

Use of the Físchlár Video Library System

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Abstract. Físchlár is a shared video retrieval system that lets users record, browse and watch television programmes using their web browser. In Físchlár, the programmes users can watch and record are organised by channel, by theme and by personal recommendation as provided by the ChangingWorlds' ClixSmart personalisation engine. Our initial results from user trials illustrate the usage of each of these features.

1 Introduction

With the arrival of new cable and satellite television services, and the next generation of Digital TV systems, we will soon be faced with an unprecedented level of programme choice – even today users of these systems benefit from upwards of 200 channels and 4,000 programmes per day, and this is set to increase rapidly. The current generation of electronic programme guides (EPGs) go some way to assisting users by offering an online source of listings and schedule information, but they do not go far enough. The burden of search is still very much on the user. At the same time users are essentially slaves to the television schedules and are constantly forced to choose between competing viewing options: if a user watches a programme then she misses parts of other programmes. Personal video recorder such as AVIR [1], TiVo [2] and ReplyTV [3] provide a current solution to this problem by providing users with local storage and personalised on-screen EPGs for choosing what to watch and record.

In this paper we report on user trials of a shared video retrieval system that was developed as part of a joint research project between the Centre for Digital Video Processing and ChangingWorlds. This system combines Físchlár's video indexing, browsing and playback technologies [4] with ChangingWorlds' personalised EPG [5,6]. In the sections that follow we will

describe the Físchlár video retrieval system and its user-interface (Section 2) and preliminary results from its current trial (Section 3).

2 The Físchlár Video Retrieval System

Físchlár is a shared video retrieval system that lets users record, browse and watch television programmes online using their web browser [4].

2.1 Personalised Programme Listings

The programmes our users can *watch and record* are listed by channel, by theme and by personal recommendation as provided by the ClixSmart personalisation engine [5,6]. Users can also access programmes by their “favourites” category which lists the programmes they previously indicated they like. Each programme also has a short textual description.

Users rate programmes in a five point scale – hate, dislike, okay, like, love. These ratings are passed on to the ClixSmart personalisation engine which provides the recommendations for the user of programmes to watch and record. The system assumes a user likes a programme if they record it and have not previously rated it.

2.2 Capturing and Storing Content

Programmes are captured in MPEG1 format from any of eight broadcast television channels. Currently, we capture one channel of the eight at a time. Once captured, a programme is analysed for shot boundaries by comparing the histograms of consecutive frames. Then a keyframe is extracted for each shot based on its similarity to the average histogram of that shot.

After analysis, a recorded programme is put onto our video streaming server which has up to 400 hours of storage and can support almost 200 concurrent users. The oldest programmes are removed to make space for the new ones as required. Currently, this results in a programme being available for playback for just over three weeks.

2.3 User-Interface For Recording Programmes

To record a programme the user clicks the record section of the interface and then browses the television schedule for today and tomorrow (Figure 1). The user can list the schedules by recommendations, favourites, television channels or by themes. The user clicks on the programme’s name to record it. The programmes in gray cannot be recorded as some other programme is

being recorded on a different channel at the same time. A user can rate a programme by using the thumb buttons beside the programme's description.

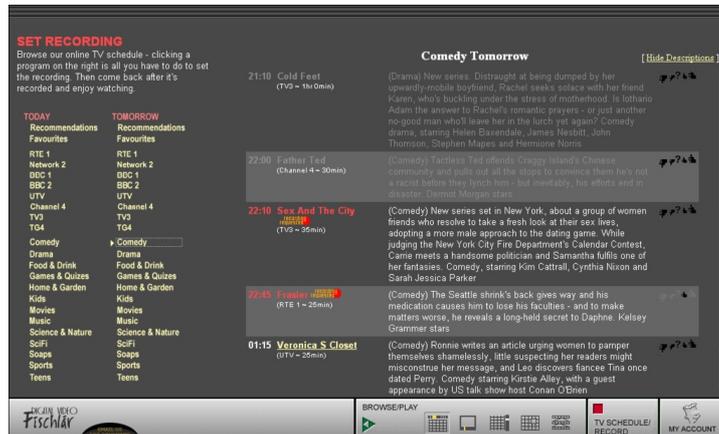


Figure 1. The user has selected the comedy theme from the record section of the web site.

2.4 Interface For Browsing The Recorded Programmes

By default, the latest 7 days of recorded programmes are initially listed in the play section of the interface (Figure 2). To list programmes by favourites, recommendations, themes or channels the user selects the required listing from the Collection dropdown list. Users can browse a given programme using the keyframes that represent each of the programme's shots and can start playback of the video from any shot in the programme by clicking on its representative keyframe.

