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Collaborative Storytelling for Sharing Digital Photos in Offline Communities

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Abstract

With the emergence of smart devices, taking photos in offline communities has become part of everyday life. However, photo sharing demands additional effort and is generally performed only by highly motivated people. We suggest storytelling as a way to trigger and sustain photo sharing within an offline community. In this project, two observational pilot studies envision how storytelling empowers community members to share their digital photos. In the first study, we observed that creating a story on a large photo wall drew the attention of a community and that some members actively participated by adding more photos and narratives. We then interviewed both active and passive members and concluded that scaffolding storytelling tasks would help more people to participate. In the second study, we conducted a group workshop on utilizing a 4-frame cartoon format when creating stories with digital photos. Using the format, participants easily learned what to do and collaborated with each other to complete a series of stories. Based on the studies, we conclude with design implications for implementing a system for sharing digital photos via storytelling.

digital photo; photo sharing; storytelling

With the growing number of smart devices, taking photos of each other in an offline community has become common in everyday life. Sharing community photos is meaningful because it helps to preserve memory and aid recall (Balabanović et al., 2000), as well as enhancing a sense of community (Cheverst et al., 2005). However, the act of photo sharing is separate from the act of photo creation (Nov & Ye, 2009), so there are several challenges to overcome when gathering digital photos from community members.

First of all, transferring photos from devices has been pointed out as a bottleneck of photo sharing (Ames, Eckles, Naaman, Spasojevic, & Van House, 2010). Although technical advancement lowers the burden to upload photos, browsing a vast set of photos to pick ones

to share still requires additional user effort. In particular, compared to traditional photo collections, digital photo collections are enormous, causing people to feel overwhelmed and leading them to organize fewer photos (Van House, 2009). Therefore, tremendous photos remain unorganized in personal devices, and few are shared.

Motivating members to share photos is another important concern. Nov and Ye found that the number of photos has a negative correlation with the quality of photos in an online SNS (social network service), Flickr (Nov & Ye, 2009). In other words, people who upload a small number of photos tend to share only photos of high quality. This implies that some members would filter their photos to share at their own personal discretion. These members may have photos of a certain quality, looking nice enough to be shared, but are simply not motivated enough to share them. Attracting these hidden, quality photos would be another key to successful digital photo gathering.

In this paper, we introduce how to apply storytelling to digital photo sharing, triggering and sustaining photo sharing in a community. Based on a theoretical background in motivation, we conducted two observational studies to see how storytelling-oriented photo sharing helped people to gather scattered photos within a community and to understand how using a format to could ease their participation.

Photo Sharing via Storytelling

Storytelling is one possible way to engage members to naturally share photos in the form of co-creation, rather than individual content sharing. Balabanović, Chu, and Wolff observed that people who are sharing photos alternate between two styles of storytelling: photo-driven and story-driven (Balabanović et al., 2000). According to their observation, people tend to connect and gather photos in relation to each other for story-driven storytelling; on the other hand, they focus on explaining each photo for photo-driven storytelling. When a story comes to one's mind, the search for related photos begins.

Theories of motivation also would explain how storytelling will impact photo sharing. Due to its creative nature, storytelling with photos may be accompanied by intrinsic motivations such as fun and enjoyment, allowing for an immersive experience. In addition, storytelling is a natural social use of photos (Van House et al., 2004), driving extrinsic motivation for social values (Ryan, 2000).

We expect that storytelling enables people to consider digital photos not just as files but as materials to build a story. In particular, offline community members have a shared awareness of one another and mutual experiences, which implies that they have which innately have stories to share. Storytelling with digital photos would become another special community event in its own right.

Do People Gather Photos for Storytelling?

To understand whether storytelling can attract offline community members to gather photos, members of a university department were asked to freely and asynchronously create a story with digital photos. The department included 256 total people, including students, professors, and other staff members.

We decided to use physically printed copies of digital photos to ease the storytelling process and to draw more attention among the community. During the storytelling process, we observed how people gathered photos for storytelling. We then conducted semi-structured interviews with both active and passive members to understand how they made their decisions on participation.

