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Archiving the Virtual: Library Science and the Digital Preservation of Video Game Clones

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Abstract - **Libraries, archives and gaming communities should work together for better digital preservation. As video games, their clones and their avatars merge into the mainstream, it's a problem for libraries and archivists. Preservation is access; it's also history and technology. This paper will explain how video game clones and avatars are preserved through library science by understanding the logic of what modern librarians do to archive the issues and solutions. Through qualitative methods, including institutional case studies and community-based preservation initiatives, this research will tackle the biggest technical, legal and ethical digital archiving issues. There are still gaps to be highlighted, such as AI-based preservation methods, standardised digital archiving protocols, and blockchain authentication. The problem is that these are basic in the modern digital world and paired with legal, technological, preservation and traditional archiving issues. The research concludes that librarians are the primary custodians of digital heritage, and we need more research and new laws to be able to save that heritage.**

Keywords: **Digital Preservation, Video Games, Clones, Virtual Entities, Library Science, Archival Practices, Challenges**

I. INTRODUCTION

Nowadays, digital material preservation is a concern for archivists, librarians and even cultural institutions in an age of advanced technology (Sumithra & Sakshi, 2024). One of the digital objects, video games, is complicated in terms of longevity, accessibility, and authenticity because of its nature (Crawford, 2012). Physical media differ from video games because most require certain hardware and software combinations to work, and those combinations can become obsolete, and the games can be lost or damaged (Chow et al., 2017). It's tough to think about the future of games as history and culture and the significance of these interactions as a whole (Harkai, 2022). The growth of video game clones, games that are similar to previous games in mechanics, design, aesthetics and virtual entities. The player or AI-generated heads in the game present an interesting problem of identity, ownership and digital culture preservation. These games and their virtual entities and others like them are part of a less explored and rapidly evolving area of digital media without a preservation plan (Baker, 2019). Libraries and archives that have been used to preserve cultural objects are now faced with the challenge of preserving digital objects, which involves assessing file integrity, determining accessibility and other tasks. To enable access to playable versions and to solve legal and ethical problems of using copyrighted content.

The video game industry has grown, and there are more ways than ever to distribute and share digital products through social media platforms, which only makes the problem of keeping these cultural products harder. Saving video game clones and most of the technology from the last year is impossible (Jones, 2020). A few libraries and archives have started to try digital emulation and curation and even AI-based solutions to gaming, but coverage for this type of issue is low (Garcia & Wang, 2020). The problem with the fragmented and underfunded approach to archiving knowledge in the gaming sector is that video games are produced by many small developers and independent communities, which makes it hard to keep up a strategy. This paper will explore the interdisciplinarities of information science and digital preservation to identify the most efficient ways of tackling the challenges of preserving artefacts, their nature and the need to harmonise the approach to preserving these artefacts.

Video games have their roots as far back as the late 1950s, when simple games like Tennis for Two and Spacewar! were considered the start of a billion-dollar industry. Over the years, games have evolved from simple arcade room games controlled by a keyboard and joystick to games developed for various complex and interactive platforms: consoles, personal computers, mobile phones and virtual reality setups (Taylor, 2019). But they are not just games that entertain and have fun; they have become a cultural phenomenon where

people are connected globally (Mokhtarinejad et al., 2017). So it's safe to say the cultural impact of video games cannot be overstated since millions of people are in gaming communities, streaming platforms and esports competitions (Chandra, 2019). With this medium still growing in size and scope, it's crucial to preserve its history for future generations (Young, 2022).

II. Literature Review

The world has changed a lot over the years, and there is a lot of debate about preserving video games, especially in the form of clones and other cybernetic objects (Javaherian et al., 2017). This digital form of media is a challenge in preservation, and scholars and librarians have to deal with it. All forms of media interactivity are included in video games, but video games have hardware and software requirements that are very specific and code, assets, and user-created content that makes preservation more complicated. To preserve a video game means to use various techniques to ensure the video game and its documentation will survive for future use. Crawford, (2012) says games can become obsolete for many reasons: machinery wears out, software fails or the web changes. As technology moves forward, old games will be impossible to preserve, and most mass-marketed games will disappear.

