence of different perspectives on copyright and how these perspectives interact with technological, economic, and cultural changes. His approach emphasizes that digital copyright is not merely a legal issue, but also a social matter intertwined with technological innovations and cultural norms.

UNESCO's "Convention for the Safeguarding of the Intangible Cultural Heritage" (2003) and the activities of the World Intellectual Property Organization (WIPO) represent important international mechanisms engaged in the global effort to protect cultural heritage. UNESCO's convention recognizes intangible cultural heritage elements—such as traditions, performing arts, social practices, rituals, and festivals—as humanity's common heritage and underscores the importance of transmitting these elements to future generations. The convention provides a framework that encourages member states to cooperate in safeguarding this heritage and ensuring its sustainability. WIPO, for its part, contributes to protecting cultural content in the digital environment by developing international standards in the field of copyright and related rights. In 2016, WIPO worked on developing the legal and technical solutions needed to protect and disseminate cultural content in the digital age. These efforts aim to prevent the unauthorized use of cultural content in digital environments and ensure fair compensation for its creators.

Protecting cultural content is also important for educational and research activities. Strict copyright enforcement can create restrictions on academic work and the development of educational materials. Therefore, supporting fair use and open access policies will promote access to information and cultural development (Litman, 2001).

In conclusion, copyright and the protection of cultural content in the digital age is a complex and multidimensional issue. Technological developments challenge existing legal frameworks and require the development of new approaches. Aligning copyright with the dynamics of the digital environment should protect content owners' rights while also ensuring public access to cultural heritage. Achieving this balance requires international cooperation, flexible legal regulations, and technological solutions that consider users' legitimate rights.

3.5.3. Digital Ethics and Responsible Content Sharing

With the rapid advancement of the digital age, the production, sharing, and consumption of cultural content have undergone significant changes. This transformation has made digital ethics and responsible content sharing even more important. Digital ethics involves the moral principles guiding the behavior of individuals and institutions in the digital environment, while responsible content sharing ensures that cultural heritage is represented respectfully and accurately. In this context, it is crucial to consider cultural sensitivities and prevent stereotypes and prejudices when sharing content on digital platforms (Zuboff, 2019).

In examining the effects of digital technologies on society, Shoshana Zuboff (2019) introduced the concept of surveillance capitalism. This concept refers to the practice of digital platforms collecting user data and using it for economic gain. According to Zuboff, neglecting ethical values in this process leads to violations of privacy and erosion of social values. Therefore, adopting ethical principles in the sharing of digital content and acting with awareness become necessary.

Luciano Floridi (2013) and Charles Ess (2013) have made significant contributions through their studies on ethical responsibilities in the processes of producing and sharing information and content in the digital environment. Floridi, by developing the concept of information ethics, highlights the ethical obligations between digital content producers and users. In his view, the ethical challenges encountered during the production, distribution, and use

of information in the digital environment require guaranteeing the accuracy and reliability of the shared information. Floridi advocates for adherence to ethical standards to prevent information pollution and misinformation.

Charles Ess, in his work on digital media ethics, examines the ethical dimensions of content sharing on digital platforms in detail. Ess emphasizes the importance of taking cultural differences and sensitivities into account in a globalizing digital world. In this context, he posits that preserving and respecting cultural heritage is a fundamental ethical principle in the digital content sharing process.

Stereotypes and prejudices frequently encountered on digital platforms can fuel social fragmentation and discord. In analyzing the impact of digital technologies on human relationships, Sherry Turkle (2011) points out that although people's expectations of technology are increasing, feelings of trust and empathy toward one another are decreasing. This situation can lead to less scrutiny of shared content in the digital environment and the spread of ethically problematic content.

UNESCO (2015b) and the OECD (2016) contribute to the sustainable and equitable development of information societies by publishing important reports and policy recommendations that encourage ethical practices and standards in the digital environment. UNESCO's report emphasizes the need for ensuring access to information, freedom of expression, privacy, and adherence to ethical principles in the digital age. By setting international standards for digital ethics and responsible content sharing, this approach fosters the construction of inclusive information societies committed to ethical values. UNESCO's stance highlights the importance of respecting human rights and fundamental freedoms in digitalization processes.

In a 2016 report, the OECD provides detailed policy recommendations for protecting consumer privacy and promoting ethical practices in the digital environment. According to the OECD, the sustainability and reliability of the digital economy are possible only if users' personal data are effectively protected and high ethical standards are enforced. These recommendations foresee strengthening data protection and privacy principles on digital platforms, as well as placing ethical values at the center.

Rafael Capurro (1990), through the concept of information ecology, describes ethical and responsible content sharing in the digital environment as an element that should be evaluated within a broader ecological system. According to Capurro, information ecology refers to the sustainable and ethically appropriate management of information resources. This concept encompasses not only the processes of producing and consuming information, but also the environmental, social, and ethical aspects of these processes.

Capurro's approach requires considering the human and environmental impacts of information and technology. Information ecology promotes the prioritization of sustainability and ethical principles in the processes of producing, sharing, accessing, and using information. In this context, information ecology treats digital ethics and responsible content sharing as parts of a cycle within a broad ecosystem. This cycle includes elements such as preserving, reusing, and fairly distributing information resources (Capurro, 1990).

In conclusion, digital ethics and responsible content sharing can be important for preserving cultural heritage, maintaining social values, and ensuring that individuals' rights are safeguarded in the digital ecosystem. When sharing content on digital platforms, cultural sensitivities must be respected, stereotypes and prejudices prevented, and the accuracy and reliability of content ensured. In this process, content producers, users, platforms, and international organizations share a common responsibility. By adhering to ethical standards and enhancing digital literacy, the digital world can become a safer and more respectful space.