Setup

In the student lounge in the department, we set up a photo wall on which people could post printed photos and write narratives. The photo wall, made of black paper foam board, was 3.6 m wide and 1.2 m long. Next to the photo wall, we installed a photo printer for smartphones to allow people to easily send and print their digital photos. The printer we used could receive the photos through a Bluetooth wireless network, and it took 40 seconds from sending to printing. The dimensions of the printed photos were 50 mm by 76 mm. To help people add explanations, comments, and decorations to the photos, we provided stationery, colored pens, and sticky notes. We recorded the photo wall with a CCTV (closed-circuit television) camera for six days to observe and analyze people's behaviors (Figure 1).

Figure 1: Experimental setup to observe how people use the photo wall.

To initiate storytelling, we initially suggested a topic that all the department members would have an interest in. Since the photo wall was set up right after the department's annual party, we wrote "Let's gather photos of our annual party!" in the top left corner of the photo wall. Below this topic, we attached 10 photos to attract attention to the wall (Figure 2), showing exemplary uses of the photo wall.

Result

During the six days, 43 new photos were posted and many notes were added around the photos. Of these photos, 41 of 43 showed community members, and the other two showed a flower and an entertainer. Figure 2 groups the new photos by the time they were posted. The first 15 photos (marked white) were posted around the already provided photos, the next 15 photos (marked pink) were posted on the blank space that extended to the right side of the wall, and the last 13 photos (marked red) were spread out across the wall (Figure 2).

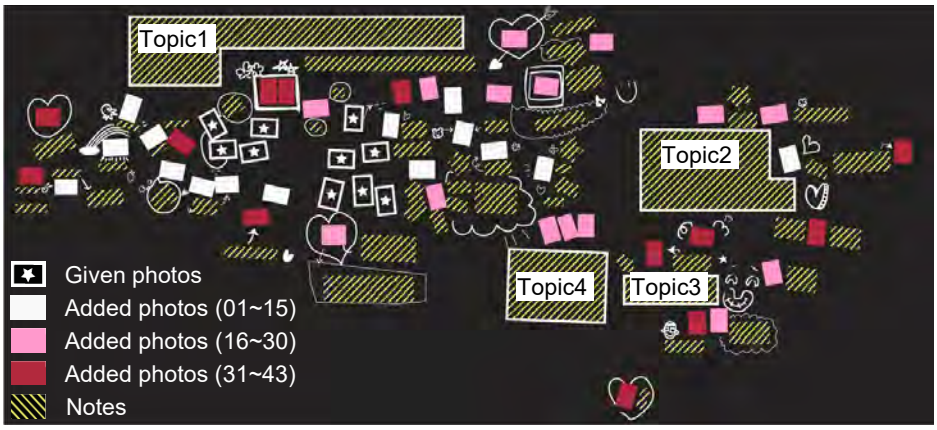

Figure 2: An abstract diagram of the photo wall made by the community.

Participants suggested three unexpected new topics. Although there was no clear boundary between the topics, relevant photos were closely located around the topic's title, which was written in big letters.

We manually compared the facial images of participants and found that there were 146 unique participants, more than the half of the whole population. Of these, 13 posted photos or notes, and the other 133 were viewers. We also found that a few active users made most of the contributions. The three most active participants posted 40.9% of the photos and 58.3% of the notes.

Figure 3 illustrates the number of added photos and the number of unique viewers per day. Over half (51%; 22 of 43) of the photos were posted on the fourth day. The highest number of viewers in a single day was 100, on the fifth day.

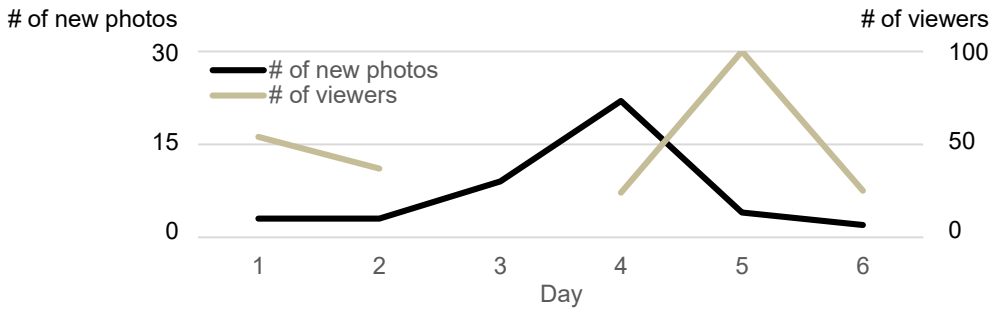

Figure 3: The numbers of actions by time: adding photos (black solid), and viewing (gray solid). The number of viewers in the third day is unknown due to the camera breakdown.

