Stewarding a Legacy: Responsibilities and Relationships in the Management of Post-mortem Data

Jed R. Brubaker, Lynn Dombrowski, Anita M. Gilbert, Nafiri Kusumakaulika, Gillian R. Hayes
Department of Informatics
University of California, Irvine
{jed.brubaker, ldombrow, gilbera1, nkusumak, hayesg}@uci.edu

ABSTRACT
This paper extends research on the giving and inheriting of digital artifacts by examining social network site accounts post-mortem. Given the important role that social network sites play in online bereavement practices, we conducted a series of in-depth qualitative interviews to explore issues around inheritance and post-mortem data management of Facebook accounts. We found that participants focused less on ownership of the data, and instead on the duties and potential conflicts associated with maintaining an account post-mortem. Subsequently, we argue for "stewardship" as an alternative to inheritance for framing post-mortem data management practices. Analysis of post-mortem data management activities highlights how stewards are accountable and responsible to the deceased and various survivors. However, weighing competing responsibilities is complicated by varied relationships with disparate survivors, as well as the inability to consult with the deceased. Based on our findings, we claim that post-mortem solutions need to account for the needs of stewards in addition to those of the deceased and survivors. We suggest that a model of stewardship better accounts for the interpersonal responsibilities that accompany online data than inheritance alone.

Author Keywords
Stewardship; digital legacy; inheritance; death; social network sites; Facebook; qualitative study

ACM Classification Keywords
H.5.3. [Information Interfaces and Presentation]: Group and Organization Interfaces; K.4.2 Computers and Society: Social Issues

INTRODUCTION
The growing centrality of online services has prompted questions and concerns surrounding post-mortem account and data management. Article headlines such as "What happens to your digital assets when you die?" [36] and "How to Manage Your Digital Afterlife" [2] frame these issues in individual terms, and stress the importance of including online accounts and data in one's living will and trust. In many cases, these conversations are timely and sensible. People already bequeath photo albums, why not digital photo albums?

Popular press, emerging tools and services, and current research frequently use the term "digital legacy" when referring to online data and its importance. Caring for one's digital legacy amounts to including overlooked digital assets in a will or living trust so they can be passed on like other forms of property. The term legacy is compelling – it speaks to the symbolic significance of these data in addition to their value. For example, two headings in a book entitled "Your Digital Afterlife", Carroll and Ramano [8] first argue, "Your content is a reflection of you" followed by "Your content is your legacy." In this swift move, one's data and one's social identity are collapsed into one.

Framing digital legacies in terms of inheritance privileges notions of ownership, however, digital legacies are more than just collections of digital assets. As has been noted elsewhere [17, 31], the process of bequeathing objects can act as more than a reflection of relationships, it can be constitutive of them. Additionally, inheritance as a model often presumes a defined heir, which is not necessarily the case with online accounts and data.

In this paper we present "stewardship" as an alternative model to inheritance when considering digital legacies. Focusing on Facebook accounts and their data, we discuss the needs of recipients of these accounts as a way of highlighting issues surrounding the stewardship of social network site (SNS) profiles. Grounded in the experiences of 20 interview participants, who reported at least one death of a friend with a Facebook profile within the last two years, we enumerate the various ways prospective stewards remain accountable to both the deceased and various survivors even in the face of limited knowledge about these people's interests and desires; the challenges that exist when trying to meet these obligations; and the role that future systems could play in the management of post-mortem data.

While social media accounts are frequently included in the list of data that comprises one's digital legacy (*e.g.*, [8]), the personal data associated with these accounts do more than provide an archived memorial. Social media profiles are sites of social interactions that continue on after the account

CHI 2014, April 26 - May 01, 2014, Toronto, ON, Canada.

ACM 978-1-4503-2473-1/14/04…$15.00.
http://dx.doi.org/10.1145/2556288.2557059

holder has died, most notably through the memorial practices of survivors [5, 6, 7, 14, 16, 23, 29]. Thus, we considered the types of management that may accompany the ongoing use of these spaces.

Stewards act as mediators for the wishes of the deceased and their data, as well as moderators of the actions, needs, and requests of other survivors. As such, stewards are accountable to multiple parties—the deceased, surviving online friends, and friends and family who are not connected to the online social network—who all have varying claims to management of and interaction with the deceased's data and profile post-mortem. Based on their particular needs, we emphasize the importance of designing end-of-life planning tools in ways that incorporate stewards in the planning process, attend to their needs after the account owner's death, and support account owners to understand both that technological and social considerations relevant to digital data that may not be as familiar as traditional assets for inheritance.

LEGACY AND STEWARDSHIP

Engaging the connotations of "digital legacy" requires that we consider the use of the term "legacy" more broadly. There are two common understandings of the term: that which is bequeathed to another, an enduring representation of an individual after their death. Hunter & Rowles [18] provide a broader typology, noting that one's legacy is composed of a biological legacy, material legacy, and a legacy of values. Pertinent here are material legacies that can include heirlooms, possessions, and symbols.

Much of related HCI research has focused on material legacies, particularly the bequeathal of heirlooms and possessions (*e.g.*, [16, 25, 30, 31]). However, the third category, symbols, has been understudied in HCI to date. Symbolic legacies include "leaving social markers," such as a named building or endowing an academic chair that serve as "public legacies that might result in a form of symbolic immortality" [18]. In contrast to heirlooms and possessions that are amenable to ownership, symbolic legacies more commonly necessitate stewardship – someone to manage and maintain the marker on behalf of the deceased. The public nature of social media data and the broad set of stakeholders impacted by these data make analysis of them in symbolic terms appropriate.

