
Dispersing the Interactivity: Mobiles and Electronic Programme Guides

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Abstract

This paper investigates how hand-held technology might be used to augment existing electronic programme guides (EPGs), to better support television planning. Using the results of a television planning diary study, we developed and evaluated design concepts to allow users to learn about potentially interesting programmes via their mobile as well as using recommendations from family and friends. We present results from a user evaluation that suggest migrating some of planning activities to a hand-held device has promise.

Keywords

Interactive Television, Electronic Programme Guides, Mobile, Interaction Design.

ACM Classification Keywords

H5.2. User Interfaces

Introduction

Interactive Television (iTV) offers an exciting future full of dynamic viewer-channel interactions. However, while increasing numbers of consumers purchase iTV capable devices and channel providers experiment with services, a range of usability challenges remain.

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CHI 2006, April 22–27, 2006, Montreal, Canada.

ACM CHI Workshop on Investigating new user experience challenges in iTV: mobility & sociability

One problem that warrants investigation is that of planning what to watch on television. With an increasing number of channels on offer, each offering lots of different programmes, it is clear that for many, “the main problem isn’t a dearth of programming. Its finding what’s on” [8].

Electronic programme guides (EPGs) have been developed to help television viewers deal with this increasing number of channels and are now regularly used by many people. EPGs display the television schedules on the television screen and allow viewers to choose what to watch directly from the on-screen list.

Although they are certainly popular, EPGs on their own are not necessarily best suited to the task of television planning. Unlike printed television guides they can only be used whilst in front of the television set. The user cannot use them whilst on the way to work, or whilst waiting for a train to arrive. Furthermore, their use typically requires a ‘sit forward’ style of interaction. The viewer must be focused on using the system and be actively engaged in setting viewing preferences and browsing the on-screen listings [2]. This does not come naturally to most television viewers because television is traditionally a very passive device. Viewers like to ‘lean back’ and passively watch television, they do not want to have to ‘sit forward’ to have to interact with their television set.

Hand-held technology presents an opportunity to augment traditional EPGs and to better support television planning because it enables it to be done away from the television set. This not only empowers the viewer, enabling them to plan their television

viewing anywhere and at any time, but means that their natural style of interaction is better supported.

Our research efforts have been focused, then, on investigating how hand-held technology might be used to augment existing EPGs so that TV planning is better supported.

In this paper, we begin by considering the related work on EPGs, multiple device user interfaces and paces of interaction. Then we outline the results of a diary study into TV planning activities. That study led us to propose a handheld prototype that was evaluated with twelve users and we report on the insights this provided.

Background

Electronic Programme Guides

A wide range of research has been conducted to look at how best to design EPGs. These include studies evaluating the usability of EPGs [4] and studies looking at how people’s television viewing and planning habits might influence and inform the design of future EPGs [2, 13]. Such studies often result in EPG design guidelines and recommendations, such as those offered by Serco [11], and those put forward by Taylor and Harper. However, guidelines are primarily directed towards on-screen EPGs, that is, programme guides accessed directly via the television set. No such guidelines exist for an EPG running on a hand-held device, or for a system integrating an on-screen EPG with a hand-held device.

Some of these EPG-style systems, such as the EPG for Peng and Vuorimaa’s mobile digital television system [9] have made the transition to hand-held devices, but all are very much technology driven. The push appears

to have come from the technology behind the personalisation and artificial intelligence, not necessarily from any identifiable user needs for such a system. Furthermore, systems are lacking any real integration with EPG systems. They provide recommendations but do not allow users to directly act upon them, for example, by requesting recommendations to be recorded. The only notable exception to this is Symth et al's PTVPlus-GuideRemote [12]. This system not only enables a user to directly control the television but also provides personalised television listing information and programme recommendations. However, being based around a universal remote control and not a PDA or mobile phone, the system clearly has very limited scope for use away from the television set.

Multiple Device User Interfaces

Whilst there has been research into using hand-held devices and digital television together, this has not been directed towards television planning. For example, Robertson et al developed an information system for Estate Agents that allows a user to use a PDA in conjunction with digital television [10]. Multiple device user interface systems for digital television tend to be orientated towards either delivering extended television, or like Enns and MacKenzie's touchpad remote control [6], towards directly controlling the television using a hand-held device.

Extended television can be seen as an attempt to extend digital television beyond the television set itself, allowing the extension of television brands to a range of different electronic devices [5]. Adams talks of the possibility of carrying a television programme on, through a mobile phone, the web or interactive

television, even when it is not on air and there is no television within reach [1]. Such services can involve synchronous interaction, where the interaction occurs whilst the television is on, or asynchronous interaction, where the interaction occurs either before or after the programme has been broadcast. SAVANT, for example, [3] is a synchronous system. It allows television programme information, such as up-to-date game statistics for a football game, to be sent directly to a user's PDA or mobile phone. Such information can thus be viewed in parallel with the television programme.

Paces of Interaction

As a user's context changes, so might the desired level of interaction with the technological resources available to them. We might then differentiate between the "lean-back" interaction seen in conventional TV viewing, and the "sit-forward", highly engaged, form seen with computer use [7].

