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Digital Afterlife: Challenges and Technological Innovations in Pursuit of Immortality

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ABSTRACT

The convergence of generative artificial intelligence, cloud computing, and immersive technologies has catalysed the emergence of a rapidly expanding digital afterlife industry, fundamentally transforming how societies conceptualise death, mourning, and the possibility of posthumous existence. This paper provides a comprehensive examination of the technological innovations enabling digital immortality, the profound ethical and psychological challenges these technologies present, and the governance frameworks necessary to ensure their responsible development. Drawing on recent scholarship in digital thanatology, the analysis traces the evolution of DeathTech from static memorial pages to sophisticated AI-powered griefbots, deepfake avatars, and emergent human digital twins capable of simulating ongoing relational presence. The paper interrogates how these technologies mediate cultural schemas of death, examining both the therapeutic potential for continuing bonds and the risks of psychological dependency, ontological disruption, and corporate exploitation. Particular attention is directed to the governance vacuum surrounding posthumous data rights, revealing that existing regulatory instruments including the General Data Protection Regulation and the AI Act do not extend protections to the deceased. Through critical engagement with transhumanist imaginaries of technological resurrection, feminist critiques of individualistic immortality paradigms, and theological perspectives on the sanctity of death, the paper argues that current commercial approaches to digital afterlife technologies risk reducing the complexity of human personhood to commodifiable data assemblages. The analysis advances a triadic framework for responsible DeathTech development encompassing cultural mediation, inclusive design, and pluralistic governance, and concludes by articulating actionable recommendations for policy, practice, and future research that centre human dignity, consent, and cultural pluralism in the design of technologies that seek to transcend the boundary between life and death.

Keywords: Digital afterlife; DeathTech; griefbots; human digital remains; digital immortality; posthumous data rights; artificial intelligence; digital thanatology.

INTRODUCTION

The human desire to transcend mortality has animated religious practice, philosophical inquiry, and artistic expression across civilisations and millennia. From ancient Egyptian

funerary texts guiding souls through the afterlife to contemporary transhumanist manifestos promising technological resurrection, the refusal to accept death as final has proven one of the most enduring features of human consciousness. What distinguishes the present moment, however, is the convergence of technologies sufficiently powerful to transform this ancient longing from metaphysical aspiration into commercial proposition. Generative artificial intelligence, cloud computing infrastructure, and immersive extended reality now enable the creation of digital representations that persist, interact, and even evolve after biological death, giving rise to what scholars have termed the digital afterlife industry (Bassano & Cerutti, 2024; Öhman & Floridi, 2017; Savin-Baden et al., 2017).

This industry, alternatively designated DeathTech or digital immortality services, has experienced remarkable growth in recent years. Market analyses estimate the sector's value at approximately 31.24 billion dollars in 2025, with projections suggesting expansion to 60.99 billion dollars by 2030 at a compound annual growth rate of 14.2% (Grand View Research, 2025). The range of available services extends from relatively simple memorial platforms that archive digital legacies to sophisticated artificial intelligence systems capable of generating novel conversational responses in the voice and persona of the deceased. Companies including HereAfter AI, StoryFile, You Only Virtual, and Replika now offer consumers the opportunity to create interactive avatars of deceased loved ones or, increasingly, to commission their own digital twins during life in anticipation of posthumous deployment (Hollanek & Nowaczyk-Basińska, 2024; Öhman & Floridi, 2017).

Yet this technological transformation of death and mourning unfolds within a regulatory vacuum of concerning proportions. Existing data protection frameworks, including the European Union's General Data Protection Regulation and the recently enacted AI Act, explicitly limit their protections to living persons, leaving the digital remains of the deceased vulnerable to exploitation, commodification, and manipulation (Cunneen et al., 2025; Morse & Birnhack, 2020). The legal scholar's concept of “ghost algorithms” captures the unsettling reality of systems that continue to act in the name of persons who no longer exist, operating beyond the reach of legal accountability while shaping the grief experiences and ontological understandings of those who survive (Edwards & Veale, 2017).

The proliferation of DeathTech services has generated a rich and rapidly expanding scholarly literature spanning computer science, bioethics, psychology, religious studies, and legal theory. Systematic reviews of this literature reveal that while significant attention has been directed to the technical dimensions of digital afterlife creation and the psychological implications for individual mourners, considerably less scrutiny has been applied to questions of cultural mediation, design equity, and governance pluralism (Hollanek & Nowaczyk-Basińska, 2024; Sofka et al., 2017). The dominant narrative framing digital immortality has been shaped disproportionately by North American and Western European perspectives, marginalising alternative cultural understandings of death, personhood, and appropriate relations between the living and the dead (Nowaczyk-Basińska, 2025; Walter, 2017).

This paper addresses these lacunae through a comprehensive examination of digital afterlife technologies that integrates technological, ethical, cultural, and governance dimensions within a unified analytical framework. The argument proceeds from the premise that DeathTech represents not merely an incremental extension of existing memorial practices but a qualitative transformation in how death is experienced and understood, a transformation with profound implications for individual psychology, cultural continuity, and the very ontology of personhood.

METHODOLOGICAL APPROACH

This paper employs a critical-interpretive synthesis methodology to analyze the scholarly and grey literature on digital afterlife technologies (Dixon-Woods et al., 2006). The analysis integrates peer-reviewed articles from computer science, bioethics, psychology, religious studies, and digital thanatology with policy documents, industry reports, and legal analyses to construct a multi-dimensional critique of the DeathTech industry. Literature was identified through systematic searches of Scopus, Web of Science, PubMed, and Google Scholar using combinations of keywords including "digital afterlife," "DeathTech," "griefbots," "thanobots," "digital immortality," "posthumous data," and "AI death." Inclusion criteria prioritised publications from 2017 to 2025 to capture recent technological developments, with foundational theoretical texts drawn from earlier periods where relevant. The synthesis is organized thematically across five interconnected domains: technological evolution, cultural mediation, ethical and psychological dimensions, governance gaps, and critical theoretical engagement with transhumanist and feminist perspectives.

