A Case Study on Interactions with User Contributed Website in a Public Space

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Abstract

In this paper, we show our pilot study on Web interaction in public spaces. We now usually access to the Web personally in our office or home, but we think we will soon use the Web communally in public spaces in near future. To reveal the principle of such interaction with user contributed Websites, we developed an event and a system. This paper describes the outline of the event and the system, and the analysis of the practice.

Keywords: Web Interaction, Public Spaces, User Contributed Website, Media Art.

1   INTRODUCTION

The World Wide Web is now a part of our daily lives. We get and put various kinds of information from/to the Web every day and every time. With not only explicit use of the Web but also implicit use through Web-based systems, the Web will become more and more common and necessary in near future.

Currently, it might be usual that people access to the Web *personally* from their offices and homes. We aim to reveal the principle of Web interaction in rather *communal* use. Yes, we now share information on the Web usually, this can be said communal. But we think communal interaction such as a large display in a physical space where people gather will be more common in near future. For example, consumers' impressions on some item will perhaps be displayed on street advertisements. In addition to marketing or business use like this, it can be a media of citizens' expressions. People may display their works on screen on a street through the Web.

While the Web is only a technology for information transfer, people's contributions are quite important in fact on the Web. A concept of "Web 2.0" is now widely accepted [1]. People's activities on the Web will help other people. So, how do people contribute to the Web in public spaces? How do people interact with it? There are two types of interaction; interaction with people there and interaction through the Web.

In this research, we developed a Website, installed it to a university campus, and analyzed the case of it. The Website collects and displays people's posts, each of which consists of a photo and a text message, through people's mobile phones at the venue. It was displayed on combined four screens attached on windows so that people walking around there naturally find it. We also developed a campaign to explain and promote the Website for a week there.

This paper is organized as follows: After describing related works in the next section, we explain our practice and its system called *iii-Engawa*. The results and discussions are shown in Section 4 and we conclude this paper in Section 5.

2   RELATED WORKS

This work is to analyze Web interactions in public spaces. As we mentioned above, this can be said to be communal access, regarding common Web access in office or home as personal one. Not just reading Web contents, Web interaction here includes active participation like posting information or discussing with other users. There are a personal/communal axis and an active/passive axis in Web interaction. Our target can be mapped to the communal-active quadrant.

Passive Web accesses are not rare; our daily Web uses are rather passive. But there is an especially passive work. Watanabe proposes an interface called PersistentInterface [2], which presences continuously so that a user is able to "observe it". His prototype system presents both user's memo and automatically combined and generated memo.

One of representative work analyzing active uses of the Web is Matsumura's one. He analyzed the biggest Japanese BBS Community 2channel using text mining techniques [3]. Now there are many systems where people publish and share their contents, such as Flickr [4] and YouTube [5]. In these systems, individuals post their contents separately, and then the contents are listed and linked based on tags, categories or something. In our target systems, contents are created and posted in shared place, so they are expected to be connected and related to other contents before published.

As described above, we are now usually using the Web personally. There are several works on multiuser Web use [6][7], but in most of them, users access to the Web separately. While there are cases of multi-person interactions on the Web and presentation/visualization of the Web in the real world, expressing and posting in public spaces are not well analyzed. There is a practice of communal Web creation in media arts; "The World's Longest Sentence" by Douglas Davis (1994) is one of the earliest Web-based art projects. People posted their own words to the Website, and then the words combined to a very long sentence [8]. This is said to be the first Web-based collaborative sentence, but the interactions among people are not held at the venue. We can find examples of multiuser direct interaction in games. Now it is getting popular that people gather and play video game sharing a large display. Some of consumer game machines now equip network connection. This can be a seed of communal Web interaction by physically gathered multiple users.

3   III-ENGAWA

For the purpose of observing what people post to and how interact with Websites in public spaces, we developed a user contributed Website and actually installed it into an open environment. In this section, we describe about this event named *iii-Engawa* and the system.

