

Who Is This Guy Who Liked My Picture?

Privacy Control Mechanisms on Facebook for Generations X and Y

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Abstract: The abundance of personal data exchanged through social networks has caused internet users to unintentionally expose themselves to others, which may lead to unpleasant consequences. This statement fuels the debate on user privacy in social networks. In this context, the present study seeks to investigate how Generations X and Y distinctly employ privacy controls on Facebook by evaluating user interaction by means of usability testing. In general, the study showed that users of both generations found it difficult to use privacy configurations of Facebook, mainly due to usability issues. However, Generation X users displayed less ability handling these features and, furthermore, were less concerned with privacy of their shared data. Tests suggest that few users are familiar with all the resources available in privacy tools currently offered by Facebook. Some redesign solutions were discussed that seek to mitigate problems and thus contribute to more accessible and user-friendly features for both generations.

1 INTRODUCTION

Social networks enjoy ever increasing popularity and are already present in the lives of most people with internet access. People from different age groups have been using social networks to maintain social interaction with friends and family members by sharing information and interests with one another. Thus, users produce and manage a great deal of information in social networking communities. However, it is not always possible to know which path this information travels through and it is difficult to measure the extent that the information may reach.

This context sheds a light on one of the main debates concerning social networks: user privacy. Given the abundance of information published out there, social networks can overly expose the lives of its unsuspecting users. In order to mitigate potential problems, it is crucial that social networking services provide appropriate mechanisms according to user needs, by taking usability principles into account, in order for internet users to gain control of the privacy of their information.

Given this context, the present study seeks to investigate how different generations employ Facebook's privacy control features (Facebook,

2012). Usability tests were administered using qualitative-quantitative analysis, with users belonging to Generations X and Y (Generation X includes people born between 1965 and 1976 and Generation Y includes those born between 1977 and 1997). The evaluation through the perspective of different generations considered the fact that they had different contact with technology throughout life, which could lead them to nurture different understanding and abilities regarding the assessed features. Tests were conducted on Facebook features that were useful in managing the privacy of data and postings, especially ones that could lead users to expose their personal information and share pictures and messages. The present article shows the results of this investigation.

2 LITERATURE REVIEW

Due to the abundance of information published online, social networks may overexpose the lives of its users beyond their expectation and thus disturb users' privacy.

The definition of privacy, according to the Oxford Dictionary, is the state of being free from public attention (Oxford Dictionaries, 2012).

However, the concept of privacy is very subjective and can vary greatly across cultures and depending on the person. This concept is thus closely linked to personal values and people's perception of ethical issues. Unauthorized use of user data, publication of user information and third party posts that lack user consent because of lack of knowledge or negligence, are all illustrative examples of situations in which violation of privacy occurs. Privacy is a fundamental human right recognized in the Declaration of Human Rights, proclaimed at the United Nations General Assembly (United Nations, 1948). However, owing to the large number of connected users who access posted information practically in real time, maintaining absolute control over the information shared on the web may prove to be difficult.

The lack of user awareness and proper privacy control tools have resulted in the inappropriate use of social networks. Thus, a large quantity of user data is being appropriated by authorities, strangers and criminals, leading to unpleasant consequences (Aïmeur et al., 2009). Moreover, it is becoming more and more common to witness people losing their jobs or missing college access opportunities because of inappropriate material available through social networks (Kim et al., 2009). On the other hand, although social networks provide efficient privacy control mechanisms, these tools must be accessible and user-friendly by meeting basic usability principles. Usability is a concept directly associated to the ease with which users interact with a tool's interface, resulting in fast learning and memorization, the ease with which one finds desired information, and the likelihood of making a mistake when using the tool (Nielsen, 2007). How easy it is to understand privacy levels and how to configure them is directly related to how user-friendly the tools are. Any difficulty can lead users to stop managing their privacy level or, moreover, can lead them to choose options that do not meet their expectations.

According to data from the Pew Internet research institute (2012) on social network users in the U.S., Facebook was used by 66% of Internet users in 2012, followed in terms of popularity by LinkedIn (20%) and Twitter (16%), although the latter two networks are most used by young adults. On the other hand, 83% of Facebook users are between 18 and 29 years old. In Brazil, data from the Brazilian Internet Steering Committee (Comitê Gestor da Internet no Brasil – CGI, 2011) also revealed that in 2011 83% of young people aged 16 - 24 use social networking sites, such as Orkut, Facebook and LinkedIn. However, between young adults, 65,5%

use this sites too. Then, there are a significant number of users of the X and Y generations.

