ENHANCING PHOTOWARE IN THE SOCIAL NETWORKS ENVIRONMENT

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Abstract: This paper presents *SMIL PhotoShow*, an authoring tool for photo books, which allows the creation of enhanced multimedia presentations, enriched with audio (music or spoken) comments, transition effects and animations in a very simple way. Our tool allows to create a digital counterpart of a printed photo book with the aim to bridge the gap between digital web albums and printed photo books. Since authoring a photo book is a time consuming activity, *SMIL PhotoShow* provides the users also the possibility to create, with only three clicks, an engaging slideshows with transition effects and background music.

1   INTRODUCTION

With the introduction of digital photography, the number of pictures taken has deeply increased, but the number of printed pictures did not. This problem deeply affects this market and is essentially due to the fact that the huge number of photos requires a lot of time to manage them: a picture can be saved, printed as is, arranged into a more interesting photo book or shared through the web. Since all these operations require time, people tend to save them in a local folder and leave them for a period.

Printed albums are still considered the best way to archive photos (Frohlich et al., 2002; Frohlich et al., 2008), but can be used only to share memories between family members and friends who are *in the same place at the same time*. Unfortunately, the real life is often different, and families and groups of friends are spread in different cities and countries. This is one of the reasons for the success and diffusion of social networks, e. g., Facebook. Nevertheless, the way Facebook and other social networks manage the photos is still insufficient especially for what concern the possibility to arrange pictures into a layout: the same Facebook's timeline is a first attempt to give the users the possibility to arrange pictures into a layout to better represent themselves.

Slideshows of images synchronized with an audio comment, in which the user descrives the pictures can be a partial solution, but the authoring of such a presentation is still a complex and time consuming activity, and software that can be used to create a printed album does not allow to create also a digital counterpart which can be shared into a social network.

Therefore, to the best of our knowledge, there are two possibilities to show pictures to other people and discuss on them:

- *in presence*, with the help of a printed photo book. In this case, the quality of the product offered to the users is high, but the authoring activity is complex and highly time-consuming;

- *on line*, with the help of features offered by social networks to share pictures and discuss on them. In this second case, the quality of the product is very poor, but pictures are quickly and easily uploaded.

Our goal is to provide an easy-to-use tool for sharing on line pictures in a more involving way, thus filling the gap between social networks and photo book authoring systems since many users still consider photo books as the best way to archive memories, but they cannot be shared on line. Therefore the possibility to enhance their digital counterpart with animations, transition effects, music and spoken comments, which can be shared through the network, is interesting.

Moreover, another motivation for this work is that Frohlich and Fennell (Frohlich and Fennel, 2007) define audio commentary as one of the key functionalities to be implemented to improve the sharing of experiences depicted in photos.

This paper presents *Smil PhotoShow*, a prototype authoring tool which allows to create simple slideshow and complex animated photo books. Our tools fills the gap between digital web albums and printed

photo books. The idea is to give the user an application to create, at the same time, a photo book for later printing, and a multimedia presentation to share with friends, not only the taken pictures, but the experiences they told. For this reason, we implement a tool fully integrated in Facebook, since this social network is the place chosen by many Internet users to share experiences, pictures and, more in general, piece of their life. The goal is to allow users to appreciate the result of their work but also to have fun during the authoring activity, since users can enjoy and share with friends even the experience of creating a photo book.

Our tool gives two choices: the user can create an animated slideshow, enriched with audio comments and music, in very few clicks, or spend more time to author a more sophisticated photo book enriched with animations, transition effects, spoken comments and music. The photo book is also translated into a pdf file to be printed.

2 RELATED WORK

Other works in literature consider the problem of managing photos. We can classify photo tools in three classes: Photo Management Systems (PMS), Photo Book Authoring Tools (PBAT) and the Photo sharing tools (PST). PMSs allow to browse, date, geo-localize, tag and organize pictures into folders or albums. Their goal is to help the users to organize pictures or to find a set of images among a collection. Sometimes they provide also photo editing tools.

PBATs organize photos into photo books for printing. They usually help the user in this activity trying to automatically create the photo book filling the pages with pictures taken in the same place, or with the same person, etc. These tools usually provide a digital preview of the obtained result that cannot be shared through the Internet. Finally PSTs allow to share pictures with friends through the web.

