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Taking Social TV Beyond Chatting: How The TV Viewer Adds Value To The Network

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TAKING SOCIAL TV BEYOND CHATTING: HOW THE TV VIEWER ADDS VALUE TO THE NETWORK

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Abstract

In this paper, we provide a comprehensive overview of the state-of-the-art in a contemporary iTV research area: social and networked TV. In our approach, instead of considering research sub-topics that build upon particular disciplinary threads (e.g., usability, personalization, multimedia annotations), we take a multidisciplinary approach that builds upon findings in media studies, human-computer interaction and multimedia systems. Moreover, we downplay the importance of chatting over a distance in favor of non-verbal communication modalities. In contrast, we focus on Social TV practices and highlight the role of each viewer as a node that adds value to the TV network. Finally, we provide directions for further research in neglected topics, such as supporting collocated viewing, and sharing the TV experience in a seamless way.

Keywords: *Interactive TV, Social TV, Internet TV, Networked TV*

1 INTRODUCTION

The Social TV strand of iTV research focuses on television watching as a social activity and on content distribution though computer networks. Although television, since its inception, has been considered a social link between people, commercial social television systems have been scarce in the marketplace, until very recently. There has been a significant body of computer supported co-operative work (CSCW) research on supporting interaction among geographically distributed co-workers, but there is limited investigation in the context of leisure activities, and in particular distributed use of audiovisual content, such as TV.

As a matter of fact, there is not much knowledge on designing applications for leisure or informal TV sociability. What features should this applications support and how should we design them? Previous research has already considered a closer integration between mass media content and social communication, but most of those approaches have focused only on verbal communication. Social TV applications have a wide appeal as audiovisual content becomes more closely integrated with the social structure of Web video services, such as YouTube. In this article, we explain how Social TV research could reach its full potential by moving beyond chatting systems.

Previous research has defined 'Social TV' as a system that allows distant viewers to communicate directly or indirectly with each other using several interpersonal communication modalities, such as open audio channel, instant messaging, emoticons, etc. One of the first technological approaches to Social TV was the "Inhabited TV" research effort (Benford et al. 2000), which developed a collaborative virtual environment, where viewers could interact with other viewers or virtual objects. In that case, viewers were watching TV within the virtual environment and not within physical space. Thus, viewing was extended with social interaction among participants and increased interaction with content. In an Inhabited TV application, the television becomes an actor and a part of a group of people interacting within a virtual online world.

Content sharing and social communication corresponds to a meta-content activity, "have you seen that goal?" or 'you should definitely watch this clip!' The majority of research on communication process has focused on chat-enabled television channels, real-time voice communication, or synchronous avatars

that indicate the current state of a viewer. There are only few non-verbal systems and studies that support TV sociability in a seamless way. Moreover, there is limited technological support for leveraging the typical habits (e.g., skip, pause, record, replay) of the viewers for the benefit of networked TV.

This rest of this article is organized as follows: In the next two sections, we examine how the traditional hierarchical content flow paradigm has been breaking down and being enhanced with content sharing between users and between devices. Then, we explore technological support for and studies on social communication about TV content, which has been the most popular research sub-topic in Social TV. Besides chatting, we describe why the seamless sharing of experiences is the next step for Social TV research. Finally, we conclude that all these changes are transforming each viewer into an active node that adds value in networked TV distribution.

2 BEYOND HIERARCHICAL CONTENT DISTRIBUTION

The flow of TV content starts when media is captured. The raw material might be captured using digital means or can be, later, converted into digital format. Then, the content is encoded and might be authored by aggregating various media elements into one presentation, by determining the layout characteristics of each media element, and by introducing handlers for user interaction. Finally, the content is delivered to the end-user's device for consumption (Bulterman, 2007).

TV content in the living-room and outside has been provided mostly by means of broadcast stations. A basic ITV system includes tuner and a processor that decodes the signal and provides processing and storage capabilities that enable interactive applications. Nevertheless, the disagreement on a common open middleware platform has been an obstacle for the development of sophisticated interactive applications that are independent from the STB hardware. On the other hand, there is agreement over the specifications for the digital video broadcasting (DVB-S/C/T/H specifications satellite, cable, terrestrial, and mobile).