As a focus of this study, the next section addresses both generations of members considered in this research: X and Y.

2.1 Generations X and Y

Tapscott (2010) classified the last generations according to historical periods, as shows Table 1.

Table 1: Generations according to Tapscott.

Generation name	Year of birth
Baby Boom Generation (TV Generation)	1946 – 1964
Generation X (Baby Bust)	1965 – 1976
Generation Y (Internet or Digital Generation)	1977 – 1997
Generation Z (Next Generation)	1998 – present

Generation X entails a Generation lacking many discoveries, preceding the Internet and personal use of technology. Generation Y, in turn, is considered the first global Generation in history, which established contact with technology from birth and was able to teach it to their parents. It is also known as Internet or Digital Generation and has attracted the attention of society as a whole. Internet and technology have brought many behavioral changes to Generation Y. One of the differences observed between current and former generations is that the Digital Generation seeks freedom at home, by means of the online universe, while the preceding generations sought freedom outside the home (Tapscott, 2010).

3 METHODOLOGY

In order to investigate how Generations X and Y employ privacy control features on Facebook, this study employed usability tests with twelve real members. For Nielsen (2000), a usability test with five users is sufficient to find around 85% of usability problems in a system. Thus, based on Nielsen's observation, twelve real volunteer users participated in tests for evaluating Facebook, six belonging to Generation X and six belonging to Y.

The evaluation under the perspective of different generations considered the fact that they had different contact with technology during life, which could lead them to have different understanding and ability in the use of Facebook privacy setting tools. Unlike Generation X, Generation Y has lived with

technology since childhood. However, Generation X also employs technology for personal use and participates in social networking communities. The tests were conducted on a number of Facebook features for privacy settings, giving priority to those that could lead users to expose their personal information and share pictures and messages. Among the evaluated settings, general privacy settings can be accessed from a menu on the top right hand corner of the screen, shown in Figure 1.

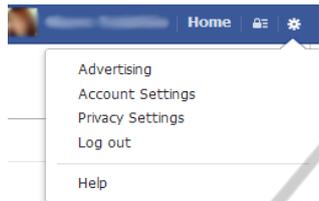


Figure 1: Facebook Settings Menu.

The usability tests included a task guide, shown in Table 2, which consists of different levels of privacy settings for personal information and posts on their Facebook profile.

Each participant member was asked to execute the tasks and later respond to a survey that requested information from their profile (such as date of birth, gender, education, how often and for how long the user accessed Facebook) and their impressions on the tasks and available features. There were also subjective issues, in which the user could describe the difficulty encountered in each task and suggest improvements in the addressed features.

In order to check the efficiency of its planning methods, the test was first applied to two users, who informed their understanding of the tasks and the survey. This pilot test allowed for adjustments to a few guideline details, such as the description of certain tasks, which were rewritten for better understanding by participants. Subsequently, the tests were reapplied to fourteen users in different environments, for three consecutive days, in the month of July, 2012. Seven Generation X users and seven Generation Y users were selected. However, due to problems with the video recording of the interaction by two participants, they had to be disregarded. Therefore, the research material was analyzed with the twelve remaining users, six from Generation X and six from Generation Y.

In order to participate in the tests, the users signed a consent form, according to Resolution 196/96 by the National Health Council (1996), which regulates research conducted in human beings in Brazil. The task execution proposed in the guideline was monitored, through screenshots,

Table 2: Task guide for user test.

Task	Description
Task 1	Using the Google search tool, look up your name and check if your Facebook profile shows up in the results. In case it does, see how your profile appears to any person who conducts the search, even for someone without a Facebook page.
Task 2	If your profile is visible to everyone, log in and change the privacy settings so that your profile can no longer be publically accessed through a search engine (e.g. Google). Make it visible to friends only.
Task 3	Did you know that it is possible to view your profile in the way it appears to a friend and the way it appears to people who are not your friends? Try to view it in both forms and check if your personal and sharing information is shown in both cases.
Task 4	Change the privacy of your date of birth so it is only visible to yourself.
Task 5	Did you know it is possible to define the privacy of your pictures and albums, making it visible only to your friends, to a group of people, or to a single person? Try it out by modifying the privacy of a picture on your profile so that only one friend can access it.
Task 6	It is possible to choose who can post a message or share information on your profile or timeline. Change your settings so that only your friends can post on your profile.
Task 7	Change the setting so that you can analyze posts in which you were tagged before it is shown on your timeline. This way, whenever you are tagged in someone's picture or message, the tag will be pending until your approval or rejection.
Task 8	In the status update box ("How are you doing?" "What's happening?", etc.), post a message and block one or more specific people from seeing what you wrote.

for subsequent observation of the user's interaction with the assessed tools, which allowed for comparison with the answers to the questionnaire.