Independent of the content of one's legacy, legacy crafting can be seen as a practice in which one engages, typically near the end of life, as in the Stage Theory Model of Adult Cognitive Development [35]. This understanding of legacy is as a curated self-presentation intended to endure after one's death. However, of course, people do not all die in old age or explicitly craft their legacies.

Stewardship involves taking on this responsibility of caring for and crafting a legacy on behalf of another. The etymology of the word "steward" can be traced back to "guardian", and starting in the late 14th century England and Scotland, was used as a title to refer to "one who manages affairs of an estate" [12]. Consistent with this definition, stewards do not necessarily own the things for which they are responsible. Instead, stewardship focuses upon carrying out responsibilities entrusted to the steward.

Stewardship has received the most significant treatment in the social sciences, particularly management and organizational science [27]. In particular, Stewardship Theory describes leaders who act in service of a collective, as opposed to in their own best interests [10]. Stewardship as a concept within technology, meanwhile, while not particularly new, is under-theorized. It is seen predominantly in security, data governance, and business information systems (*e.g.*, [11]) when describing a person who takes responsibility for existing data, or possible future data. For example, in large classification systems, it is a suggested practice to have a steward for each data node – someone who can speak on behalf of the data that exists or might exist in this node.

As the size and complexity of our personal data grow, it is not surprising to see similar needs emerge outside the traditional sphere of corporate and academic datasets. However, stewardship of SNS data can be distinguished from other types of stewardship based on the tight relationship between the data and identity of the individual who created it, an issue we explicitly address here.

RELATED WORK

Death and end-of-life issues have gained increased attention in HCI. Much of this work takes inspiration from Bell's call for the study of techno-spirituality [4], which consequentially includes practices surrounding death. Research focusing on end of life needs has been proposed as part of a broader lifespan-oriented approach to HCI [25]. Inheritance of technology is noted as a key area for further research, as well as the creation of and experiences surrounding legacies and monuments. The life record made available via Facebook profiles presents a particular challenge given the ad-hoc repurposing of these spaces for memorialization.

Inheritance and Bereavement

Among the various strategies users may prefer for the management of their online data post-mortem [38], strategies that enable inheritance are common. However, existing literature has documented substantial design challenges around inheritability, such as adequate planning for digital assets post-mortem or "the will-drafting problem" [24]. Meanwhile, Odom et al. [30] note potential tensions with the presence of uncurated social media data in family archives. One potential solution to these challenges could include "deep storage" and decay of digital artifacts [31]. However, decay is sometimes seen as antithetical to the nature of digital objects, which can always remain in their authentic condition [17]. A desire for authenticity may present some challenges when the data involved serves as a

representation of the deceased, as is the case with a Facebook profile.

Concerns around inheritance necessarily extend to the needs of the bereaved. In particular, inheriting a physical object can be riddled with ambiguities when the recipient is uncertain of its meaning [31]. These ambiguities might be amplified in the case of SNS profiles where some individuals feel that profile ownership is retained by the deceased [6].

In an online support context, meanwhile, Masimmi highlights an important distinction between loss and grief when designing technologies to support the bereaved and cautions against approaches that may intermingle the two [26]. Loss includes the shock related to the initial loss, but the experience of grief is often ongoing. This distinction is pertinent when considering the specific practices in which a steward might engage, and their timing. Ideal solutions, however, remain unclear, and existing solutions take myriad approaches to meeting these needs.

Social Network Sites and Online Memorials

SNSs present additional challenges when considering inheritance and the needs of the bereaved [2, 5, 6, 16, 22, 26, 29]. As Facebook has matured, the number of profiles representing the deceased has grown [21]. The continued presence of SNS profiles, meanwhile, enables "post-mortem social networking" [6], practices which linguistically reflect the kinds of front-stage performances associated with funerals [14]. Likewise, post-mortem practices on Facebook, in particular, expand the site in which individuals experience and encounter death [5], which can result in over-exposure of the bereaved and trolling [23]. Finally, as younger generations are more likely to experience and engage in postmortem interactions [22], recommendations for existing and future services are important. A number of design considerations have been forwarded to address the evolving needs of survivors on SNS. Specifically, control over access to an account, the need for additional moderation tools, and means by which to communicate with the deceased's network [23, 29] speak to the kinds of stewardship practices we consider here.

Historically, many online services (including Facebook) deleted user accounts and content if and when they learned that the account owner had died. However, in late 2009, Facebook introduced their "Memorial Profile" feature – a state into which accounts are now placed when Facebook is notified of a death [13]. Anyone can notify Facebook that a user has died, and Facebook, after confirming the information, will change the account's state to "Memorialized." Memorializing a profile changes it in four significant ways: logging into the account is disabled; contact information (*e.g.*, street address) is removed; the profile becomes invisible to everyone except for the deceased's existing friends; and consequently, new friend requests can not be submitted or accepted.

Facebook's "Memorial Profile" does presents some challenges. Individuals report ambiguities around who has the right to tell Facebook that the account owner has died [5]. After the profile is memorialized, no one is allowed to login to the account, leaving Facebook in the position of stewarding the account and managing any potential issues with the profile or content posted to it. Circumstances could easily rise in which Facebook support staff may not be adequately responsive to the needs of survivors. Finally, by making the memorialized profile invisible and disabling the ability for individuals to connect with the deceased's profile, the profile's ability to serve as a memorial or long-term archive is severely limited [1].

