Creating Conversation Opportunities in Urban Spaces through Public Displays and Personal Devices

Martin Hommer, Robert Kowalski, Bettina Conradi, Alexander Wiethoff,
Sebastian Boring, Heinrich Hußmann

Media Informatics Group
Ludwig-Maximilians-Universität
Amalienstrasse 17, 80333 Munich, Germany
{hommer, kowalski}@cip.ifi.lmu.de, {bettina.conradi, alexander.wiethoff, sebastian.boring,
heinrich.hussmann}@ifi.lmu.de

Abstract. In this paper we present *Team Battle Quiz*, a game that runs on publicly accessible screens and is played through the users' mobile phones. Our aim was to provide a game open for everyone that encourages participants to discuss and play together as a team. Our first user study demonstrated that the approach has the potential to elate the anonymous crowd to get in touch with each other. It further enables conversations among potential strangers in urban spaces by fostering team spirit among its participants.

Figure 1. User Research – interviews with daily commuters on a subway station.

1   Introduction

In major cities, urban spaces are populated by thousands of people every day, who enter and leave them mostly anonymous. However, in an interview-based field study we discovered that people would appreciate to get in contact with others around them (see Figure 1). Nevertheless, overcoming people's intimidation barriers remains an open issue [7]. In former times, urban spaces like market places used to be a center not only for trading but mainly for communication. In contrast, today these areas have changed to foreign places, where nearly no communication or social interaction takes place. Additionally, these spaces are increasingly flooded by public displays with information or advertisement, while bystanders watch passively, staying in their own isolated world. Thus, they can be described as "non-places" [1].

Furthermore, modern technologies are a mixed blessing for crowds in urban environments: on the one hand public displays as well as smart mobile devices entertain people as pastime with news, advertisements, or games. On the other hand, they have entirely different usage models resulting in different behaviors: public screens are mainly used to inform bystanders and do not enable communication and mobile phones appear as "private anti-social devices", since they signal a certain wish for isolation and privacy to their owner's surroundings [2, 3].

Our goal is to investigate the social circumstances of public spaces and discover ways to employ existing technology in order to enable communications between strangers in this context. An initial field study provided first insights into the needs of persons in urban spaces. Based on the main findings of the initial research phase, we developed *Team Battle Quiz*: a game utilizing commonly known technology. The goal is to examine the potential of combining an existing infrastructure and familiar applications or games[1] as communication enabler among strangers. A controlled study in our lab confirmed our initial assumptions. In addition, further informal deployments and demonstrations lead to extensive positive feedback from users.

2 Field Study

To obtain initial insights into the needs and desires of people in urban spaces we conducted an open interview with 14 commuters (age: 16 – 77 years) in a highly frequented subway station (see Figure 1). We interviewed them about their pastime while waiting for the trains as well as suggestions for improvements on these subway stations and the public screens respectively.

The most interesting insight was that people like to get entertained by public displays (e.g. by showing news or quiz-like games) but some also long for communication among bystanders. For example, one Indian man told us that he does not understand why no one is talking to others since this is perfectly normal in India. A German woman stated that she likes funny cartoons displayed on those screens the most, because she then can laugh with people nearby. This suggests that basic interests in entertainment and communication exist. In addition, the study already revealed another important aspect: as some nationalities tend to be more introvert than others, cultural differences (which are increasingly found in urban spaces) have to be considered as soon as one designs conversation enabling technologies.

Our study (and the need for communication among potential strangers in particular) motivated us to develop an interactive quiz game that should help people getting in touch with each other, trying to make urban spaces more social.

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[1] The basic setting of our quiz game is an analogy to the TV quiz "Who wants to be a Millionaire?" http://millionaire.itv.com/

3 Related Work

The psychologist Stanley Milgram first addressed the phenomenon of the Familiar Stranger [7]. Paulos and Goodman considered this when looking at the social aspect in public spaces [8]. Familiar Strangers are individuals that we repeatedly observe but do not interact with. Our relationship to these persons is characterized by the mutual agreement to ignore each other without hostility. A good example would be persons we see on the subway or other public spaces every morning when we commute. To make this Familiar Stranger a familiar conversation partner and to get in touch with him, the intimidation barrier (cf. [8]) has to be bypassed or lowered somehow.

GroupCast tries to offer suitable conversation topics to strangers, by showing common or exclusive interests of bystanders on a public display [5]. However, tests revealed that private data is risky to serve as a communication enabler: people might feel ashamed when their interests are exposed in public and are not willing to share them. Thus conversation topics should be more neutral to allow small talk.

Games are another approach towards socializing in urban gatherings. The *FlashlightJigsaw* is an ad-hoc multiplayer puzzle game on a public display where players have to search for puzzle pieces on the display with their torchlight-like wireless controller [4]. While their evaluation showed that the three players mainly played the game in a collaborative fashion and further started a conversation, bystanders could not actively help the players and thus could not join in the conversation. Since we also wanted to engage non-players in the conversation, the game should allow for many users joining and helping others. Its underlying interaction technique is further not suitable for spontaneous participation in public places since they use proprietary wireless handheld controllers. For systems targeting this option, it is consequently inevitable to support already available and common technology such as mobile phones.

4 Team Battle Quiz

Based on the results of the field study we put up two design goals that were important for the application: First and foremost, the game should *enable conversations* among strangers. Mutual goals in a game (e.g., defeating another team) may contribute to a sense of team spirit [6]. It further fosters collaboration among participants and consequently motivates people starting conversations with strangers. And second, the system should be *easy to use*, since potentially everyone should be able to participate without a cumbersome settling-in period.