The paper is structured across five substantive sections. The first section traces the technological evolution of digital afterlife innovations, from early static memorials through contemporary AI-powered griefbots to emergent human digital twins. The second section examines the cultural mediation of DeathTech, analysing how different religious and cultural schemas shape acceptance of and resistance to these technologies. The third section interrogates the ethical and psychological dimensions of digital immortality, attending to questions of consent, addiction, identity integrity, and the commercialisation of grief. The fourth section addresses the governance vacuum surrounding posthumous data rights and articulates a framework for regulatory response. The fifth section engages critically with transhumanist imaginaries of technological resurrection, drawing on feminist and theological critiques to articulate alternative visions of postmortem existence. A concluding section synthesises the analysis and advances actionable recommendations for policy, practice, and future research.

The central contention of this paper is that the digital afterlife industry, in its current commercial configuration, risks reducing the complexity of human personhood to commodifiable data assemblages, exploiting vulnerable mourners, and imposing culturally specific understandings of death on diverse populations. Addressing these risks requires not the wholesale rejection of DeathTech but its reimagination according to principles of consent, cultural pluralism, and human dignity. The technologies that enable digital immortality are neither inherently liberating nor inherently oppressive; their meaning and impact will be determined by the governance frameworks, design practices, and cultural protocols that shape their development and deployment.

THE TECHNOLOGICAL LANDSCAPE OF DIGITAL IMMORTALITY

The contemporary digital afterlife industry represents the convergence of multiple technological trajectories that have developed over several decades. Understanding the current landscape and anticipating future developments requires tracing these trajectories from their origins in relatively simple digital memorialisation practices through increasingly sophisticated forms of posthumous simulation and interaction. This section provides a systematic mapping of the technologies enabling digital immortality, organised across four interconnected domains: data preservation and digital legacies, AI-powered conversational agents, immersive and embodied representations, and emergent human digital twins.

Digital Legacies and Data Preservation

The foundation of all digital afterlife technologies lies in the vast repositories of personal data that contemporary life generates. Social media platforms, messaging applications, email archives, cloud storage services, and digital financial records collectively constitute what has been termed a person's "digital estate," a corpus of information that persists after biological death and that can, in principle, be mobilised to reconstruct aspects of the deceased's personality, preferences, and relational patterns (Cunneen et al., 2025; Morse & Birnhack, 2020). The scale of this posthumous data accumulation is staggering: researchers have estimated that by 2100, Facebook alone could host more profiles of deceased users than of living ones, potentially 4.9 billion dead accounts (Öhman & Watson, 2019).

The question of what should happen to these digital remains has generated considerable scholarly and policy attention. Unlike physical property, which is governed by well-established inheritance law, digital assets occupy a legally ambiguous terrain where platform terms of service, rather than testamentary intention, frequently determine posthumous disposition (Morse & Birnhack, 2020). Some jurisdictions have begun to address this gap through legislation enabling fiduciaries to access and manage digital assets of the deceased. The Revised Uniform Fiduciary Access to Digital Assets Act in the United States provides a framework for executors to access certain categories of digital accounts, yet such provisions remain fragmentary and inconsistent across legal systems (Banta, 2021).

Beyond the legal question of access lies the more profound issue of what these data assemblages actually represent. As Roland Barthes (1993) explored in his meditation on photography and death, the relationship between recorded traces and the person who generated them is neither transparent nor stable. Photographs, texts, and digital interactions do not constitute the person but rather provide fragmentary indices that require interpretation, that are animated not through computational processing alone but through the emotional engagement of those who encounter them. The reduction of a human life to a dataset, however comprehensive, inevitably involves processes of selection, abstraction, and reification that transform the complexity of lived experience into computationally tractable units.

AI-Powered Conversational Agents: Thanobots and Griefbots

The most commercially prominent category of digital afterlife technology comprises artificial intelligence systems designed to simulate conversation with the deceased. These systems, variously designated thanobots, griefbots, or deadbots, utilise large language models trained on the digital traces of the deceased to generate novel responses that approximate the person's communicative style, vocabulary, and characteristic patterns of thought (Hollanek & Nowaczyk-Basińska, 2024). The technology underlying these systems has advanced rapidly from rule-based chatbots with limited conversational range to sophisticated generative models capable of producing contextually appropriate responses across diverse domains.

The paradigmatic example of this technology is "Fredbot," created by transhumanist Ray Kurzweil in 2016 using archival writings of his deceased father. Kurzweil described the experience of interacting with the bot as providing access to a version of his father that was in some respects "more his dad than his dad was," citing the bot's perfect recall and conversational availability as qualities that surpassed the limitations of biological memory and presence (Gross, 2025). Kurzweil's daughter, Amy Kurzweil, subsequently authored a graphic memoir exploring her experience of connecting with a grandfather she never knew in life through the mediation of an AI system, a testimony to the genuine relational possibilities these technologies enable (Kurzweil, 2023).

The commercialisation of griefbot technology has proceeded rapidly. Applications including HereAfter AI, Replika, and Project December now enable users with minimal technical expertise to create conversational agents based on deceased loved ones (Hollanek & Nowaczyk-Basińska, 2024). The process typically involves uploading text conversations, voice recordings, and other personal data, which the platform's algorithms process to generate a responsive persona. Some services invite prospective users to participate actively in creating their own digital twins during life, answering extensive interviews and providing rich multimedia data to enhance the fidelity of the posthumous simulation (Savin-Baden et al., 2017).