Hierarchical content flow is only one part of the distribution options for interactive television. Viewers are enjoying television content on computers and on the move, but more importantly, viewers are becoming an active node that might add value and distribute media content. Bulterman (2007) shows a comparison between the typical client/server architecture (Broadcast station /set-top box) and the current one: a hybrid approach. This hybrid approach highlights that clients might become more active nodes, and technical achievements on P2P networks and mobile/TV convergence supports this paradigm shift.

In summary, networked television systems operate as the middlemen of TV content flow. Networked television has emerged thanks to the Internet and thanks to a growth of interoperable telecommunication infrastructures and networked multimedia terminals.

3 SHARING CONTENT BETWEEN USERS AND DEVICES

Besides hierarchical networks, TV content can be efficiently distributed over peer-to-peer (P2P) networks. In this way, the variety of video delivery paths has been increasing with the support of new internet technologies, which allow new ways of distributing video (e.g. broadband connected TV boxes). Thus, ITV applications are neither limited to the traditional TV device and broadcast delivery, nor to the typical channels of satellite, cable, and digital terrestrial networks. Alternative and complementary devices and distribution methods have been considered, such as mobile phones (mobile DTV).

Social TV builds upon the convergence between different technological infrastructure, such as broadcasting, telecommunication, and internet. The convergence has been realized in different forms. On the one hand, Internet content may be accessed through television web browsers, or linked to ITV programs (e.g. interactive advertisements). Communication applications such as messaging, chatting, or voting during certain programs (quizzes, contests etc.) strengthen viewer's loyalty to the specific program. However, Internet access via television may disrupt current viewing patterns. Besides user

interaction, at the network-level, internet connection facilitates video transfer over P2P networks. Moreover, the distribution of TV content over IP-based platforms, known as IPTV (Internet protocol TV), provides additional opportunities for the delivery of a wide variety of TV programming. In addition, 3G mobile networks could be used to distribute and control TV content.

In all these cases it is essential to take into consideration the digital rights management (DRM) for all the content owners (including the end-users as content creators). Nevertheless, many approaches to DRM have been considered harmful to the usability of TV-related activities. In this context, we need to study sharing of fragments of television programs. Gift-giving and sharing of fragments of television content are potentially strong business models, although topics such as copyright control, versioning control might be obstacles in the way.

Sharing content does not only regard how a particular content item moves from one device or user to another one. A potential direction for further research might consider how content should be rendered when multiple users and multiple devices are present in the living room or outside. The availability of small broadband multimedia devices has facilitated the development of multimodal systems that split the user interface over multiple screens (Robertson et al. 1996). Additional results have been provided by Cesar et al. (2008) on sharing fragments of television content by employing secondary screens. The most interesting part of those works is how the user interface and the content is distributed, instead of mirrored between the complementary devices.

In summary, networked television systems are a necessary technological infrastructure for advancing the state-of-the-art in Social TV research. In addition to flow within a dedicated distribution network, the flow of content is also realized between devices owned by one or more viewers. For example, viewers might record broadcast TV content, transfer to the Web, then synchronize to a mobile device. In this way, the traditional hierarchical distribution of content has become just a sub-case of content sharing between users and devices.

4 TALKING ABOUT CONTENT

Despite the many criticisms on the quality of TV content and on the passive nature of the watching activity, the social uses of TV have been documented in acclaimed research (Kubey and Csikszentmihalyi 1990, Rubin 1984). In particular, the use of audiovisual content as a point of reference for starting and sustaining relationships (e.g. discussions about yesterday's football match, or a popular TV series) is an everyday experience for the majority of TV users. Nevertheless, the pressures of daily life and the increase in the number of diasporic households make joint television viewing increasingly difficult.

Social TV systems offer one or more computer mediated communication features, which are closely integrated with the TV watching experience. Computer mediated interpersonal communication over distance, or over time could employ various communication modalities such as audio, text, and video conferencing. Besides text and audio in interpersonal communication, there are also non-verbal modes, such as: 1) personal video-photos and 2) non-verbal cues (e.g. emoticons, avatars). During the last decade, there have been many Social TV systems in corporate research labs. Those systems provide support for buddy lists, talking about content, as well as sharing personal photos and home videos. Interpersonal communication is based on voice, text, and video formats, as well as animated avatars.

Chorianopoulos and Lekakos (2008) have described television sociability in two dimensions: synchronous – asynchronous communication and collocated – distant presence. The resulting quadrants point towards four basic scenarios that should guide further research in Social TV systems and studies. By placing contemporary research on the matrix it immediately becomes apparent that there are some interesting, neglected scenarios for Social TV. In particular, there is very limited research on supporting groups of people watching at the same place at different times. In other words, there is an opportunity to design and evaluate systems that treat TV content as a notification, scheduling, and communication mechanism in a family home.