Emerging Tools for Post-mortem Data Management

A handful of third-party tools also exist, most of which focus on sending messages post-mortem to loved ones. IfIDie [19], the most established service on Facebook, allows an account owner to create a message that will be posted to their profile after they die. Promotional materials suggest this message could include a piece of advice, a deep secret, or a set of final requests. Meanwhile, a newer service named Perpetu [33] allows individuals to automate a set of "final wishes" across a growing number of services. One might add a final post to one's Facebook Wall have photos emailed to a friend, delete Twitter posts, or set one's GitHub repositories to open-source. While these "wishes" are limited by the functionality of each service's API (*e.g.*, deleting Facebook statuses on Facebook is not an option), Perpetu will programmatically perform these wishes when a designated individual informs Perpetu of the user's death.

One major player, Google, has attempted to address issues related to post-mortem data access with their recently released "Inactive Account Manager" [28]. Instead of sharing data with "trusted contacts" when notified of a user's death, Google will automatically provide access when the account is deemed inactive for longer than the length chosen by the account owner.

The growing set of services allow account owners to prepare for their deaths, however, few of them are designed to facilitate the transfer of total ownership or control to another individual. This omission is undoubtedly impacted by the terms of use for each of these services; however, the importance of managing the deceased's account – in addition to accessing data – is important enough that legal efforts are underway throughout the United States to grant this right to next of kin [32]. While legal and policy issues around post-mortem data are evolving, this study reflects the perspective of would-be-inheritors and demonstrates that inheritance may not be the most appropriate model when designing future services or solutions.

STUDY DESIGN

In this exploratory qualitative study, we examined post-mortem data management on Facebook through both traditional interview questions and the use of design sketches for a potential application that could support the

transfer of login credentials for a deceased Facebook user's account. We interviewed 20 participants (10 men, 10 women), age 20-50 (M=30.9; SD=10), from across the United States who reported having experienced the death of a Facebook friend within the previous two years. Interviews were conducted by three of the authors and ranged in length from 1-3 hours. Interviews were conducted primarily over video communication (*i.e.*, Skype or Google Hangouts), with the remainder conducted in-person (5) or over the phone (5). The majority of participants in our study described their relationship with the deceased as "close" or formerly close (as in the case of schoolmates who had grown apart), and while many participants reported experiencing multiple deaths of Facebook friends, the interview focused on the most recent.

The interview included two sections. During the beginning of the interview, we asked participants about their experiences with death and social media broadly, their relationship with the deceased, and about the specifics of their loss. During the second section, we provided participants with a set of sketches related to a fictional SNS application designed to transition data management permissions from the deceased's Facebook account to the participant. A variety of sketches depicting a message or notification to this effect were used to solicit perspectives on how such an exchange could or should be conducted. The interviewing researcher solicited feedback from the participant, sketch by sketch. In the case of remote participants, the sketches were shared via screen sharing or a digital packet sent in advance with instructions to not review the sketches but have them available during the interview. These sketches encouraged participants to "project" themselves into a realistic situation [37], an approach commonly used to discover a participant's perception of the world and how they behave in it [34]. This method proved particularly useful for discussing the sensitive topic of a recent death in a grounded way.

Participants were then provided with depictions of various current Facebook features and functionality (*e.g.,* edit photos) to prompt conversations around perceived norms of use under these circumstances. Specifics about possible practices and temporality were intentionally ambiguous, resulting in varied contextual narratives from participants. Our approach encouraged participants to think deeply about the use of familiar features under these conditions that they might otherwise consider inconsequential.

ANALYSIS

We performed analyses of the interviews using grounded methods. All interviews were transcribed, names were anonymized, and participants were assigned the participant numbers used in this paper. Three of the authors engaged in open-coding of the transcripts [9] focusing on participant practices and their decision making strategies. Individual practices were organized into preliminary categories, such as "preserving data", and contrasting data were noted as a way of identifying tensions across participants. All authors collaboratively refined these categories using the constant comparison method that "combines inductive category coding with a simultaneous comparison of all social incidents observed" [15]. Our final categories are presented as stewardship duties in our findings. Axial coding was then performed to determine how duties were prioritized, and under what circumstances. This analysis highlighted the primacy of interpersonal responsibilities in stewardship duties, and is presented in the second half of our findings.

FINDINGS

The role of a steward as seen in our data involves being responsible both for the deceased's account and the needs and interests of those connected to it. An understanding of the stewardship duties our participants described emerged from our analysis, and we refer to our participants as stewards throughout our findings for the sake of clarity.

Stewardship as defined here may align with concepts of ownership but is a distinctly different model than inheritance in its focus on *authorization* to perform *management* of data, alongside the *responsibility* to individuals connected to these data. *Authorization* refers to a steward's ability to access account functionality and perform particular actions. *Management*, made possible by the authorization a steward has been granted, involves the ability to make decisions about the account (*e.g.*, the addition or removal of data, friend requests, etc.) regardless of whether these activities are ever performed. Finally, *responsibility* refers to the obligations a steward has to other people connected to the deceased (online and off). In our study, participants described their sense of responsibility to multiple parties when controlling who has access to the deceased's profile, under what circumstances, as well as managing the influx of new data.

Personhood and interpersonal relationships are key to informing stewardship practices and defining the role of the steward. If *management* is understood as the practices of stewardship, and *authorization* as the technical capacity to perform them, then *responsibility* speaks to the interpersonal and symbolic relationships the steward has and maintains that motivate and inform his or her practices.