3.1 Resources Used for Tests

The tests were conducted in desktops and notebooks with similar settings, both using a mouse as the pointing device (thus avoiding trouble with the touchpad that could interfere in the result of the evaluation), with Microsoft Windows 7 operating system and using Internet Explorer, versions 8 and 9, as the browser. For recording user interaction, the free software Free Screen Video Capture, from Top View Soft, was installed.

First, the evaluators presented the evaluation proposal to participant users. This presentation

aimed not only to introduce the theme, but also to minimize possible doubts as to task execution as well as to ask users to sign a consent form. Participating in the evaluation was contingent upon signing the consent form, which aimed to reinforce the academic nature, ensure ethical aspects of the project, as well as to ensure that the users' participation was voluntary. The participants then followed the task guidelines that requested the configuration of different levels of privacy for personal information and posts on Facebook. After accomplishing the tasks, participants answered the survey, identifying their profile and level of experience with Facebook, and informing their impressions about the executed tasks.

4 DATA ANALYSIS

It is important to emphasize that the focus of this article is not to identify the usability problems of Facebook privacy control features; it is rather to investigate how Generations X and Y users distinctly employ these features, identifying problems in knowing about, understanding, and setting up desirable privacy levels for each post and personal information.

Therefore, data analysis sought to identify the main differences between Generations X and Y, through executing the proposed tasks, by analyzing the videos, and through reading the answers to the survey. Whereas the video analysis made it possible to observe the practical development of users with the system, the survey analysis revealed the users' perception in relation to Facebook's privacy settings.

About the generation X users: three of them were born in 1969 and the other three, in 1966, 1965 and 1974 respectively. Two of them were male and four, female. About the generation Y users, each of them was born in a different year: 1978, 1982, 1987, 1988, 1990, and 1994. Two of them were male and four, female.

4.1 Video Analysis

Initially, the tasks were classified as "Executed" and "Not Executed". However, the videos of user interaction made it possible to observe that, in various situations, users knew how to perform the task correctly; however, due to lack of attention or understanding of what was requested, they were not able to execute the task completely. In these cases, the task would be considered "Not Executed". However, the knowledge the user possessed was not

ignored, seen that the aim of the test is precisely to verify the level of knowledge and the ease with which users find settings which they ignore. Thus tasks were classified as "Executed", "Partially Executed", and "Not Executed". The analysis of user interaction during task execution resulted in Table 3 comparing the result obtained by each generation.

Table 3: Classification of tasks executed by Generation X and Y.

Tasks	Executed		Partially Executed		Not Executed	
	G. X	G. Y	G. X	G. Y	G. X	G. Y
Task 2		2			6	4
Task 3		2	1		5	4
Task 4	3	6			3	
Task 5	1	5	3	1	2	
Task 6	1	5			5	1
Task 7	2	4		1	4	1
Task 8	2	4	2	2	2	

It is worth noting that Task 1, which proposes using the Google search engine to search for a Facebook profile, was not included, since the task per se is not executed in the Facebook interface, rather on the Google search engine, so it does not interfere in the analysis of evaluated features.

The following conclusions can be made from observing Table 3:

- Generation X was not able to reach 100% completion in any task;
- At least one person belonging to Generation Y managed to perform each task;
- The amount of tasks executed by Generation Y is comparable to number of tasks not executed by Generation X;
- In the Generation X group, all tasks included at least one person who was unable to execute them;
- In the Generation Y group, three tasks were totally or partially completed;
- Considering both generations, within the twelve participants, only two participants were able to complete Tasks 2 and 3;

The video analysis revealed that only one in twelve participants managed to successfully complete all the tasks. The authors observed that participants from Generation Y found it easier to locate the privacy settings that were unknown to them, while participants from Generation X found more difficulty in the same situation. The authors also observed that, when Generation Y users were unfamiliar with the settings mentioned in a task, they navigated through different menus and setting

options and followed various paths in their attempt to fulfill the task. Whereas Generation X users, when experiencing the same situation, gave up more easily, and insisted less in finding different paths for completing the task. This difference is also shown in the runtime of all tasks for each generation, the average of Generation Y being 17m57s and of Generation X being 13m01s.

