Swipe ‘I like’: location based digital narrative through embedding the ‘Like’ button in the real world

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ABSTRACT
This project explores the novel situation and design space that emerges through implementing the popular digital ‘Like’ feature as ‘tangible interface’ that connects to the location of the events on which people comment in the real world. This paper describes a pilot study we conducted in order to investigate the potential of geo tagging people’s likes and dislikes expressed currently mainly in a digital form through social network applications such as Facebook. The aim is to augment virtual communication in Facebook with location based narratives and real time sharing of people’s preference for events that take place in the real world.
The design process, implementation in a real world context, feedback collected together with observations enable the discussion of wider issues raised, in particular in relation to privacy, and highlight the potential in particular when implementing RFID or NFC into mobile phones for future prospects.
Keywords
Ubiquitous computing, location based, Facebook, RFID, ‚Like‘ feature

INTRODUCTION
We are connected globally through social networks such as Facebook and communicate via voice-over-IP services like Skype, but we are still experiencing our daily narratives locally in the real world. The more we are connected to the digital world through ubiquitous computing devices the more we share and present our local experiences with the world. In this process digital encounters are essential components of our technologically mediated experiences [1].
Mitchell describes our ‘presence’ as a “variety of related senses” which includes our presence in a certain place to a certain time and how we present ourselves in the real and the digital world. This will inevitably lead to the division of our presence due to emerging virtual possibilities [2].
The increasing use of geo tagging in photos and social networking applications such as Facebook Places seem to satisfy our need for contextualizing our presence [3]. However, these technologies are based on technical positioning through longitude and latitude of ourselves rather than sharing contextualized narratives.
More recently, the ability to use the ‘Like’ feature in applications such as YouTube and Facebook, in addition commenting on News Feed stories, has become significant to the way people communicate, discuss and show appreciation in the world wide web [4]. It introduced a way of engaging people to interact with each other and link different events and activities in the digital.
This raises the question whether we can embed a physical system in our real world that acts as an interface between the global and the local world and links our digital and physical presence with other people’s presence and preferences.

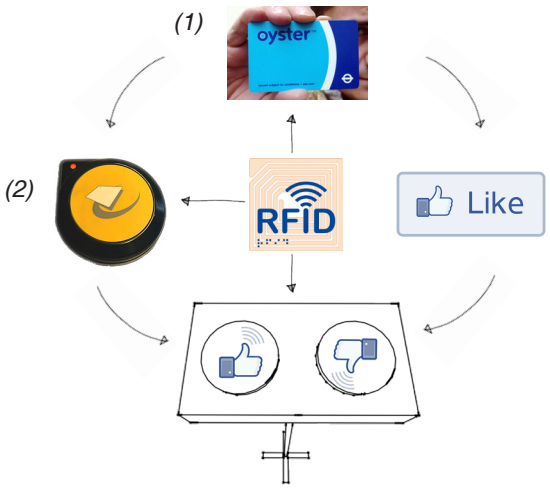


Figure 1: concept circuit
(1) Oyster card for cashless travelling in London
(2) Oyster card touch points for entering public transport

This paper presents a pilot study that deploys a new ubiquitous computing device, the ‘Like’ button, in a real world setting using RFID technology. The aim is to explore emergent social behavior and spatial patterns of people’s local presence in the physical world and in relation to their presence in the digital world.
In the next section we describe related work. We then proceed to describe the implementation of the prototype.
We conclude by considering the potential of linking the physical ‘Like’ button to the social network application Facebook with the aim to create a location based service. Finally, we highlight the potential and outline emergent challenges.