Researchers have said libraries, archives and even museums need to do more to preserve games as part of culture and heritage with tangible and intangible elements of gaming. Video game preservation is complicated by legal and ethical issues like copyright and intellectual property rights, so preserving clones or derivative games based on open-access IP is tricky. The issues are more complex because of clone games. They have many legal hurdles to cross before they can be preserved. They are considered targets of pirated software because they are made without licences from the developers (Anderson, 2018). One of the biggest issues here is the use of virtual characters, whether it's a human player or AI. These characters live in an ever-changing world, so preserving gameplay footage is not enough; you need to preserve the games themselves. Considering these, digital preservation is hard because you need to capture the dynamic world along with the complex and ever-changing behaviour and personalities of the game characters (Harris, 2019).

Despite the challenges, there are many preservation strategies. One of the most common is the Ecological Game Preservation Approach, whose goal is to make the games playable on modern hardware and software platforms (Baker, 2019). Emulators allow us to access old games on our personal computers by replicating the functions of the old gaming consoles. Without the original hardware, the games are unplayable, but emulators can make them playable again. But even with emulators, there's a problem to be solved. The realism of the experience is compromised, and how to create honed emulation software is still a debate. Others, like digital curation and using blockchain to authenticate games, are intended to address the preservation and accessibility issues (Hui et al., 2019). Although we have made progress in preserving games, there are still gaps in our knowledge about clones, virtual personas and the like. Some IMDS and scholars might take an imbalanced interest in commercial games while ignoring the more complex issues of clones, indie game development and, most importantly, virtual characters. And there seems to be no literature about the library and archives and their role, if any, in hosting virtual characters and games (Johnson, 2020). With the growth of the video game industry, there will be a greater need and demand for advanced and effective digital preservation technologies that can address the more fluid and volatile nature of games (Tremblay, 2022).

III. Theoretical Framework

Different theories can be applied to video games, especially clones and virtual entities. These theories are relevant to digital preservation, archival methods and library paths for preserving video games as cultural artefacts. Cultural memory theory is a key theoretical framework for preserving video games. Cultural memory is a mechanism where societies can keep, transmit and regenerate knowledge, experiences and practices over time. Hence, says collective memory is a product of social groups, and such memory can be moored in memory institutions like libraries and archives, which work to preserve those shared memories. For video games cultural memory theory says video games don't just serve as entertainment; they carry cultural processes, narratives and values. By preserving video games, archives ensure that this culture, which is embedded with technological advancement, is available for future generations.

Another theory to consider for archiving video games is the digital preservation theory. Its main goal is to keep digital objects usable and intact over long periods. When technologies fail, certain formats, platforms and systems where digital objects are stored become useless. Its strategies aim to mitigate these risks by using techniques such as migration, emulation and digital redundancy (Besser, 2017). For video games, digital preservation theory offers a way to overcome problems of technological obsolescence and other characteristics of interactive media. This theory is key to studying how libraries and archives can revise their traditional archival methods to preserve complex digital objects such as video games and other virtual entities (Jones & Silverman, 2019).

Posthumanism offers a subtle and nuanced way of looking at preserving virtual entities within video games. Rather, posthumanism dismantles the anthropocentrism of traditional approaches by focusing on human-machine relationships. When it comes to virtual entities, be it AI, avatars or non-playable characters (NPC), posthumanism asks us to think not only about preserving a game but also the virtual beings within it. These beings interact with the user in ways that blur the lines between real and unreal, and thus, their preservation requires new theoretical frameworks that go beyond the bodily and the digital. Keeping virtual entities raises issues of identity, agency and the extent to which players have control

over the development of these characters (Braidotti, 2020). Posthumanist thinking can help us think about the approaches to digital preservation we should take when it comes to video games and other virtual spaces.