Across our findings, we demonstrate the impact of these three attributes across the four duties. We then describe ways in which conflicting needs might emerge when fulfilling these duties and challenges stewards may experience as they weigh their various responsibilities. We present a hierarchy of responsibilities to describe how stewards prioritize competing needs, and conclude our findings by demonstrating this hierarchy in relationship to an extreme act of stewardship: account deletion.

Assumed Duties of a Steward

Stewardship of post-mortem accounts involves four primary duties: honoring the last requests of the deceased, providing information surrounding the death, preserving the memory

of the deceased, and facilitating memorial practices of survivors. These duties, coupled with strategies for balancing competing social responsibilities, influence how people make decisions about the accounts of the deceased.

Honoring the Last Requests of the Deceased

When presented with design sketches of a notification indicating that they had been selected to take over a friend's account, participants universally reported an expectation that a set of instructions or last requests would be provided. Anxiety about acting on behalf of someone who has died can lead to a desire that "last wishes" (P05) accompany any notification of stewardship.

I'm hoping it [the notification] is going to be followed by more details. "Please do not accept any more friend requests," "Please do not post as me," "Here's what I am comfortable with being there," "Take care of this," "Delete this"... I don't know. Some sort of instructions... (P04)

Assumptions about when they would receive such a request were split between participants: half suggesting in advance of the owner's death and half at the time of death. Pre-mortem notifications provide at least the option to speak to the owner and clarify any instructions:

If I did receive this [notification pre-mortem] without a conversation, I would make calls [to the account owner] asking, you know, "hey what's going on?" Kind of get a little bit more detail… (P01)

The ability for a steward to confirm the owner's wishes could also provide the opportunity to confirm the owner's choice of them as steward and clarify their rationale. Although participants all claimed they would accept the role of steward if no one else could, participants often questioned whether they would be the right person to steward the account regardless of the closeness of their relationship.

If for some reason I was the only person that Mara or Jean-Claude could find to take over their Facebook account and that was their wishes, then I would say yes and I would do what they asked. (P16)

I mean, you are not going to decline… (P10)

Given complex social situations, last requests often need clarification. The importance of discussing last requests pre-mortem is significant given that existing tools and services typically send messages, notifications, and provide access to data to the bereaved after the owner's death. Actions taken post-mortem foreclose the opportunity to clarify expectations, which, as others have noted, presents a challenge for the bereaved [24]. Indeed, most services activate some time after the owner's death (typically 1-3 months post-mortem), a design feature that presents challenges to the stewardship duty we discuss next.

Providing Information Surrounding the Death

Likely duties of the steward include posting informational and logistic details on the deceased's Wall, such as an obituary or funeral announcement. For example, P03 told us about the benefits of a family member who acted as a source of information on Facebook following the death of a high-school friend:

His timeline was filling… with lots of questions and people expressing grief and it was definitely in need for someone to come in and sort of manage the situation. It was almost like if everyone showed up at the church for a funeral and nothing was happening… I think it was very important for someone to come in and go "Thank you all for your kind messages. The family really appreciates it, I want to give you an update on what's happening..." And it really was purely informational… (P03)

In the absence of an individual to act as a central informational resource, information tends to emerge haphazardly on the deceased's profile or through other sources. Participants described distress at the absence of a clear indicator that the owner had indeed died. We frequently heard stories in which the profile was flooded with posts expressing shock and sorrow, but without anyone clearly sharing the news of the death. Typical of SNS-communication, friends post Wall content to communicate directly (though publicly) with the account owner, but rarely with others in the owner's social network. Based on our interviews, the designation of a steward appears to be one way to overcome this SNS-norm and provide an "official" source of information needed by the surviving community.

As stewards perform these informational tasks, identifying them and their role may be important. Participants provided a number of possibilities, such as an indicator next to any content they posted on the deceased's Wall, the ability to post content on behalf of the deceased, or as P16 explained, directly in their profile information:

I feel like its important… for the people to know that there was somebody who was [an] acting trustee… A message would come up "This account has now been given to the care of Sahar" or maybe I could write a message … (P16)

Participants' desires were partially motivated by a wish to make others aware of them as a resource. However, such an indication would also serve to legitimatize their actions, particularly when their behavior differs from other survivors. Concerns over the legitimacy of their actions and how their actions impacted others were common throughout interviews.

Preserving the Memory of the Deceased

In absence of any clear directives, maintaining the status quo at the time of death was a common strategy described by participants to avoid disrespecting the wishes of the deceased. Participants often stated they would not alter account settings or existing content unless explicitly directed to do so in the owner's last requests. For most, the presence of profile content at the time of death represented

at least an implicit acceptance by the deceased, and therefore should not be altered.

It's just sort of… weird. It would be like going into somebody's office and rearranging their stuff… like [how] you thought it should be [arranged], instead of how they had it already. (P13)

Participants commonly used place-based metaphors, such as the office above, to describe their inaction, overlooking, of course, that in the physical world inaction is almost never the answer. For example, after the mourning period, an office would be packed and made ready for a new inhabitant, a child's bedroom might eventually be turned into a home office, and so on. Stewards experience a tension between a desire to maintain the owner's content and the needs of new inhabitants of the owner's profile, raising questions about the length of time for which inaction is a viable strategy.

In some cases, stewards may feel that preserving an appropriate memory of a loved one mandates some content curation. Participants rationalized these changes in the name of creating a more accurate or appropriate representation of the deceased and an ideal memorial space for the bereaved. While in the minority, P14 explained that he would delete "the trivial stuff" to make the "page seem more humanized, more personal." In contrast, the majority of participants viewed any content removal as inauthentic representations of the person "even if… their entire Timeline was FarmVille notifications" (P13).