3.1   EVENT OUTLINE

The event was held at a new hall in the University of Tokyo in Japan, which was built on March, 2008. We named the event *iii-Engawa*. "*Iii*" is an abbreviation of "Interfaculty Initiative in Information Studies," the department moving into the hall. We mean by "*Engawa*" as follows: First, the walkway along the hall, which is covered by the eaves, looks like Japanese traditional veranda *Engawa*. Second, Japanese sentence "*en*-ga-*wa*," which means "*en* is *wa*" or "*en* becomes *wa*." "*En*" is "connection" and "*wa*" is "circle," so the sentence means something like "connections form circles."

A post entry in the event/system is a pair of a photo and a text message. The theme for posts is <環>. Participants may freely interpret the theme. This Chinese character has several meanings like circumstance, circle, and round, and used in Japanese words like environment and *iii*. Or daring to ignore the meanings, participants may use its speech sounds, "wa" or "kan."

The event was organized in following three phases:

Phase 1 22nd February through 4th March, 2008.
Participants can post entries through e-mails. No feedbacks, no display.
Phase 2 5th March through 20th March.
Participants can post via the Website. Past entries can be browsed in a list view.

Photo 1: Scenes from the campaign and the system installation.

Phase 3 21st March through 28th March.

Campaign was run in the university campus. Staffs invite people to participate. Participants post entries via e-mail using their mobile phones at the venue. Shower-style view of the system was projected on a large screen.

The campaign of the phase 3 was held at the "Engawa" of the hall, i.e., the walkway. The system is projected from inside of the hall onto screens attached to the windows, and participants see it from the outside. Screens have approximately 2.4m (8ft) width for each and four screens are combined. Photo 1 shows scenes from the campaign and the system installation.

Figure 1 shows the users' actions in each phase and the relation to the system. About the detail of the system, we describe in the next subsection.

3.2 SYSTEM OVERVIEW

The system installed in the event consists of following three parts (See Figure 1):

- Posting functions
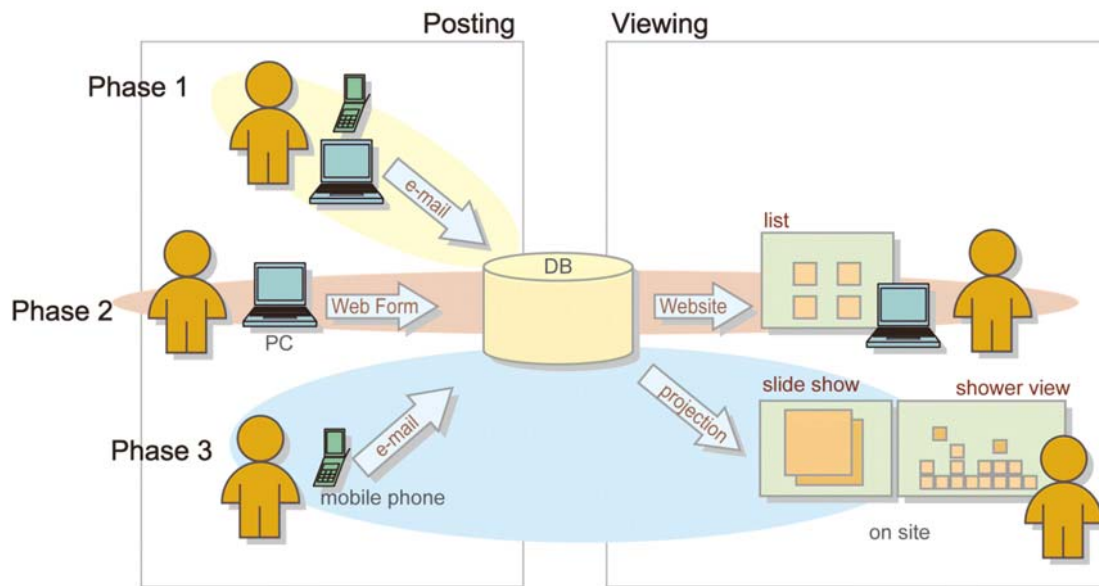 - E-mail receiver
  - Web form

Figure 1: Outline of the system use case and its architecture.

