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ORIGINAL ARTICLE

Assessing the value of brief automated biographies

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Abstract New systems have been introduced that support the visualisation and sharing of personal digital data, but relatively little work has been done to establish how such systems support reminiscence and personal reflection. In this paper, we explore Intel's *Museum of Me*, a tool that collates and presents Facebook data in the form of a virtual museum, by asking how such an automated biography might support personal reflection and a process of life review. We supported users in their creation of personal virtual museums and interviewed them about their experiences, using a theoretical framework that highlighted the importance of personal narratives and life review in identity formation and psychological well-being. Our participants enjoyed the experience and welcomed the opportunity for reminiscence, but considered their resulting videos to be rather shallow representations of self, reflective of some of the more trivial exchanges and relationships that can come to dominate social media. We argue that social media in its current form is not well suited to support a meaningful life-review process.

Keywords Life-review · Museum of Me · Reminiscence · Facebook · Intel · Qualitative methods

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1 Introduction

The use of narrative to make sense of our everyday lives is often considered a fundamental human behaviour [1] and one that is increasingly supported by new forms of social media that allow us to make sense of the different digital traces we create. People share information with colleagues, friends and family using e-mail, video, photo or text messaging. They log and share health and fitness information and build up large personalised collections of music, photographs and other digital artefacts. The acts of storing or sharing large amounts of highly personal digital content are very well supported by new technologies and services, but until recently, the curation or cataloguing of content to make a meaningful narrative has been neglected. This, in turn, has limited the ways in which people can *reflect* on the information they collate about themselves.

Our digital memories are generally stored as a highly diverse collection of information, captured across different devices, stored in different formats and supported by different services—each with distinctive 'ownership rights'. A single individual may subscribe to services such as Facebook, Twitter, Instagram, Tumblr, Flickr, Pinterest, Vine and LinkedIn—each of which has the capability to transmit different information to different audiences. This means that it becomes difficult to use these diverse accounts in order to reflect on our own self-image. Not surprisingly, many people have described an acute sense of regret about some of the things they have posted online [2, 3] and report that they are gradually relinquishing control of their digital selves, effectively 'losing awareness of what exists, where it is, who has access to it, who is accountable for it, and what is being done with it' [4, p785].

Into this space comes a raft of new tools that can help users both manage their online content and give them more

insight into their digital selves. These tools may simply offer timely reminders about who might be able to see their contributions [5], or they may offer new organisational structures so that an individual can more easily review and annotate their own timeline or collate items of interest across different social media platforms [6]. Other tools—of particular interest here—offer individuals the chance to reflect more closely upon their digital selves, offering up a daily selection of fragments drawn from prior posts [7] or brief biographies constructed entirely from digital data, as in Facebook's *A Look Back* or Intel's *Museum of Me*. These brief automated biographies take social media content that was intended to be a communicative act and turn it into a deliberative archive for self-reflection. We are particularly interested in the value of such biographies, as they have the capacity to offer a new lens onto an individual's online persona.

Our own project, *ReelLives*, launched in 2013 with the explicit goal of exploring new tools for the automatic generation and deliberative editing of personal biographies that will allow users a better sense of the aspects of self they broadcast online. As a starting point, the team recognised that the social media data that forms the raw material for such self-narratives may offer only limited insight into an individual's life, and so we set about trying to understand more about the ways in which those biographical systems currently available have been received, the extent to which they can be viewed as 'accurate' representations of self and the ways in which the design and application of future biographical systems could be improved. We will proceed by considering two important themes in this online reflection process, the value of life-review theory which outlines taxonomies of reminiscence pertinent to our work, and the tools which are now enabling these kinds of reminiscence in a digital format.

2 Theoretical framework

2.1 Reminiscence, personal narration and life review

It is traditional to think of acts of reminiscence as happening in the later stages of life. Indeed, life-review theory [8, 9] developed as a framework for understanding the role of reminiscence as a later-life act, conducted, whether conscious of it or not, as a preparation for death. Life review gives people an opportunity to re-experience past events, review them and deal with any unresolved conflicts. Life review is said to help give new significance [if conflicts are integrated] and increase self-esteem and satisfaction [10], as well as minimising fear and anxiety about the future [11]; however, the process may also result in

negative feelings that life has been a failure [12]. In his original article on the value of life review, Butler expressed the view that for people of all ages, the primary focus of their lives should be the present:

> 'Of course, people of all ages review their past at various times; they look back to comprehend the forces and experiences that have shaped their lives. However, the principal concern of most people is the present, and the proportion of time younger persons spend dwelling on the past is probably a fair, although by no means definite, measure of mental health' [8, p73].

In the years since that article was published, there has developed a considerable body of evidence showing that reminiscence, far from being a dysfunctional process, can have psychological benefits throughout the life cycle, leading to improvements in mood, self-esteem, feelings of belongingness and contributing to a sense of meaning in life [13, 14]. In a review of the ways in which reminiscence and life review can be beneficial [15], shows that acts of narration can be important in adolescence [16] and into adulthood [17]. The contemplation of autobiographical memories can be used to both affirm identity and improve self-esteem across the lifespan [18], helping us to distance ourselves from negative events and focus upon the positive [19].

