An integrated multiple media portal with semiautomatic editing features*

Caj Södergård *,1, Matti Aaltonen 2, Christer Bäckström 1, Ari Heinonen 4, Timo Järvinen 1 , Timo Kinnunen 1, Pauliina Koivunen 3 , Sari Lehtola 2, Ville Ollikainen 1, Katja Rentto 2, Mikko Seppälä 4 , Antti Tammela 2

[1] VTT Information Technology, P.O. Box 1203, FIN-02044 VTT, Finland
[2] VTT Information Technology, P.O. Box 1206, FIN-33101 Tampere, Finland
[3] University of Jyväskylä, Information Technology Research Institute, P.O. Box 35, FIN-40351 Jyväskylä, Finland
[4] Journalism Research and Development Centre, FIN-33014 University of Tampere, Finland.

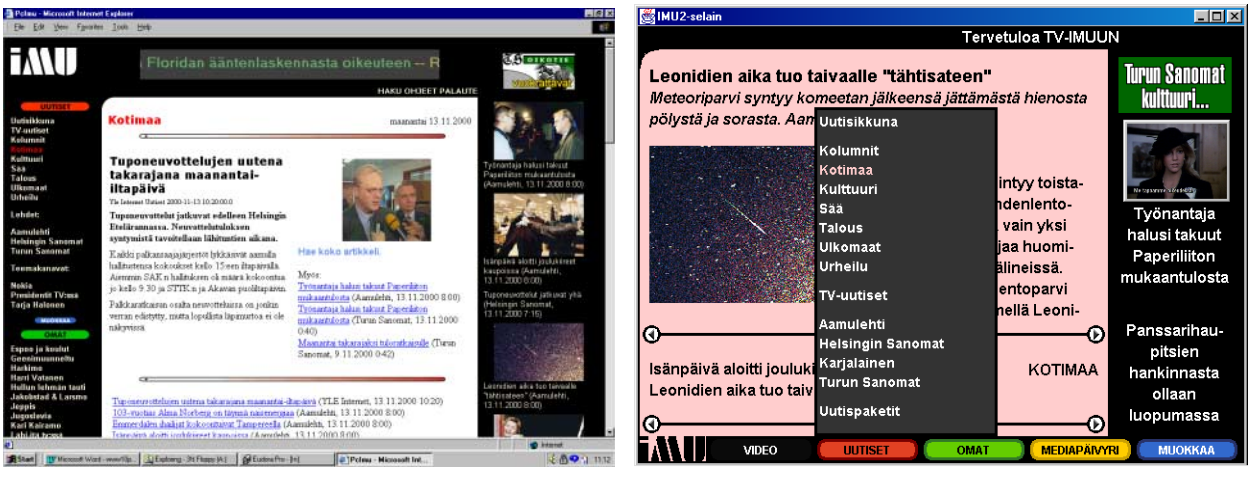
Abstract

The emerging multiple media portals accessed by a variety of terminals require semi- and fully automatic procedures for managing the material. The IMU trial system, developed in this work, automatises parts of the news content acquirement and processing work of the portal web master. The IMU active proxy server extracts the metadata from news web sites and from the television news broadcasts through video analysis making an automatic classification and linking of related articles and TV clips possible. The deeply integrated material is partioned into personalisable news composites, channels. The automatically computed event and media calendar allows for a new type of integration of news and up-coming events. The news content is refined by setting up filters for monitoring of the business environment. The content is accessed from PC, TV mobile phones and can be downloaded in voice synthesized form to MP3 player as a service to the blind. To balance the automatic procedures with journalistic judgement, we created web tools for journalists to control and override the automatic operations and for creating new content. The community feature enables groups to share news and to discuss topics internally.Keywords: Portals, Integrated publishing; Multiple media publishing; Personalization; Video analysis; Semiautomatic editing; Community building; Environmental scanning.

1 Introduction

Portals, like Yahoo[1] and MSN[2], are common entry ports into the WWW. To gain in popularity, they are including more and more features like common and localised news, search engines, chat, communities, calendars, personalization and e-commerce. Audio and video multimedia material are increasingly being added creating *multiple media portals* [1]. In this environment, content – even if primarily intended for a certain medium – is repurposed for a multiplicity of distribution channels and receiving terminals. A goal is, that the media consumer can get content versions independently of the terminal at use at the moment, be it a PC, TV, WAP telephone or a PDA. The management of these multiple media and personalisable portals poses a significant challenge –the editors and web masters must be able to use semi- and fully automatic procedures. In a recent paper [2], we presented the IMU trial system[3] for integrating newspaper and television news on personal channels. In this second phase of the IMU work, we have added and put into user trial several new features.