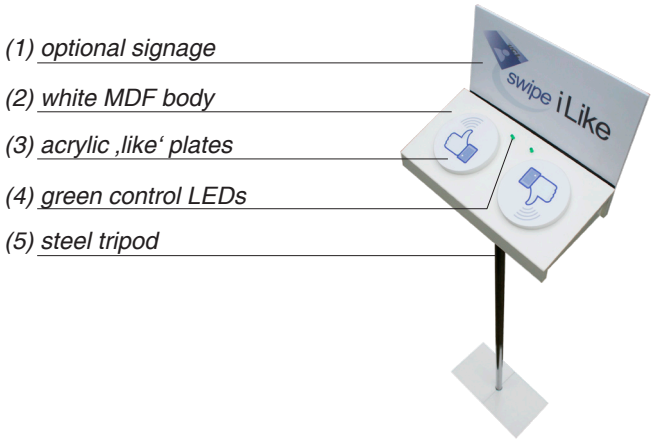


Figure 2: The electronics are hidden under (2) a 300x150x50 mm white coated MDF box which is mounted on (5) a free standing steel tripod. On top of the box two white circular 8 mm acrylic plates (3) with a diameter of 100 mm are attached. The left one carries the 'Like' thumb up illustration and the right one the thumb down. Both thumbs carry the wireless quarter circle pictogram. Two green LED lights (4) fixed in between the plates flash up after successfully voting. Optionally a 300x200 mm white board (1) can be attached on the back of the device with an imprinted graphic giving the instruction to 'Swipe I like' with an RFID card.

RELATED WORK

RFID technology and Near Field Communication might be the promising key to future ubiquitous computing.

Latest research on RFID technology suggests that this emergent technology is not only suitable for logistic and security purposes.

A research project called Touch at the Oslo School of Architecture & Design explored the usability of RFID and Near Field Communication (NFC) for mobile communication [5]. Within this cooperation the iPhone RFID project uses RFID tokens implemented in physical objects to trigger certain interactions in the digital environment. An iPhone carrying an RFID reader triggered by RFID tags in different objects enables a simple media player on the phone to play different video clips according to the particular physical object [6].

More recently there are efforts in social networking applications to make use of RFID technology. In April 2010 a group of Facebook developer called f8 initiated a conference about future developments on Facebook in San Francisco, USA. At this event a framework called Facebook Presence was first introduced. Every conference attendant received a Facebook card with an unique RFID tag on it which should be initialized by the owner through her/his Facebook account. On several locations in the venue RFID reader were installed. By swiping their initialized ID card the current location of the user was immediately sent to the user's Facebook account [7]. Currently no further information about the latest development of this project by Facebook is available. We assume that a system like this is on the one hand too complicated and expensive to hand out RFID tokens to all Facebook user and on the other privacy issues might prevent Facebook to introduce this system.

DESCRIPTION OF THE PROJECT

Design of the Device

One of the major challenges of embedding the 'Like' button in the physical environment to evaluate certain events was to make sure that this device cannot be manipulated by pushing the button over and over again by the same person. A system to identify every single vote was needed. As well as the usage must be as simple and less time consuming as possible - otherwise people would not use it.

Therefore the advantage of an already existing system used by London's transport system (TFL) was considered. Their Oyster cards are plastic smart cards like debit cards and carry a passive mifare 13,56 MHz RFID tag with antenna inside. This cashless ticketing system was first introduced to the public in 2003. According to Transport for London (TFL) approximately 5 million people in London using this card with an unique serial number on it. For the accessibility and understanding of the 'Like' system the fact that almost everyone is carrying an Oyster card in her/his pocket is one advantage. Another is that the gesture of swiping this card is meanwhile common use.

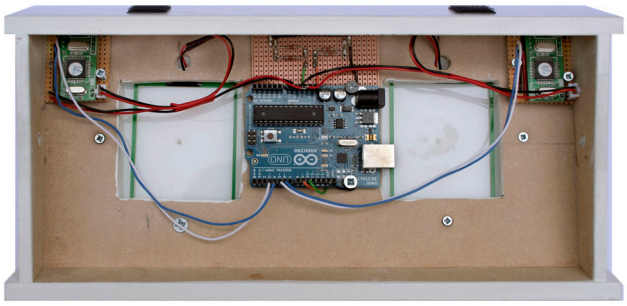


Figure 3: The electronics in the body of the device.
The 'Like' device itself is based on two separate RFID readers and antennas which are connected to an Arduino board. Through a USB wire, the connection to a laptop is ensured. The Arduino software reads the serial data input and converts it for further purpose into Processing software.