4.2 Survey Analysis

The difference between Facebook experience levels according to generation becomes obvious when analyzing the survey. All participants from Generation Y have accessed Facebook for over a year, while more than 80% of participants from Generation X accessed for less than a year.

Analysis of the survey answers also indicates that, out of six Generation Y users, five access the social network at least four times a week and, out of these five, four access it daily. Only two participants from Generation X access Facebook daily and three access it less than once a week. Thus, one easily notes the considerable difference in Facebook level of experience among users from Generations X and Y. Besides using Facebook for longer, Generation Y users access the social network more often.

Another important aspect can be observed in the amount of negative answers to the question: “Do you use to manage the privacy settings of your personal information and posts on Facebook?” given by users of Generation X. Out of the six Generation Y participants, five answered “no” to that question, while only one participant said yes. Therefore, the expected answer to the following question, asking the user whether he/she knew how to manage the privacy settings proposed in the tasks, was no. Indeed, half of them answered that they did not; however, the other half assumed that they knew how to manage at least part of the settings. These answers reveal that Generation Y is more concerned, in terms of changing their privacy settings, than Generation X. This is an interesting finding, for the younger generation is known for appreciating the exposure of intimacy (Época, 2011). The authors observed that half of Generation Y participants knew how to execute at least one of the proposed tasks. Still, they did not develop the habit of managing the privacy of their information.

Another observation worth noting during the survey analysis lies in the fact that, when comparing the answers to the questions “Did you manage to execute the tasks outlined in this guideline?” and “Did you have any trouble finding where to manage

the mentioned settings?”, all Generation Y participants answered that they were able to accomplish all or most and had few or no difficulty.

With data from Figure 2, which shows the percentage of tasks executed by each generation, one notices that, although most users inform in the survey that they did not have much trouble performing the tasks and that they managed to complete all or almost all of the guidelines, the video analysis shows that some tasks were not executed or were only partially executed. Thus, the answers to the survey are not consistent with the reality seen in videos of Generation Y, who did not execute 24% of tasks.

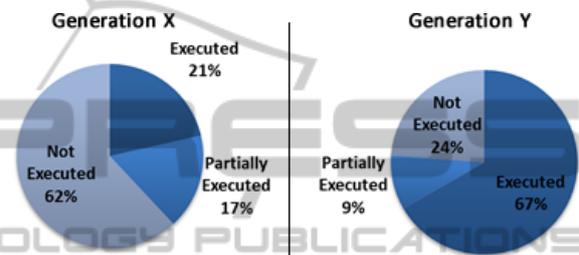


Figure 2: Task Execution Graphs.

As shows Table 3, the experience of Generation Y in using Facebook privacy settings exerted great influence in the answer to the question: “Do you think the settings offered by Facebook meet your expectations regarding privacy?” Unlike the latter, Generation X considered the settings they were unfamiliar with inexistent.

The subjective questions included in the survey, especially the question requesting observations about or suggestions of improving Facebook features for controlling the privacy of personal information and posts by the user, provided a few relevant considerations. A participant belonging to Generation Y observed that, when changing a privacy setting, the features for managing privacy levels are not centralized and, if they were organized in a single place in the Facebook interface, it would be easier to access the settings. The user’s suggestion is pertinent, considering that, when following the task execution by video, researchers observed that some users (especially from Generation X) tried to manage all the privacy settings requested in the guideline through the option “Privacy Settings”; however, settings of many items were found scattered across the Facebook interface. The privacy settings for viewing pictures, for example, occur in the photo album itself, and the visibility of posts is generally selected the moment it is posted. Another participant from Generation Y

suggested that the privacy setting of pictures should be allowed to be adjusted for each picture and not only by photo album, as is currently the case.

A participant belonging to Generation X suggested that Facebook's privacy options should be visible to any user, not only to people who are more familiar with computers. Another user from the same generation shared a similar opinion, since he observed that the paths for executing tasks should be clearer and more objective.

