MultiChannelStory: an idea to develop interactive narrative with iTV

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Abstract
The growth of digital television has driven new challenges for broadcaster, content producers and software developers; interactivity, in particular, represents a clear shift in the paradigm of television applications. The art of interactive narrative can easily take this opportunity because interactivity allows viewers to change the plot and, at the same time, allows authors to present multiple perspectives of the story. The combination of interactive narrative with iTV could represent a further chance in the transition process from analogue to digital TV, where one of the critical needs is the development and delivering of new services and applications, able to attract new viewers. In this paper we propose a viable approach to develop interactive narrative with iTV technology. We present an idea to deliver television events, usually dramas or cartoons, having multiple and selectable plots, using the DVB-MHP platform (DVB Consortium, 2003).

Key Words
Interactive narrative, media navigation, iTV, DVB-MHP.

1. Introduction

The migration from analogue to digital TV is an essential change that is widely taking place in television world. This change has two main implications: an impressive increase in the capacity to broadcast more channels in the same bandwidth, and the considerable possibility to send software applications mixed with audiovisual contents, enabling the appearance of new market opportunities in the context of digital TV as it is described in (Pagani, 2003). It is clear that the spreading of digital television over satellite, cable and terrestrial networks, offers a wide scope to viewers, first of all the chance to interact with television programs.

From this point of view the art of interactive narrative can easily take this opportunity, because interactivity allows viewers to change the plot and at the same time allows authors to present multiple perspectives (Meadows, 2002) of the story, or of the characters into the story. In this paper we propose a viable approach to develop interactive narrative with iTV technology. We describe a model to deliver television events, like dramas or cartoons, that apparently follow ordinary patterns, but in the context of multiple and selectable plots. We define these events as *MultiChannelStories*.

A *MultiChannelStory* is a television program that could have multiple plots and consequently different conclusions; the viewer has the possibility to have his personal vision choosing among several stories linked together. It could be watched more than once in order to encourage the users to see coherent story with a different beginning, a different evolution and a different ending.

2. Model Conceptualisation

Both digital television and interactive narrative are subject to restraints and follow specific rules. For instance, the second one presents typical issues: every interactive story must address the way the user interacts with it, and also how, in turn, it responds to the user's actions. In particular the user can indicate his choices within the narrative (Hammer, 2002), in two different ways: implicit and explicit. In the method of explicit choices, the structure of the story provides specific points, at which the user is faced with a limited set of options. The story pauses while the user chooses, and then resumes based on the choice that he made. Instead, in the implicit choice method, the choice-making is closely woven into the narrative, and the user is not necessarily aware when he is making a choice or exactly how his actions are affecting the story; this is the case of some videogames. Explicit choice is obviously more limited than the implicit one but, at the same time, it is the most suitable to comply the restraints of the television system, like the real-time broadcasting. On account of that, the structure of a *MultiChannelStory* is based on the method of explicit choice.

3. Structure of a MultiChannelStory

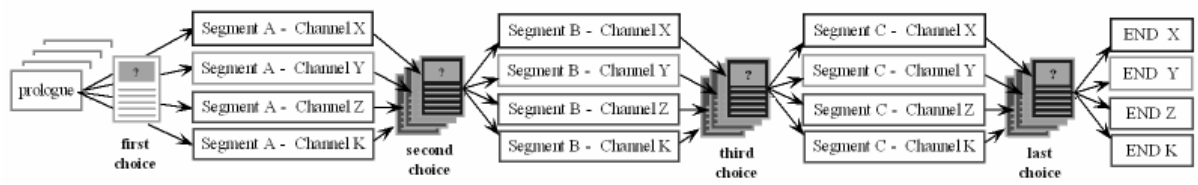


Figure 1. Structure of a *MultiChannelStory* with four channels

In Fig. 1, is showed a *MultiChannelStory* broadcasted with four channels. The story is divided into segments. Between segments there are the advertising breaks. After a short, common, prologue, each segment shows a different plot. In order to optimise the use of every channel, a *MultiChannelStory* should be developed considering that the segments pertaining to a channel should have a plot with a clear meaning. It should also be written, considering the possible connections between the available segments.

During the vision of a *MultiChannelStory*, a suitable MHP application (an Xlet) shows a selection menu with specific items (explicit choices) throughout each advertising breaks, usually every 15/20 minutes. Depending on the user selection the Xlet tunes the channel where the plot, related to the selected item, is telecasted. A *MultiChannelStory* could be composed at least by two or more single events; that depends on the number of available channels and on the effort of the authors and production. The synchronization among plots is granted by the start time, the brake time and the segment time that are the same for every channels. The number of the possible plots is given by the formula:

$$P=[C]^{S+1}-IP$$

Whit:

P = Number of Plots
C = Number of Channels
S = Number of Segment (+1 considering the ends)
IP = Interdicted Plots

For the *MultiChannelStory* showed in Fig. 1 we have 4^4=256 combinations. In the production phase the authors should choose which possibilities are interdicted. For instance, imagining a spy story, if one of the characters dies in "segment B – channel Y", the user couldn't select "segment C – channel K" or "segment C – channel X" where that character is hale and hearty. In this case, the choice "segment B – channel Y" automatically interdicts four plots, as it showed in Fig. 2.