That is not to say that reminiscence has the same purpose throughout. The Reminiscence Functions Scale [20] identifies eight types of reminiscence uses: (1) Bitterness Revival [rehashing and ruminating on memories of difficult life circumstances, lost opportunities and misfortunes]; (2) Boredom Reduction [using memories to fill a void of stimulation or interest]; (3) Conversation [communicating personal memories as a form of social engagement]; (4) Death Preparation [using memories to deal with the thoughts of one's life coming to an end]; (5) Identity [using personal memories in the search for coherence, worth and meaning in one's life and to consolidate a sense of self]; (6) Intimacy Maintenance [holding onto memories of intimate social relations who are no longer part of our lives]; (7) Problem Solving [using the past to identify former strengths and coping techniques to apply to current challenges] and (8) Teach/Inform [sharing memories to transmit a lesson of life and share personal ideologies]. Using this scale, older adults have been found to reminisce more for teaching, intimacy maintenance and death preparation purposes relative to younger adults.

Of course memories are not always shared. Once retrieved, we can choose to keep our personal memories to ourselves in a period of extended reflection, but the decision to withhold or share memories and decisions about with whom we share our stories can have major

psychological implications. Webster et al. [21] note that within the family, certain memories gain a privileged place, partly as a result of family collusion and power plays around which memories get told, noting a study by [22] in which the elaboration and explanation of shared family reminiscences by mothers [although not by fathers] contributed to the development of positive self-esteem and adjustment in preadolescent children when assessed 2 years later.

2.2 [Digital] Identity

We have seen that one of the primary functions of reminiscence is to affirm identity—to provide some consolidated sense of self and to establish the worth and meaning of one's life. Identity has itself been the subject of decades of study, generally conceived as an accumulation of past and perceived future events [23] that change over time, partly as a result of continual social interaction [1]. Boyd [24] explains that our identity consists of two aspects—an internal notion of self, and a projected version. During face-to-face interactions with strangers, we are restricted by our corporal body in terms of ways we can present ourselves [25]. However, we could project ourselves as whatever we wanted to, provided there was consistency with our physical being. Erving Goffman's work is seminal here [26]. His idea of self-presentation is analogous to a theatrical performance, created for a particular audience, with the individual as 'actor'. Goffman's dramaturgical approach suggests people wear a mask in order to portray a character to the outside world—but present an 'idealised' rather than authentic version—Goffman labels this the 'front stage'. Here the actor is said to strategically select or omit information to tailor their impression for others. In the 'back stage' an audience does not exist, the performance stops and refinement of character can occur [27]. Not surprisingly, Goffman's work is highly cited in discussions of social media, where the use of communicative platforms such as Facebook, Instagram or LinkedIn ensure that the construction and performance of identity takes on a new dimension [28] which has become a particularly pressing issue for 'networked teens' [29]. Since Goffman, work has asked questions about how an individual might seek to influence their 'imagined audience'—a conceptualisation of the people they are communicating with [30]. The different postures adopted by individuals at various times reflect not only different selves, but also different audiences and different motivations.

'Digital identity' has similarly been conceptualised akin to theories of offline identity—it is multifaceted, with fixed as well as malleable components—all of which make a person unique. In addition, digital identity is considered transient and subject to change due to the affordances of the social web [31]. A commonly referenced framework in this space is the 'tiers of identity' notion [32]. These tiers comprise of: (1) My Identity—constant information, unlikely to change, such as name or date of birth; (2) Shared Identity—attributes assigned to the individual by other people, such as their social network; and (3) Abstracted Identity—information comprised from membership of particular groups. A body of work has already highlighted the desire for users of social media to portray an idealised and self-promoting digital identity [33]. This is achievable because of the nature of 'abstracted identity'—it can alter over time and be re-presented as the individual wishes to appear. For example, work has explored identity presentation in online dating environments. People are more likely to present an 'ideal self' online in order to downplay features they dislike, such as weight or height, yet the likelihood of face-to-face meetings mean they mediate the tensions between impression management and a desire to present an authentic version of self [34]. The identity literature clearly indicates an ability for individuals to represent multiple identities in both offline and online environments [35, 36].

If we set new reminiscence developments in social media against this theoretical background, we can see that a number of interesting questions present themselves. What happens when such acts of reminiscence take place automatically in the form of a digitally generated narrative or experience? Does the automated biographer take control of digital identity in a way which is appealing or unsettling? Would these new, automated forms of reflection generate the same psychological and well-being benefits associated with reminiscence and narration? We offer a very early exploration of such issues in the context of the *Museum of Me* [MoM].

3 Application areas

3.1 Life-logging

A number of niche technologies have been developed to facilitate the effortless logging of personal data, facilitating a massive collection of information about the self. The phrase 'life-logging' has been used to capture this process and is most notably documented by Gordon Bell in his *MyLifeBits* project [37]. Bell, a Microsoft researcher, digitally captures all documents, photographs and sounds he has experienced throughout his lifetime. For Bell, life-logging is automatic and unobtrusive. The new affordability of devices to capture this kind of data makes this practice achievable, but not necessarily a model for everyone.