4. Discussion

In today's rapidly advancing era of digitalization and globalization, digital ecosystems present both significant opportunities and various challenges for the preservation and sustainability of cultural identities. In this article, the effects of digital ecosystems on cultural identities have been examined in detail, and the functions of digital tools

in the preservation of cultural heritage have been analyzed. The analyses highlight the potential benefits of digital technologies in supporting and preserving cultural diversity, while also revealing important risks such as cultural homogenization, the digital divide, and data security.

Firstly, the opportunities provided by digital ecosystems for the digitization, archiving, and dissemination of cultural heritage offer innovative and effective methods for preserving cultural identity. Tools such as digital archiving techniques, virtual reality (VR) and augmented reality (AR) applications, artificial intelligence–supported analyses, and blockchain technologies make it possible for cultural content to reach wide audiences and be passed on to future generations (Sussan & Acs, 2017; Briscoe, 2009). The use of these technologies is crucial for protecting cultural heritage from physical deterioration and for dynamically sustaining it in the digital environment. Particularly, digital storytelling and VR/AR technologies enable the presentation of cultural heritage in interactive and user-friendly formats, allowing users to form a deeper and more interactive connection with that heritage (Manovich, 2013; Champion, 2016).

However, alongside the advantages brought about by the digital transformation process, there are also serious challenges such as cultural homogenization and the digital divide. Under the influence of global digital platforms, local and unique cultures may become increasingly similar, resulting in a decrease in cultural diversity and the erosion of local identities (Appadurai, 1996; Castells, 2010). This situation makes it more difficult for societies to preserve their unique cultural practices and identities, and threatens the richness of cultural diversity. The digital divide, on the other hand, draws attention to the insufficient representation of certain communities in digital spaces due to inequalities in access to technological infrastructure (Noble, 2018). These inequalities disadvantage communities with no or limited access to digital technologies when it comes to preserving and disseminating their cultural heritage in the digital environment.

In this context, it is necessary to develop strategic and comprehensive approaches for ensuring the sustainability of cultural identity within digital ecosystems. Increasing digital literacy can enable individuals to use digital technologies effectively and consciously, thereby contributing to the proper and ethical preservation of digital content (Potter, 2013; Gillen et al., 2018). Digital literacy programs allow individuals to improve their ability to cope with information pollution, evaluate digital content, and think critically. In this way, the accuracy and reliability of cultural content shared within digital ecosystems can be increased, and information pollution can be prevented.

The development of copyright and Digital Rights Management (DRM) systems also plays an important role in protecting cultural content. Protecting cultural works in digital environments through copyright safeguards the rights of content owners while also preventing unauthorized use of these works (Lessig, 2004; Rosenblatt & Dykstra, 2003). In this framework, international cooperation and harmonized legal regulations are of critical importance for the protection and sharing of digital content (Ginsburg, 2017; Hugenholtz, 1996). The frameworks provided by international organizations such as UNESCO and the World Intellectual Property Organization (WIPO) guide the protection and sustainability of cultural heritage in digital environments (UNESCO, 2003; WIPO, 2016). Adopting such international standards supports the global protection of digital content and the maintenance of cultural diversity.

Digital ethics and responsible content sharing also emerge as vital elements in protecting cultural heritage within digital ecosystems. Considering cultural sensitivities, and preventing stereotypes and prejudices when sharing content on digital platforms are of great importance (Zuboff, 2019; Floridi, 2013; Ess, 2013). The development of ethical obligations among digital content producers and users ensures that cultural heritage is represented respectfully and accurately. In this context, the adoption of digital ethical principles and the strengthening of ethical standards contribute to making digital ecosystems safer and more respectful environments (Turkle, 2011; Capurro, 1990).

Additionally, digital storytelling and VR/AR technologies offer new approaches to cultural heritage preservation and enable an interactive experience of cultural content (Robin, 2008; Jerald, 2015). The applications of these technologies in the fields of education and tourism not only make cultural heritage accessible to larger audiences

but also contribute to the preservation of cultural diversity. However, for these technologies to be successfully implemented, important issues such as ensuring the accuracy and authenticity of content and reducing digital inequalities must be taken into account (Noble, 2018; Papacharissi, 2010). Increasing infrastructure investments and raising levels of digital literacy will allow all communities to use digital technologies equally and effectively, helping to reduce digital inequalities.

In summary, the effects of digital ecosystems on the preservation and sustainability of cultural identities may encompass both opportunities and challenges. The conscious and strategic use of digital technologies holds great potential for the protection of cultural diversity and the strengthening of cultural identities. However, to fully realize this potential, digital ecosystems must be supported by ethical, legal, and strategic frameworks. Factors such as enhancing digital literacy, protecting copyrights, embracing digital ethical principles, and reducing digital inequalities may be crucial to the success of these processes in preserving and disseminating cultural heritage in digital environments.

For future research, there is a need for studies that examine more deeply the effects of digital ecosystems on cultural identities. Understanding how digital technologies are used in different cultural contexts and how they affect cultural diversity will contribute to the development of policy and practice recommendations. Furthermore, addressing the ethical and legal dimensions of digital technologies more comprehensively will enable more effective use of digital ecosystems in preserving cultural identity. As digital ecosystems continue to evolve in parallel with technological innovations, they will present both opportunities and new challenges for preserving and sustaining cultural identities.

Finally, given the dual impacts of digitalization on cultural identities, it may be important to manage digital technologies within a framework of social equity, cultural diversity, and ethical values. The conscious and strategic use of digital ecosystems stands out as an indispensable tool in the process of preserving cultural heritage and passing it on to future generations. In this regard, effectively shaping digital technologies to strengthen cultural identities and ensure the sustainability of cultural diversity can support efforts to protect and enhance the cultural richness of modern societies.

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