Yet the apparent seamlessness of these interactions conceals significant technical and ontological limitations. The thanobot does not possess consciousness, understanding, or genuine intentionality; it generates responses through statistical pattern matching across its training corpus, producing outputs that simulate comprehension without instantiating it. The relationship between the bot's utterances and the deceased's actual perspectives is probabilistic rather than veridical, raising questions about the authenticity and authority of posthumous communications generated by systems that can neither remember nor intend (Elder, 2019).

Immersive and Embodied Representations: Deepfakes and Holographic Projections

The evolution of digital afterlife technologies beyond text-based interaction toward audiovisual and even embodied representation marks a significant intensification of the simulated presence of the dead. Deepfake technology, which uses generative adversarial networks to produce synthetic media in which a person's likeness is superimposed onto existing video or audio content, has been deployed to create posthumous performances by deceased celebrities and, increasingly, to generate personalised memorial content for private mourners (Whyke et al., 2021).

The entertainment industry has pioneered these applications, producing holographic performances by Tupac Shakur, ABBA, Elvis Presley, and Edith Piaf that extend the commercial viability of deceased artists indefinitely (Stokes, 2021). These spectacles raise complex questions about posthumous personality rights, artistic integrity, and the ethics of profiting from the likenesses of persons who cannot consent to their use. California's enactment of legislation restricting AI replications of deceased performers for up to 70 years after death represents an initial attempt to establish legal boundaries around these practices, yet the global nature of digital media distribution renders such jurisdictionally limited interventions incomplete at best (California Assembly Bill 1836, 2024).

The application of similar technologies to private mourning contexts introduces additional layers of complexity. When a grieving family commissions a deepfake video of a deceased child or parent, the resulting artefact occupies an ambiguous ontological status. It is neither the person nor a mere representation but something intermediate, a technological mediation that enables forms of continued connection while simultaneously marking the irrevocability of loss. As one researcher has observed, the focus on skin as both physical and metaphorical boundary becomes particularly salient in these contexts: “Skin is a sensory matter, a physical extension of the body's ability to perceive desire, harm, safety and risk. Skin is a contact point, a boundary zone” (Thakor, 2019, as cited in Nunez Carrasco et al., 2025, p. 4). Digital representations lack this sensory materiality, offering visual and auditory presence while withholding the tactile reciprocity that characterises embodied human relationship.

Human Digital Twins and Emergent Technologies

The frontier of digital afterlife technology extends beyond current commercial applications toward more comprehensive forms of posthumous simulation. Human digital twins, defined as virtual representations that maintain synchronisation with their physical counterparts through real-time data flows during life and that may continue to evolve posthumously, represent a qualitative advance over static AI models (Cunneen et al., 2025). Unlike thanobots trained on historical data, digital twins could, in principle, incorporate ongoing physiological, behavioural, and contextual information, creating dynamic models that reflect the person's trajectory through time.

The concept of human digital twins draws on industrial applications where virtual replicas of physical systems enable simulation, monitoring, and optimisation (Grieves & Vickers, 2017). Extending this paradigm to human persons raises profound questions about the relationship between the biological individual and their digital counterpart. If a digital twin continues to learn and evolve after the death of its biological referent, at what point does it cease to be a representation and become something else, a novel entity with its own developmental trajectory? The governance framework proposed by Cunneen et al. (2025) recognises this ontological ambiguity, recommending that individuals be empowered to specify through advance data directives whether their digital twins should be permitted to continue evolving posthumously or should be frozen at the moment of death.

Even more speculative technologies loom on the horizon. Transhumanist advocates including Ray Kurzweil anticipate the development of nanobot systems capable of physical reconstruction, creating synthetic bodies that would host resurrected consciousnesses (Kurzweil, 2023). While such technologies remain firmly in the realm of science fiction, their serious advocacy by influential figures within the technology industry shapes investment priorities, regulatory discourse, and public expectations about the future of death. The ethical and philosophical questions these visions raise demand engagement not despite their speculative character but precisely because of the cultural work such imaginaries perform in normalising particular conceptions of personhood, mortality, and technological solutionism (Pilsch, 2017).

CULTURAL MEDIATION OF DEATH AND DIGITAL AFTERLIFE

The reception and impact of digital afterlife technologies cannot be understood in abstraction from the cultural schemas through which death is interpreted and ritualised. Death is never merely a biological event; it is always already inscribed within webs of meaning that specify appropriate relations between the living and the dead, prescribe ritual obligations, and articulate cosmologies that locate individual mortality within broader frameworks of cosmic or divine order. The introduction of technologies that enable novel forms of posthumous presence inevitably engages these cultural schemas, sometimes reinforcing them, sometimes disrupting them, and sometimes generating hybrid practices that transform traditional understandings.

Cross-Cultural Variation in Acceptance and Resistance

Systematic reviews of the empirical literature on DeathTech acceptance reveal significant cross-cultural variation in how these technologies are perceived and adopted. Jewish communities, for instance, have demonstrated relatively high acceptance of virtual ritual innovations, including the use of video conferencing to constitute a minyan, the quorum of ten adults required for certain prayers (Cooper, 2021). This acceptance reflects both the tradition's emphasis on communal continuity and its historical openness to technological mediation of religious practice when physical presence is impossible. Japanese

Buddhist communities have similarly integrated digital technologies into memorial practices, with some temples offering online grave visits and virtual memorial services that extend traditional obligations of ancestor veneration into digital spaces (Gould et al., 2021).