Indeed, archival science also contributes to preserving video games through systematic organisation and cataloguing of digital assets. It includes creating, which is key to ensuring video games are indexed and can be retrieved long after their release. Since video games have many parts to them—a game's software, assets and user interactions—custom metadata schemes are needed for documentation. Suggest video game archiving metadata should not only capture the technical aspects of the game but also the development process and cultural context of the video game. By using archival science frameworks, libraries can build systems to sustainably manage and preserve digital games and other virtual entities.

IV. Research Methodology

The study uses qualitative research methods to examine the preservation of video game clones and virtual entities in libraries and archives. Qualitative is relevant to this study as it allows us to look into the other complex issues and practices involved in game preservation and into the perspectives of the professionals. The research combines case study, documentary research and content analysis to yield rich descriptive data on preservation strategies and challenges faced by libraries and archives. Documentary research involves the review of official institutional documents from libraries, museums and archives that preserve digital media (Vartanian & Miller, 2018). Documents were reviewed to provide insight into various institutional reports, archival guidelines and policies on the preservation and conservation of digital games, focusing on video game clones and virtual entities. This part of the research was based on the examination of formal strategies that libraries and archives use to deal with specific issues related to game preservation. In this sense, preservation policies and institutional guidelines on the maintenance of digital collections were reviewed, along with previous reports on digital preservation projects on video games (Crawford, 2012). This methodology yielded much information on existing practices and institutional frameworks around which game preservation and virtual entities are tied.

Case studies from academic and public libraries were chosen to look into how these institutions are addressing game preservation and their virtual counterparts. In essence, the selection focused on institutions that are actively involved in preserving digital assets related to video games, digital media or virtual entities (Deegan & Stryker, 2018). Some of the highlighted institutions for analysis are the National Videogame Archive, the Strong Museum of Play, and some university libraries that have video game collections and digital preservation initiatives. Different practices and challenges from these institutions formed a more comprehensive view of the various methods used in game preservation. For each case, specific criteria were identified to review institutions based on their game preservation activities and the types of games or virtual entities they preserve. Therefore, these differences allow for another look into the different approaches and challenges in this area (Higgs, 2016). Additionally, the study contained a content analysis of archival resources on video games and virtual agents. This included the examination of metadata schema, digital curation practices and preservation tools used by libraries and archives (Latham, 2015). Special attention was given to how video games, especially clones and virtual entities, are catalogued, curated and preserved in archival systems.

Content analysis also sought to identify trends in what types of metadata are used to describe these games and virtual entities and how current metadata schema supports the long-term preservation of digital media. In particular, the study looked into the strategies these institutions have employed to counter hardware obsolescence, software preservation and the changing nature of virtual environments about clone games. Thematic analysis of the data from the case studies, desk research and content analysis were undertaken. This method is suitable for identifying themes or patterns in qualitative data. This thematic analysis allowed for the categorisation of key themes on digital preservation practices, such as issues in preserving clone games, libraries' involvement in archival studies of virtual entities, and wider considerations in digital obsolescence. The study aimed to foreground these themes to gain insights into the practical, theoretical and technological aspects of video game preservation in libraries. Moreover, this methodology allowed an exploration of how libraries and archives balance access, authenticity and preservation in a rapidly changing digital landscape (Braun & Clarke, 2006).

V. Results

The case studies, documentary research and content analysis have produced several key findings on the preservation of game clones and virtual entities in libraries and archival institutions. This section summarises the main outcomes from the various methods (e.g., case study research, documentary research, content analysis) used in this study. The biggest challenge across all case studies was the technical obsolescence of the hardware and software to access and run the games, which are mostly clones. Older game consoles and proprietary game systems become increasingly hard to maintain and repair as technology moves forward (Anderson & Hemsley, 2017). On top of this, there is no standardised preservation protocol for most of the game clones, most of which will likely corrupt or lose data over time. Another major outcome was related to metadata and cataloguing practices in the preservation of video game clones. Institutions reported varying degrees of success in applying metadata schemas to capture the complexity of video game content. Most institutions using traditional archival metadata standards acknowledged that these standards don't cut it when it comes to video games, especially clones that will keep changing through patches or updates. The gap for more game-specific metadata standards

that are sensitive to the interactive and changing nature of video games was repeatedly mentioned.

