ITV services for socializing in public places

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ABSTRACT
Watching TV in public locations is very different from watching at Home, but it can also be a worthy experience, especially in the context of certain collective events, such as live football. The increasingly rich features of iTV services may even provide the ground for making the Television infrastructure an alternative framework for the deployment of public display services. In this paper, we present and discuss integration scenarios in which the iTV infrastructure and public display services conceived for multi-user interaction in public spaces are combined to generate new types of services offer. It reveals a considerable potential on the idea of leveraging iTV infrastructures for supporting new types of public display services benefiting from content generated and social interactions of the co-located audience. The successful use of these approaches will require a clear understanding of the properties of the iTV infrastructure and a focus on the type of applications in which those properties may provide more added-value than limitations.

Categories and Subject Descriptors
H.4.3 [**Communications Applications**] H.5.2 [**User Interfaces**]

General Terms
Design, Human Factors

Keywords
iTV, public displays, socialTV, crowd interaction

1. INTRODUCTION
Even though people tend to think of Television as something that is primarily conceived to be experienced at Home, TV content can easily be found in many public (out-of-home) locations we move into during the day. Watching TV in these contexts can be a particularly socially rewarding experience in the context of certain collective events, such as live football.

The emergence of Interactive TV (iTV) could offer interesting new opportunities for TV consumption in public places, enabling whole new scenarios in which TV content could be consumed collectively in an interactive and co-located experience. Additionally, the interactive features of iTV could also enable the Television infrastructure to become an alternative ground for new types of public display services. These can benefit when the social interactions and content from the collective audience is considered.

In this paper, we analyse some of these possibilities and discuss the opportunities and limitations of hybrid approaches that combine public displays and collective audiences with the technologies of iTV platforms.

2. RELATED WORK
The sociability fostered by television has been studied by a significant number of authors. From the 1975 Martin Jones predictions (about the economic and social impact of Interactive Television in generating a greater sense of community awareness) [5] to the James Lull [6] ethnographic study (concluding that television can act as facilitator of communication or as a mean to start conversations) many researchers have explored the sociability potential of television. These and other findings allowed different research groups to work on social iTV prototypes and proposals. Some include: the 2BeOn project [1], Reality IM – Accenture Labs; Amigo TV – Alcatel; Social TV – PARC; ConnecTV – TNO; CollaboraTV – AT&T; Find-A-Friend - University of Siegen; Living@room – CSP (for more details on these prototypes see [2]) and STV – Motorola [3], [7].

The main goal of Social TV has been to allow people geographically separated, to watch the same program, as if they were collocated doing it together. This is also clearly a way to address the potential of iTV platforms as a socialization tool. However, this research field has been focused in the interaction between users in their Homes, while the proposal in this paper tries to explore the scenario of physically collocated viewing in public places. This may still be seen as a form of Social TV, in line with definition of Harboe et al [4]: “using communication technology to connect TV viewers, in order to create remotely shared experiences around TV content” and encompassing opportunities for allowing these shared experiences to happen even if users are collocated and sharing only one display.

Despite the referred focus in the communication between remotely located viewers, there are some applications that start to explore the potential of iTV in public scenarios for socially engaged activities. The Weteli[1] application for Google and Samsung TVs presents an interesting approach by allowing viewers in public spaces to interact with the TV content. It allows expressing likes or dislikes by sending virtual “stars” or “tomatoes” with mobile phones right to the shared TV screen.

[1] http://movl.com/wp/apps/weteli/

3. Public displays and iTV

Public display networks and iTV services share a similar characteristic in the sense that they both provide a TV centred experience, but so far they have been largely separate fields with specific technological visions and usage assumptions. Recent advances in both areas have been widening their boundaries, blurring some of the traditional differences and opening the path for hybrid approaches that may provide new service offers.

In this context, it is worth to consider the possible motivations behind the idea of using the iTV infrastructure for interactive public display services.

- ITV operators are highly experienced in providing robust technology and mature services designed from scratch for a very large-scale distribution. This could facilitate widespread deployment of new public display services.
- Because so many public spaces already have a TV screen and some type of set-top box, there is an enormous potential in leveraging that infrastructure for new purposes. This could enable new public display services to be provided with only minor investments on new infrastructure.

However, there are also many assumptions that are significantly different between iTV and public displays.

The most striking difference is probably the assumptions regarding control of the content. With Television there is the assumption that one person holding a remote control will be the only person in control of the content being shown. Social protocols determine who holds the remote control and to what extent other people may influence the holder to change the selected content. Ownership of the remote control becomes a key element in the power relationships. The overall concept behind iTV is about empowering people to watch what they want, when they want it. However, in a public location, viewers normally accept that they will not be able to exert any control over the content being presented, which is usually determined by the place owner. Even though this is an obviously limited approach, regarding its ability to serve potentially diversified interests, it is nevertheless a socially accepted practice that relies on the good judgment of someone who is probably interested in satisfying its visitors.

In public displays, interactive applications may enable co-located people to generate new content to the display system using multiple types of devices and technologies. Integrated with an iTV infrastructure this aim may also be achieved if alternatives to the remote control are considered such as mobile devices or smart tangible artefacts.