Qualitatively, we observed four types of participation: sharing photos, annotating, viewing, and taking a photo of the wall. To share photos, people printed their own photos from their personal devices and attached them to the wall. Rather than printing photos one by one, people tended to print several photos at once. Before attaching a photo, participants moved it around the wall to determine the best position. Annotating (Figure 4b) often went along with sharing photos. Annotating included writing descriptions (such as people's names) for the photos, drawing speech bubbles, or adding decorative symbols. An unexpected type of annotating featured suggestions of new topics, which in turn triggered others to share more photos on that topic. Viewing was the most frequently observed behavior (Figure 4c). People came to the wall alone or in groups. Viewers in groups often pointed to specific photos with their fingers while talking about the photos. Another unexpected behavior was taking a photo of the wall with a smartphone. One participant attached a photo, added an annotation to it, and then took a photo of the wall, focusing on her photo.

Figure 4: Types of participation: (a) sharing photos, (b) annotating, (c) viewing, and (d) taking a photo of the wall.

It is noteworthy that that all the members who participated in content creation were university students, young adults who are accustomed to using smart devices and wireless connections. Differences in fluency with information technology would separate the roles in collaborative storytelling. There was an interesting case of active interaction between generations: students asynchronously gathered several photos of a middle-aged staff member, showing their appreciation of him; then he actually visited the photo wall several times, noticing a growing number of his photos. The types of participation may differ with the age and occupation.

Interviews

We conducted semi-structured interviews with four participants to determine their motivations for participating and to understand how they recognized the photo wall. The interviewees were the participant who attached the most photos (P1), a participant who only made notes (P2), a viewer (P3), and a participant who took a photo of the wall (P4).

P1 said sharing photos on the wall was similar to sharing photos online. P1, who is a member of a photography club, often takes photos of friends and uploads them to Facebook. P1 said she did not worry so much about privacy of her friends because the wall, unlike SNS, was for members of the department who knew each other well. P1 especially showed interest in the photos she attached, saying, "I've wondered who made annotations on my photos." Regarding her motivation to share photos, she mentioned, "I was excited when

people started to add photos similar to mine," and continued, "that positive feedbacks perhaps made me share more photos."

On the other hand, P1 said that she was careful to locate her printed photos because she did not want to move or detach others' photos, considering the photo wall to be "our common work." P1 also said that she did not add new photos when she thought that the work was "almost completed." She commented, "I would add more photos and notes if there was more empty space."

P2, who only made annotations to the wall, said that he was interested in the wall but simply too lazy to print his photos. P2 added, "Anyway, the empty space around the photos of my friends drew me to write down what I know." The reminiscent aspect of collaborative storytelling (Frohlich et al., 2002) might motivate certain participants.

P3, a viewer, said that he had "no idea what to do." Although P3 thought looking at the stories on the wall was enjoyable, he did not have an idea to create a new story. He did note, "Perhaps I would make some notes if there was a photo of me." P3 also thought of the wall as a co-created artwork. He said that he has some nice photos and that he would be willing to share "if someone asked."

We asked P4 why she took a photo of the wall. She replied, "Although I have the original digital file of the printed photo, I wanted to remember that I attached the photo with lovely annotation on this wall." P4 also uploaded the photo of the wall onto her SNS. Her comment implies that photo sharing itself can become a memorable event.

Directions for Collective Storytelling with Digital Photos

Based on our observation and the interviews, we set some design goals to engage members to participate more actively in photo-based storytelling within a community:

1. specify photos desired for storytelling,
2. support emergence of new topics, and
3. remove spatial limitation.

Can a Format Make Storytelling Easier?

Considering the above directives, we decided to use the 4-frame cartoon format for photo-based storytelling. The cartoon format consists of four squares, which represent four scenes in a row. Simple, short stories in the 4-frame format are easy to understand and even to create. Providing a format could work as scaffolding, making explicit the component tasks of storytelling and, in this case, helping more people understand what to do. It was claimed that making tasks more visible increases the likelihood of contributions within a community (Kraut et al., 2012). In addition, providing formats makes storytelling more scalable by defining a manageable unit for each story. Therefore, the collective storytelling would be adaptive for diverging topics.