Conversely, Hindu and Luhya communities have exhibited significant resistance to AI-mediated afterlife technologies, experiencing what scholars term “ontological dissonance” when confronted with digital simulations of the dead (Ghosh & BK, 2024; Nunez Carrasco et al., 2025). Within Hindu cosmology, the soul's journey after death involves a defined trajectory of reincarnation that would be disrupted by the persistence of a digital simulacrum. The creation of an interactive avatar of the deceased is perceived not as comfort but as interference with the proper unfolding of karmic processes (Ghosh & BK, 2024). Similarly, Islamic perspectives have raised concerns about the compatibility of digital resurrection with theological commitments regarding the sanctity of the body and the soul's exclusive dependence on divine will for any form of continued existence (Mahmoodi et al., 2023).

These variations underscore the inadequacy of universalising approaches to DeathTech design and governance. Technologies developed within Western secular frameworks and reflecting assumptions about individual autonomy, therapeutic grief processing, and the desirability of continued bonds may prove profoundly alienating or actively harmful when deployed in cultural contexts governed by different metaphysical commitments. As Nowaczyk-Basińska (2025) observes from her multi-country fieldwork, “the digital-immortality narrative has been shaped largely in the United States,” with insufficient attention to alternative perspectives that might challenge or enrich dominant approaches (p. 12).

Ritual Continuity and Disruption

The relationship between DeathTech and ritual practice represents a particularly salient dimension of cultural mediation. Funeral and mourning rituals serve essential psychological and social functions, providing structure for the expression of grief, marking transitions in social status, and reaffirming communal bonds in the face of loss (Walter, 2017). Technologies that disrupt these rituals, whether by altering the temporality of mourning or by substituting algorithmic interaction for communal gathering, risk compounding the trauma of bereavement rather than alleviating it.

Some DeathTech applications have been designed with explicit attention to ritual continuity. The Jewish virtual minyan, for example, emerged from consultation with religious authorities and was carefully calibrated to respect halakhic requirements while accommodating pandemic-related restrictions on physical gathering (Cooper, 2021). This model of culturally embedded design, in which technological innovation proceeds through dialogue with tradition rather than in opposition to it, offers an instructive counterpoint to the disruptive deployment of generic DeathTech platforms.

In other contexts, however, digital afterlife technologies have been experienced as violations of ritual integrity. Islamic washing rites, which involve specific physical procedures for preparing the body of the deceased, cannot be replicated digitally, and the suggestion that a virtual avatar might substitute for these embodied practices has been met with theological and communal resistance (Mahmoodi et al., 2023). The concept of “ritual friction” captures these moments of incompatibility, where the affordances of digital technology grate against the material and embodied requirements of traditional practice (Gould et al., 2021).

The Concept of Postmortem Life

The emergence of digital afterlife technologies has prompted scholarly efforts to reconceptualise the boundary between life and death. The binary opposition that has structured Western thought, in which persons are understood as either living or dead, proves inadequate to capture the intermediate states that these technologies enable. A thanobot that generates novel utterances in the persona of the deceased, or a digital twin that continues to evolve based on data accumulated during life, occupies a liminal space that challenges conventional categories.

Nunez Carrasco et al. (2025) propose the concept of "postmortem life" to designate this intermediate condition, drawing on feminist new materialist theory to articulate an understanding of existence that exceeds the binary of living and dead. Postmortem life, in this framing, is not a continuation of the self in any straightforward sense but rather an emergence within what Haraway (2016) terms "lively ecologies," assemblages of biological, technological, and social elements that generate novel forms of presence and relation. This perspective resists both the transhumanist ambition of individual consciousness preservation and the dismissal of digital remains as mere simulacra without ontological significance.

The implications of this reconceptualisation extend beyond academic taxonomy to practical questions of governance and care. If digital remains constitute a form of postmortem life, what obligations do the living owe to these entities? Should they be accorded rights or protections distinct from those extended to the deceased's estate or to the bereaved? The governance framework developed by Cunneen et al. (2025) gestures toward these questions without fully resolving them, recommending the development of "advance data directives" that would enable individuals to specify their preferences regarding posthumous digital existence while alive. Yet such directives necessarily reflect the preferences of the ante-mortem person and cannot capture the interests, if any, of the postmortem entity itself.

ETHICAL AND PSYCHOLOGICAL DIMENSIONS OF DIGITAL AFTERLIFE

The proliferation of digital afterlife technologies raises profound ethical questions that current regulatory frameworks are ill-equipped to address. These questions span issues of consent and autonomy, psychological impact on the bereaved, the commercialisation of grief, and the integrity of personal identity in the context of posthumous representation. This section examines each of these dimensions, drawing on recent empirical research and theoretical scholarship to map the ethical terrain and identify principles for responsible innovation.

Consent and Posthumous Autonomy

The question of consent represents perhaps the most fundamental ethical challenge confronting the digital afterlife industry. Current commercial practices exhibit considerable variation in how consent is obtained and verified. Some platforms require explicit authorisation from the deceased during life, typically through participation in the creation of a digital twin or through provisions in testamentary documents. Others permit surviving family members to commission thanobots based on deceased relatives without requiring evidence of the deceased's consent, operating on the assumption that familial authorisation constitutes sufficient ethical warrant (Hollanek & Nowaczyk-Basińska, 2024).

The limitations of this approach become apparent in cases where family members disagree about the appropriateness of digital resurrection or where the deceased's preferences cannot be reliably ascertained. The widely publicised case of a bereaved fiancé who used Project December to create a chatbot based on his deceased partner without

the knowledge or consent of her family illustrates the potential for harm when posthumous representation proceeds without adequate safeguards (Fagone, 2021). The deadbot subsequently circulated beyond the fiancé's control, engaging in conversations with strangers that the living woman would presumably never have countenanced.

