Targeting Different Demographics

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ABSTRACT
Teenagers and young adults are deeply embedded in digital culture, so it seems strange that they aren't more actively designed around, with respect to the tasks that they routinely carry out. By targeting different demographics (in this case, teenagers and young adults), we can hopefully produce software that is more meaningful to the end users, and more integrated in their day-to-day living. In order to target these different demographics successfully, it is important to first understand how they differ from other demographics, but also to identify threads that are consistent across them too. In this paper, we investigate literature that has explored: how teenagers identify with virtual possessions, as opposed to physical ones; the commonality of reminiscence across different demographics, and then identifying aspects of it that can be used in development for teenagers, and; identifying tasks that teenagers typically partake in (such as recording video clips), and then designing software that extends this (video editing), while appropriately emulating the core tenets of the task (in this case, the social aspect).

In addition in this paper, we also investigate literature that has explored more work-oriented tasks that teenagers would routinely carry out, and how it is often non-ideally implemented with respect to the mindset that they operate in. We also identify existing frameworks that teenagers and young adults use (virtual networks), and attempt to understand why they are so popular, so as to know what to design for.

Author Keywords
Teenagers; Virtual Possessions; Metadata; Video Editing; Reminiscence; Collaboration; Virtual Environments; Virtual Worlds; Digital Natives.

ACM Classification Keywords
H.0. General. H.5.m. Information interfaces and presentation (e.g. HCI): User Interfaces. H.5.3. Collaborative Computing.

General Terms
Human Factors; Design.

INTRODUCTION
With the technological singularity that has erupted (and persisted) in our culture since 1989, there has been a marked portion of the younger population that is steeped in digital culture, to such an extent that they think and approach problems differently [5]. This means that there is a marked disconnect between the older generation, who are making software with a certain mindset, and those who digest it, utlising their own mindset. To that end, a lot of teenagers are performing tasks, or interpreting data, inefficiently or incorrectly. This seems amazingly detrimental, given that a study in 2003 on world population revealed that about $1/5^{th}$ of the world's population is in the 10-19 age demographic – indeed, approximately half of the world's population is under 25 [8].

Because of the lack of appropriate software, teenagers and young adults perform both their leisure and work activities sub-optimally. Indeed, there are concerns that teens aren't entering higher education institutions with appropriate information parsing skills, in part due to the way that modern software helps users select search terms, and then present that information [1].

This paper hopes to explore some of the literature relevant to producing software for teenagers and young adults, for both leisure and work activities. Further, it hopes to highlight and explore why some existing models that teenagers already use are so successful.

SEGREGATION OF TASKS TEENAGERS AND YOUNG ADULTS WANT TO ACCOMPLISH

Work versus Leisure
Teenagers and young adults are social creatures, but the majority of them also take part in some sort of education – be it high-school, higher education, or trade schools. Because of this segregation of tasks, appropriate software design needs to be taken into consideration.

STUDIES
A multitude of work has been carried out, regarding designing software for the different types of tasks that teenagers and young adults typically carry out. This varies from leisure activities (as is the case of Odom *et al. [5]*, Peesapati *et al.* [6], and Terrenghi *et al.* [9]), to work activities (as is the case of Beheshti [1]).

In addition, research already exists that tries to identify and explain what makes existing software that already fulfills these frameworks work as well as they do (Messinger *et al.* [4] and Mantymaki *et al.* [3]).

Preliminary Work

Before fully understanding and appreciating the research and work explained above, groundwork needs to be put in place.

Prensky [7] presents interesting ideas that can be extrapolated to the work that is being discussed in this paper. Prensky uses the idea of anyone being born after 1989 as being a 'Digital Native' – that is, someone that has lived their life steeped in technology and digital culture to such an extent that they now interpret information differently from their predecessors (the 'Digital Immigrants). Indeed, Prensky goes as far to say that Digital Natives have different brain structures from their older generations [7].

Csileszentmihalyi *et al.* [2] discuss the importance of work, and its importance for the successful development of teenagers. They state that the reason that jobs are intrinsically rewarding themselves is because they are a way to gauge ones performance in a particular subset of skills [6].