2 The functions and the user interface



PC *TV-set*

Figure 1. The IMU publication, where the channels are presented on the left (PC) or in the pop-up menu selected with the with the remote control red button (TV). The channel "Kotimaa" is selected. The channel contains the domestic news headlines and TV news drawn from several newspapers and TV stations. A News banner with the top headlines is displayed on the right. The TV-news topics found with video analysis are listed together with their representative stills at the right. Links to related articles are also computed. The TV browser application is written in Java.

The PC and TV interfaces are very similar. The same information can be retrieved via the TV and the PC. Of course, the smaller resolution of the television screen affects the way in which the elements are shown. For example, the news stories

* A full version of this paper is available at http://www.vtt.fi/imu2/
[1] http://www.yahoo.com/
[2] http://www.msn.com/
[3] http://www.vtt.fi/imu/

cannot be scrolled as on the PC, and have therefore to be paginated. The remote control device has to be taken into account. The WAP-IMU service provides personalised news for the users. The metaphor behind the user interface is the channel [3].

3 The system architecture

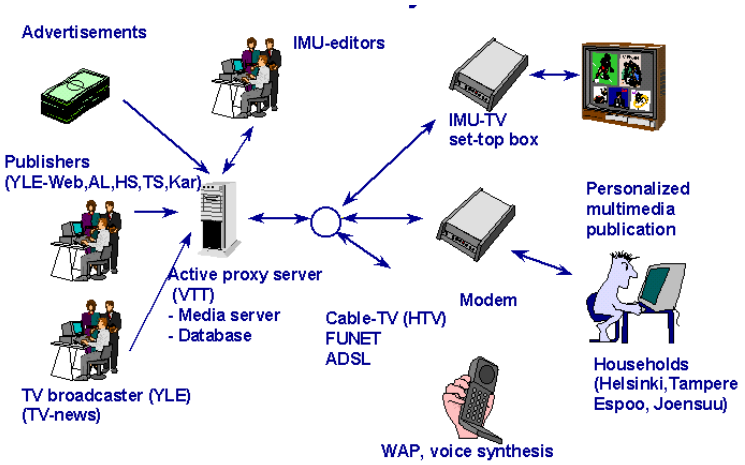


Figure 2. The trial set-up, where the active proxy server processes the content from the media houses. The IMU editors control the machine-made choices and produce own news packages. The publication is used on different terminals.

3.1 PC, TV and WAP Clients

The PC mainly uses a thin client. One servlet takes care of most user interaction tasks. All data needed for the user interface is kept in Java objects that remain active throughout the session. The model of the visible user interface is kept internally in a DOM tree structure. After each interaction the whole DOM tree is written out as an XML document. The XML content is converted into HTML by the browser according to rules given in an XSLT style sheet attached to the XML file. The personalization wizard is implemented as a simple applet and the application logic is handled by a servlet. The TV client uses a fat client architecture, where the browser is written as Java application. The WAP client is a scaled down version of the PC client, where WML documents are generated by the server servlet directly. An applet-servlet combination was used to implement the Editor.

3.2 Server, database and video analysis

There are two NT server computers in the system: the media server and application server. The media server uses Microsoft's streaming media. The server-side part of the IMU application runs completely in the application server. The database uses XML only as the storage format of textual content of articles. Each article is stored in the file system as an XML file that conforms to the XMLNews-Story DTD. Article, image and video clips metadata are stored in the RDBMS. The database API , written in Java, retrieves data from the RDBMS and returns it to the client modules as Java objects. Those objects are instantiated from classes that represent IMU objects such as users, channels and articles. The Java objects contain URIs to images and videos. The textual content of the articles is passed as DOM objects.Television news broadcasts are segmented into stories. Even if the segmentation methods resemble those in the literature, see e.g. [4], we are applying them in a new way. The repetitive appearance of the news anchor and various kinds of visual effects governs the setting of boundaries for a story. A story is further segmented into separate scenes with associated stills. The segmented news stories are labelled with news transcripts retrieved from closed caption texts.

4 Conclusions

The trial with PC, TV and WAP terminals showed a stable interest in the service. The typical user retrieved a few fresh articles at prime time in the evening. One fourth of the retrieved articles on PC was television news topics. The television set user selected three times more channels than the PC user, which supports our initial belief that the TV set is most suitable for this type of material. The most popular channels for the TV-user were TV programme schedules, TV clips coming in second. The community channels attracted a significant amount of TV-users. Personalisation was used scarcely and searches even more seldom. The interviews showed that the system was well accepted, except for the navigating in the TV-IMU application with the remote controller..

4 References

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