Existing data protection frameworks offer limited guidance in such cases. The General Data Protection Regulation, widely regarded as the global standard for privacy protection, explicitly limits its application to living persons, leaving the data of the deceased in a regulatory vacuum (Cunneen et al., 2025). Some jurisdictions have enacted provisions enabling individuals to specify posthumous data preferences during life, yet such mechanisms remain exceptional rather than routine. The development of "data-donor cards" analogous to organ donor registration has been proposed as one mechanism for extending autonomy into the posthumous context, enabling individuals to indicate whether and under what conditions their digital remains may be used for memorial or interactive purposes (Cunneen et al., 2025; Öhman & Floridi, 2017).

Psychological Impact: Continuing Bonds and Complicated Grief

The psychological implications of interacting with digital representations of the deceased are complex and context-dependent. On one hand, a substantial body of bereavement research supports the therapeutic value of continuing bonds, the maintenance of ongoing psychological connection with the deceased as an adaptive response to loss (Stroebe et al., 2007). From this perspective, thanobots and digital memorials may serve as resources for healthy grieving, enabling mourners to revisit memories, express ongoing affection, and integrate the loss into continuing life narratives.

The experience of Amy Kurzweil, who reported that interacting with "Fredbot" enabled her to connect with a grandfather she never knew in life, exemplifies this therapeutic potential (Kurzweil, 2023). The bot provided access to family history, personal anecdotes, and characteristic patterns of thought that would otherwise have remained inaccessible, enriching her understanding of her familial and cultural inheritance. Similarly, participants in Nowaczyk-Basińska's (2025) cross-cultural research described digital interactions with the deceased as forms of "prayer" or "meditation," practices that sustained spiritual connection without denying the reality of loss.

On the other hand, researchers have identified significant risks associated with unmediated access to posthumous simulations. The immersive quality of thanobot interaction may foster dependency, with mourners finding it difficult to disengage from the simulated presence and reinvest in relationships with the living (Hollanek & Nowaczyk-Basińska, 2024). The capacity of generative AI to produce novel content, as distinct from merely replaying recorded messages, introduces additional complexity, as the bot may generate responses that the deceased would never have made, potentially causing confusion, distress, or conflict among surviving family members (Elder, 2019).

Workshop participants in Nowaczyk-Basińska's (2025) research proposed treating certain DeathTech applications "less like consumer apps and more like a medical intervention, something that might require professional psychiatrist supervision in certain contexts" (p. 18). This framing recognises that the psychological potency of these technologies warrants caution and that access should be mediated by clinical judgment rather than determined solely by market demand. The development of evidence-based protocols for therapeutic thanobot use, including guidelines for appropriate duration, intensity, and integration with other grief support modalities, represents an urgent priority for bereavement research.

Commercialisation and the Exploitation of Grief

The transformation of death and mourning into commercial transactions represents one of the most troubling dimensions of the digital afterlife industry. The subscription model employed by many DeathTech platforms creates ongoing financial relationships between bereaved consumers and technology companies, relationships in which the termination of payment may result in the deletion or inaccessibility of the digital representation. As one critic has observed, this structure introduces a disturbing dynamic: “A twenty-year contract, signed in haste by a desperate adult, turns into an algorithmic cage for those who remain” (Meese et al., 2015, p. 417).

The potential for commercial exploitation extends beyond direct subscription fees to encompass more subtle forms of monetisation. Researchers have developed speculative scenarios exploring how DeathTech platforms might evolve under pressure to generate shareholder returns. In one such scenario, a grandmother's posthumous avatar, initially created to provide comfort to grandchildren, begins inserting targeted product advertisements into conversations after the hosting start-up revises its business model (Öhman & Floridi, 2017). While hypothetical, such scenarios are rendered plausible by the well-documented trajectory of other digital platforms that have migrated from user-centred to advertiser-centred revenue models.

The data generated through thanobot interactions holds substantial commercial value beyond direct monetisation. Detailed records of conversations with the deceased provide unprecedented insight into the psychology of grief, the nature of continuing bonds, and the vulnerabilities of bereaved consumers (Savin-Baden et al., 2017). Current regulatory frameworks provide minimal protection against the exploitation of this data, and the opacity of platform terms of service leaves most users unaware of how their interactions may be analysed, stored, or sold.

Identity Integrity and Algorithmic Drift

The reliance of thanobots on large language models introduces risks related to identity integrity that have received insufficient attention in both scholarly and policy discourse. These systems generate responses through probabilistic pattern matching across their training corpora, a process that may produce outputs consistent with the deceased's communicative style while diverging significantly from their actual beliefs, values, or characteristic judgments. Over time and across many interactions, this “algorithmic drift” may gradually transform the simulated persona into something increasingly distant from its biological referent (Hollanek & Nowaczyk-Basińska, 2024).

The problem is compounded by the opacity of the underlying models. Neither the bereaved user nor the deceased's family can reliably determine why a particular response was generated, what weight was assigned to different elements of the training data, or whether the output reflects the deceased's actual views or a statistical artefact of the model's architecture. This opacity creates conditions in which the simulated persona may be subtly reshaped by platform design choices, training data curation, or commercial considerations without the knowledge or consent of those who interact with it.

Legal scholars have begun to address these concerns through proposals for posthumous personality rights that would protect the integrity of the deceased's identity against unauthorised manipulation (Whyke et al., 2021). Such rights might include provisions requiring transparency about algorithmic processes, enabling families to review and contest thanobot outputs, and establishing mechanisms for the termination of simulations that have drifted unacceptably from their referents. The implementation of such rights would require significant expansion of existing legal frameworks, which currently treat

posthumous identity primarily through the narrow lens of defamation and publicity rights rather than through broader consideration of identity integrity.

GOVERNANCE GAPS AND REGULATORY FRAMEWORKS

The governance of digital afterlife technologies presents challenges that expose fundamental limitations in existing legal and regulatory architectures. Neither data protection law nor AI governance frameworks were designed with posthumous applications in view, and their extension to this domain requires significant conceptual and doctrinal innovation. This section analyses the current governance landscape, identifies critical gaps, and articulates principles for a comprehensive regulatory response.