Examples from the first class are, among others, (Ryu et al., 2011) and (Gomi and Itoh, 2011). Ryu et al (Ryu et al., 2011) create a photo management system which allows to automatically cluster photos on the basis of user preferences and provides tools for summarized visualization. Gomi and Itoh (Gomi and Itoh, 2011) implement a photograph web browser to cluster and navigate collection of pictures on the base of location, time and person tagged in the photos.

Sandhaus et al describe the process of photo books production as a complex activity divided in three phases: the capture phase, the author phase and print phase (Sandhaus et al., 2008). The authors identify the second phase as the most time consuming and an-

noying activity. "Many for one" (Boll et al., 2007) is a tool that automatically arranges the photos into templates for printing. Moreover it enriches the photo book by inserting interesting related information (e. g. a text or pictures from a travel guide).

Flickr and Facebook are examples of the third class of tools. The experience of users sharing photos through web communities has been studied in (Cunningham and Masoodian, 2007) and (Frohlich and Fennel, 2007). They both highlight that interacting with a web album must be more appealing to be really enjoyable for users.

These classes are not completely separated, e. g. Apple iPhoto, is a PBAT which contains also some feature of the PMSs, because it allows to tag and classify pictures. Google Picasa is a PMS which allows also to share web albums with friends.

Storytelling is another means of conveying personal experiences through digital photos which shares the same scenario described above: Storytellr (Landry, 2008) is a system that integrates tasks of the storytelling process with photo activities like annotation and arrangements. PhotoArcs (Ames and Manguy, 2006) allows to add narratives to web photo albums. The photos are organized into linear arcs connected by text information. Different narratives may intersect creating multiple versions of a story.

Some works cope with the problem of non-existing connection between printed photos and their digital counterpart. Gaggi and Ghidoni made a first step to allow users to create printed photo books and enriched multimedia presentations with the same tool at the same time (Gaggi and Ghidoni, 2010). They arranged pictures into predefined page layouts which contains also animations and transition effects. The tool gives as output a PDF file for printing and a SMIL presentation, but the latter cannot be integrated into a web page, and SMIL players are not commonly available in the users PC. For these reasons, this tool does not allow to share animated photo books into the web, but it requires a SMIL player.

3 SMIL PHOTOSHOW

SMIL PhotoShow is an authoring tool for animated photo books fully integrated in Facebook, since this social network is the platform chosen by millions users to share pictures and personal information. To improve the user experience during authoring activity, we propose two possibilities: the user can quickly create a slideshow of pictures, or a complete photo book. The idea is to address two different requirements:

1. the need for an easy and really quick way to share

pictures which is more engaging of a simple web album (animated slideshows);

2. a tool to author photo books to be printed, but that can also be shared inside the network.

The first operation requires three clicks and less than a minute, to select pictures (from Picasa or Facebook), transition effects, and to uploads a background music. If comments or caption are associated to a picture, they are visualized in parallel with it.

The second operation is more complex and time-consuming, but provides a more engaging result. *SMIL PhotoShow* provides a basic set of features to create a photo book. It allows to create a new photo book or modify an existing one, to import photos from Facebook or Picasa Web Albums, to add or remove a page, to modify the layout of a page and add pictures and text comments on it. Moreover it allows to add a background image to a page, a music or a spoken comment to the multimedia presentation of the photo book, and to generate a PDF file for later printing.

The system provides a set of predefined page layout which can be filled dragging the pictures from a panel and dropping them in the selected frame. If someone is tagged in a picture, the system automatically add a comment with this information in the nearest text box. Each page layout may contains animations and transition effects. Page layouts with transitions are denoted by a star icon, and the presence of animations are denoted by a triangle to help the user in the selection (see Fig. 1). Moreover, the tool provides a set of predefined background images which can be used instead of a picture of the user.

The system provides two outputs for each created photo book: a PDF file for printing and a multimedia presentation, which shows all the pages of the photo book, one at a time. The user can choose the interval of time during which a single page remains on the user screen, while the background music plays. Each page plays animations and transition effects of the chosen layout. Both slideshows and photo books can be published in the user wall, or share with friends.