Location of the Experiment

In total four lectures were evaluated. The most interesting and largest event is the UCL's International Lecture Series (ILS). The other two lectures were held by academics of the Bartlett School of Graduate Studies. All four talks were evaluated between the 16th and 23rd of March 2011.

The ILS were held in a Lecture Theatre in the university's main campus which houses approximately 300 listeners and the master courses were held in a lecture room which provides around 30 seats.

The 'Like' device was located outside the lecture venues. Its position was chosen deliberately between the exit and the staircase not trying to interrupt the flow but in a certain distance to give passer-by enough time to identify the device and its purpose. Next to the device a table with the questionnaires was positioned.

METHODOLOGY

For the experiment we conducted the overall number of listeners who attended one of the four lectures was counted. Further the attempt was made to categorize the age groups. Collecting the RFID numbers of people who voted with their student ID or Oyster cards allowed to count the number of people interacting with the rating device as well as their vote.

The collected data consist of a nine digit long unique serial number on the RFID tag. Dependent on whether the ID card owner voted for 'I like' or 'I dis-like' the Arduino software adds two digits at the end of the number; „LL" for voting 'I like' and „DL" for 'I dis-like'. In this context, it is necessary to mention that without access to the database by the Oyster card or the university it is impossible to get any further information about the owner of the card.

The aim of collecting and storing the unique ID numbers along with the likings was on the one hand to ascertain if people attend other lectures as well and on the other hand to observe their likings. The collected data should reveal patterns of behaviors and potentially predict the preferences of the ID card users.

Figure 4: real world experience

The most difficult part in organizing the experiment was the attempt to find and convince lecturer at the university who are willing to let their talk be evaluated through the listeners. The reasons for their denial were diffuse.

As part of the research questionnaires were delivered to people who used the 'Like' device or had strong concerns about it. The objective of the questionnaire was to figure out whether there is a correlation between people using social networking websites such as Facebook and online recommendation systems such as the digital 'Like' buttons as used in Facebook or YouTube. Another interest was related to the use of Oyster cards and the awareness of RFID technology and concerns about privacy.

The correlation to age groups was important to explore whether different patterns between the generations emerge. After four lectures 24 questionnaires were submitted.

In addition photographs were taken and a video of the last experiment was recorded to show the listeners behavior leaving the venue and passing the 'Like' device.

RESULTS

Observed Reactions

It has been an overall positive and exciting experience to engage with people in an early stage of a project development. In general participants were surprisingly cooperative and showed interest towards the research project. Getting a huge variety of different responses and feedback seems to be an effective way of developing and improving ideas and concepts for the prospective user.

The observations show that swiping an Oyster card is already a conscious common gesture. Most people immediately associated the Oyster card interface with the design of the 'Like' device. Participants even waited for an immediate response after swiping their cards. By recognizing only a green flashing LED (figure 2) a few users were asking for the typical audio signal activated usually through the Oyster card.

Another essential outcome of the observation is the way people get used to new implementations. In the beginning there is almost no activity, the first listeners leaving the venue did not get attracted by the device. It was difficult to engage them to swipe their cards. After a few people started interacting more and more people were attracted. At the end people even were queuing to give their vote. Even spontaneous encounters and conversations were enabled. This kind of learning effect, people watching others is a crucial element to be aware of.

The attempt to attract more people through an optional signage (figure 2) was not successful at all. People got even irritated and swiped the 'I Dis-like' button although they liked the lecture.