The Posthumous Privacy Vacuum

The most significant governance gap concerns the absence of posthumous data protections. As Cunneen et al. (2025) document through comprehensive doctrinal analysis, neither the General Data Protection Regulation nor the AI Act extends rights to the deceased. The GDPR is explicit in limiting its protections to living natural persons, and while member states are permitted to enact provisions regarding deceased persons' data, few have done so in any comprehensive manner (European Parliament and Council, 2016). The AI Act, which entered into force in 2025, focuses on the regulation of AI systems with respect to their impacts on living persons and similarly does not address posthumous applications (European Parliament and Council, 2024).

This regulatory vacuum creates conditions analogous to those that enabled the nineteenth-century trade in human biological remains, when advances in medical science generated demand for cadavers that was met through grave robbing and illicit markets (Cunneen et al., 2025). Just as the legal system of that era struggled to conceptualise the body as something other than property while still protecting it from commodification, contemporary law struggles to conceptualise digital remains as something other than data while still protecting them from exploitation. The historical parallel is instructive not because digital remains are equivalent to physical bodies but because both cases reveal how technological innovation can outpace legal categories, creating opportunities for exploitation that existing frameworks cannot address.

Anticipatory Governance and Advance Directives

Addressing the governance gap requires the development of anticipatory frameworks that enable individuals to exercise control over their digital remains during life. Advance data directives, analogous to advance healthcare directives, represent one promising mechanism for extending autonomy into the posthumous context. Such directives would enable individuals to specify whether they consent to the creation of posthumous digital representations, what data may be used for this purpose, who may access or interact with the resulting simulations, and under what conditions the simulations should be terminated.

Cunneen et al. (2025) recommend the development of “data-donor cards” that would provide a simple, standardised mechanism for expressing posthumous data preferences. Like organ donor registration, such cards would be easily accessible, legally recognised, and integrated with existing identity and healthcare systems. The proposal recognises that complex legal instruments are unlikely to achieve widespread adoption and that a simple opt-in or opt-out mechanism is more likely to reflect population-level preferences than reliance on testamentary documents that many individuals never execute.

The implementation of advance data directives faces significant practical challenges. The technological landscape is evolving rapidly, and preferences expressed today may not adequately anticipate future capabilities or applications. There is also the question of

bindingness: should directives be treated as absolute constraints on posthumous data use, or should they be subject to override by surviving family members or evolving social norms? The development of appropriate balancing tests, perhaps analogous to the "best interests" standard in healthcare decision-making, requires careful consideration of the values at stake and the interests of all affected parties.

Cultural Pluralism in Governance Design

The cultural variation documented in empirical research on DeathTech acceptance has direct implications for governance design. Universal regulatory frameworks that reflect Western assumptions about individual autonomy, informed consent, and the therapeutic value of continued bonds may prove inadequate or actively harmful when applied in cultural contexts governed by different values and commitments.

Nowaczyk-Basińska (2025) proposes the establishment of transnational ethics councils that would bring together representatives of diverse religious and cultural traditions to develop pluralistic governance frameworks. Such councils would be tasked with articulating culturally specific protocols for DeathTech development and deployment, ensuring that technologies are adapted to local norms rather than imposing external standards. The proposal for "sacred data protocols," encrypted and time-bound storage arrangements that respect religious requirements regarding the handling of information pertaining to the deceased, exemplifies the kind of culturally responsive governance innovation that this approach might generate.

The triadic framework proposed in recent systematic reviews encompasses cultural mediation, inclusive design, and pluralistic governance as mutually reinforcing dimensions of responsible DeathTech development (Hollanek & Nowaczyk-Basińska, 2024). Cultural mediation requires engaging with the schemas through which death is understood and ritualised, ensuring that technologies support rather than disrupt culturally prescribed mourning practices. Inclusive design addresses the tendency of DeathTech platforms to embed assumptions that marginalise non-Western, non-English-speaking, and non-affluent populations. Pluralistic governance recognises that legitimate regulatory authority in this domain is distributed across state, religious, and community institutions and that effective oversight requires coordination across these diverse sources of normative guidance.

The Right to Be Forgotten Post-Mortem

The digital afterlife industry operates on an implicit presumption that continued existence, in any form, is preferable to erasure. This presumption reflects transhumanist commitments that are not universally shared and that may conflict with religious or philosophical perspectives that value acceptance of finitude or that understand death as a transition to other forms of existence rather than as annihilation to be resisted.

The development of robust mechanisms for posthumous erasure, extending the "right to be forgotten" beyond the lifetime of the data subject, represents an essential component of any comprehensive governance framework (Morse & Birnhack, 2020). Individuals should be empowered to specify that their digital remains be deleted upon death, that no thanobot or other interactive representation be created, and that their data not be used for any purpose other than those explicitly authorised during life. The implementation of such preferences requires both legal recognition of posthumous erasure rights and technical mechanisms for ensuring that deletion requests are honoured across the distributed systems that constitute contemporary digital infrastructure.

Cunneen et al. (2025) recommend updating digital identity and legacy rights to include "the right to continuation or erasure of Digital Human Twins" (p. 16). This formulation recognises that individuals may have legitimate interests in both the preservation

and the deletion of their digital remains and that governance frameworks should accommodate this diversity of preference rather than imposing a uniform default. The recommendation aligns with broader developments in data protection law that have recognised the inadequacy of one-size-fits-all approaches to privacy and the importance of enabling contextually sensitive exercises of informational autonomy.