When stewards do make changes, the presumed intent of the deceased, as well as the expressiveness attributed to the data, help inform the steward's choices. In these cases, a helpful distinction can be made between factual and expressive data. Seven participants suggested they might change data they considered factual, such as removing a mailing address or adding a high school they imagined the deceased had "forgotten" to include on their profile. Expressive data, particularly status updates and photos, were approached much more cautiously. The lines between these types of data, however, can certainly blur:

Languages… maybe they fibbed a bit. I wouldn't go "They were wrong, they didn't know Arabic." If they thought they knew Arabic, they thought they knew Arabic. I wouldn't change that. (P14)

We see here a subtle distinction between information about the deceased and actions taken by the deceased. Preserving the memory of the deceased on SNSs is complicated, given that pre-mortem data about the deceased is typically available as a product of actions taken by the deceased.

Determining whether profile content was the result of the deceased's intentional actions was pertinent when considering changes to the data. To probe this issue, the screenshot of the Facebook Timeline in our sketch packet included a sensitive item: an indication that the owner had "Liked" a Facebook page titled "Having a fun day killing hookers and stealing cars, now time to play GTA [Grand Theft Auto]." When participants discussed this entry, they actively considered how best to manage it relative to a personal rubric in which they imagined both the circumstances under which this page was "Liked" (An accident? An avid gamer?), and how the deceased would have wanted them the participant to respond.

He's a jokester… and all of his friends could know that its a joke because he's a joker and you don't want to take that away so that people in a time of sorrow can have a little laugh… "He's dead but he still made me laugh." (P10)

In this case, P10's explanation reframes content that might offend some survivors into an item that might bring fellow survivors some relief from their grief.

Stewards also manage a plethora of different types of requests from friends, family, and other survivors. Participants almost always discussed requests in terms of conflicts – either between requests or with the status quo of the profile. While most participants talked about the potential difficulty of having to negotiate between conflicting requests, for P03, the ambiguities resulted in him erring on the side of inaction:

If I'm erasing all these pieces of Daniel that were real… just because they didn't fit into my way of viewing Daniel… I'm erasing pieces of him that are never coming back and what everybody is going to see is… my interpretation of Daniel. (P03)

Thus, even as stewards can play an important role in preserving the use of data, their actions can be a threat to the data itself. Even when well intended, changes to profile content about the deceased oblige us to ask: Whose version of the deceased?

In the absence of a steward, contrasting perspectives may result in the types of conflicts between survivors noted elsewhere [6, 23]. A steward – functionally acting as the deceased, while not actually the deceased – can moderate some of these issues, but must negotiate and reconcile their own understandings of the deceased with those of others. If stewards do act beyond the requests provided by the deceased, they must attempt to do so by balancing what they perceive as the deceased's intentions with the interests of those who are grieving – including themselves.

While the deceased's Facebook profile is filled with previous actions, the memory the steward seeks to preserve is one held by survivors. This requires stewards to decide between retaining the record of past actions of the deceased and actively managing the current needs of survivors. If stewards start making changes, they may be left having to account for the reasoning behind them. Even curation by the best-intended steward is selective and always represents some kind of loss. Others have already argued for the importance of technology to support "multiple

representations in an archive" [30], but while the steward is technically empowered to make these representations, they may not know how to do this or for whom.

Facilitating Memorial Practices of Survivors

In addition to preserving a memory of the deceased, stewardship involves facilitating the practices of survivors as they mourn and memorialize the deceased. Participants provided diverse strategies for meeting survivors' needs, including non-action, changing privacy settings, encouraging the posting of memories and photos, and regular posting of memorial content. Participants consistently described a desire to facilitate memorializing practices, often drawing on experiences in their own lives:

Posting messages [on the deceased's Wall] seems to make some people feel better… I would want that to be available... (P16)

Participants focused on two types of content in particular: memories posted by other survivors to the deceased's Wall and photos of the deceased:

The things that I see on their walls are the absolute best... the little random memories. This is something that I started doing… inspired by these people [other survivors]… Just because my memories of somebody can be a lot different… and I like to see people share their memories of something that I may have forgotten. (P01)

The role of photography in how we represent and remember the dead [3] certainly extends to social media. The value participants placed on photos reflects their importance and confirms what others have documented [14, 22]:

I would want pictures... and nice memories… A space for their memories to be curated and maybe put some into an album of "Favorite moments" -- a place for other people to go to look at the good things… [they] did in their life. Kind of like a big scrapbook... for other people who also are fond of this person and remember the good stuff. (P16)

Stewards might also include the commemoration of important days and events from the deceased's life. This result complements other research that indicates an uptick in activity related to such events on deceased profiles [6].