Virtual Possessions

Odom *et al*. recognized in their research that teenagers are "…rapid adopters of technology" [5]. Because of their willingness to steep themselves in digital spaces, there has been a marked shift in the types of possessions that they deem as being important to them. Namely, the shift away from tangible objects, to instead virtual ones – photos, music albums, playlists, and the like.

An interesting idea explored in the paper, is how one attaches sentimental value to these virtual possessions. With traditional possessions (mementoes and such), meaning is often extracted from times spent with the object. This doesn't translate well to possessions that obviously have no shape or form [5]. To that end, Odom *et al.* discuss the importance of, not only the computer generated metadata tied to a virtual possession, but the ability to modify it. The metadata itself would be a reminder of the event, such as time and date. By manipulating metadata, meaning can come, not from the possession itself, but the way that the newly generated metadata related to other people or events, such as friends or key dates.

Another important notion was the personalization of the virtual possession, through collaboration – that is, making the metadata editable by other people [5]. The possessor vicariously draws sentimental worth from the possession, through their friend's edits of the metadata.

All these points relate to the topic at hand, because they highlight how a different demographic (that is, teenagers) draw worth from possessions. Knowing how they interact with them, to produce sentimental value, allows us to focus on how to best design systems that facilitate those processes.

Reminiscence

As explored by Peesapati *et al.* reminiscing is described as a "type of remembering" [6]. It's spontaneous, and based off triggers that have significance to the person performing the remembering. Because of the importance of spontaneity in the process, they designed a piece of software, 'Pensieve' that is based around this.

Pensieve collects data from its user's linked sites (such as last.fm or twitter), and uses this to generate meaningful triggers for them (sending them via email). The triggers then further encourage the reminiscing process, by allowing users to elaborate on an associated memory. Indeed, 85% of users replied to the triggers [6].

The core user group for such linked sites is teenagers and young adults, and this is reflected in the demographic of Pensieve's users. With a total of 91 users, 42 were reported being in the 18-25 age-range [6]. Therefore, we can see the relevance of the act of reminiscing with respect to the teenage demographic.

This pertains to the topic at hand, because it focuses on a task (that is, reminiscing) that is often not associated with a younger demographic. The context of performing it in a digital environment creates some interesting design issues – such as, how to deal with a user's privacy while generating triggers, and how to choose appropriate triggers for the teenage demographic.

Collaborative Video Editing

Terrenghi *et al.* discuss in their research that the act of taking a video is spontaneous, and the sharing of it is often a group activity [9]. However, current software for editing is diametrically opposed to the core ideas behind video capturing. With these issues in mind, they propose a collaborative video editing solution, with teenagers being the core demographic that they tested and designed around, seeing as teenagers are more likely to capture video spontaneously because of the types of tools they have available to them (such as mobile phones with cameras in them)[3].

The main goal of their research was to introduce a social aspect to the editing side of things, using the idea that creativity can be produced via group work [3]. The solution to that was to design the software around a digital desktop (in this case, the Microsoft Surface). With everyone able to see the work that others around the table are producing, this would ideally create a more fertile environment for collaborative work. To further aid this, the physicality of the Microsoft Surface was a key component. That is, making the software able to recognize multi-touch (so two users can manipulate the same digital object simultaneously to reach a shared goal), and the like. However, because of

technical limitations of their software, this was never fully realized [3].

The focus group, consisting entirely of teenagers, expressed their interest in using the software in public places, but stated their engagement with the software would be proportional to how easily one could move the video from the recording device, to the surface, and then how easily it could be shared to other people from there.

This relates to the proposed topic, as the research is based around how one can produce a video editing environment that is meaningful to a demographic that is more readily available to produce videos, given the type of tools they have available to them.

Virtual Environments

Beheshti presents the idea that teenagers have no problem effectively using the information presented to them from the web for leisure – be it for internet shopping, sharing personal information and artifacts via social networking sites, or finding news or diet plans [1]. Indeed, designers from a different generation seem to have no problem with producing "vibrant and dynamic" portals that Digital Natives can traverse easily [1].