The comparison presented in Figure 2 clearly shows differences between both generations in terms of performance in executing the suggested tasks. However, the fact that all participants of Generation Y joined Facebook more than a year ago and most access it daily, while users of Generation X access Facebook less frequently and most have profiles for less than a year, raises a question: is the greater advantage of Generation Y in performing the tasks due to a greater ability of this generation's users or is it due to greater amount of time dedicated to Facebook? In order to answer that question, the performance of participants in following the tasks was analyzed, considering only users who accessed Facebook daily, regardless of the generation. The result of this analysis is shown in Figure 3.

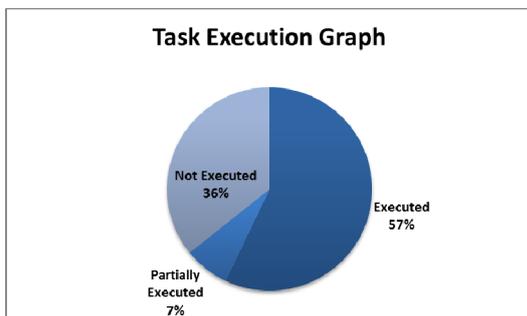


Figure 3: Graph showing task performance of users who access Facebook daily.

When separating users solely by weekly dedication to Facebook, the percentage of performed tasks drops from 67% (Figure 2) to 57% (Figure 3), if compared to Generation Y. It is thus possible to conclude that, in this sampling, the amount of time dedicated to Facebook does not necessarily determine the user's knowledge and ability in employing privacy settings.

4.3 Redesign Solutions

Although tool redesign solutions are not the focus of this study, a few considerations are presented in this section.

Observing task performance allowed for the identification of a few usability problems in features for managing privacy, including the location of these features, which are dispersed through the Facebook interface, and names and descriptions, whose purpose is unclear to the user. These shortcomings hindered the performance of Tasks 3 and 4. The centralization of privacy settings, as suggested by a participant, might be a good alternative for improving the usability of these features. The user would not have to scour the webpage searching for settings that are distributed across the interface. The settings attributed to pictures, for instance, must be changed on the photo album where they are inserted. Privacy settings for personal information, additionally, must be changed one by one. Therefore, the user may find the settings reunited and classified in different submenus within the Privacy Settings, which would provide flexibility to the system, since each setting can be adjusted centrally or locally.

Users had trouble completing Tasks 2 and 3, as observed in the fact that, out of twelve participants, only two completely executed the tasks, shows that these options presented usability problems and are unclear to the user. In the case of Task 2, which requests that the user change privacy settings so as not to allow his/her Facebook profile to be accessed by a search engine, such as Google, the participant should turn off "Public Preview", available in the option "Ads, Apps and Websites", described as settings manager for advertisements, applications, games and websites, in Privacy Settings. The title and description of these options should be modified in order to clarify that this manager includes settings related specifically to search engines, in addition to settings for websites in general.

Task 3, which asks the users to view their profile the same way a friend and the general public can view it, should be performed by using the option "See how...", located in their timeline. This feature simulates different views and allows the user to check what his/her friends and the general public can see his/her profile. The term "See how..." was not an appropriate choice of words for describing the feature, for it is possible to interpret it as a help option with tutorials that allow the user to "see how" to change whichever setting.

In December 2012, after conducting these tests, Facebook presented a new feature for managing user privacy, called "Privacy Shortcuts". This menu centralizes a few privacy options (as suggested above); however, it does not encompass enough, and many important settings, such as viewing pictures or

profile information, are not contemplated in this shortcut.

In a positive light, this new feature highlights the option “See how”, which was necessary for completing Task 3 (which was executed by only two out of twelve research participants) and is crucial in verifying what is being shown to or hidden from friends and the general public. In addition to the new feature “Privacy Shortcut”, Facebook also changed the nomenclature of privacy options/submenus, rendering them clearer and more accessible to users. This modification is in line with what was suggested as an alternative to decrease difficulty of performing Task 2. It is worth highlighting that these shortcuts were not yet available when this study applied the task guideline to research participants.

5 CONCLUSIONS

The purpose of this study is to investigate how users belonging to Generations X and Y understand and employ privacy control features on Facebook and, consequently, whether these features correspond to the users’ expectations. The difference in the number of tasks successfully performed and the difficulty observed during the performance of these activities showed that the social network’s privacy settings are not easily understood by either generation.