- Presentation functions
  - List view
  - Slide show view
  - Shower-style view

- Database and data managing functions

3.2.1 Posting Functions

There are two subsystems, (1) e-mail receiver, which stores photo-attached e-mail to the DB, (2) Web form and CGI program. Both of them process the following for the preparation of presentation.

(1) Morpheme analysis of text messages.
(2) Grouping based on the initial words' pronunciations.
(3) Categorization and counting of entries based on included words.

We employed MeCab [9] for morpheme analysis and estimation of words' pronunciations.

3.2.2 Presentation Functions

(1)   List view

The list view shows the stored entries in chronological order. This view is for browsing all entries via Web browser on users' PCs.

(2)   Slide show view

Slide show view shows some of recently posted entries by turns, to present new posts at the venue.

Figure 2: Screen images of the shower-style view.

(3)   Shower-style view

Shower-style view shows all entries in machinery arranged interface based on the contents. The view has the following two steps.

1. Thumbnails of entries fall down from the upper edge of the screen and are piled up on the bottom edge (See Figure 2(a)). The piling position of an entry is based on its text message's initial letter's pronunciation.
2. After all entries are piled up, several entries form a circle based on a randomly selected shared word (See Figure 2(b)). Minimum number of entries for each circle is four.

This view has three-screen width to be projected in phase 3 at the venue.

As shown in Photo 1, the slide show view and the shower view are projected onto the screen. Passengers can see entries on the screen, and can post their own entries on site with their mobile phone. The posted entries are soon displayed on the slide show, and will be used for word-based circles.

4   RESULTS & DISCUSSIONS

4.1   NUMBERS OF POSTS

Through the event, 351 entries are posted by 184 users. Table 1 shows the numbers of entries for each phase from mobile phone and PC (e-mail from PC and Web Form).

Table 1: Numbers of entries for each phase.

	mobile phone	PC	total
Phase 1	4	13	17
Phase 2	57	96	153
Phase 3	100	81	181
total	161	190	351

Table 2: Numbers of users and their posts by number of posts per user.

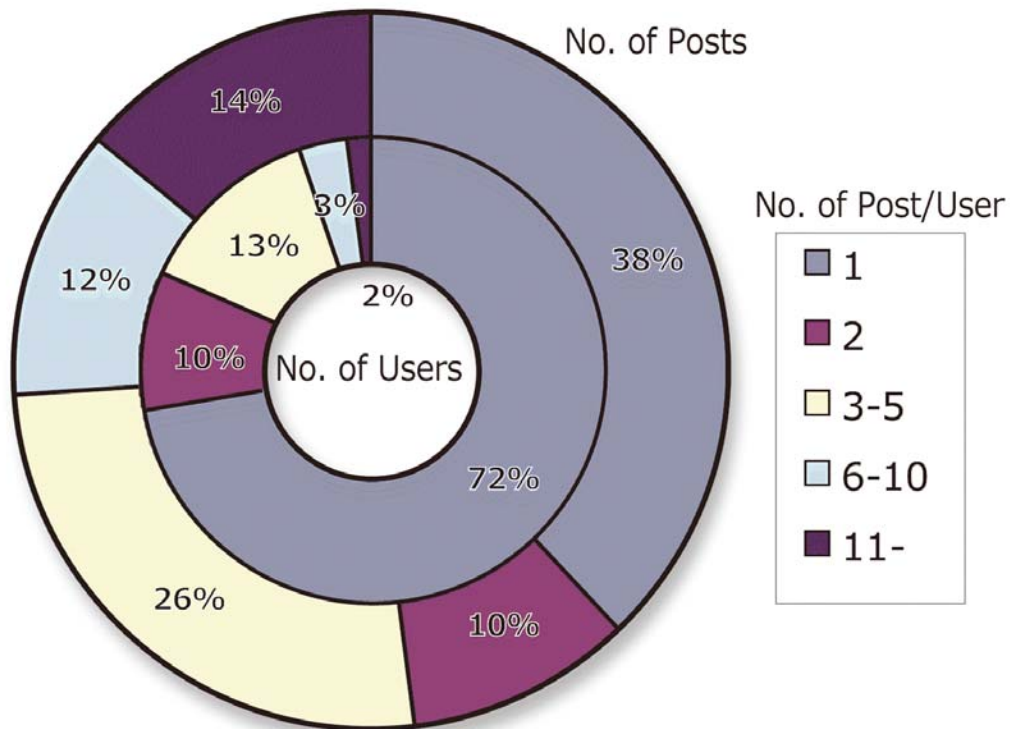| No. of Posts/User	No. of Users		No. of Posts	
	mobile phone	PC	mobile phone	PC
11-	3		49	
	1	2	15	34
6-10	6		43	
	0	6	0	43
3-5	24		90	
	7	17	27	63
2	18		36	
	8	10	16	20
1	133		133	
	81	52	81	52
total	184		351	
	97	87	139	212