Whilst Bell's attempt at 'total capture' is an extreme case, the practice of life-logging has been suggested as a valuable service to compensate for the fallibility of human memory [38]. Devices such as SenseCam, a wearable camera worn round the neck, have already been explored as a means of improving the lives of people with memory deficits [39], and this technology is now being marketed more widely as a way to capture memories. The 'Narrative Clip', a commercial product described as the world's smallest wearable camera, takes a photo every 30 s and uploads them to the Cloud.[1] Other services designed to locate an individual, such as Placeme.com, publish daily timelines describing where you are, allow storage of your activity data and provide streaming to other users. Fitness applications such as *Strava* and *Myfitnesspal* similarly allow users to document physical activity, upload it to a website and share it with friends—creating both a personal and a social history of 'lived informatics' [40].

With the capacity for documenting various aspects of the self growing so rapidly, a number of authors have begun to ask serious questions about whether such practices offer any benefit to the individual. Sellen and Whittaker [41] argue that there are clear benefits to such massive personal data collections and describe these in terms of the 'five Rs': (1) Recollecting: offering the opportunity to retrieve specific life experiences and supporting various acts of episodic recall; (2) Reminiscing: the ability to relive past events in order to experience the emotions and sentiments experienced at the time of data collection—for example, looking through family home videos; (3) Retrieving: facilitating the specific retrieval of digital information that otherwise could become lost in the vast data array, such as e-mails and photographs; (4) Reflecting: supporting a new perspective on past behaviour and allowing the individual to acquire self-knowledge or explore changes in behaviour over time; and (5) Remembering intentions: offering support for acts of prospective memory, planning future activities such as attending appointments or running an errand. In other words, life-logged data can help us retrieve information about the past, reflect on the present or plan for the future.

Others have asked whether we really *want* to remember everything. Life-logging technologies offer a way to recall everywhere we went, everything we said, everyone we met, and everything we did there. Yet day-to-day, we allow ourselves to forget things that aren't important or that may cause distress or embarrassment, if remembered. In today's world, what does it mean for us if technology doesn't allow us to forget? Life-logging is said to be capable of unobtrusively recording misjudgements as well as 'average' behaviour [42]. By using human memory as a guiding

principle, it has been suggested that technology should be designed with a forgetting function in mind, in order to avoid digital overload [43]. It is perhaps indicative of this need for forgetting and temporality that applications such as *Snapchat*[2] have evolved, limiting the storage and display of user information.

Finally, there are some serious privacy implications of technologies that record every aspect of self. *Fitbit* devices—wristbands or small monitors you attach to clothing and that can track exercise habits and offer opportunities to log food, drink and sleep—were the subject of major privacy concerns when it was announced that user data was purportedly being published in search engine results [44]. Similarly, the announcement of Google Glass in 2013 provoked privacy concerns in the media and HCI community [45]. In 2012 the European Commission proposed a regulation to allow users to request data about them to be deleted, and in 2014 this issue has been raised again in the international media with reference to the data storage policies of Google who now offer a 'right to forget' form for users wanting to opt out of all-encompassing data storage. Developments such as these highlight the necessity for individual choice, but again we are reminded that the capacity for any one individual to truly manage their online presence is extremely difficult. The potential issue with systems that are able to record infinite amounts of information about us is that human memory does not work like this—recordings do not have to be the same as a person's memory in order to recall events [46].

3.2 Automated biographies

As commercial services are changing to accommodate user needs, academic work has focused on the value of the [re]presentation of digital identities. Some of these services are explicitly designed to encourage reminiscence—either to help individuals find moments of value in their lives [15] or as deliberate acts that can encourage happiness [47]. Others are intended to be tools that help the curation of the digital self and management of a life narrative. In a study exploring ways to combine digital streams of information [6], people were asked to assess 15 sketches designed to represent personal information using formats such as timelines, scrapbooks or diaries. They concluded that one single archive could not adequately represent the different facets of self, and stressed that tools to portray their many 'digital selves' were important. Participants did not feel that social media necessarily needed to be archived at all; the data was considered ephemeral. Only 'key events' such as weddings and birthdays were considered valuable enough to be included. These findings are important, firstly to highlight

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[1] http://getnarrative.com

[2] www.snapchat.com

that the concept of identity cannot be represented with one 'design', but also that the temporal nature of social network data may not be the best resource to draw on when considering ways to represent who we are. In response to this amassing of digital data, most of which may not be remembered [48] let alone valued, a selection of creative means have been developed to capture and make sense of data, helping people see what is actually being collected about them.

Echo, a smartphone application designed to support personal reflection and reminiscence, was developed by US researchers in 2013 [7]. In recognition of the increase in digital records, their work explored a practice described as 'technology mediated reflection' [TMR]. TMR goes beyond simply using technology to document important life events; it focuses on the ways we may benefit from *reflecting* on them over time. With the exception of [49] and [50], other systems that utilise online presence in this manner are explained as only *reminding* users about past events. The Echo application allows curation of activities by the uploading pictures, text descriptions and ratings of emotional states. Each day the application presents up to three posts from the past for users to reflect on. This private system enables them to appreciate their positive life events, or reflect more deeply on negatives ones and learn from them. Reminiscence produced 'measurable improvements' in the well-being of participants.[3]

This work highlights that reflection on negative, as well as positive life experiences has value—yet we know that social media sites such as Facebook typically involve self-promotion and have a bias towards positive postings [27]. Negative or unpleasant events such as divorce, separation or bereavement are key milestones that are readily identified as part of a 'life script' containing the most prevalent events you might expect in a person's lifetime [51, 52] and young people have been shown to want to reflect on both good and bad life events in future-gazing tasks [53]. Such issues present challenges for those who would use social media as any kind of genuine personal record.