Just as a social thing I would probably try to commemorate anniversaries, death,… the birthday. "Let's think about so-and-so on his birthday. Does anybody have a good story?" So try to make it like the community hang out… (P02)

Beyond common memorial events, some participants suggested that they might continue temporally-based social media practices in which the deceased engaged while alive. P13, for example, imagined she might continue to post "Throwback Thursdays":

It might be kind of cool… "Today, August 8th, back in '09 Mason was at the gym…" Because you can go back and see those posts, so it might be something to bring back… to share that again. This is what Mason liked to do...(P13)

In addition to fostering interaction, stewardship appears to involve meeting the unknown, but anticipated, needs of survivors. Issues around managing a safe space for grieving survivors frequently involved who was allowed to participate in the online memorial space. Most (but not all) participants described being ill-equipped to make decisions about new friend requests made to the deceased's account post-mortem and were skeptical of the motivations behind them. Otherwise, stewards leaned toward an inclusive approach provided individuals behaved in what participants felt was an appropriate manner:

Yeah, because it should function as kind of a safe space, like a memorial -- like going to somebody's grave, but on Facebook. If somebody is going to like deface it with graffiti then that's an issue, but if they're going to leave little flowers and notes and stuff, whatever. (P13)

As with the management of data posted by the deceased, data posted by survivors also creates some tensions. There is a tension between new data contributed by survivors and existing data – between preserving the deceased's profile and providing a space for memorialization – as well as between the potentially conflicting needs of survivors. However, a steward can speak to and negotiate with survivors, where no such option exists with the deceased.

Managing a defaced profile or a potential conflict between survivors on the Wall was often discussed as a hypothetical scenario. However, for a few, the importance of actively moderating the account was more prescient. P14 spoke to us about an auto-accident in high school, in which most in the car died as a result of an intoxicated driver. He shared the very real possibility of upsetting content:

Especially for Mason, if people started putting slander – "Oh, you were driving drunk and you were the reason my sister died"... I would block those people. I want it to be a peaceful account. He passed away. Let's keep it clean. His family is already hurting. They don't need to see those kinds of things... I'm not afraid to block people. (P14)

In these cases, to maintain a safe space for the bereaved [23], participants explained that they would prioritize the needs of those they perceive to be most close to the deceased. However, the priority given to various relationships deserves additional study.

Weighing Social Responsibilities

Approaching stewardship as a set of social responsibilities, there are questions around balancing the care of the deceased, survivors, and the data associated with the account. Participants described preserving the deceased's memory, often by maintaining as much of the deceased's profile data as possible and by executing any last requests. Acting as an information source and facilitating memorial practices, meanwhile, were important services a steward could provide to other survivors.

The duties outlined require that stewards balance two tensions: the needs of the deceased vs. survivors and

preservation of existing data vs. facilitation of memorializing practices that result in new data. Often these tensions are aligned – for example, preservation of existing data frequently meets the needs of survivors. However, when these tensions are in conflict, stewards must prioritize needs. An analysis of how participants prioritized needs resulted in our development of a hierarchy of responsibility that describes how participants evaluated requests. In this section we start by describing the hierarchy and then we demonstrate how the hierarchy informed the ways participants approached the extreme scenario of deleting the deceased's account.

Hierarchy of Responsibility

When stewards are unable to resolve conflicting needs through alternative solutions, decisions may be informed by the identity of the requestor and their rationale for the request. Across our interviews a clear prioritization of needs was evident:

1. **Explicit requests from the deceased** serve as specific requests made in advance of death in anticipation of no longer being able to make requests.
2. **Needs of survivors** can be accommodated, provided they do not conflict with the wishes of the deceased or impact other survivors.
3. **Perceived wishes of the deceased** impact decisions that are made on behalf of the deceased, but for which there are no explicit instructions.

The priority the deceased holds in this hierarchy presents a problem given that they are not present to make their wishes known. Last requests are one way to make wishes explicit, but in the absence of tools designed to declare and share these requests for online accounts, explicit requests from the deceased rarely exist. Even when the deceased provided last requests, the requests imagined by interviewees lacked sufficient information or context to enable stewards to always understand the spirit or motivation behind them. Explicit instructions cannot cover all scenarios – many of which the deceased will have never experienced or anticipated. This results in stewards having to consider the perceived wishes of the deceased, wishes that cannot be verified.

Although perceived wishes are given least priority, they represent a means through which explicit requests of the deceased can be interpreted in ways that justify meeting the needs of survivors. For example, one can imagine a scenario in which the deceased's request to maintain the profile so that people have a place to convene is interpreted to also mean proactively supporting the bereaved. Conversely, perceived wishes of the deceased could be overruled by explicit requests of the deceased in unforeseen circumstances.

Throughout the hierarchy, but particularly when weighing needs of survivors, scope and severity of impact play a prominent role when considering content changes. For example, restricting an offensive commenter's access to the profile Wall may negatively impact one individual, while ensuring a "safe space" for everyone else. In contrast, a scenario in which a close family member requests the profile be deleted, despite the benefits it provides others, was deeply troubling for participants. Isolating content through separate spaces, such as a public memorial page and a private profile, can reduce conflicts between multiple requests. Likewise, reversible strategies, such as changing privacy settings instead of deleting content, preserves the ability to undo stewardship decisions at a later point.

Deleting an Account

To demonstrate use of the hierarchy and how survivors invoked the wishes of the deceased, we examine stewardship in relationship to one particular Facebook feature: account deletion. As an extreme act of stewardship, the prospect of deleting the deceased's account resulted in concerns that cut across the duties we have described. Participants' responses highlighted tensions between the privileging the profile as a site owned by the deceased and its new role as a memorial, and subsequently, tensions between the needs of the deceased and survivors.