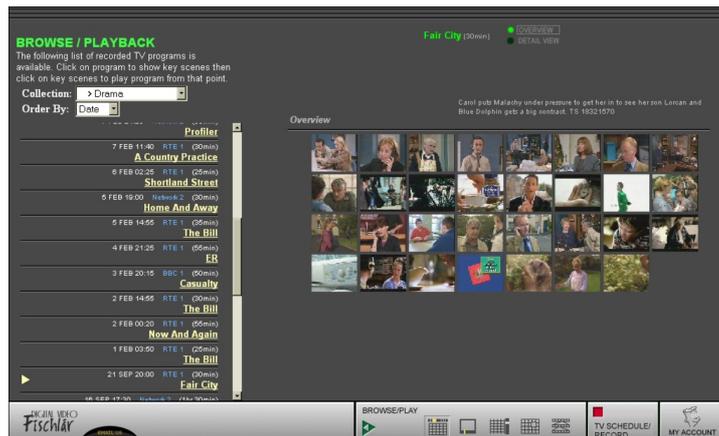


Figure 2. The user selected the 'Fair City' programme from the list of programmes under the drama theme in the play section of the web site.

The user has a choice of five content browsers – overview/detail, slide show, scrollbar, dynamic overview and hierarchical browser [7]. The overview/detail browser displays an overview page and also allows browsing of all the keyframes in pages of 24 images. The scrollbar browser lists all the keyframes on a single page. The slideshow browser lets the user flip through the keyframes one at a time. The dynamic overview browser flips through the keyframe group that the user puts the mouse over in the overview. The hierarchical browser displays the keyframes in a tree.

3 Evaluation

The content browsers have undergone many usability tests with sample users. This has led to many refinements of the individual interfaces. To improve our system we are performing trials with users on Dublin City University's campus. When the current trial is complete, analysis of the user activity, questionnaires and interviews will inform us of necessary refinement and development.

We started user trials of the combined Físchlár-ClixSmart system in December 2000. The system was made available to students in all the laboratories of the Computer Applications Building in the University (500 computers) and also from the apartments in the University's residences.

In this section we outline initial results from the current trial. We will describe the users, and how they record and watch programmes. We will show the usage of the different content browsers and the use of the explicit ratings.

3.1 Users

The profile of a typical user is a University student aged between 18 and 22. Those using it from the computer laboratories are computer literate and interface problems may not be as visible with this user population. Most of these users have a television and video recorder in their home and therefore they are not dependent on the system for television access. The users in the computer laboratories are using the system in a situation where there are social norms that have to be taken into account. They might not watch certain programmes that they would watch in their home. How they interact with the browsing system may also be different.

In the two months of usage between December and February (excluding the Christmas break) 581 users registered and used the system. A lot of these users have not been using the system for very long. Over half logged in for their first time in the last 4 weeks. Just under a half of all users have used the

system only 1 or 2 times (Table 1). So, what we are describing in this paper is the *initial behaviour* of users.

Table 1. Number of times current users have logged into the system.

Number of logins	Number of users
10 or more	78
5 – 9	101
3 – 4	148
1 – 2	254
Total	581

3.2 Recording Programmes

A minority, 140 of 580 users, choose programmes that the system will record for everyone. About 100 of these users have chosen only 1 or 2 programmes to be recorded and just 20 users have made the majority of recordings. 3 users have recorded 158, 108, 105 programmes respectively. Typically five different people dictate what will be recorded on a specific day. About 16 to 20 hours of programmes are recorded and analysed each day. When most people access the television schedules they will not be able to choose any programmes to be recorded as the choice will already have been made earlier in the morning.

3.3 Comparing What is Browsed/Watched to What is Recorded

When we compare the content that is being recorded to that which is being watched we see that there is a different pattern (Figures 3 and 4). First, far more content is recorded than is being watched. A lot of programmes are being recorded that are never watched even by the people who record them.

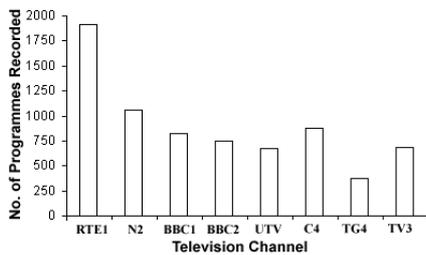


Figure 3. Number of programmes recorded from each channel.

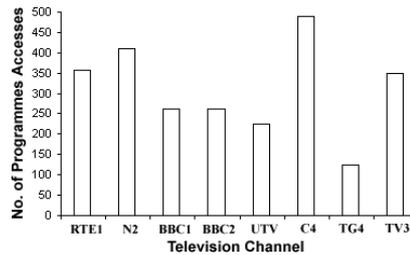


Figure 4. Number of times a programme is browsed or watched from each channel.

The popularity of RTE1 may be due to the fact that it is the default channel listed in the recording section (Figure 1). Some users go from this channel

listing to the next until they reach the last when choosing programmes to record. If they set an initial recording in RTE1 then they limit what they can record on the other channels. Restricting the number of recording requests that users can initiate will make them more thoughtful of what they do record. We should also show each user the programmes that cannot be recorded as a result of placing a given recording. And so, hopefully a user can make a more informed decision (if only for herself) as to what to record.