3.3 Tools for reminiscence

Whilst there are a number of apps and web services that now allow you to repackage personal digital data, we only identified two that have been developed to provide automated biographical highlights based explicitly on Facebook data. *A Look Back* was launched by Facebook in 2014[4] as a service designed to compile highlights of a user's profile since joining the site in filmic form. In this

service, content from an individual's Facebook account, including photographs, popular events, liked posts, shared photographs and statuses are collated and turned into a 2-min video. This video can then be re-watched and shared. Intel® launched '*Museum of Me*' [herein referred to as MoM] in 2011.[5] This website requires a user to sign in using their Facebook credentials, and the software generates a short video from this data, presented as though their life was being displayed in a museum exhibition (see Fig. 1). The video opens with the claim: 'This exhibition is a journey of visualisation that explores who I am'. The video walks users through a physical museum space covered with information gleaned from their account, including friends, photos, locations, common status words, favourite links and videos displayed in different 'rooms'.

The idea of a museum of the self is not new, and the inexplicable link between identity and our 'collections' has been described in detail elsewhere [54]. MoM, however, offers a particularly interesting example of a digital biography as it avoids the more obvious social media timeline and creates a format in which an individual's history is presented as if seen by an impartial observer. The choice of MoM as a case study here was primarily due to its accessibility [a single webpage], brevity [data collected in a matter of minutes], and its utilisation of a popular social network site [Facebook]. In order to learn more about public responses to such biographical services, we report a qualitative study whereby triad groups of friends viewed and then discussed their MoM outputs, as well as reflections on Facebook's *A Look Back* that was launched a short time prior to the onset of our work.

4 Methodology

4.1 Pilot

In an initial pilot study, participants were invited to view the MoM video in their own time and submit their impressions of the service in a written response [via e-mail]. These responses were then used to help develop the protocol for a series of semi-structured laboratory-based interviews with friendship triads [although some of the more interesting e-mail comments are included in the discussion below]. Pilot participants [academic staff and postgraduate students at a large UK university] were contacted via e-mail and given a brief description of the MoM website and our study. They were directed to the *Museum of Me* URL and asked to view their video before responding in free text boxes about their reaction to it. Responses were e-mailed back to the researcher. Seven

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[3] For other applications which remind users of their content, see http://morningpics.com or http://timehop.com/

[4] https://www.facebook.com/lookback
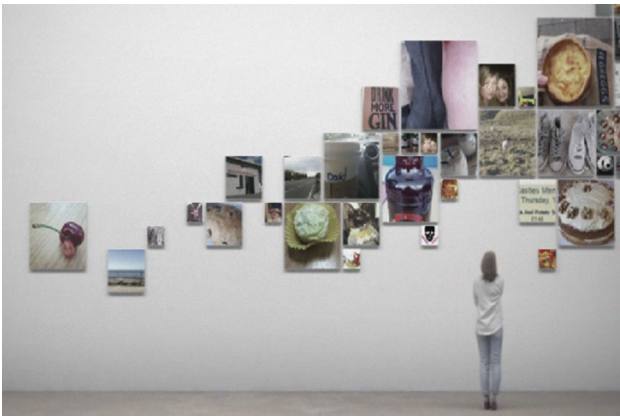
[5] www.intel.com/museumofme/

Fig. 1 A screenshot of a *Museum of Me* video

participants [4 female, aged 25–47] responded with detailed feedback.

4.2 Triad interviews

We adopted a self-reflective approach to encourage participants to consider their automated biographies, but in particular wanted to explore the value in close friends considering their Museum of Me data. In-depth interviews were conducted with friendship triads designed to engage participants in conversation about their social media representation. Twelve laboratory-based sessions were held, involving 36 individuals. Participants came from three groups: school-attendees, undergraduates, and Master's students. School-attendees were recruited from an opportunity sample, and parents were contacted by letter to authorise consent before participation. Undergraduate and Master's students were recruited from a UK university corpus, contacted via e-mail or on-campus poster advertising the study. The rationale for either online viewing or triad discussions was thus: we recognised that the MoM videos would hold material that would not readily support a discussion between an individual and an unknown researcher, but would support a more detailed process of self-reflection in an isolated setting and offer a good common ground for discussion between groups of friends. The life-review literature also points to reminiscence being a social rather than an individualistic process [55], with studies explicitly utilising group reflection [56].

4.2.1 Participants

Six school-attendees aged 16–18 [3 female], twenty-four undergraduate students [from various disciplines] aged 19–23 [19 female], and six Master's students aged 21–26 [5 female] took part. Data collection ceased when we

reached data saturation, and no new themes emerged [57]. The study received full approval from our institution's ethics committee.