Explicit requests from the deceased served as the most core obligation of stewardship. While participants typically had a strong preference for preserving content, the steward's role in executing last requests obligated most participants to delete the account if explicitly requested:

I think if Daniel had said… "I want you to maintain this account for a set amount of years" and if he had left instructions to delete the account after a certain amount of time, I would absolutely honor his wishes… It would be very difficult… [but] I would have *to do that. (P03)*

Likewise, if the owner had requested the account be kept active, participants indicated they would attempt to maintain the profile, even if others objected. Imagining a scenario in which the deceased's parents asked that their son's profile be deleted, P08 explained that he "would be clear with his parents that this was his last wish. And it would be this way in spite of their discomfort." However, requests from immediate family were particularly challenging given the potential depth of their grief. Continuing on, P08 explained:

For me the more difficult question is the opposite… if they [the parents] begged me to not delete it and he wanted it gone... I could see that their feeling on it might be something akin to me killing him all over again… killing off any remnant of their memory of him. (P08)

The responsibility a steward has to those grieving was a concern of participants, particularly for scenarios in which the steward cannot meet their needs. P08's comment speaks to the importance of developing additional tools (or making existing tools more readily apparent) that can provide stewards with alternative strategies for meeting divergent needs – in this case, perhaps an offline archive for the deceased's parents.

In very palpable ways, stewards bear responsibilities to those impacted by fulfilling requests of the deceased or other survivors. As such, deleting the profile becomes more fraught when it is an active site of memorialization for a grieving community. When we asked participants how the level of activity on the profile might impact their decisions, two common strategies were shared: alternative solutions that might decouple conflicting needs and explaining their actions (and the deceased's wishes) in a way that attempts to enroll others into the hierarchy. Both of these strategies were evident when P09 talked about how she might handle a request from the deceased to delete the account:

I mean I would delete the account. But maybe a different page can be made…? Yeah, I would send out some kind of message that just let people know that she requested it… that she told me that she wanted it to be deleted. (P09)

The challenge is that with the deceased unable to reiterate, clarify, or contextualize the meaning or importance of their request, survivors (including a steward) are left to interpret them on behalf of the deceased. The weighing of options, then, also becomes a process through which a steward must weigh the relative legitimacy of various interpretations of the deceased's intent. In more ambiguous scenarios, participants adopted the perspective of the deceased as a way of arriving at a rationale:

My goal would be to try to maintain the page at all cost, unless… I could not see hurting see my friend's mother. Because I would… go back and go "okay what would Daniel do? If something was hurting his mom would Daniel go 'look this is bigger than the both of us, you're just going to have to get over it'?" He would not do that... he probably would shut down the page. (P03)

In the most complex of scenarios, the steward is left weighing not only the explicit last requests of the deceased against the needs of survivors, but also the deceased's intent as projected by both the steward and the other survivors. This can be emotionally burdensome and may lead to questions about the legitimacy of their role as a steward.

CONCLUSION

Prevailing approaches to digital legacies adopt a model of inheritance for post-mortem data management. However, framing digital legacies in terms of inheritance reduces them to a collection of digital assets whose ownership can be transferred. In this study, we found that prospective inheritors of Facebook accounts did not talk in terms of inheritance or ownership, but instead as an undocumented role that we termed "stewardship." Notably, we argue that stewards are concerned with the relationships represented in and surrounding post-mortem data, rather than data alone. Subsequently, design efforts focused on the inheritance of data may be inadequate for the needs of stewards.

When using inheritance as a model, two positions are privileged: the deceased and the inheritor, the latter of which can be any survivor. Stewardship provides a model that allows us to account for alternatives to ownership and a new role that includes a small but important set of users. Stewardship allows us to consider needs particular to those who act as mediators of the deceased's data and moderators of the needs of various survivors. In the case of social network sites, the rich social interactions and public nature of profiles may ultimately limit the utility of inheritance. Stewardship, meanwhile, acknowledges profiles as active communal spaces with shifting needs by attending to the management of the profile space and multiple parties.

We have outlined duties and challenges that can accompany the stewardship of a deceased friend's Facebook account. Our analyses indicate that Facebook stewardship involves four types of duties that leave stewards weighing the needs of the deceased and various survivors. Enumerating specific design recommendations is beyond the scope of this initial study and requires future study. However, future research on the needs of stewards requires acknowledging the potential of stewardship in the design of systems that seek to attend to post-mortem issues.

The challenges associated with stewardship that we have presented here demonstrate the importance of both acknowledging stewardship in the design of systems that seek to support post-mortem data management as well as the need for tools to support stewardship duties. Most pertinent on Facebook is providing structure and support for the difficult and potentially emotionally taxing demands that a steward might face. In moments of conflict, stewards are placed in positions to have their judgment of and their relationship with the deceased challenged. This raises questions about the steward's own experience of mourning, and their ability to develop and maintain a "continuing bond" [20] with the deceased. When using stewardship as an approach, issues such as these are brought to the fore in ways unseen when designing for inheritance alone.

ACKNOWLEDGMENTS

We thank our participants for making this work possible, and Courtney Loder, Melissa Gregg, Sen Hirano, Steven Frost, Sara Bareilles, and members of LUCI for feedback and support. This work was supported in part by the Intel Science and Technology Center for Social Computing.

REFERENCES

1. Acker, A. and Brubaker, J. R. Death, Memorialization, and Social Media: A Platform Perspective for Personal Archives. *Archivaria 77,* (2014).
2. Arnold, C. How to Manage Your Digital Afterlife. *Scientific American Mind*, 2013. http://www.scientificamerican.com/article.cfm?id=how-to-manage-your-digital-afterlife.
3. Batchen, G. *Forget me not: Photography and remembrance*. Princeton Architectural Press, 2006.
4. Bell, G. No More SMS from Jesus : Ubicomp, Religion and Techno-spiritual Practices. *Ubicomp 2006*, Springer (2006), 141 – 158.