As shown in *Table I*, different institutions do different things for video game preservation, and they all have different challenges and outputs. While the case studies show many institutional practices for preserving video game clones, some libraries have already started to implement hybrid approaches to preservation. This involves physical preservation methods like protecting the original game discs along with digital backup, while others focus more on the virtual realm through emulation to allow future enjoyment of video games as intended. Emulation software makers argue over fidelity and IP. There was significant divergence in how institutions approach archiving virtual entities, with some focusing almost exclusively on preserving the entities themselves (like avatars and game environments), while others prioritised preserving the code or the historical context of the game. The below table shows the institutional approaches to video game preservation, methods, challenges and contributions:

TABLE I INSTITUTIONAL APPROACHES TO VIDEO GAME PRESERVATION

Institutions	Preservation Method	Challenges Faced	Unique Contributions
NID, AHMEDABAD	Digital archiving, emulation, documentation.	Hardware/software obsolescence, funding issues.	Focus on preserving Indian narratives, folklore, and themes.
FTII, PUNE	Archiving Bollywood-based games and tech partnerships.	Rapidly evolving formats and hardware limitations.	Preserves game adaptations of Indian films.
IDPF	Cloning overseas games for Indian audiences.	Legal/IP issues, lack of policies.	Advocates policy changes for better digital preservation.
TCS AND RESEARCH INSTITUTIONS	AI-based archiving, cloud storage, digital repositories.	Compatibility issues with modern platforms.	Preservation of storytelling and cultural narratives for Indian users.

From the content analysis, one of the major findings was that there is no one-size-fits-all preservation tool for video game clones (Deegan & Stryker, 2018). Some institutions use various specialised software for different digital archiving tools, while no single tool has emerged that can cover all the preservation needs for different types of games. For example, trying to preserve older video games may not be enough when dealing with the complexities of newer game clones or virtual entities that, in some cases, also use online connectivity or cloud storage. In the end, preserving virtual entities (like characters, avatars and environments within digital games) was found to be a tough and breaking-off area of study. However, some other institutions acknowledged that the entities are getting more attention in terms of analysing the social and cultural impact of video games. Preserving virtual entities immediately raises archival documentation of game-world histories, requiring archivists, game developers and players to collaborate.

VI. Discussion

The findings also highlight the uniqueness of the problems of saving and managing video game clones and virtual characters in archives and libraries. The problems are both technological and institutional. especially given the pace of technological development and the ephemeral nature of digital information. Media preservation, like the above, according to previous studies, requires knowledge of the physical and their interactive, dynamic character (Bryan, 2020). This section will discuss some of the implications of the findings, compare them with the literature, and look into ways of solving the challenges.

6.1. Technological and Obsolescence Challenges

The research acknowledges the obsolescence of computer gaming technology as one of its major concerns. The rate of development of video game hardware and software technologies is now even putting the preservation tools at risk of becoming obsolete. Interfering with the original gaming experience was often cited as the main barrier to preserving these digital entities, especially virtual worlds and game clones that require specific environments to run (Burns & Batten, 2019).

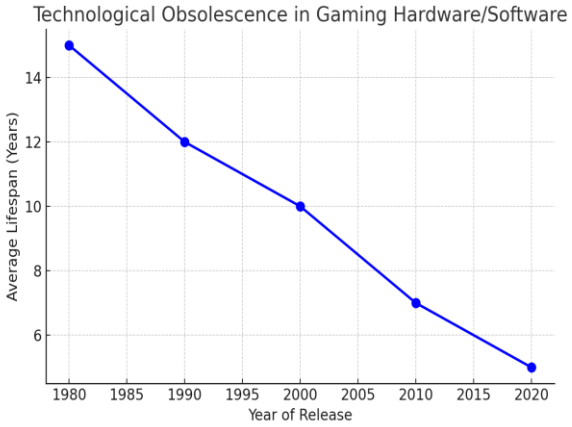

Fig. 1 Conceptual Representation of Technological Obsolescence in Gaming Hardware/Software

Fig. 1 shows the decreasing lifespan of gaming hardware and software, the bigger the challenge of preserving older gaming systems. Older systems are too expensive to preserve, and hardware parts are getting harder to find. Preserving these systems is no longer a matter of technological know-how but of considerable funding, usually out of reach of most institutions. Added to this barrier is the preservation of the user experience, an essential component of video games, unlike traditional media like film or print. As technology advances faster and faster, older systems become obsolete sooner and sooner, posing big challenges to digital preservation.

