

FMS – Flying Message Service: The Comeback of Carrier Pigeons

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Abstract: Flying Message Service (FMS) is a design project promoting community-based messaging in public spaces in the city. We have built a system that enables people to attach electronic messages to pigeons. From input stations located in public plazas, pigeons would transmit text messages to be displayed on large public screens at plazas throughout the city. The project evolved through ethnographic and experimental design methods and resulted in a working electronic prototype tested in a public square in Göteborg. Our approach and prototype are described in this paper, along with a preliminary user experience evaluation. FMS is a technologically-based cultural system that augments urban environments and animal behaviours to support local communications and communities.

Keywords: ubiquitous computing, augmented reality, pigeons, “wizard-of-oz” prototyping, ethnography

1 Introduction

The purpose of the project Flying Message Service, (FMS), was to investigate applications of information technology for public spaces and community use in our hometown of Göteborg. We developed an interactive system with the intention of encouraging social interaction among visitors to plazas around the city, thus making the squares more interesting for people to spend time in.

Our design process resulted in a concept for the city’s pigeons to carry and distribute digital messages. While it may seem far-fetched, the idea successfully incorporated existing conditions in the city, common social patterns in plazas and a feasible technology infrastructure. However, the system presented us with challenges in terms of how to prototype and test the system, and how to evaluate the concept. A fully-implemented prototype would require pigeons and much technical infrastructure that might be too difficult and demanding with our limited resources. The design proposal we finally decided to prototype consisted of a very obscure and strange concept: using the cities pigeons for carrying out digital messages throughout the city.

This paper presents a description of our design process, which included ethnographic studies,

speculative scenarios, and “wizard-of-oz” prototyping. We discuss how we moved from an abstract concept to specific design choices in building a working prototype and the results of our user experience evaluation with the prototype.



Figure 1: Potential message-carriers

2 Background

Throughout history, plazas have been sites for social interaction, places for leisure and play along with forums for citizens to meet, discuss and exchange opinions. Nowadays, at least here in Göteborg, it seems like plazas are unfortunately just places of

transit, where people change trams or buses, or silently wait for a rendezvous. It seems like the previous importance of public squares has changed in the lives of the city's inhabitants. These wide-open spaces seem inevitably surrounded by grey apartment blocks, they are poorly decorated and furnished, and not particularly inviting for people to spend time in. Their past role as social melting pots are gradually decaying with no one left to care. Our aim was to create, or rather sketch a design alternative - *a technologically-based cultural system*, which could:

- Make squares more desirable places to be in
- Encourage people to stay a while and come back
- Encourage social interaction between visitors to the public squares
- Create a better reputation for the city's pigeons

The project resulted in a concept we came to call FMS, Flying Message Service. The central idea is to enable people to attach electronic messages to pigeons using input stations situated at squares. Pigeons would then carry messages to other squares where they would be displayed on large screens.

3 Related Work

One source of inspiration to our design process was Project #26765 – Flirt: Flexible Information and Recreation for Mobile Users. (Raby et al, 2001). The project inspired us by the creative methods used in their research.

Another source of inspiration was a proposed standard for Internet Protocol (IP) communication using pigeons. (Waitzman 1990, Waitzman 1999).

A Linux user group implemented the standards in collaboration with the Carrier Pigeon Association in Norway (Shankland, 2001). They transmitted information using the Carrier Pigeon Internet Protocol (CPIP). This proved that someone had actually used pigeons for transporting digital information before and that our concept was realistic.

4 Design Process

Our design process began with studies of the proposed arena: public squares in Göteborg. We wanted to know: What type of people and environmental elements are found in the plazas? Who spent time there and why? What did they do? What kinds of needs might they have? Is there any kind of need we could help to fulfil?

4.1 Observations and Data Gathering

In order to investigate these questions, we conducted an ethnographically inspired study based on the “quick and dirty” approach (Hughes et al. 1994) and resulted in various materials:

- *Photographs* – These helped us to recall objects and people we saw when we were back in our studio environment and were also a valuable source of inspiration in our latter brainstorming sessions.
- *Observation notes* – We observed people, followed and talked to them to find out what they were doing, and their opinions about the square.
- *Scenarios* – Then, we wrote scenarios and biographies inspired by the people we met or observed. In this way, we could imagine situations in which characters would use design ideas that we were generating.

We studied the materials gathered and began to examine the possibilities inspired by things that were already there and that were typical to many squares: the architectural elements, behaviours, and activities that give squares their special quality. For instance, we considered park benches, trees, hot dog vendors, kiosks, phone booths, trashcans, and pigeons.



Figure 2: A typical square in Gothenburg.

4.2 Pigeon Studies

We found the concept of using pigeons intriguing to investigate further in terms of information and communications concepts. In order to better understand their behaviours and characteristics we conducted pigeon studies. Essential questions included: Do pigeons actually fly from square to square? Or do they just stay in just one or two places throughout their lives? Understanding of such factors would be vital to consider in designing a

system incorporating pigeons and to the credibility of the project. Thus we interviewed a pigeon expert at the Swedish Museum of Natural History and learned that pigeons move between places with great regularity. They eat in one place, drink in another, rest in a third and sleep in a fourth. An ordinary urban pigeon operates within a few square kilometres. Now we had enough information to know that involving pigeon behaviours in our concept was feasible.

4.3 System Concept

We developed our concept of pigeons as carriers of local gossip and information. We decided on this for various reasons, including:

- *Pigeons are unpredictable* – We were interested in this as a way of leveraging “word-of-mouth” and other unpredictable ways that gossip is passed.
- *Animal vs. Technology* – Cities naturally involve animal as well as human and architectural co-habitation – we were interested in incorporating all of these aspects into an IT-based system.
- *Reputation* –Pigeons have a mixed reputation in Göteborg, however as inevitable inhabitants we were interested in creating a role for them in the society. Perhaps making them useful could lead to a comeback for pigeons and people would like them better.