This article discusses situations in which the usability of tools must be improved in order to mitigate trouble found by users, especially those belonging to Generation X, in the privacy settings of personal information and posting. As previously mentioned, test analyses conducted with this sample revealed that an important difference between generations lies in the behavior facing unknown tasks. Users from Generation Y found it easier to search for privacy settings when these were unknown, for they felt more instigated and sought different paths in attempting to execute the task. Conversely, Generation X users found it harder to succeed in the same situation and gave up trying to execute the task.

Another aspect that differs both generations is that users from Generation X access Facebook less often than Generation Y users; therefore, they dedicate less time to attempting to understand setting details. Centralizing privacy settings could minimize this difficulty.

As observed, although most users answered that they managed to perform all or almost all the setting tasks requested in the tests, the interaction videos

showed that many of them were not completed. Some participants managed to access a feature without completing the required setting. This fact also showed that the feature lacks clarity, for it did not inform the user that a setting was changed.

The study also noted that people from Generation Y showed less concern in managing privacy settings, especially regarding their pictures. This occurs because people belonging to that generation share a much larger volume of information from a different nature and are aware that, besides their friends, their parents, grandparents, employers and teachers are also online. Users from Generation X tend to share only that which they consider inoffensive to their image and personal security, precisely because, in most cases, they ignore or have trouble with security settings. However, when applying the questionnaire, researchers observed that users of both generations are still surprised that content about themselves, which they believed were private, are accessible to everyone.

In order to shorten the gap between users of different generations, Facebook could adapt the interface according to the user’s age. Therefore, some settings would be highlighted for older users, showing more details about the purpose, as well as importance, of each feature.

Furthermore, pre-set profiles could be used according to different levels of privacy. Users would be free to manually adapt their privacy settings according to their needs or choose among existing types of profiles. Each profile type would have pre-established settings for each personal information and posting, using the nomenclature that describes these levels of privacy, such as: “public profile: all your personal information and what you share will be visible to everyone who accesses your profile”, “moderate profile: only your friends can see your personal information, but your posts can be seen by everyone who accesses your profile”, “private profile: only your friends can see your personal information and your posts”.

The methods used in this investigation allow researchers to identify various usability problems that complemented each other. It was also possible to observe the behavioral difference in generations facing difficulties in performing the tasks. There were a few difficulties in applying the tests, including lack of collaboration of various users, who preferred not to participate in usability tests when they were informed that a software would be used for recording their interaction. Even after reading the consent form and the explanation about the safety of

the procedure, they remained skeptical and decided not to participate in the research. There were also technical problems with two malfunctioned videos, causing the participants to be disregarded.

It is interesting to note that many participants, after the test, requested instructions on how to manage the settings that they had not been able to perform during the tests. This shows that these settings are interesting to users but are not completely accessible to them, either because they are badly distributed on the interface or because their purpose is not clearly informed to the user.

The Facebook redesign system is recommended under the light of privacy improvements. However, the focus of this research is not to discuss solutions for usability problems. In general terms, the study underpins the importance of tools being used to warn users of the importance of controlling the privacy of their data and the risks involved in overexposure of their personal life. In this sense, recommendations regarding social networking privacy can be formulated, so as to contribute to the field of Systems Engineering and Human-Computer Interaction in the modeling system based on social networks.

Based on the methodology used and the findings reached by this article, a research study is being developed with the theme "Evaluation of usability of Facebook privacy settings with the use of personas". It is an extension of the current study and seeks to employ the concept of personas as a method for evaluating usability. The use of personas allows the investigation of other factors that may influence the way users interact with the system beyond their age group or generation, such as educational level, economic status, and other social aspects. Thus, the aim is to evaluate mechanisms designed by Facebook for users to manage their data privacy, as well as to analyze the difficulty that different types of users may encounter regarding these mechanisms.

Future studies will also discuss other important points that strongly impact privacy, namely the destination of users' information after their death. Nowadays, social networks do not offer users any options to determine the destination of their digital legacy. Therefore, when a person dies, he/she leaves a profile posted with a large amount of information, pictures and videos. This digital property becomes unmanageable when the owner of the account is dead, in case it is not visited by anyone who has access to the account or deleted after notification of the user's death. In both cases, there is a series of implications.

This article initiated a debate that is paramount

for users belonging to both generations to satisfactorily enjoy the benefits of social networking communities without feeling unsafe about sharing details of their personal life with other people. It is crucial that social networks offer features that are user-friendly and unquestionably clear, so that these users may express their preferences regarding privacy of each piece of information and posting.

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