4.2.2 Analysis

Interview sessions were audio-recorded and transcribed, and sentence-by-sentence thematic analysis was employed using NVivo qualitative software. Text obtained from the e-mail responses was also imported into the program for analysis. The analysis process followed stages recommended specifically for thematic analysis, namely: (1) familiarisation with data [reading and re-reading transcripts]; (2) generating initial codes [constant comparison between data]; (3) searching for themes [identifying when patterns and repetition emerged in the data]; (4) reviewing themes [checking themes against extracts and overall data set]; and finally, (5) explicit naming of themes, a practice recommended in the literature [57]. Reliability coding was conducted between two members of the research project team.

5 Results and discussion

5.1 The 'collapsed platform'

Social media can sometimes collapse information across social contexts [58], flattening multiple audiences into one and forcing us to present one identity online that gives a 'best fit'. When this 'collapsing' is done for us, it can sometimes create a surprising but enjoyable experience. Certainly, some of our participants liked the novelty of the MoM and were able to liken it to the Facebook Look Back video [which several participants had created a few months earlier]. For those able to make the comparison, the museum format was deemed 'cool' and different:

> 'It was good. It was really funny. It was quite cool just to see everything going around as if you were in an actual museum' [Hannah, 22, interview].
> 'I liked the funky robots and tricks of the app.' [Mandy, 30, online].
> 'It made me feel excited as if I saw a movie at the theatre or a real gallery' [Gemma, 33, online].

However, a 'collapsed platform' can also bring concerns. As our social connections grow, we find ourselves revealing sensitive information to an extended audience that includes friends, co-workers, family members, employers, partners and our children. The problem is that we may choose to present different 'selves' to different people and services such as MoM may remove this act of

choice. Marwick and Boyd [59] note that we are not always expert in managing the boundaries between these different selves, and poor boundary regulation can lead to social anxiety [60, 61]. It is not, therefore, surprising to see signs of nervousness from young people, when faced with the idea of sharing their MoM video but not being quite sure what would be shown:

> 'I hope there's nothing from when I was 16'.
> 'Mine's going to be really embarrassing' [Clare, 20; Milly, 19; interview].

Surprisingly, some of our participants decided to post their MoM video to Facebook before they had been given the chance to view it themselves [this was an option on the site]:

> 'You have the option to say "Don't post anything" [facilitator].
> 'I'm posting it' [Mary, 21].
> 'I'm posting it' [Kate, 21].
> 'It depends if mine is good enough to post' [Nicola, 20].

As well as posting to the Facebook timeline, participants wanted to share their videos with each other. One group even decided to play their videos in turn so they could all watch each other's museum. This led to participants issuing warnings to their friends that they couldn't be sure what they might see:

> 'It's a bit creepy this. I'm nervous! You'll see things that you haven't seen yourself' [Helen, 25, interview].

What is interesting here is that their MoM video is not a true collapsed platform in the sense that it pulls from different social media platforms. Indeed, our participants were only sharing existing Facebook posts with a friend network that already has access to those posts. However, all participants recognised that they may have posted information at points in the past that they would not wish to resend or that they would not wish to see incorporated into this new format. This speaks to the work of [62] around the ethics of social media and the importance of maintaining 'contextual integrity'. The same material, posted to the same friends, but viewed in a different context does not constitute the same communicative act. The underlying values and the resulting experience can seem very different. We would exercise, here, our first note of caution in terms of the potential values placed on automated biographies in terms of the relative absence of personal control in the generation of the 'life review'. Our participants were not, in any sense, constructing or affirming identity, but were passive recipients of a third person view. We pick up this point again in relation to 'the distant biographer' below.

5.2 A true reflection?

The absence of control over their MoM video led participants to engage in an assessment of the video in terms of whether or not the resultant representation resonated with their own sense of self. The MoM was quickly disregarded as a useful long-term tool when inaccurate relationships were uncovered, and high on the list as a test of face validity was the question of whether or not their 'top friends' featured. Most participants were pleased that the people they felt closest to were visible, and groups often commented on who had 'made the cut' from the people taking part in the study:

> 'I quite liked mine. That bit at the beginning when it showed all your friends, it got it right. It showed all my best friends' [Holly, 23, interview].

However, some participants recognised that their day-to-day communication practices meant that people who were closest to them were somehow missing:

> 'The people that I was closest with wouldn't have necessarily have been on there, because I talk to them by text, rather than on Facebook' [Julie, 20, interview].

Some people no longer used Facebook as their main social network, which clearly impacted on the content of their video, and ultimately their judgment of its value as a representation of self. This meant that the value of MoM was tied to changes in the individual's level of Facebook activity over time:

> 'It's more of a Museum of Me over the last two years rather than a Museum of Me' [Rachel, 16, interview].
> 'So a lot of it might have been relevant once upon a time but isn't relevant now because it's taking your whole Facebook life instead of a current snapshot' [Bella, 21, interview].

For people that did still use Facebook, they felt their MoM video did not represent them well either:

> 'Compared to most people, there is very little of me on Facebook. I have done stuff. I just don't put it on the internet. For me, if you were going to do some kind of museum of your life, you would have to include the ages up until then and beyond as well. It is quite a narrow snapshot of what is going on' [John, 23, interview].
> 'I think the video missed the essence of my online [and physical, for that matter] persona – interests' [Jack, 27, online].