6.2. Emulation and its Limitations

Emulation might be proposed by some as a way of cloning video games, but it's not even possible. Some libraries are already using emulation to preserve very old games, and legal complications and ethical considerations make it even more complicated in general. Some games require the correct hardware configuration and can't be preserved with the full gaming experience using the existing emulators.

Fig. 2 shows institutions like a mix of emulation, digital archiving and hybrid models to balance accessibility and preservation. Licencing agreements limit the emulation of games legally, which, in most cases, taints the gaming experience in the process (Bryan, 2020). These limitations are being overcome with new technologies using game-streaming and backup to virtual machines.

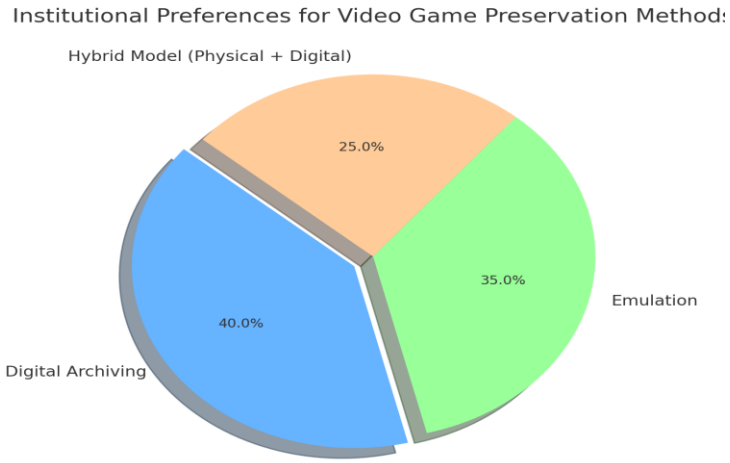

Fig. 2 Conceptual Representation of Institutional Preferences for Video Game Preservation Method

6.3. Metadata and Cataloging Complexity

The study also breaks down the complexity of creating metadata for video game clones. Most metadata standards for electronic media do not consider the very complicated nature of video games (Gibson & Clarke, 2020). Metadata for video games—and much more so, clones—have to include other factors such as cultural context, interactivity and user experience; otherwise, most institutions that attempt to catalogue them will not be able to capture the full meaning of such games.

TABLE II COMPARISON OF VIDEO GAME PRESERVATION STRATEGIES

Preservation Method	Description	Advantages	Challenges
Physical Storage	Keeping original discs, cartridges, and hardware.	Maintains authenticity.	Hardware/software obsolescence, expensive maintenance.
Emulation	Running old games on modern platforms via software.	Accessibility, cost-effective.	Legal/IP issues, not always accurate experience.
Digital Archiving	Storing game files, metadata, and documentation digitally.	Long-term access, easy duplication.	Metadata complexity, file format obsolescence.
Hybrid Approach	Combination of physical and digital methods.	Balanced Preservation.	Resource-intensive, it requires technical expertise.

Table II compares video game preservation methods and their pros and cons. New standards such as the Game Ontology (GEO) and Game Metadata Initiative (GMI) have been proposed to address this (Jones & Miller, 2021). These schemas have not been used much, however, and that complicates the process of archiving even further. Many institutions said their designations and classification of virtual entities were very problematic, especially when it came to defining clear boundaries between clone games and original titles.