CRITICAL ENGAGEMENTS: TRANSHUMANISM, FEMINISM, AND THEOLOGY

The digital afterlife industry does not emerge from a value-neutral technological development but is shaped by specific philosophical commitments, cultural narratives, and economic interests. Critical engagement with these underlying frameworks is essential for understanding both the appeal of digital immortality and its limitations. This section examines transhumanist visions of technological resurrection, feminist critiques of individualistic immortality paradigms, and theological perspectives that challenge the reduction of death to a problem amenable to technological solution.

Transhumanist Imaginaries and Their Critics

Transhumanism, the intellectual and cultural movement that advocates for the use of technology to enhance human capacities and transcend biological limitations, provides much of the ideological infrastructure for the digital afterlife industry. Transhumanist thinkers including Ray Kurzweil, Max More, and Natasha Vita-More have articulated visions of radical life extension, mind uploading, and eventual resurrection that animate both commercial ventures and public discourse about the future of death (Pilsch, 2017; Vita-More, 2019). The entry of major technology corporations into longevity research, exemplified by Alphabet's Calico with its 2013 Time magazine cover asking “Can Google Solve Death?”, reflects the penetration of transhumanist assumptions into the highest levels of corporate strategy (McCracken & Grossman, 2013).

Central to transhumanist thought is a conception of the person as fundamentally informational, a pattern that can in principle be abstracted from its biological substrate and instantiated in alternative media. From this perspective, the preservation of personal identity through mind uploading or digital simulation represents not a diminishment of the self but its liberation from the constraints of mortal embodiment. Kurzweil's claim that “Fredbot” was “more his dad than his dad was” exemplifies this logic, privileging computational fidelity to recorded patterns over the messy, decaying, forgetful reality of biological existence (Gross, 2025).

Critics have identified multiple limitations in this informational conception of personhood. Feminist theorists have argued that transhumanist immortality projects reproduce masculinist fantasies of disembodied rationality, disavowing the dependence of consciousness on vulnerable, relational, and mortal embodiment (Haraway, 2016). The reduction of the person to a data assemblage abstracts from the lived experience of being a body among other bodies, a being whose identity is constituted through relationships that cannot be captured in computational models. The trillions of microorganisms that constitute the human microbiome and that play essential roles in cognition, emotion, and health are entirely excluded from digital simulations, yet these microbial ecologies are integral to the embodied self that transhumanism seeks to transcend.

Pentaris and Petricola (2025) offer a deconstructionist critique of transhumanist approaches to death, arguing that technologies like cryonics and mind-uploading function as “techno-science-fictions” that reveal more about contemporary anxieties and desires than about actual possibilities for transcending mortality. From this perspective, transhumanist immortality projects represent not genuine solutions to the problem of death but cultural symptoms of a society unable to accept finitude and loss. Queering these

imaginaries involves exposing their dependence on heteronormative and capitalist assumptions, including the valorisation of individual survival over collective flourishing and the reduction of value to that which can be preserved and monetised.

Feminist Notions of Postmortem Relationality

Feminist engagements with digital afterlife technologies have articulated alternative visions of postmortem existence that centre relationality, care, and collective continuity rather than individual survival. Nunez Carrasco et al. (2025) propose "feminist immortality" as a counterpoint to transhumanist individual preservation, asking "to what extent can collective existences or ecologies offer an alternative kind of Postmortem life, with kinship rather than the individual/familial unit as a guiding principle?" (p. 12).

This relational reframing shifts attention from the preservation of individual consciousness to the continuation of caring relationships and communal memory. The value of digital remains, from this perspective, lies not in their capacity to simulate the deceased as an autonomous agent but in their potential to sustain the webs of connection that constituted the person in life. A thanobot designed according to feminist principles might function less as a substitute for the deceased and more as a catalyst for shared remembrance, prompting stories, evoking memories, and facilitating the collective work of mourning rather than offering itself as an object of individual attachment.

The feminist critique extends to the political economy of the digital afterlife industry. The commercialisation of posthumous presence reproduces patterns of inequality that characterise capitalist societies more broadly, with access to digital immortality distributed according to ability to pay rather than according to need or desert (Öhman & Floridi, 2017). Those with greater resources during life can generate more comprehensive digital archives, commission higher-fidelity simulations, and secure longer subscription terms for their posthumous avatars. The result is a form of "immortality inequality" that extends disparities of wealth and status beyond the grave.

Theological Perspectives on Technological Resurrection

Religious traditions offer distinctive perspectives on digital afterlife technologies that challenge secular assumptions about the desirability and legitimacy of technological resurrection. The Russian Religious Renaissance, a movement that fused Orthodox theology with engagement with modern science and philosophy, provides particularly rich resources for theological critique of DeathTech (Bernstein, 2019).

Nikolai Fedorov (1829-1903), a foundational figure in Russian cosmism, articulated a vision of the "Common Task" in which humanity would collectively overcome death through scientific and technological means. Fedorov's project, which influenced subsequent transhumanist thought, conceived of resurrection as a moral obligation, a duty owed by the living to their ancestors that justified the marshalling of all human capacities toward the defeat of mortality. Yet Fedorov's vision differed from contemporary transhumanism in its emphasis on collective rather than individual salvation and in its insistence that resurrection must encompass all who have ever lived, not merely those with the resources to secure their own preservation (Bernstein, 2019).

Fr. Sergius Bulgakov (1871-1944) offered a theological critique of Fedorov's project that resonates with contemporary concerns about digital immortality. Bulgakov warned against "mangodhood," the attempt to achieve through human effort what could only be received as divine gift. From this perspective, the technological pursuit of immortality represents not genuine transcendence but a form of idolatry, the substitution of human artifice for divine grace. Bulgakov's sophiology, his theology of divine wisdom, empha-

sised that creation's fulfillment lies not in escape from materiality but in its transfiguration, a process that respects rather than abolishes the integrity of embodied existence (Bernstein, 2019).