Many of our participants felt that Facebook represented a distorted sense of self. They noted that some status updates

were 'frapes' [when a third party gains access to and then alters the content of the account], or were poorly judged content, posted after a social night out. When asked how they would feel about a potential employer viewing their videos, most felt their content misrepresented them in some way. Here again, we see boundary regulation issues [60], although it is interesting to note that this isn't simply about who sees what, but also about noting elements of their profile that just didn't seem to properly represent their own sense of self. Irrelevant photographs, status updates or videos on profiles were also seen as misrepresentations:

'I took a screen shot of my iPhone, the weather, and that just came up there as if it was a memory but it wasn't, it was just me showing people that the weather is going to be good' [David, 18, interview].

Finally, participants noted the absence of those aspects of self that are reflected in the objects that we choose to surround ourselves with. Facebook was seen as a collection of friends and experiences. The 'likes' helped to add a sense of who we choose to be, but it was notable that the MoM was unable to convey anything substantial about the everyday and the treasured objects that populate our lives. A system that might draw data from 'social collecting' websites such as pinterest.com could potentially compensate for this void, helping to portray a richer sense of personal taste [63].

5.3 The value of looking back

Earlier, we noted the importance of reminiscence for psychological well-being and wondered to what extent automated services such as MoM could support this valuable experience. We saw some signs that our participants gained a lot from both the creation and the review of their video and even those cynical participants who had predicted something tacky admitted that it provoked an emotional response that they hadn't anticipated:

'There's this cartoon that I used to watch when I was little and that my sister posted on my wall about a month ago and that came on and I was like, "Ah"' [Amy, 17, interview].
'I feel like I'm going to get emotional' [Megan, 26].
'I know. If you need to cry I've got a tissue!' [Val, 23, interview].

Some of the important elements of life review are supported by MoM. For example, *intimacy maintenance* reflects the act of evoking memories of relationships from the past in order to sustain the psychological benefit of social ties. Our participants expressed the pleasure that came from seeing photographs of friends and relatives they hadn't thought of in a while and remembering shared events that provided social bonding:

'I've just seen some photos there of people I haven't seen in a while but I am still close to, which is a great reminder' [Martin, 21, interview].
'I liked the bit where it showed all your pictures on the wall, those pictures from my little sister's christening and when my little sister was born and stuff like that that I haven't looked at in ages. I thought, "That's cute"' [Mel, 19, interview].

Despite a tendency for participants to delete content [some younger participants mentioned their 'exes' had appeared on their video], they recognised the value in saving information for prosperity. If a MoM video was created for the end of someone's life participants agreed that all content should be retained:

'I would keep everything in, just so that you could remember everything, even if it was stuff that you didn't like at the time or you wanted to forget. In 40 or 50 years' time, it is probably not going to affect you as much' [Hannah, 22, interview].

Another key process in life review is concerned with *identity maintenance*, comprising processes for self-reflection and a consideration of self-worth. Again, we saw such processes in action:

'You don't think you've done much in life and you haven't- you haven't travelled, but you've still done a lot in your life- you realise from the amount of photos' [Fran, 20, interview].

Finally, some of the participants said that they valued brevity in the MoM video, noting that the shared experience of reminiscence [related to the teach/learn element in life review] can sometimes be a tedious experience:

'You know if you go to your gran's and she gets out a photo album and shows you that? It could be like the new, modern equivalent which would be less annoying because if it's only three, four minutes long, you don't have to sit through a whole album' [Lee, 16, interview].

5.4 The automated biographer

One of the issues we were keen to explore is the impact of a biographical compilation that has been created without any real sense of personal involvement or agency:

'I didn't like how it refers to "I" at the beginning, as it is inferring that I wrote that when it was actually the software' [Mark, 25, online].

For ordinary citizens, it is an unusual experience to see what impartial software has made of their own lives. Some noted that the act of one person summarising the life experiences of another most commonly occurs as a eulogy following their death. Not surprisingly, then, some participants felt their video had a morbid undercurrent:

'It feels a little bit like you've died' [Megan, 26, interview].
'Yes, a memorial video thing' [Val, 23, interview].
'It felt quite morbid in the sense that people were looking at the history of someone who had just died' [Mark, 25, online].

Participants also worried about the ease with which the software collated their information, and the legality or appropriateness of including other people in their videos:

'I find it a bit creepy that it can extract that info just connecting to Facebook' [Greta, 47, online].
'I'd take out the photos of my ex-boyfriend's little brother. His stepmum tagged me in a photo of his baby brother in the bath because it was a toy next to him that I'd bought. That picture came up… I haven't got a right to post a photo of her son on a video' [Fran, 20, interview].

In general, the MoM wasn't considered particularly clever. Participants quickly realised that their videos were created using a formula and that the 'biographer' lacked any kind of personal sensitivity—raising interesting ethical challenges. They recognised that if their Facebook profile did not already include valued content, the video was never going to reflect their current friends, favourite activities or treasured memories accurately. Participants were explicitly asked to talk about what an alternative museum might offer and here we saw evidence of the desire for more active engagement in the process of narrating their own lives—transforming a biographical into an autobiographical process.