Since the reason why many users do not create photo books is the time needed for this operation, we think that the slideshows can be a way to interest users to get a more sophisticated results: animated photo books differ from slideshows for the introduction of page layout and text comments. If the user like the animated presentations created with the slideshows, she/he can decide to spend more time to get a better result. The assumption that users prefer activities which give them a better result even if they require more time is supported also by the fact that photo books production is increasing better then the total number of printed pictures. As an example, CeWe
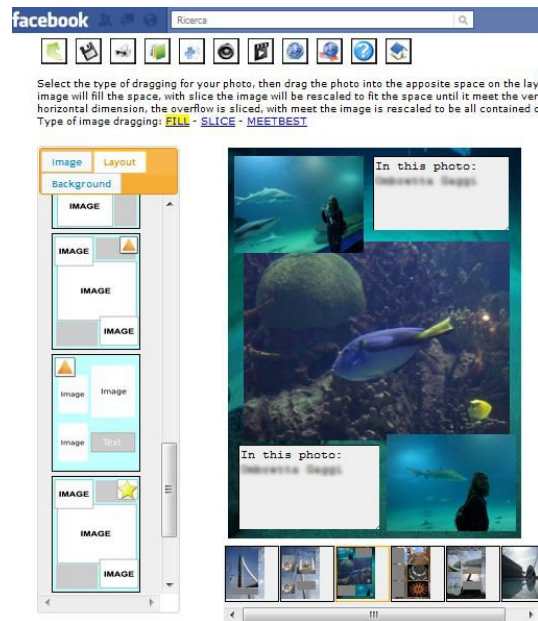

Figure 1: A screenshot of the authoring interface of *SMIL PhotoShow*. The text comments were automatically added on the base of the tags of the pictures.

Color produced about 4.3 million photo books in 2010 and this production has increased by 19% with respect to 2009 and by about 38% with respect to 2008, while printed pictures increased only by 4.6% in the same period (CeWe Color Holding AG, 2010).

3.1 System implementation

The system is composed of two modules, *Smiling Web*, a SMIL player (Gaggi and Danese, 2011) and *SMIL PhotoShow*, an authoring tool fully integrated in Facebook. *SMIL PhotoShow* contains the server-side application, implemented using the PHP language, and the client-side user interface, developed with the JavaScript language.

The server-side application uses the JSON format to exchange data with Facebook, e. g. data about the user, her/his friends, and photographs, or data about photo books and slideshows, and is encapsulated in the social networks pages through an iframe. It stores data about photo books and slideshows, e. g., date and time of creation, author, URLs, etc., into a SQL database. To address privacy issues, the database managed by our tool does not contains pictures, tags or comments of the users, but only a references to them. In this way, these objects are not exposed, but can be accessed only inside the social network by users with a proper account.

For each photo book or slideshow created, *SMIL Photo Show* creates an XML file for internal use,

describing the element's structure, i. e., number of pages, the selected pictures, layout of each page, etc. Then, the XML file is translated into a SMIL document containing the multimedia presentation, or into a PDF file for printing. As discussed for the local database, the XML files and the multimedia presentations do not contain tags, pictures or comments in order to address privacy issues. This is not true for the printable photo book, which is a PDF file. Therefore, to protect his/her privacy, the user can control access to this file.

Facebook Graph API are used for the connection to the social network and to retrieve data about the user, his/her albums, photographs and friends. Moreover the social plug-in Comments is used to allow discussion on the elements and the "I like" button. Photographs from Google Picasa web albums are accessed through Zend Framework. The PDF version of the photo book is created with free FPDF library.

The client-side application is implemented in JavaScript and manages the user interface, e. g. the available buttons, the drag and drop operations to change the layout of a page, or to fill a predefined layout with photographs. We paid particular attention to make the tool works with all available browsers, to be adaptable to user preferences. Animated photo books and slideshows are played with *SmilingWeb* (Gaggi and Danese, 2011).

4 USER EVALUATION

SMIL PhotoShow has been published at the end of July, 2011, and it was used by 60 users: we invited 18 users to try the application, the others has found it by themselves. The users have created more than 50 elements (i. e., photo books and slideshows)[1] of different sizes, e. g., the number of pages of the photo books ranges from 5 to 15. We ask the users to evaluate the tool and give feedbacks through a questionnaire. 18 users answered to our questions.

The user study allows us to evaluate the tool, but also its suitability to the target audience and the possible impact on the users' choice among different authoring tools and web communities for photo sharing. The goal was to assess the interest of potential users in adding sound comments, animations and transitions to standard photo books and the degree of user-friendliness of the system for non expert users.