Another key difference is the nature of the social experience. In social iTV, multiple participants can be engaged in a shared and more personalized experience, probably centred on TV content, but each participant is at his own Home using his remote control. In public displays, the experience is only local and there is not normally any expectation that other people at other locations may be watching that same content.

While these differences do not exclude the type of hybrid scenarios we are discussing in this paper, understanding their implications is a crucial part for any successful approach that aims to combine both technologies.

4. TECHNICAL APPROACHES

This section describes some of the technical possibilities for enabling collective experiences around iTV content in public places and discusses their implications for the proposed goals.

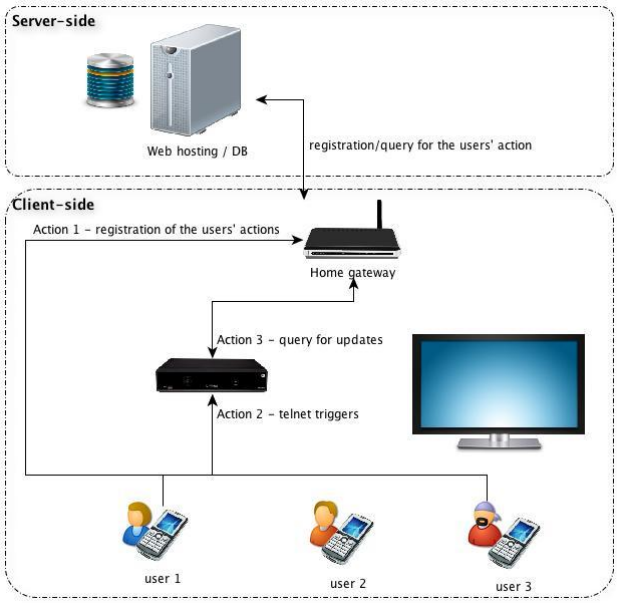

Figure 1 – A basic IPTV system architecture enhanced with mobile interaction.

Figure 1 presents the basic system architecture of a typical IPTV application comprising a Home Gateway (providing wired Internet access to the set-top-box and Wi-Fi to the home network); a set top-box retrieving video and exchanging data with remote servers via TCP/IP; and a (TV) display.

The integration of other devices is especially relevant when considering collective viewing. As referred, in a public display scenario there is no such thing as a shared remote control for the crowd. However, the equivalent to multiple individual remote controls can be created by taking advantage of personal mobile devices acting as means of individual participation in public viewing or even regular objects enhanced with smart tags. The flow of actions presented in figure 1 shows how an interactive application can be implemented using a Wi-Fi enabled mobile phone as an input device.

5. Integration Scenarios

Considering this setup and the social dynamics of watching television in a public display, we will now present and discuss 2 possible scenarios for the use of iTV infrastructures for public display services that integrate mechanisms for audience participation and control.

5.1 Situated Interaction around TV content

This scenario refers to situations where users are watching a common interest TV show, like a football match, interacting using their mobile phones as remote controllers or information input devices.

With interactions focused on the TV content, it is possible to anticipate a scenario where users can:

- vote on which match to watch (collaborative decision);
- see how many fans each team has in the room;
- support their teams by providing collaborative actions (e.g. all viewers shaking their mobile phones to create a virtual *ola mexicana*);
- challenge other fans with emotional messages or visual effects sent to the screen;
- make predictions, in a public pool promoted by the iTV application, related with TV content (e.g. in what minute the 1st goal will appear).

Because this is very much grounded on the core iTV principles, this is an approach that does not pose any major challenges to the iTV infrastructure. The main challenge would be the integration in the applications of appropriate interaction models and devices for supporting multi-user interaction. Again, mobile phones or smart tangible artefacts can play an important role in supporting collective control.

5.2 Opportunistic content sharing in the TV area

This may be seen as an opportunistic scenario in which the TV screen is shared between TV content and local information. The reserved area for local information could also be used to display User Generated Content being shared by the audience, providing some feedback and challenging people to engage. This approach may be applied in cultural public spaces. For example, a TV set in a museum cafeteria could be showing regular TV content and simultaneously a feed from an application that allows people to share their photos or announcing the next events on the museum. This scenario raises additional challenges related with the right balance between regular TV content and UGC, competing for screen area, and the collective mood. Social negotiation of what content to be shown presents important challenges and may be solved through the integration of shared pools or multiple control devices.

6. CONCLUSIONS

There is a considerable potential on the idea of leveraging iTV infrastructures for supporting new types of public display services and new forms of audience participation. Still, there are some limitations in this approach that result directly from the specific assumptions behind iTV services. From the brief analysis we have described in this position paper, we may assume that there is a clear design space for hybrid solutions to be explored. However, iTV, as we know it today, is based on very different design assumptions and was not originally conceived to support public display scenarios and collective control. As a consequence it will not be an immediate solution to many of the applications that are now common in public displays. The successful use of iTV for that purpose requires a clear understanding of the properties of the iTV infrastructure and a focus on the type of applications in which those properties may provide more added-value than limitations. Designing new interaction devices that support multiple and concurrent control and studying new interaction models represents relevant challenges for future research activities.

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