However, Beheshti raises the point (raised by other researches), that modern teenagers and young-adults lack information literacy skills when entering higher education institutions [1].

Beheshti makes the connection that teens are information illiterate because of the type of information-seeking models in place in current applications is detached from their way of processing information [1][5]. Beheshti explores Kuhlthan's Information Searching Process (ISP). This model adapts its information seeking using the concept of time – that is, how the teens thought processes change as they move through a problem [1].

A solution to this that is more in keeping with the thought processes of a Digital Native, within a real-world constraint, is the idea of a virtual library [1]. Inside this virtual library, teens can navigate through a 3D space (much akin to a video game), and select relevant books (which are websites).

This relates to the topic at hand, because it emulates an environment that, while not a lot of teens and young adults necessarily visit in their day-to-day lives, still know. Further, because the resources the teens are searching for represent an object in physical space, there is no layer of abstraction, and it allows the teen to make connections between related data because it is also in the same nearby physical space.

Virtual Worlds

Virtual worlds (such as Second Life) are a fertile ground for producing software for teenagers and young adults. Mantymaki *et al.* state in their research that virtual worlds for teens are the fastest growing type virtual worlds – using Habbo Hotel as an example [3].

Habbo Hotel is a virtual world, used in over 150 countries, with 32 country-specific portals, and over 10 million unique visitors each month, with 90% of its player-base in the 13-18 age demographic [3]. Habbo runs in a browser (so is easily accessible), and the users have their own avatar and rooms that they can decorate and customize to enhance the social interactions they have inside the virtual world [3]. These aspects reinforce the relevance of designing virtual worlds with teenagers in mind, so the majority of this section will be dedicated to understanding virtual worlds, and the factors that brings teens back to using virtual worlds – or the 'Stickiness' of a virtual world, a term coined by Mantymaki *et al.* [3].

According to the work of Messinger *et al.* [4], virtual worlds have particular typology familiar across all particular types:

1. Purpose (or the context of the interaction). This is the type of virtual world – be it thematic, social or educational. This typology in and of itself has its own subsets – about whether or not the virtual world augments real-world activities the user already does, or acts as a point of immersion for the user, so they can explore behaviours and activities that they normally wouldn't (for example, Massively Multiplayer Online Games).
2. Place (or location of interaction). This is where the users are located geographically.
3. Platform. This is the type of device used (mobile, desktop PC), as well as the way that the virtual world is presented to the end user (via browser, or if it requires its own install).
4. Population. This is the type of people that will use the virtual world.
5. Profit Model. This is the type of monetary investment required to use the service (micro-transactions, fixed fee, or free).

In addition to these aspects of virtual worlds, there also exist particular classes of virtual worlds [4]:

1. Education-focused.
2. Theme-based.
3. Community focused.
4. Children focused.
5. Self determined.

The education-focused virtual worlds present training for users (such as architecture and design, or language learning, etc.). Because of this, they often require: realistic and accurate rendering of objects in the virtual world;

expressive avatars that the users can act through; high performance and responsiveness, and; ease of use for both the users and educators.

Mantymaki *et al.* use the idea proposed by motivation theorists (that "human behaviour as being driven by… desirable outcomes") as one of the core tenets of their research model. Inside this model, a myriad of outcomes (called hypotheses) from the use of a virtual world help determine continued use of the said world. These hypotheses (H1 through to H7) are presented thus [3]:

1. H1: Utilitarian outcomes. In the case of Habbo, enhanced communication and expression via avatars and customized spaces creates user happiness.
2. H2: Hedonic outcomes. This is the ability to derive pleasure from use – viable to be looked at in the case of Habbo, because it has no intended use other than personal use in social contexts.
3. H3: Status. Gaining status and social recognition are both key for the user to gain social acceptance from peers inside the virtual world. The chatting functions used inside Habbo help drive this.
4. H4: Social Presence. This is the need to "feel close… and accepted" by other individuals using the service – again, achievable by Habbo's social functions (such as chat, as well as the ability to maintain a friends list).
5. H5: Perceived network size. Described by Mantymaki *et al.* as "… (a) large number of users in one's personal network is likely to increase the value of adopting a technical innovation" [3] – so continued use of a virtual world is directly proportional to the amount of users inside said world. Habbo makes this apparent to the user when they can choose to log in via country-specific portals.
6. H6: Interpersonal Influence. The social circles that the person operates in can be the source of influence for continued use (a form of social pressure, if friends are using the virtual world).
7. H7: Secondary (external) influence. This is pressure exerted by mass media and advertising.

The hypotheses presented can themselves be segregated into the types of outcomes expected (see Figure 1). These are:

- Utilitarian outcomes: H1
- Hedonic outcomes: H2
- Normative beliefs: H6, H7
- Social outcomes: H3, H4, H5

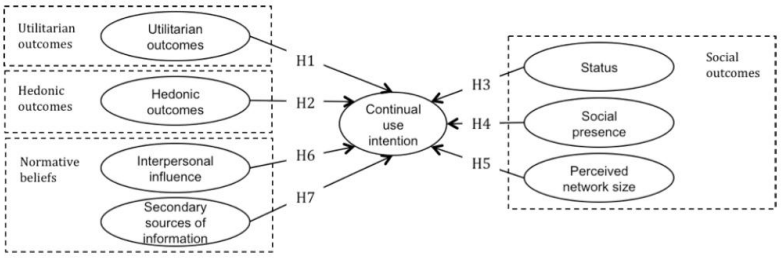

Figure 1: Research model, proposed by Mantymaki [3]

After testing this model on 844 German teen Habbo users, Mantymaki *et al.* found that H1, H2 and H4 were the main factors of continued use for users [3]. Realising this, it became apparent that what determined continued use (or Stickiness) of Habbo, were the intrinsic properties of Habbo itself – those being: connecting with friends and spending time with them; having fun, and; feeling "human contact and warmth" [3]. Also, it wasn't the external factors (interpersonal influence, secondary influence, status among others when using the service) of the virtual world that determined continued use.

Using that knowledge, it becomes apparent that the service itself is what draws users to persist in using it, as opposed to external factors. Indeed, on an analysis of 165 users, 66% used it because 'fun' (with 50% of those explicitly stating that it was the socializing with new and old friends aspect that created that fun), 22% used it for its chatting functionality, and 8% used it to play the in-built games in the system.

CONCLUSION

From the collected research, we can see the worth of targeting different demographics for software development. Explored in this paper were: the concepts of how teenagers now have personal attachment to virtual possessions (as opposed to physical ones); how the concept of reminiscing is applicable to a demographic that is steeped in digital social environments; design issues present, and the importance of collaborative work associated with a task that many teenagers actively pursue (taking videos); how because the thought processes of Digital Natives and Digital Immigrants are so diametrically opposed, that the current production of software is having detrimental affects on the way that teenagers and young adults process information, and the idea of making a virtual environment to help remedy this, and; the success of existing virtual worlds, and what steps they take to make users keep using them, by identifying what factors users use their service for – namely, the social aspect that is a significant pull factor for teenagers and young adults.

FUTURE WORK

While the idea of a virtual library, proposed by Beheshti (as a means of improving a teenagers or young-adults

information seeking process) seems to be an ideal approach to the problems presented [1], one of the issues raised by test-subjects using the system was the idea of help functions that assist in learning to use the system. Indeed, participants believed that the help should be context sensitive (so in the case of the virtual library, there would be a librarian avatar to help them [1]).

A main shortcoming I identified while collecting the research for this paper, was the fact that the research tried to find the appropriate mind-set of teenagers, and then develop within those confines. Naturally, regardless of how in-depth the understanding of these models are, there is still that disconnect between generations, as identified by Prensky [7]. Indeed, there seems to be gaps in research for finding models that find an interface between the thought-processes of these two generations.

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