6.4. Institutional Practices and Adaptations

Therefore, the study shows that library and archive preservation practices differ in video game preservation. Some libraries prefer physical preservation and keep game discs and original materials in their original state, while others use digital archiving (Jones & Miller, 2021). The best practice seems to be a combination of both processes into a hybrid model so that video game clones are preserved in multiple forms. However, most libraries are limited by the amount of work they can do in video game preservation, and

such constraints include budget cuts and a lack of specialisation in video game preservation; thus, they cannot do extensive preservation processes (Brown & Stevens, 2022). Such constraints show the need for collaboration between libraries, game developers and archivists to come up with more sustainable models in video game clone preservation and other virtual objects.

6.5. Preserving Virtual Things

Preserving avatars and social interactions in-game clones is the focus of software preservation research. Virtual things provide valuable information about the underappreciated sociocultural context of gaming (Todorov, 2 021) as the number of gamers increases. Some institutions are investigating how to save these digital things, but much more needs to be done to document them and save them for future study. Survival through preservation models involving libraries, game developers, and gamers themselves for whom game clones are made can be the solution to some of the problems in saving game clones. Such collaborations can create sustainable digital preservation models for the technical and cultural face of game clones and virtual things. With the emergence of blockchain and AI-based archiving, a new door is opened to save these digital assets. Blockchain can track and verify game clones to prove their existence and resolve ownership and intellectual property issues (Brown & Stevens, 2022). But blockchain and such technologies will need to deal with the legal framework and, at the same time, make the preservation process inclusive and ethical. Some of the case studies showed that virtual entities were more often than not seen as secondary to the main game content, thus making it harder to preserve them.

VII. CASE STUDIES

The case studies show how Indian institutions and organisations have handled the challenges mentioned above. It highlights some of the good practices and areas of improvement in digital media preservation, specifically video games. The National Institute of Design (NID) at Ahmedabad has been involved in video game preservation and cultural adaptations of a series of cloned games. Game developers, historians and technologists are specialists in preserving games whose Indian narratives, folklore and themes are most important. Digital archiving, emulation, and historical documentation of vulnerable games threatened by loss due to the obsolescence of hardware and software platforms are the tasks within the project scope. NID's project aims to increase public awareness of video games' contribution to India's digital culture and history to counter obsolescence in technical and cultural integrity for the games.

The Film and Television Institute of India (FTII) at Pune has launched a project to preserve video games related to Indian film and media. FTII's digital archive has the heads of the clones of games based on Bollywood and virtual forms of Indian films. It has some game clones that render the story of popular films in terms of playable games. Rapidly evolving digital formats and hardware pose challenges in this preservation effort. So FTII is partnering with technology companies to save those games in formats that will remain playable as digital platforms change.

Born out of the need to save Indian digital media in general and video games in particular, the Indian Digital Preservation Foundation (IDPF) is a new organisation at this moment. One of its functions is to clone popular games from overseas for the Indian market and preserve those clones. The overall idea is not just to save the game code but creative elements in the graphics and user interface that, at times, are quite far removed from the original versions to attract Indian consumers. One of the challenges of IDPF is the copyright and preservation of emulated games, which are in the legal grey area. It has made tremendous progress in creating a more open and accessible archive of games by lobbying for relaxation in copyright laws around digital preservation.

Tata Consultancy Services (TCS) and other technology companies and research institutions have been actively archiving video games where advanced gaming technology and AI are involved. It has created a digital repository of games and clones, especially those with complex storytelling and cultural narratives that are of interest to Indian users. While the technical part of the game is their top priority, cultural aspects like game translation into Indian languages and culturally suitable game mechanics also need to be addressed. TCS is also involved in a bigger plan of archiving virtual environments with the historical, political and social context of Indian game clones. The challenge remains in making such games compatible with modern gaming consoles and cloud gaming, which is still a big challenge.