5. Brubaker, J.R., Hayes, G.R., and Dourish, P. Beyond the Grave: Facebook as a site for the expansion of death and mourning. *Information Society 29*, 3 (2013).
6. Brubaker, J.R. and Hayes, G.R. "We will never forget you [online]": An empirical investigation of post-mortem MySpace comments. *Proc. CSCW '11*.
7. Brubaker, J. R. and Vertesi, J. Death and the Social Network. Presented at the *CHI 2010 Workshop on HCI at the End of Life: Understanding Death, Dying, and the Digital*.
8. Carroll, E. and Romano, J. *Your Digital Afterlife: When Facebook, Flickr and Twitter are Your Estate, What's Your Legacy?* New Riders, 2010.
9. Corbin, J. and Strauss, A.L. *Basics of qualitative research*. Sage Newbury Park, CA, 2008.
10. Davis, J.H., Schoorman, F.D., and Donaldson, L. Toward a Stewardship Theory of Management. *The Academy of Management Review 22*, 1 (1997), 20–47.
11. English, L.P. *Improving Data Warehouse and Business Information Quality: Methods for Reducing Costs and Increasing Profits*. John Wiley & Sons, Inc, 1999.
12. etymonline. Steward. http://www.etymonline.com/index.php?term=steward.
13. Fletcher, D. What Happens to Your Facebook After You Die? *Time*, 2009. http://www.time.com/time/business/article/0,8599,1932803,00.html.
14. Getty, E., Cobb, J., Gabeler, M., Nelson, C., Weng, E., and Hancock, J.T. I Said Your Name in an Empty Room: Grieving and Continuing Bonds on Facebook. *Proc. CHI '11*.
15. Goetz, J.P. and LeCompte, M.D. Ethnographic Research and the Problem of Data Reduction. *Anthro & Education Quarterly 12*, 1 (1981), 51–70.
16. Graves, K. E. Social Networking Sites and Grief: An Exploratory Investigation of Potential Benefits. Dissertation at the University of Indiana at Pennsylvania. 2009.
17. Gulotta, R., Odom, W., Forlizzi, J., and Faste, H. Digital artifacts as legacy. *Proc. CHI '13*.
18. Hunter, E.G. and Rowles, G. Leaving a legacy: Toward a typology. *J. of Aging Studies 19*, 3 (2005), 327–347.
19. ifidie. http://ifidie.net/.
20. Klass, D., Silverman, P.R., and Nickman, S.L. *Continuing bonds: new understandings of grief*. Taylor & Francis, Philadelphia, 1996.
21. Lustig, N. 2.89m Facebook Users Will Die in 2012, 580,000 in the USA. *Nathan Lustig*, 2012. http://www.nathanlustig.com/2012/06/06/2-89m-facebook-users-will-die-in-2012-580000-in-the-usa/.
22. Maciel, C. and Pereira, V. C. The internet generation and its representations of death: considerations for posthumous interaction projects. *Proc. IHC '12*.
23. Marwick, A. and Ellison, N.B. "There Isn't Wifi in Heaven!" Negotiating Visibility on Facebook Memorial Pages. *J of Broad. &Elec Media 56*, 3 (2012), 378–400.
24. Massimi, M. and Baecker, R.M. A Death in the Family : Opportunities for Designing Technologies for the Bereaved. *Proc. CHI '10*.
25. Massimi, M. and Baecker, R.M. Dealing with death in design. *Proc. CHI '11*.
26. Massimi, M. Exploring remembrance and social support behavior in an online bereavement support group. *Proc. CSCW '13*.
27. Menyah, K. Stewardship Theory. In S. Idowu, N. Capaldi, L. Zu and A. Gupta, eds., *Encyclopedia of Corporate Social Responsibility*. Springer-Verlag, 2013.
28. Micklitz, S., Ortlieb, M., and Staddon, J. "I hereby leave my email to...": Data Usage Control and the Digital Estate. *2013 IEEE Security and Privacy Workshops*.
29. Mori, J., Gibbs, M., Arnold, M., Nansen, B., and Kohn, T. Design considerations for after death. *Proc. OzCHI '12*.
30. Odom, W., Banks, R., Kirk, D., Harper, R., Lindley, S., and Sellen, A. Technology heirlooms? *Proc. CHI '12*.
31. Odom, W., Harper, R., Sellen, A., Kirk, D., and Banks, R. Passing on & putting to rest. *Proc. CHI '10*
32. PBS Newshour. Law Lags Behind in Defining Posthumous Protocol for Online Accounts. 2013. http://www.pbs.org/newshour/bb/science/jan-june13/digitalassets_03-11.html.
33. perpetu. https://perpetu.co/.
34. Sampson, P. Qualitative research and motivation research. In R.M. Worchester and J. Downham, eds., *Consumer market research handbook.* Elsevier Science Ltd, 1986.
35. Schaie, K.W. and Willis, S.L. A stage theory model of adult cognitive development revisited. In M. Rubinstein, M. Moss and M.H. Kleban, eds., *The many dimension of aging.* Springer Publishing Company, New York, NY, 2000, 175–193.
36. Sweigman, B. What Happens to Your Digital Assets When You Die? *Huffington Post,* 2013. http://www.huffingtonpost.ca/brian-sweigman/digital-assets_b_2606822.html.
37. Webb, J. *Understanding and designing marketing research.* Academic Press Inc, London, 1992.
38. Zhang, M., Jennett, C., Malheiros, M., and Sasse, M. A. Data after death: User requirements and design challenges for SNSs and email providers. Presented at the *CHI 2012 Workshop Memento Mori: Technology Design for the End of Life.*