Studies all agree that television traditionally supports a very passive style of interaction, but that this level of interaction increases with the introduction of increasingly interactive services, such as EPGs. There is a clear conflict between the traditional "lean-back" style of television interaction and the more interactive, sit 'forward style' of interactive television services. It is therefore perhaps not surprising that studies have shown that not all viewers are very eager to switch to a more involved level of interaction, preferring the old and the reliable to the new and suspect [15]. Research, such as personalised EPGs have sought to reduce this level of interaction, by pushing more personalised content. However, little work has to date investigated the possibility of moving it away from the television, on to a different platform, such as a PDA or mobile phone.

Television planning DIARY study

Eight people from the United Kingdom, aged between 18-35, were asked to keep a week long diary of their TV planning activities. They were asked to note the resources they used, when they were used and for what purposes. These entries were used as a basis for a mid-study phone interview and an end-of study face-to-face discussion. Full details of the study and its results can be found in [14]; here, though, we highlight the following findings.

Planning can be a social activity

All diarists indicated that they often watch television with other people. This seems to have a real impact on how they plan what to watch because consideration must be given as to what others might want to watch.

Although most diary entries were of individuals using television planning aids, a number referred to collectively planning. This was the case when agreement was being sought over what to watch together. Channel flicking or on-screen television planning aids were used to enable everyone to see what programmes are available. Perhaps the ingrained social nature of watching television makes on- screen television planning aids more suitable for collective planning. Watching television is frequently a social activity, so it would seem natural for the use of a television to plan television viewing to also be a social activity.

Television can also provide a social commonality. For example, diarists spoke of chatting to friends about programmes that they watched. There was also evidence of diarists recommending programmes and movies to friends. One diarist spoke of a friend with

whom they regularly sent text message television programme recommendations to and from. Another saw a programme that they felt a friend might be interested in and phoned them to let them know that it would be on. There appears to be evidence of people, not just looking for themselves, but of also looking for television programmes that might interest others as well.

Viewers look for 'more of what they like'

The type of programme and whether the diarist had seen it before and liked it, were the most important factors when deciding what to watch. The channel the programme is being shown on was seen as being important because it is recognised that some channels, such as MTV only show programmes of a certain type (music in this case). Furthermore, there is a clear issue of trust. It is recognised that some channels, primarily the terrestrial ones in the UK, can be relied upon to show programmes worth watching. That is, the quality of the content is seen as being higher than of some of the other television channels on offer.

Often diarists would talk about watching a programme because there was a lot of discussion both in the media and in their communities about it. Furthermore, programmes were watched because they were recommended by others. Such recommendations might come from friends, family or from editorials and television critics. Recommendations appear to be especially influential for films and one off television programmes, where there is little prior knowledge of the programme.

Planning is often short-term

Predominately people used the guides to map out the coming evening's viewing or, whilst sat in front of the TV, to consider what was available, 'now and next'. Longer-term planning was focused on programmes they particularly wanted to watch or record (e.g., a film or documentary) .

DESIGN CONCEPT

We developed a low-fidelity mobile prototype to support viewing planning in three ways (see Figures 1 & 2):

- By providing a recommendation facility where one user can send suggestions to another's mobile and 'recommender services' (e.g. broadcasters) can also send alerts. Suggestions are sent in a text-message mode: recipient alerted as soon as one is sent.
- By focusing the mobile guide on personal highlights for the user, by default listing only the upcoming day's highlights. Users can create lists of their favorite programmes and programme types.
- By reminding them of some a programme they indicated they wanted to watch/record.

Further details of the prototype can be found in [14].



Figure 1. Mobile EPG design concept. User receives recommendation from a friend (top); and, Reminder dialogue – allows user to activate their Personal Video Recorder remotely (bottom).

Evaluation

A proof-of-concept study was carried out with twelve users (5 female, 7 male, aged 18-35). Each participant worked with the prototype that consisted of mock-up dialogue screens attached to a hand-held computer and manipulated by the investigator in a naïve wizard-of-oz form (see Figure 2). Users were asked to work through a series of tasks that demonstrated the extended EPG facilities. At the end of their session, they were asked to rate the features and provide additional feedback during an interview.

The most useful feature was seen to be the personalized TV highlights. Second in popularity was the reminder function. In terms of the recommendation features, users expressed a strong preference for family/friend recommendations over third-party ones. Even so, many participants reported that they would prefer to phone or text someone, rather than explicitly recommend a television programme. There were also concerns about being alerted each time a new recommendation arrives. A less intrusive system, allowing recommendations to be dealt with when it is convenient to do so, not necessarily when they arrive, was seen as being preferable. That is, a system much more like email than texting. The only instance for which recommendation alerts were seen as being desirable were for television programmes that are currently being watched. However, most participants still reported that they would rather call because there is no guarantee that their friend or family member is watching television at that moment.



Figure 2. The design concept mock-up used in evaluations. Shows *TV Highlights* dialogue giving user personalized information for near future.

CONCLUSIONS

We have presented some initial arguments and evidence that suggest conventional electronic programme guides (EPGs) need augmenting. EPGs do not support planning away from the television set, and do not support the engaged, social style of interaction, required in some TV planning scenarios. Migrating some of these activities to a handheld device appears a promising approach, meriting further investigation.

While the social element of the system – the personal recommendations – was viewed favourably, our study suggests that there is much further work needed to understand how to integrate existing collaborative viewing practices (such as word-of-mouth promotion) within emerging iTV technologies.

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