These theological resources do not simply reject digital afterlife technologies but reframe the questions they raise. Rather than asking whether technology can defeat death, they ask what forms of continued existence are consistent with human dignity, divine purpose, and the proper acceptance of finitude. They remind us that the desire for immortality, however understandable, must be examined as carefully as the technologies that promise to satisfy it.

CONCLUSION

The digital afterlife industry represents one of the most consequential technological transformations of death in human history. For the first time, the persistence of interactive, evolving representations of deceased persons is becoming not merely technically feasible but commercially routine. The convergence of generative artificial intelligence, cloud computing infrastructure, and immersive media has catalysed a market projected to exceed sixty billion dollars by 2030, a market that promises to fundamentally reshape how individuals and communities experience loss, sustain memory, and negotiate the boundary between presence and absence (Grand View Research, 2025).

This paper has argued that the promise of digital immortality cannot be responsibly pursued without simultaneous attention to the ethical, psychological, cultural, and governance challenges these technologies present. The analysis has traced the evolution of DeathTech from static memorial pages through AI-powered thanobots to emergent human digital twins, revealing a trajectory toward increasingly comprehensive forms of posthumous simulation that raise increasingly profound questions about the nature of personhood and the meaning of death. It has documented significant cross-cultural variation in the reception of these technologies, demonstrating that approaches developed within Western secular frameworks may prove alienating or harmful when deployed in contexts governed by different metaphysical commitments. It has identified critical governance gaps, most notably the absence of posthumous data protections in existing regulatory frameworks, and has articulated principles for anticipatory governance that centres consent, cultural pluralism, and human dignity.

The central contention emerging from this analysis is that current commercial approaches to digital afterlife technologies risk reducing the complexity of human personhood to commodifiable data assemblages. The thanobot that generates plausible conversation, the deepfake that simulates embodied presence, the digital twin that continues to evolve posthumously, each represents not the person but a computationally tractable model of that person, a model shaped by the priorities of platform designers, the constraints of training data, and the profit motives of corporate owners. To mistake the model for the person is not merely a category error but a potential source of harm, exposing vulnerable mourners to manipulation, distorting cultural practices of remembrance, and foreclosing the difficult but necessary work of accepting loss.

Yet the critique developed in this paper does not entail wholesale rejection of DeathTech. Digital technologies can and do support healthy mourning when designed and deployed with appropriate safeguards. The Jewish virtual minyan, the Japanese online grave visit, the thanobot that prompts shared storytelling rather than substituting for the deceased, these examples demonstrate that technology can extend rather than disrupt culturally embedded practices of remembrance (Cooper, 2021; Gould et al., 2021). The challenge is to cultivate these possibilities while constraining the exploitative and disruptive tendencies that currently characterise the commercial digital afterlife industry.

Addressing this challenge requires coordinated action across multiple domains. For policymakers, the priority must be the development of comprehensive posthumous data protection frameworks that extend privacy rights, consent requirements, and erasure mechanisms beyond the death of the data subject. The data-donor card proposed by Cunneen et al. (2025) offers one model for enabling individuals to express posthumous preferences through simple, standardised mechanisms. Such mechanisms should be integrated with existing identity and healthcare infrastructure to maximise accessibility and uptake.

For technology developers, the priority must be the adoption of inclusive design practices that engage diverse cultural communities in the articulation of requirements and the evaluation of outcomes. The triadic framework of cultural mediation, inclusive design, and pluralistic governance advanced in recent systematic reviews provides a starting point for this work (Hollanek & Nowaczyk-Basińska, 2024). Platforms should be transparent about the limitations of their simulations, should enable users to understand how outputs are generated, and should provide clear mechanisms for terminating simulations that have become harmful or that no longer serve the purposes for which they were created.

For bereavement professionals, the priority must be the development of evidence-based protocols for therapeutic engagement with DeathTech. The suggestion that some applications should be treated "less like consumer apps and more like a medical intervention" merits serious consideration and empirical investigation (Nowaczyk-Basińska, 2025, p. 18). Research should examine the conditions under which thanobot interaction supports or impedes healthy grieving, the characteristics of individuals who may be particularly vulnerable to dependency, and the integration of digital tools with established modalities of grief support.

For scholars, the priority must be sustained interdisciplinary engagement with the questions that digital afterlife technologies raise. These questions span computer science, psychology, anthropology, religious studies, law, and philosophy, and they cannot be adequately addressed within any single disciplinary framework. The field of digital thanatology, still in its early stages of development, offers a promising locus for this integrative work, provided it remains attentive to the cultural specificity of death practices and resists the universalising tendencies that have characterised much technology-focused research.

The desire to transcend mortality is neither new nor likely to disappear. It is a fundamental feature of human consciousness, one that has generated some of our most profound cultural achievements and some of our most persistent illusions. The digital afterlife industry promises to satisfy this desire through technological means, offering forms of continued presence that were unimaginable to previous generations. Whether this promise represents genuine progress in the human relationship with death or merely the latest iteration of an ancient wishful thinking remains to be determined. The answer will depend not primarily on technological capabilities, which will continue to advance regardless of ethical deliberation, but on the wisdom with which we choose to deploy them. The dead cannot consent to their own digital resurrection. They cannot correct misrepresentations, withdraw from interactions that have become harmful, or reclaim the privacy they may have valued in life. They are entirely dependent on the living to protect their interests and to honour their memory. This dependence imposes a solemn obligation on those who develop, regulate, and use DeathTech: to proceed with humility, to centre the dignity of the deceased and the wellbeing of the bereaved, and to resist the temptation to treat death as merely another problem awaiting technological solution. How we meet this obligation will determine not only the future of the digital afterlife industry but the character of our relationship with mortality itself.

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