5.5 An autobiographical Museum of Me

After viewing their own video, participants were asked what they felt might be missing from the MoM and what would be beneficial in any future attempt to collate social media information in this manner. Whilst people could find fault with specific content or design aspects of the MoM video, knowing how to improve it was difficult. One participant insightfully commented that the effort required to tailor a video to satisfy *everyone* would be significant:

'It would be a hell of a task. If you wanted to go through and make your video but had to go through every single status and every single photo with you

with an ex or you at an event, say, a funeral or something' [John, 23, interview].

Although screening all content in order to produce a more accurate video was considered difficult, participants described how they already 'pruned' Facebook content anyway, deleting anything they felt was embarrassing. Participants talked of removing vast amounts of information, most commonly deleting a relationship on Facebook, because seeing it again would upset them. Participants agreed that a function to allow for deletion of unwanted content on a case by case basis would be a desirable feature for a future MoM. This idea of self-management was taken one step further by some participants who overtly stated that if they were making a 'true' film of themselves, they would need to manage and edit all content:

'To sum up, if it was going to truly be a Museum of *Me*, it would make more sense if I could create it myself. Fill it with images and stories that I have chosen. Otherwise it is more like a museum of Facebook's perception of me' [Leigh, 26, online].

For many, the medium, rather than the message, was an issue, with some voicing concerns that a film format may not be their preference:

'I would like a digital scrapbook/album of me for personal use, i.e. something that is meaningful to me and I can participate in making it and sharing it with my closest people' [Mandy, 30, online].
'I would like it to be more like a Pinterest page' [Leigh, 26, online].

Participants felt that a video to represent one's life should be more about family, social relationships and personal achievements:

'None of these videos ever reflect on friendships that much, like your relationship to someone else. They're always quite exclusive. They're all about individuals' [Paul, 16, interview].
'Yes, so maybe stuff not even that is on Facebook but what you'd actually like. I would like achievements, stuff that you're doing at the time. Time you graduated. Yes. I think its important stuff like that, monumental moments' [Megan, 26, interview].

This notion of accurate representation was discussed in detail, and participants acknowledged that the information on Facebook may not reveal a true picture of a person; they felt people tended to post about positive occurrences. In terms of the impact on MoM videos, participants commented that a truer self-presentation would be desirable:

'You only put photos up there which you're happy with, how you look in them and things, and a lot of

the time that's people looking at their best, but that's not going to be you 24/7. If you really want a true representation, you'd have to have someone who's got out of bed in their pyjamas eating their breakfast' [Bella, 21, interview].

This could be achieved, some suggested, by taking a snapshot of more social media accounts and including data from a number of sources; for example, some remarked that Twitter might represent them more effectively:

'Twitter is more personal now than Facebook because more people feel free to write things on Twitter so you get a better representation of who you are' [David, 18, interview].

One interesting outcome of the MoM exploration were comments from people about reassessing their use of Facebook, and using it more carefully in future—in order to make a MoM video more representative:

'It was connecting me to some girl that I can't remember who was in Year Eight. I don't know' [Martin, 21].
'But then it would be up to us to delete those' [Tina, 20].
'Which I might do after this talk' [Martin].

6 Reflections and recommendations for future work

We found the *Museum of Me* to be successful in creating an enjoyable, fun experience for participants and it was an experience that supported some of the known processes of life review. In other words, it was an experience that offered potential in terms of supporting individuals in a beneficial life-review process. However, it was also an experience that could seem shallow or manipulative and that could be made more rewarding. Participants would have welcomed a better sense of ownership and the opportunity to take a more active role in the narration process—seeking opportunities to edit or filter data, or include other social media sources. The feeling of an 'automated and disinterested biographer' led to an outcome that felt more like a eulogy than a biography and was associated with the feeling that the MoM was rather creepy—a finding echoed in other work exploring perceptions of social media use postdeath [64]. Participants discussed the extent to which they felt their MoM could ever be true to their 'real' sense of self, noting that Facebook only ever showed certain facets of self and was designed to allow a certain amount of latitude in the display of identity. Certainly, there was recognition that

Facebook posts made over a long period would show how individuals had changed or 'grown up' during that period but there was also recognition that earlier posts could be embarrassing.

Concerns about 'true' selves in the biographical process touch upon two important debates that are relevant to designers of future systems: firstly a literary debate about whether life narratives of any construction can ever be 'accurate', and secondly a debate about the validity of the socially constructed or performative roles that we adopt in everyday life. On the first issue, there is a strong sense in recent literature on autobiographical writing that good narrative may blend both true and fictional events, in part because the autobiographical past 'is actually peopled by a succession of selves as the writer grows, develops and changes' [65, p61]. Smith and Watson [66] capture this challenge when opening their discussion on autobiographical writing, asking:

'What could be simpler to understand than the act of people representing what they know best, their own lives? Yet this act is anything but simple … We might best approach life narrative, then, as a moving target, a set of shifting self-referential practices that, in engaging the past, reflect on identity in the present' [p1].

