TUAM 3.3

TV ANYTIME: STORE IT ON MY TV

Ronald M. Tol and Edwin A. Montie

Philips Research Laboratories, Eindhoven, The Netherlands

ABSTRACT

This paper discusses provider-guided storage of content on a local storage device to implement TV Anytime features. The work is being carried out in two projects: STORit and myTV. Both projects are funded by the European Commission.

INTRODUCTION

Content providers and consumers have a common interest. Content providers want their content to end up being viewed. Consumers are interested in finding the programmes they want to watch and/or keep. As the quantity of content reaching the home through different channels increases, consumers will need guidance in selecting interesting content. Local storage is needed to make selected content available at times convenient to the consumer. Thus, there will be a need for systems that allows users to explore, acquire, and manage content in an intelligible way.

An open-specification approach is advocated by the TV Anytime Forum [1, 2]. The TV Anytime system will allow consumers to watch programmes when they want and in the way they want. Consumers will be able to explore and acquire TV content from a variety of sources, including traditional broadcast and new on-line interactive services – for presentation at any time. A fundamental concept in TV Anytime is unified content referencing: there is a need for an invariant programme identifier that can be used to identify a programme independently of its actual location. This identifier can then be resolved to an actual broadcast, for example. Different approaches based on proprietary solutions to the problem are being marketed by, for example, TiVo [3] and Replay TV [4]. These solutions restrict viewers to a single service/content provider.

This paper describes two European Commission-funded projects. The first one, STORit [5], pioneered the TV Anytime concept. The project started in March 1998 and ended in February 2000. The second project, myTV [6], started in January this year. It will continue in the coming two years to contribute to the TV Anytime specification and develop an interoperable Digital Video Broadcast (DVB) based TV Anytime system.

STORit

The STORit project investigated end-to-end solutions for delivering multimedia services to consumers. These involve the combination of a broadband delivery channel such as DVB, lower bandwidth connections such as internet, and affordable local mass storage at the consumer's home.

The STORit box [7] is an advanced mass home storage device. It helps run new applications in digital television, based on TV Anytime. The new services give consumers guided access to large quantities of content, tuned to their personal preferences. The STORit system relies on so-called metadata attached to the content by the content provider, and a Uniform Programme Identifier (UPI) / Uniform Resource Locator (URL) based content referencing system.
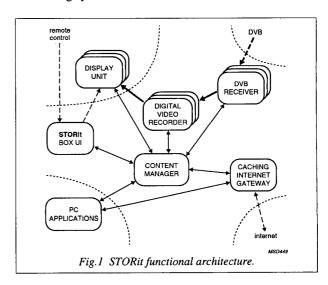

Fig.1 STORit functional architecture.

Figure 1 shows the functional architecture of the STORit system. The *Digital Video Recorder* implements real-time recording and playback to/from hard disk, optical disc or tape. The *DVB Receiver* extracts digital video and other data from a DVB transport stream. The *STORit box UI* provides the user interface, on/screen graphics, and remote control handling. The UI is shown on the *Display Unit*.

30

The *Content Manager* is the core of the system. It keeps track of all the metadata, the recording list, the table of contents (TOC), and Electronic Programme Guide (EPG). It also passes commands like play and record to the appropriate device. The *Internet Gateway* provides internet access for the STORit box and connected devices. *PC Applications* like browsers can access some functions of the STORit box including internet access, programming the video recorder, and installing profiles for preference recording.

Several features are implemented: EPG-based selection allows capture on local storage. A single click in the browser captures a whole TV series from a web site onto local storage. Clicking a button while watching a promotional trailer guarantees that the programme being advertised records on local storage later.

The user interface that manages the identifying, selecting and capturing of programmes is based on agent technology and contains lifestyle icons (L-icons). The L-icons will express different opinions that are linked to the type of programme and preferences indicated by the viewer. Thus a L-icon represents a consumer profile which can be adapted by monitoring actual viewing behaviour. L-icons are also used for automatic capture of content on behalf of the consumer.

Figure 2 shows the STORit box UI. The top shows a zoomed-out view. The middle shows the actual EPG with the "Documentaries" filter activated. At the bottom is a L-icon stating its opinion on the currently selected programme.
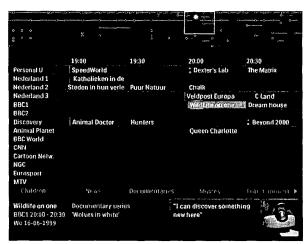

Fig.2 The STORit UI.

A first demonstration of the STORit prototype was given at the International Broadcasting Conference 1999 in Amsterdam.

myTV

Based on STORit, the myTV project aims to design and develop an interoperable DVB-compliant system with local storage implementing TV Anytime features. The first objective is to develop a consumer platform with built-in local storage. The second is to develop TV Anytime services that use local storage. Examples of such interactive broadcast applications include TV navigators, Web-TV convergence services, targeted advertising, and multimedia news services. The third objective is to provide true interoperability, both across different service providers and across different box manufacturers.

Basic issues to be addressed are: Who is in control of the storage capacity? The service or content provider, the consumer, both? What metadata needs to be standardized? How do we acquire content using that metadata, i.e. what content reference scheme do we use? How do we transmit TV Anytime data in a DVB stream?

CONCLUDING REMARKS

Adherence to open standards, as advocated in the TV Anytime Forum, ensures interoperability and a horizontal market. The resulting competition in boxes and services will result in higher quality and lower prices for the consumer.

Co-operation between equipment manufacturers and content or service providers will lead to a *low-cost* implementation of TV Anytime.

REFERENCES

[1]   TV Anytime Forum, http://www.tv-anytime.org/
[2]   S. Draper, N. Earnshaw, E. Montie, S. Parnall, R. Tol, D. Wilson, G. Winter. "TV Anytime", IBC99 Conference Publication, September 1999, Amsterdam, pp. 103-108.
[3]   TiVo, http://www.tivo.com/
[4]   Replay TV, Inc., http://www.replaytv.com/
[5]   STORit project, http://www.extra.research. philips.com/euprojects/storit/
[6]   myTV project, http://www.extra.research. philips.com/euprojects/mytv/
[7]   R.M. Tol, E.P.M. Niessen, E.A. Montie, A.J.M. Denissen. "Linux for fast prototyping a consumer device", NLUUG Najaarsconferentie, November 1999, Ede.