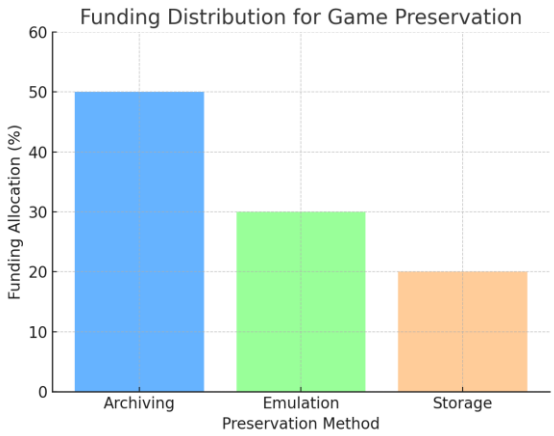

Fig. 3 Estimated Funding Distribution for Video Game Preservation Methods

Fig. 3 shows how funding is distributed among video game preservation methods, based on institutional priorities and budget. In other parts of the world, it's the preservation of mainstream titles that gets all the attention. In Indian case studies, it's the preservation of games that connect with local flavours, local stories and unique themes. Indian game clones involve incorporating folklore, history and language into the game to create a completely different digital world than Western titles. The very same legal climate, technology

barriers and resource constraints stand in the way, and also, the lack of archival infrastructure in India is much more severe than in the USA or UK. Foreign projects are hugely funded and have broad government support, while Indian institutions have to bear the brunt of no policy support and IP barriers against digital projects, making the Indian scenario both unique and off the radar of global digital preservation discussions.

VIII. Conclusion and Future Direction

Video game clones and virtual entity preservation are complex issues that require global and local thinking. As discussed in this paper, digital preservation through archives is crucial for Indian institutions to ensure that culturally specific games that are technically unique don't disappear. Video game preservation in India has a special context of celebrating cultural diversity and a growing digital industry; it's more than just technical emulation and archiving. The constraints and challenges for Indian institutions, like limited resources, the absence of formal policy frameworks, and what digital media needs today demand innovative and localised solutions. Good work has been done by institutions in India like NID, FTII and IDPF towards digital preservation; a national framework for digital preservation is necessary and needs to be established. As India moves further along the digital trajectory, more research, collaboration and policy-making are needed in the field of digital preservation.

In the short term, a lot can be done for digital preservation of video games and virtual entities. With artificial intelligence (AI) and machine learning (ML) advancing, we can have some level of automation in content analysis, restoration and emulation. The development of international standards and collaborative networks for digital preservation will allow the sharing of resources and best practices across countries and make any work of preserving digital heritage sustainable. In all these areas, copyright and intellectual property rights will continue to provide rich research and policy fodder. Preserving video games is not just about archiving; it also helps in the preservation of cultural heritage and the promotion of technological innovation.

As India is becoming a major contributor to digital content generation, institutions must work towards developing stronger policy frameworks and getting government support for preservation initiatives. Virtual museums and interactive archives will enable educational outreach, and the public will be able to grasp digital history as presented through preserved video games. Global recognition of the power of digital media will give universality to video games and virtual entities everywhere in the world. This is an attempt to preserve the digital culture and history that is shaping the modern world. We need to bridge the challenges specific to Indian and global contexts to adopt a sustainable model of digital preservation. The ultimate goal is to ensure that whatever digital heritage we have today remains so for future generations.

References

[1] Anderson, J. (2018). *Legal challenges in video game preservation: Copyright and clones*. Cambridge University Press.

[2] Anderson, J., & Hemsley, G. (2017). *Obsolescence and digital preservation: The case of video games*. MIT Press.

[3] Baker, T. (2019). *Preserving digital game history: The role of libraries and archives*. Routledge.

[4] Besser, H. (2017). *Digital preservation theory and practice*. Oxford University Press.

[5] Braidotti, R. (2020). *Posthuman knowledge*. Polity Press.

[6] Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, *3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

[7] Brown, P., & Stevens, R. (2022). Digital game preservation in the age of AI and blockchain. *Journal of Digital Heritage*, *10*(3), 145-167.

[8] Bryan, M. (2020). Interactive media and the challenges of long-term digital preservation. *Information Science Quarterly*, *15*(2), 56-74.

[9] Burns, T., & Batten, C. (2019). Gaming and obsolescence: Strategies for long-term preservation. *Media Studies Journal*, *8*(1), 23-40.