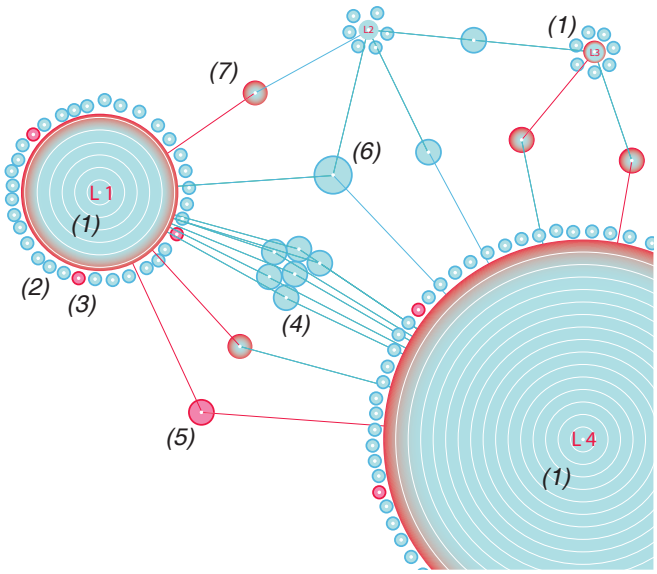
Furthermore, answering the question about "do you know about RFID technology" was surprising as it indicated that the vast majority of people answering the questionnaires did not hear about this technology before although they are using cashless ticketing regularly.

Outcome of Data

Out of 244 listeners in four lectures 42% swiped their student ID card or Oyster card at the 'Like' device. 89% of the users voted for ‚I like'. 25% of the people who used the ‚Like' device completed the questionnaire. According to the evaluated questionnaires we can assume that most users understood the interface clearly and liked the experiment. Almost everyone is carrying an Oyster card and is willing to use it for a recommendation system like this. Worrying is the fact that only few people are aware of RFID technology and have no concerns about privacy issues. Accordingly almost everyone has a Facebook account. Interestingly only 50% are using online rating systems such as on Amazon but almost everyone would like to see a recommendation system in the physical world.

The main outcome of the collected data from the ‚Like' device should reveal patterns of behaviors by the ID card users. The visualization in figure 5 is based on a particle-spring system with predefined parameters influencing the behavior of the particle.

Figure 5: visualization of social data
The large circles L1 – L4 (1) show the evaluated lectures. The sizes of these are related to the overall number of people attending the event. For instance, 164 listeners participated L4 as a result this circle is almost three times bigger than L1 followed by 63 people. Every attendee who rated the lecture afterwards is represented with a small node attached to the related lecture. The color of the nodes display whether they liked (2) (blue) or disliked (3) (red) the lecture. As soon as one of the RFID tags is identified again in one of the following lectures the correspondent node grows, moves in between both lectures and changes the color according to the vote. The nodes with the same preferences, color, size and visited lecture start clustering. The ones with contrary preferences try to keep away as far as possible. The process keeps on running through all the lectures.
(1) Lectures 1 - 4 for each circle 10 listener
(2) LIKE node
(3) DIS-LIKE node
(4) LIKE node attended 2 lectures
(5) DIS-LIKE node attended 2 lectures
(6) LIKE node attended 3 lectures
(7) node attended 2 lectures - 1 LIKE + 1 DIS-LIKE



CONCLUSION

The result of the pilot study suggests that the 'Like' device is easily accessible in the definition of ubiquitous computing. The visualization of the data displays spatial patterns of the users' preferences clustering with each other over time.
In conclusion, localized interactions to share experiences and narratives seem to be possible and desirable.
This raises the question whether there is a potential of connecting the physical 'Like' button to a social network provider to create a location based application. This might increase the potential of a recommendation system which connects people according to their preferences they experienced in their physical environment. At the moment it is difficult to achieve due to Facebook's API restrictions.
However, the spread of the 'Like' button, based on a regional system as the Oyster card is complicated. Therefore it is necessary to develop a system that is as simple as the Oyster card but much more common.
In recent years the mobile phone industry announced to implement Near field communication (NFC) in their devices. This technology would enable the use of the 'Like' system on a wider range for example customers in Japan already have the possibility to get discounts on commercial offers triggered via mobile phones.
Despite all these promising possibilities there are major concerns about privacy, for instance, the introduction of the Oyster card in London in 2005 raised a fundamental discussion about privacy issues. As using RFID technology leaves irreversible digital marks of the user [8].
This and other aspects outlined in this paper need to be taken into account in our future study.

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