We conducted a workshop to see if people understood the 4-frame format and would participate in photo-based storytelling by using it. Participants were asked to make 4-frame format stories using printed digital photos. Here, we also used physically printed digital photos to make photo manipulation easier and to aid concentration on the story.

Procedure

We recruited three groups of three participants from a hobby club, a religion club, and a college department, respectively. We provided formatted frame sheets on which they could write a title (at the top), attach four photos (in the middle), and write comments (below each photo). To create stories, participants used a laptop and the same photo printer used in the previous study. To save time and come up with initial ideas, each team prepared at least ten photos prior to the workshop. After explaining the 4-frame format and giving instructions for use of the photo printer, we asked them to freely make stories with the 4-frame format for an hour.

Result

During the one-hour workshop, each group started with 17.7 photos, printed 27 more photos, and created 11.3 stories on average. The types of topics were varied: describing characteristics of a specific member, explaining a group identity, or illustrating a sequence of events.

In contrast to the stories on the wall, some of the stories were purely or partially fictional. Figure 5 shows an example; the first three scenes consist of photos in their real sequence, but the participants added a hand drawing for the last image. Since the use of drawing instead of photos was never mentioned by researchers, participants may have been influenced by a stereotype of cartoons in the 4-frame format.

Figure 5: An example of a hand sketch replacing a photo (translated into English).

A series of parodies emerged in all three groups. After an attractive plot appeared (Figure 6a), another participant created a parody by using a similar flow with the same photo at the end and adding a sequential number to the original title (Figure 6b).

Figure 6: An example of parodying: (a) the original story and (b) a parody (translated into English).

During the workshop, every group showed collaborative behavior. At first, the participants tended to create their own stories; however, as the workshop went on, they naturally collaborated, and each person had his or her own role. For example, one group member outlined a story and wrote notes, another kept searching for photos, and the third printed photos. Collaborative actions include proposing a new story (Group 2, "Why don't we start a new story with these two photos?"), asking for help (Group 3, "Have you ever seen a photo that fits in this scene?"), and modifying an existing story (Group 1, "How about replacing that photo with this?").

In some cases, the participants came up with ideas while looking through the photos, and in the other cases, they first outlined a story and then looked for the appropriate photos. Browsing photos and creating stories were not separate activities. This finding is in the line with Balabanović's definitions of photo-driven and story-driven storytelling (Balabanović et al., 2000).

After the workshop, we had a brief survey regarding story creation. Using a 7-point Likert scale in which 1 is the most negative response and 7 is the most positive response, participants said they easily understood the 4-frame format (average: 6.2) and were interested in making stories (average: 6.3). One participant mentioned that "I truly want to show my cartoons to the main characters. They would love it." Another participant said, "The stories we made would give more fun and meaning to the community members than non-members, because we know each other deeply and share the context of the stories in detail."

Design Implications for Photo Sharing with Formatted Storytelling

Based on previous studies, we inferred the design considerations for implementing a system to support 4-frame storytelling of digital photos of a community. A system would have the form of an online service to share digital photos on mobile devices and the Web or a large, public display in the community.

1. Show a specific guideline to drive participation.
2. Support both story-driven and photo-driven storytelling.
3. Make the system adaptive for diverging topics.
4. Allow participants to ask each other for help.
5. Encourage participants to be inspired by one another.
6. Return feedback to the original contribution.

Conclusion

We conducted two observational pilot studies to understand how storytelling works for photo sharing within a community. We first found that collaborative storytelling actually enables community members to gather photos from personal devices. Starting with only a few exemplary photos with annotations, the movement of storytelling arose from community members and attracted the interest of a large portion of the community. We then investigated the use of a format for storytelling to clarify the required tasks and to make it generally understandable. Using a familiar 4-frame format creates a clear mutual goal, encouraging participants to ask each other for help. In addition, defining the unit of a story makes collective storytelling more scalable. For future work, we will implement a system to support community storytelling and investigate how storytelling works for photo sharing in the long term.

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