We chose to implement a quiz game, since these games were mentioned considerably often in the initial field study as being popular. In our version, the bystanders can interact with the display by means of their own mobile device. The device only needs to provide a web browser and wireless network capabilities (e.g., WiFi). Players need to connect their phone to the local wireless network and open a given URL shown on the closest display. This well-known connection process combined with the familiar game concept meets the goal of providing an *easy-to-use* system. However, this connection process could be further simplified by employing technologies, for example,

by selecting the target display "through the display" [10]. Questions and answers are shown both on the public display and the mobile device. While the public display shows an anonymous evaluation of all given answers after each round, individual results can only be seen on each players' phone.

To achieve the goal of enabling communication between strangers, there has to be a shared interest to initiate a conversation. Hence, we decided to form teams competing against each other, potentially fostering communication among their members. Choosing a team is implicitly done by the player's location (i.e., players in front of one screen belong to the same team). As a result, two sides of a station platform, different stations or even various cities can compete against each other. As soon as players would recognize that working as a team improves the overall score, our hypothesis was seeing them supporting each other and consequently starting to communicate.
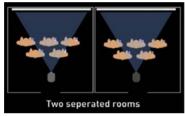

Figure 2. User Study – schematic setup of the system *(left)*. Participants are eagerly focused on a question shown on the large display *(center)* and answer questions by selecting the answers on their mobile device *(right)*.

5 Evaluation

In order to gather first insights into the capabilities as well as shortcomings of our idea, we conducted a controlled study in our lab (see Figure 2). To detect an increase in mutual communication by providing a common goal, we evaluated two versions of the game: one in which players competed in a team against another one, and a second version in which no team-based evaluations were made (i.e., everyone played only for his or her own score). Each run included 14 non-trivial questions with four possible answers. The setup consisted of two separate rooms with one display each (see Figure 2 left). In total, 25 people took part in the study, with 18 participants in the first version and seven in the second. To reflect urban spaces with its random strangers as well as possible, participants were cautiously distributed in different rooms (with three to four persons each) to assure that as few as possible know each other.

Beforehand participants received a short introduction to the scenario. It has to be noted that no hints had been given to them at any time about the purpose of the study. Consequently, they were neither reminded that they could team up nor that they have to be better than any other player or room. During the game, we recorded the players on camera for better evaluation afterwards. After the game, a questionnaire and a subsequent wrap up session was used to collect further subjective feedback from the participants and to discuss first findings, impressions, and general opinions.

As versatile as our findings are, they also suggest the validity of our initial hypothesis in a way that enabling communication among strangers in urban spaces can be achieved by combining public displays and personal devices. We discovered three main findings: First, in the non team-based version of the game, hardly any communication took place (as shown in Figure 2 center). Rivalry aroused since players just looked at their own score and wanted to beat everyone else. When asked about their reasons, they stated that they were used to compete with each other from board games and other quizzes and therefore did not see any reason to help fellow players. Second, the team-based version of the game led to communicative and even collaborative play. In nearly every round participants took less than one minute until lively discussions started. In the beginning, these were about which answer might be the correct one, but after a few questions they also started to develop strategies on how to score best, by spreading their answers. And third, the development of team spirit within the groups demonstrated how mutual goals can induce a sense of togetherness in a short period of time. This observation was undermined with statements like "you win with the team, you lose with the team" and situations where the questions were translated into other languages to allow non-native speakers to join the team as well.

6   Discussion and Future Work

Our initial field and preliminary user study provided us with first insights into desires and social behavior of people interacting passively or actively with public displays in urban spaces. We noticed the basic desire for more communication in unfamiliar places at least in our context and that the *Team Battle Quiz* seems to be a promising approach to address this matter. Further informal deployments of this system, for example at an open house in our research lab, showed similar positive results and great interest among users.

However, these results are only a starting point since the user study was conducted in an artificial lab setting with invited participants and thus entails a few shortcomings and some remaining unanswered questions: As one of the most important aspects, the lab-based setting probably lowered the barriers to approach one another and consequently the findings cannot be transferred directly to a public space. However these barriers were clearly apparent, as they were not nearly low enough for the non-team condition participants to start communicating.

Since people were invited to take part in our user study, the situation in which pedestrians join in on their own accord or refrain from participating could not be simulated. As stated earlier, we discovered that the ability of participating with your own device is an inevitable need. However, in our lab study we handed out test devices. This should consequently be changed in further studies. Moreover, it has to be evaluated, how people can distinguish players from non-players. A naive approach might be to assume that people, who are alternately watching the display and their phone, are currently playing. In advanced approaches, the mobile phone could give hints how many players are currently around. Another interesting aspect concerning the size of teams is how the group and interaction behavior changes, when teams consist not only out of three but up to 20 or even more people.

Further useful extensions were mentioned in the discussions after the study: One wish of the participants was to receive more feedback concerning the opposing team. This could be achieved by having little video windows in the corner of the public display to actually see the other group to further create awareness of the opposing team. Furthermore, the participants mentioned that the pastime in subway stations is much shorter than in our setup, since one run lasted for about ten minutes. To resolve this concern, we have to evaluate whether the current application flow is really suitable for this scenario or has to be altered. However, nearly every group started to communicate after no more than one minute, thus this should not be a major issue.

Taking everything into account, it appears that these findings open up this topic for an interesting discussion which we would like to bring into this workshop. We hope to motivate exciting conversations and are looking forward to receive inspiring comments and suggestions from the workshop's attendees.

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