Figure 3: Ratio of numbers of entries and number of users according to the number of posts per user.

Fewer entries were posted in phase 1. Users might be less motivated without feedback. While entries from PC are more than ones from mobile phone in phase 2, entries from mobile phone are more in phase 3. Entries from the venue seem to increase their number. Numbers of entries from PC in phase 2 and 3 are approximately same.

Next, we counted the numbers of entries per user. Table 2 shows the numbers of users and their posts by number of posts per user, and Figure 3 depicts their ratio.

While 72% of users posted only once, 62% of entries are posted by users who posted multiple entries. The average number of posts per user from mobile phone (1.4) is less than one from PC (2.4).

Table 3: Numbers of connected entries for each phase

	mobile phone		PC	
	connected	separated	connected	separated
Phase 1	4	0	12	1
Phase 2	33	2	110	8
Phase 3	76	24	76	5
total	113	26	198	14

4.2 CONTENTS OF POSTS

Next, we analyzed the contents of the posts. In the shower-style view, we connected four or more entries sharing a word. These entries formed a circle and it was presented on the screen. Oppositely, entries which don't share a word with other three entries are not connected to other entries on screen. For convenience sake, we call an entry which shares a word with other three or more entries as a "connected" entry, and an entry which doesn't share a word with other three entries as a "separated" entry in this analysis. Table 3 shows the numbers of connected entries for each phase from mobile phone and PC.

As for the overall tendency, connected entries are more than separated entries. Separated entries in phase 3 from mobile phone are a little bit more than others. Participants on site seem not to have read others entries so much. On the other hand, photos from the venue sometimes include the same object and the same people.

Mobile users posted fewer entries, and their entries are not so much connected. Participants at the venue seem to prefer to communicate with others there, rather than to interact with past contents. The event was semi-long term one, but the interactions in it was quite short range.

4.3 DISCUSSIONS

Comparing to existing user contributed Websites, the largest difference of our practice is that we installed the system into a physical place and held an event there. We aimed to observe the difference between people's posts from the venue and ones through the Web. Before the practice, we expected that people on site would read more past contents and try to connect their contents to them. But they didn't.

The real time and on site interaction without reading all contents depends on design of visual interface of the system and on design of environment of the place. What if the whole connection of the contents can be seen? What about direct posting into "circle"? Or, how about asking people explicitly to connect their contents? The result might be different. Actually, a participant said "I want to put my entry into a circle directly." Very recently we conducted the second practice and now we are preparing for the third one. In those practices, we changed several points and parameters. We will describe about thorough analysis on them in next paper.

From the observed behaviors of participants, we found that they wanted to see their own contents, not others ones. The slide show view was designed to display recently posted entries quickly, but it seemed not enough. A mechanism for connecting their entries to others contents in short-range and direct interaction — say, "pulse" interaction — is required.

5 CONCLUSION

In this research, we developed and analyzed an event with a user contributed Website in a public space. From our analysis, we found following points: Users on site don't read others contents so much; "Pulse" interaction within both system interface and physical environment should be designed. Our future works include revising the systems and the event, organizing more practices, and carefully analyzing them. We would like to develop an environment where people freely interact with others expressions and publish their own contents every time and every where.

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