The proposed FMS system is about using the city’s pigeons to carry messages. The pigeons would be equipped with ID-tags and selected squares would be provided with sensors. On some squares there would be an output screen and a smaller input station with a keyboard. The people on the square would, via the keyboard, be allowed to write a message that would automatically be associated with a certain pigeon on that square. The pigeon then carries it to another square, and the message is displayed for everyone to read on a public display.

5 Implemented Prototype

We developed and implemented a small-scale prototype to test specific aspects of the FMS system concept. Alongside developing the prototype for user testing, we wanted to incorporate ways of testing the concept as well. We wanted to conduct the test in the streets, bringing the technology to the people. The prototype should not only function realistically but also in a way so that people would get a better understanding of how such a system

would work. Our intention was to test and stimulate interest in the concept, and to gather feedback on how people would use the system and what they would use it for.

5.1 Technical Prototype

We created a “wizard-of-oz” prototype using two laptops running a JAVA application, representing the input and output stations located on the plaza. The laptops were wirelessly interconnected via an ad-hoc WLAN, and they were also equipped with short-range RF proximity sensors of the same type that was used in Pirates! (Björk et al. 2001). Two of us played the role of pigeons, carrying proximity sensors with a detecting range of a few meters, each with a unique ID number. When a visitor wrote a message on a laptop, the message was associated with the ID number of the nearby “pigeon.” The actual message was transmitted to the other laptop over the WLAN and placed in a queue. Next, the “pigeon” walked over to the other laptop, at the opposite side of the square. When the presence of the pigeon was detected, the message was displayed on the laptop screen.

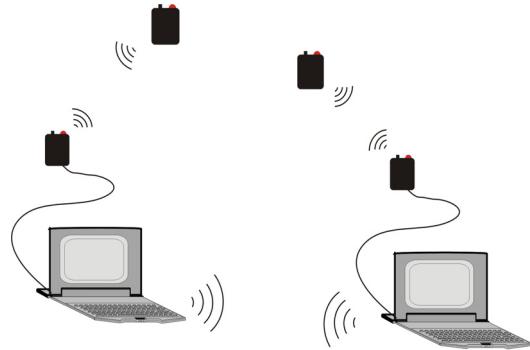


Figure 3: Schematic sketch over the prototype.

6 Preliminary Trial and Results

Evaluation of such a system is important but very challenging. We could have applied traditional HCI evaluation methods but it would not be fair applying such methods evaluating a concept like FMS

Because of the concepts eccentric character we needed to get affirmation from our intended user group that we did something that was useful, fun or at least interesting. This meant that we had to clearly communicate our idea to the audience, to make an abstract suggestion understandable to a big group of people. It was also important to show how the technology actually would work. Therefore we set out to evaluate our concept at the square *Järntorget*. Rather than focusing on our prototype, we wanted to

evaluate the concept i.e. user experience evaluation. The prototype was merely a tool in that process. When performing the evaluation, the people who moved through the square, had the opportunity to try out some of the technology, and could also get information from us about the whole project. We were interested in their reactions to the concept and we also asked them to write messages so that we got a clue about what people would write. This was a chance for us to see how people encounter technology, if they were aversive or if they embraced it at once.

The preliminary trial showed that people in general people were very interested and stopped to ask questions, some of them took the time to send a fictive message. The meeting between our design team and the public gave us a meaningful response. We were very surprised that the simple attributes of the prototype worked good, probably better than a more complicated one would have done.



Figure 4: User writing a message during the trial.

7 Conclusion

The FMS concept ended up touching a wide range of subject areas. We designed a concept, or a proposal for a cultural system, which involves aspects of art, technology, interaction design and perhaps even architecture and social science. We would like to think that the concept contains an aspect of art since it really is a device of expression. Even though it is not a subjective piece of expression, which art often is considered to be, it displays expression in a public space. The concept is a technological solution, we

use technology to something we think need improving. In that sense it is very user centered. We have used human computer interaction as the basis for our technology, which makes the project very interaction design heavy. In a very limited sense, we also touched aspects of architecture and social science. Architecture because we focused on squares and social science because we wanted to invoke a change in people's behavior.

Since the concept touched so many areas it was hard to evaluate it and we did not want to evaluate the system using traditional HCI methods. We therefore think that our preliminary evaluation, with "wizard-of-oz" prototyping is more successful in this case. Future work would incorporate qualitative evaluation.

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References

- Björk, S., Falk, J., Hansson, R., & Ljungstrand, P. (2001). Pirates! - Using the Physical World as a Game Board. Proceedings of Interact 2001, July 9-13, Tokyo, Japan.
- Hughes J., King V., Rodden T. & Andersen H. (1994), Moving Out from the Control Room: Ethnography in System Design
- Raby F., Catterall C. (Editor), Akira Suzuki, (2001), Project #26765 – Flirt: Flexible Information and recreation for Mobile Users. ISBN 1-874175-29-2
- Shankland, S. (2001), Pigeon-powered Internet takes flight. (<http://news.com.com/2100-1001-257064.html?legacy=cnet>)
- Waitzman. D. (1990), A Standard for the Transmission of IP Datagrams on Avian Carriers. (<http://www.ietf.org/rfc/rfc1149.txt?number=1149>)
- Waitzman. D. (1999). IP over Avian Carriers with Quality of Service. (<http://www.ietf.org/rfc/rfc2549.txt?number=2549>)