Moreover, there is no research at all for synchronous collocated types of Social TV. Although this scenario seems trivial, technological support might be employed to increase the enjoyment and the interaction between collocated groups of TV viewers. Designers should consider social viewing and opportunities for social communication that might take place locally, or remotely. For example, an ITV quiz game might provide opportunities for competition between family members, or remote users and drama series should provide facilities for online community building along the storyline of the broadcast.

Technological support for interpersonal communication is only the first step towards social TV. Contemporary research has contributed with several systems and studies on viewers talking about content. Nevertheless, the most interesting Social TV research concerns non-verbal communication, as well as the leveraging of meta-activities, such pause, replay, record, and share. The aggregate of those activities provides a wealth of social meta-data about TV content, which is examined in the next section.

5 TOWARDS SHARING EXPERIENCES

In comparison to technological support for chatting over a distance, broader support for sharing experiences through networked television has received little attention by researchers. Indeed, verbal communication is the most obvious way of social communication, but previous research in sociology has been highlighting that the essence of social communication lies within the non-verbal realm.

In addition to interpersonal communication, there are TV activities, such as aggregate replays, pauses, and recordings of content that hold potential for Social TV. As a matter of fact, the next wave of Social TV research needs to focus on those activities that provide wide social benefit, although they might not look or feel like direct communication. Currently, there are two approaches towards shared experiences: 1) Ambient TV provides peripheral awareness and 2) pragmatic analysis of user activities supports collaborative filtering of multimedia content.

Shamma (2007) states that there is a need to shift from semantics to pragmatics in multimedia systems. The shift from semantics to pragmatics holds a great promise as a shortcut solution to some hard researh issues in multimedia information retrieval and it is now becoming feasible due to Networked TV systems that facilitate the uninterupted flow of both content and user activity between peers.

Researchers in multimedia information retrieval have been attacking a very hard problem. For example, Ekin (2003) have developing techniques that allow automatic summarization of a sports game. In addition to patterns within the content he has also exploited knowledge about the cinematic structure of a game, in order to allow a computer program understand which are the highlights. However significant (indeed, many of those algorithms and techniques have been patented to protect the hard effort) that research approach is, there alternative approaches to multimedia information retrieval in a networked TV infrastructure.

Finally, user modeling has investigated how adaptation works for groups of people, such as a family. Researchers have argued that for a given group of people the recommended TV content might be better liked when the system considers the profiles of the respective group. For example, a study of an ITV adaptive instructional program confirmed that people tend to choose the TV content that would fit the preferences of a certain group of viewers (Masthoff 2004). Moreover, Brown and Barkhuus (2006) have formulated some essential questions such as ’how new media technologies are affecting family structures?’

6 THE VIEWER AS A NODE THAT ADDS VALUE TO THE NETWORK

Most researchers have reached consensus that television use is not a passive and solitary watching activity, and thus there is a need for further development of social interactive television systems. These systems should focus on both synchronous and asynchronous communications, as well as on providing non-intrusive means to indicate the presence of the viewer’s peers and build upon the activity of like-

minded (distant or close-by) viewers. Moreover, researchers have realized that the viewer is not the end of the chain. In contrast, the viewer becomes just another node in the production-distribution-consumption chain. That is, other node that can play different roles: distributor or even producer of content.

In traditional TV distribution, one measure of success, besides actual program liking, has been how much a TV show has been talked about between viewers. Schedule managers at TV channels have to predict and to measure the impact of each program on viewers, in order to make informed decisions about timeslots and reruns. Networked television enhances this established practice by making more efficient this particular role (measuring what has talk value) of the TV channel. Online video distributors have been enabled to set-up dynamic push content in accordance to the user activity generated around their multi-channel content offerings. Overall, networked television has leveraged the established viewer practices, such as recording, browsing (e.g., pause, repeat, skip), sharing with others, and talking about content to become significant determinants in the value chain of content distribution on any TV network.

Although content sharing usually makes most copyright owners very uncomfortable, it also makes up for an efficient and intelligent adaptation to user needs, which is the ultimate goal of most decent media business. Moreover, the aggregation of existing social practices through networked television might increase the shared experience value of content, with little marginal cost for the content owner.

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