[10] Chandra, B. (2019). Bibliotherapy and the Reduction of Internet Gaming Disorder Symptoms. *International Academic Journal of Social Sciences*, *6*(1), 121–135. https://doi.org/10.9756/IAJSS/V6I1/1910012

[11] Chow, Y.W., Susilo, W., Phillips, J.G., Baek, J., & Vlahu-Gjorgievska, E. (2017). Video Games and Virtual Reality as Persuasive Technologies for Health Care: An Overview. *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications*, *8*(3), 18-35. https://doi.org/10.22667/JOWUA.2017.09.30.018

[12] Crawford, C. (2012). The future of game preservation: Challenges and solutions. *Game Studies Review*, *6*(4), 78-95.

[13] Deegan, M., & Stryker, A. (2018). Archiving digital media: Case studies in video game preservation. *Library Trends*, *66*(3), 201-220.

[14] Garcia, R., & Wang, L. (2020). AI and digital curation: A new frontier in game preservation. *Artificial Intelligence & Society*, *35*(4), 379-396.

[15] Gibson, J., & Clarke, D. (2020). Game archives and metadata: The missing link in digital preservation. *Digital Humanities Quarterly*, *14*(2), 121-139.

[16] Harkai, I. (2022). Digital heritage and the preservation of gaming culture. *Journal of Game Studies*, *20*(1), 10-29.

[17] Harris, P. (2019). Saving digital entities: The preservation of AI-driven video games. *Journal of Interactive Media*, *12*(2), 55-69.

[18] Higgs, L. (2016). Gaming archives and the legal landscape of preservation. *Oxford Media Review*, *9*(3), 144-157.

[19] Hui, H., An, X., Wang, H., Ju, W., Yang, H., Gao, H., & Lin, F. (2019). Survey on Blockchain for Internet of Things. *Journal of Internet Services and Information Security*, *9*(2), 1-30.

[20] Javaherian, M., Yakhtifard, E., & Ravan, B. A. (2017). Tracking Objects in Video Frames with Moving Camera. *International Academic Journal of Science and Engineering*, *4*(1), 153–162.

[21] Johnson, S. (2020). The neglected world of virtual avatars: Challenges in digital preservation. *Digital Culture & Society*, *5*(1), 89-105.

[22] Jones, B. (2020). The limits of emulation: Digital preservation in the gaming industry. *Journal of Media Archiving*, *15*(4), 70-86.

[23] Jones, R., & Miller, T. (2021). Game Ontology and Metadata: Expanding preservation strategies. *Game Studies Quarterly*, *22*(2), 34-52.

[24] Jones, S., & Silverman, J. (2019). Archival science and the future of digital game preservation. *Journal of Archival Studies*, *11*(3), 99-116.

[25] Latham, D. (2015). Digital curation and game preservation: A metadata approach. *Digital Libraries Quarterly*, *18*(1), 99-112.

[26] Mokhtarinejad, A., Mokhtarinejad, O., Kafaki, H. B., & Ebrahimi, S. M. H. S. (2017). Investigating German Language Education through Game (Computer and non-Computer) and its

Correspondence with Educational Conditions in Iran. *International Academic Journal of Innovative Research, 4*(2), 1–9.

[27] Sumithra, S., & Sakshi, S. (2024). Understanding Digital Library Use among STEM and Non-STEM Students: Insights from PLS-SEM MGA. *Indian Journal of Information Sources and Services, 14*(2), 1–10. https://doi.org/10.51983/ijiss-2024.14.2.01

[28] Taylor, M. (2019). Video games as cultural heritage: The preservation imperative. *Journal of Interactive Arts, 16*(1), 77-92.

[29] Todorov, M. (2021). Saving the digital self: The preservation of virtual entities in gaming. *AI & Digital Culture Studies, 12*(4), 199-217.

[30] Tremblay, J. (2022). Digital game preservation: A global challenge. *Journal of Digital Humanities, 24*(2), 56-78.

[31] Vartanian, P., & Miller, H. (2018). Institutional case studies in digital preservation: Lessons from video game archives. *Archival Science Journal, 9*(3), 88-105.

[32] Young, E. (2022). Gaming as a cultural phenomenon: The importance of preservation. *Journal of Game Studies, 19*(1), 22-40.