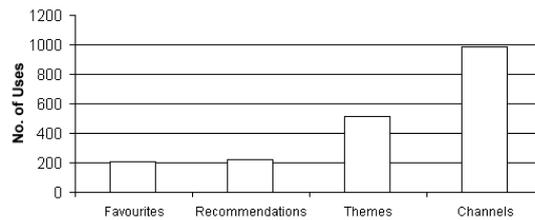


Figure 5. Number of times each method is used to browse the television schedules in the recording section of the web site.

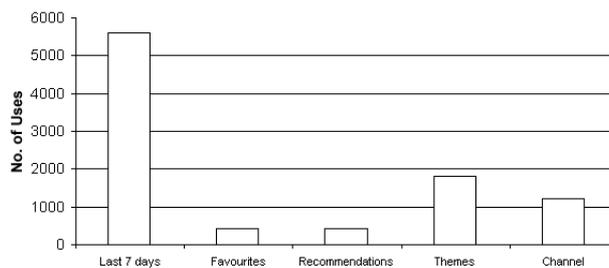


Figure 6. Number of times each method is used to browse the play list. Last 7 days is default.

In Figure 5 we can see that when browsing the television schedule, listings by channels are used twice as often as listings by themes. Also, themes are accessed three times more than favourites or recommendations. In the Físchlár-ClixSmart system there are 8 channels and 13 themes. So, recommendations and favourites are out performing the average access to a channel or theme. A programme may belong to more than one theme and some programmes do not belong to any of the current themes which probably explains why people are using the channels so much. Perhaps what we can take from these results is that people will use their favourites and automatically generated recommendations but that they will also explore the contents of a television schedule by classification (themes) and by channels. Also, since there are only 8 channels and 2 days schedules in the current system, recommendations may be somewhat of a luxury.

In contrast to the usage in the record section, in the play section of the site themes are more popular than channels in accessing the play list (Figure 6). Again favourites and recommendations get equal number of uses. The latest seven days of recordings are listed by default, which explains its popularity. The channels option may suffer from being at the end of the dropdown list which is used to change between types of listings. But even so the change of behaviour for browsing the play and record lists is significant. It could be that in the play list, the channel of the programme is displayed but the themes that the programme belongs to are not. By having the option 'latest 7 days' of recordings we reduce the need to go through the play list channel by channel as people do in the television schedules for recording.

3.4 Content Browsing

Users normally use the first of our selection of video content browsers, overview/detail browser, which is also the default, for looking at the programme's content (Figure 7). Some users do actually use the other browsers. Most of the users would not yet be familiar with browsing video or these content browsers. It is encouraging that at this early stage people are using the content browsers especially when they are not fully integrated with playback.

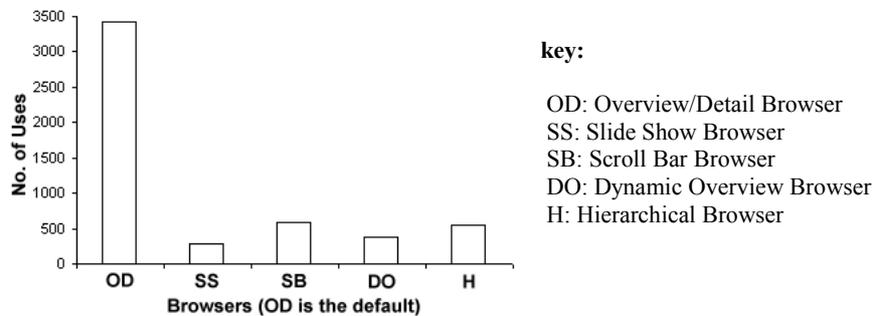


Figure 7. Number of times each content browser is used.

3.5 Rating Programmes

There are 251 users of our system who have rated programmes. A third (1,000) of all ratings are generated automatically by the system when a user records a programme. Two thirds (2,000) of the ratings are explicit. Just 20 people account for over half of all ratings and the top person has rated 426 programmes. However, this may have been done so as to list nearly all programmes on one page.

The ratings feature is not fully integrated with the play list. Currently, the rating thumbs are not displayed in the play list. This will be rectified. Also, we will need to build a recommender system that can work from users' viewing habits in addition to explicit ratings. Sensible rules for when to infer users like a programme may also be a useful shortcut.

4 Conclusions

Networked or local video storage can alleviate the problems of television schedule clashes and allow users to watch programmes when they want. Recommender systems can make users aware of what programmes they may like to watch either at broadcast time, or later. By using content browsers the user may also choose how he watches the programme - by skipping some segments like advertisement breaks or by disregarding the programme unit and watching only selective segments of the programme.

The results presented in this paper are a first step in understanding how these features are used by a group of users in a shared video system. However, these results will need to be corroborated by future trials of the Físchlár-ClixSmart system and by results from alternative systems.

References

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