The 18 users who answered to the questions were between 20 and 40 years old, selected both between

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[1]The system does not keep trace of the slideshows and photo books which has been deleted.
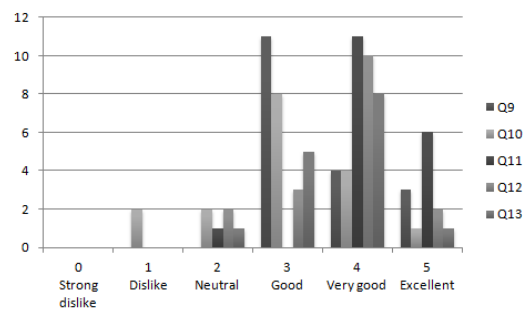

Figure 2: Answer to question 9, 10, 11, 12 and 13 of the questionnaire.

students of Computers Science degree and ordinary people. We asked them to create a photo book and a slideshow and to answer, anonymously, to 17 multiple choice questions. The questions deal with the user degree of expertise in using applications for photo book editing and photo sharing, their interest in the application, the quality of the experience made with *SMIL PhotoShow* and the obtained results. The users rate the answers on a scale from 0 to 5 (0 = "strong dislike", 1 = "dislike", 2 = "neutral", 3 = "good", 4 ="very good", 5="excellent"). A last open question gives the possibility to express additional remarks.

The questionnaires revealed the following insights. The result was positive, since 56% of the users have declared to prefer an application that produces as output also a digital animated photo book respect to authoring tools which allow to create only printed photo books. If we better consider our audience, the majority of users declare they had used at least once a program photo sharing (94%), but only 39% of them have used an authoring tool for photo books. Their degree of expertise is rather low since only 2 users declared to have created more than 5 photo books in their life. Even if our audience probably reflects a picture of the general population, we must note that, in many cases, our tool is their first experience with photoware tools, and so they do not have experience of time needed to create a photo book. This means that they maybe cannot completely appreciate what our tool provides more than the others. Therefore, 56% is not a low percentage: we note that the users that have declared a higher experience, also give a higher evaluation to our tool.

The users reported a good experience in using *SMIL PhotoShow* since all of them rated it with 3 or more points (mean 3.6, standard deviation 0.7, in Figure 2, the answers to this question are labeled by "Q9"). Moreover, 67% of the users have declared they will use our application to share pictures with friends.

The users preferred the animated photo book (mean 3.6, most frequent value 4, series "Q13" in Fig-

ure 2) to the printed version (mean 3, most frequent value 3, series "Q10" in Figure 2): only a user evaluated the animated photo book less than 3.

Users have highly evaluated the relationship between the quality of the result and the effort to get it. This is particularly true for slideshows which were rated with a score less than 4 (equal to "very good") by only one user (slideshow: mean 4.2, most frequent value 4, see series "Q11" in Fig. 2; photo books: mean 3.7, most frequent value 4, see series "Q12" in Fig. 2), maybe because slideshows require only 3 clicks to be created.

Finally, some users reported that they highly appreciated the simplicity of use of the tool.

5 CONCLUSIONS

In this paper we have presented *SMIL PhotoShow*, an authoring tool for photo books production which allows the creation of enhanced multimedia presentations with audio comments, transition effects and animations. The photo book can be printed as a classic photo books or shared through the web.

The main result of our system is the integration of the *storytelling* paradigm into a software for photowork. Since authoring a photo book is considered by many users a time consuming activity, we test if the integration of activity into the social network environment can help. Since millions users use Facebook to share photos and memories, we choose to developed our tool as a Facebook application. The user study has shown that 67% of the users declared they will use our application to share pictures with friends, therefore we can argue that the integration of photoware tools into the social network paradigm can help this kind of activity.

Moreover, the users have expressed very positive comment on the slideshows and their narration, thus the integration of the storytelling approach in the social networks environment was appreciated. Moreover, our study shows that the possibility to create, in a very simple way, a simple photo composition, can encourage users to spend more time in photoware activity to obtain a better result.

Future works will be devoted to improve the set of features of the authoring tool, by adding support to geolocalization of photographs and suggestions of pictures to include. Moreover, since our goal is to improve and facilitate the authoring activity in order to lower time it requires, we aims at providing a tool for collaborative authoring of photo books with which a group of friends can select and insert together photos, comments and music.

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