This same sentiment is captured by those describing postmodern practices in biographical writing, where those seeking to interpret the lives of others are believed to be doing no less than individuals seeking to interpret their own lives [67]. In short, they are grappling with the notion that interpretations of self will change over time—irrespective of whether this interpretation is conducted by oneself or by another.

So how might we assess the value of these films in a more measured way? As already described [41], offer an account of the benefits of such massive personal data collections in terms of the 'five Rs': recollecting, reminiscing, retrieving, reflecting and remembering intentions. Our findings resonate with three of the 'five R' principles so it is useful to revisit these. The act of reminiscence was experienced by many, as participants explicitly talked of emotional responses to long-forgotten people and events. Reactions of surprise, embarrassment and even feelings of disgruntlement were common, but always followed with comment that the experience of watching the video was valuable. These experiences were deeply personal and we found little evidence that they would provide value to anyone other than the subject of the video—but our participants found value in the act of reflecting on their own personal development—for example, considering changes over time. People sometimes said that they had 'grown up'

since they joined Facebook, which could lead to a sense of embarrassment when reflecting on their former selves. The MoM offered participants the chance to retrieve digital information that might have become lost amongst other more mundane Facebook activity. They spoke of existing archival practices outside of social media such as the printing or storing of significant photographs, and recognised that they may not have captured everything of value in this 'more permanent' form—seeing social media as a more fleeting, temporal solution. These insights speak to the design philosophy of *slow technology* [68, 69], which underscores the importance of more reflective and meaningful technological experiences. Recent work exploring an online application which encouraged content to only be posted after a time delay [a slow technology] demonstrated instances of 'profound reminiscence' for users [69].

It would also be useful to assess whether the Museum of Me offered our participants the chance for the kinds of reminiscence suggested in the Reminiscence Functions Scale described earlier [20]. We identified a number of these functions in our data, in particular *intimacy maintenance*, when participants were reminded of forgotten friends or family; *identity maintenance*, as participants reviewed activities they had undertaken and documented on Facebook which were perceived as self-defining; and teach/inform, whereby participants saw the MoM as a succinct way to present information to others. We began by considering the life review, and raising awareness that this is not just a practice that is hypothesised to occur in later life, but as something which can be psychologically beneficial for all ages. However, we have found that the benefit of utilising an automated system such as MoM was not particularly useful for our participants to get a sense of their true digital identity, and were, therefore, unable to review the events presented in their video as an accurate depiction of themselves. Yet despite the inability of our participants to review a video of their lives that encompassed them more truthfully, there was very much a sense that reviewing this content, at their young age, was worthwhile.

6.1 Limitations

Reflecting on our methodology, we acknowledge the need to consider the ways in which we have framed the outcomes of our investigation. Firstly, our participants watched and then discussed their MoM biographies in the company of good friends. They seemed comfortable during interview and the discussions were relaxed, so we believe our findings did not suffer unduly from issues of privacy or limited disclosure—however, it is likely that our triad presentations created more of a focus on shared experiences.

Secondly, the demographics of our participants warrant some consideration. We recruited people ranging in age from 16 to 47, attending either school or university. Whilst we wanted to involve people with a rich digital content who would be in a position to consider how their online personas might change in the future [assuming inclusion of people in school or higher education will be contemplating transition], we recognise that their educational levels may have impacted on technical expertise and familiarity with the task.

Thirdly, we noticed that our younger participants were much more interested in new or transient based forms of social media, with favourite services including Vine, Snapchat, Instagram and Twitter. This had the effect that their MoM videos felt rather out of date. For our older participants, moving away to university meant working harder to stay in touch with friends and family and so their hobbies, social activities and meaningful photographs were more likely to be accurately represented. We recognise that different social media systems are associated with different ages and so another focus of our work in the future will be to explore some of these issues with an older generation, to understand the value of digital reflection for the over 50s.

6.2 Future work

A key issue arising from this work is the sense that the MoM experience was immutable. There was no space for individual editing or creativity. In our own project, we aim to provide the basis of a biographical film accompanied by a suite of editing tools that will allow individuals to craft a more personal autobiography. In another strand of our work, we have commissioned a series of film-makers to explore the artistic limits of what might be created from existing digital data. Meanwhile, we are continuing to engage in work that captures those fragments of social media that people feel most accurately represent their own lives, conducting a critical analysis of where these different information sources may be found.

7 Conclusion

We have conducted a study that explores Intel's *Museum of Me*—part of a class of new tools generating brief automated biographies based on an individual's digital history. We have seen that users enjoy these experiences, but recognise that there are some limitations. MoM has a biographer that is perhaps too distant, leading to accusations of creepiness and a sense of disengagement. Some of these problems are relatively superficial and can be attributed to the fact that MoM drew entirely upon Facebook data, which was limited for some of our younger

participants and tended to place emphasis on people and events as opposed to some of the other valued attributes of a personal history [loved objects, strongly held beliefs]. We can imagine that such limitations could be overcome by systems that are capable of drawing personal data from more diverse digital sources. Less superficial is the question of whether or not digital biographies can be viewed as 'accurate' representations of self. To a certain extent this particular issue could be addressed by handing over editorial control to the user, who could then construct more nuanced biographies reflecting different facets of self or acknowledging personal growth.

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