Scriptwriters and authors decide the total number of interdicted plots, and produce the general outline of the *MultiChannelStory*.

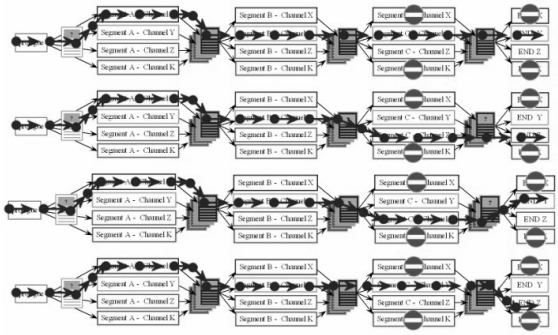


Figure 2. Example of possible plots derived from the second choice

4. Representation of the outline with XML

All the information concerning the structure of the interactive narrative is coded into an XML representation. The XML contains the title and the scheduled of the *MultiChannelStory* the URLs of the various DVB events, and the items for the selection menu with specifications of links between channels and segments.

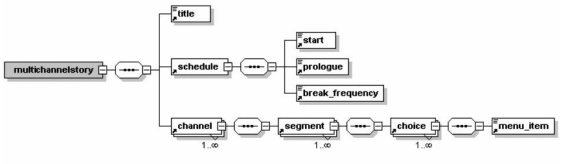
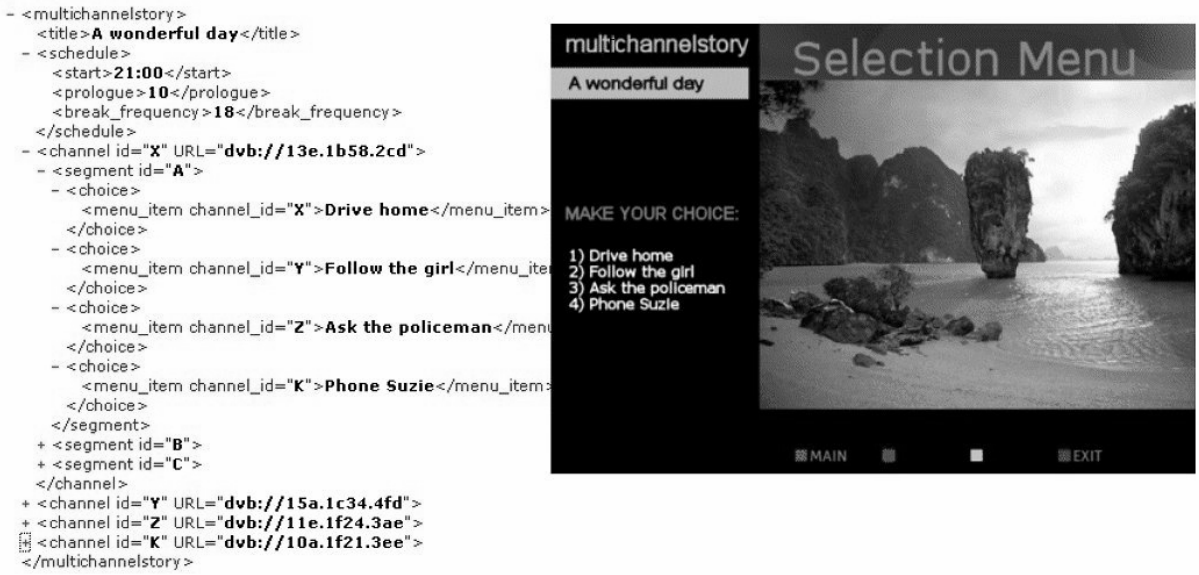


Figure 3. XML Schema (XSD) of a *MultiChannelStory*

The model architecture is composed of two tiers: local and remote. The local tier is the Xlet installed on the set-top box. It receives the XML enclosed into the MPEG2 (or MPEG4) stream, and parses it in order to compose the graphical user interface of the application. Specifically, it generates on the fly, the JavaTV and HAVi-UI (HAVi Consortium, 2003) graphic components, able to provide the items of the Selection menu, and to manage


- <multichannelstory>
<title>A wonderful day</title>
- <schedule>
<start>21:00</start>
<prologue>10</prologue>
<break_frequency>18</break_frequency>
</schedule>
- <channel id="X" URL="dvb://13e.1b58.2cd">
-
- <choice>
<menu_item channel_id="X">Drive home</menu_item>
</choice>
- <choice>
<menu_item channel_id="Y">Follow the girl</menu_ite
</choice>
- <choice>
<menu_item channel_id="Z">Ask the policeman</menu
</choice>
- <choice>
<menu_item channel_id="K">Phone Suzie</menu_item>
</choice>

+
+
</channel>
+ <channel id="Y" URL="dvb://15a.1c34.4fd">
+ <channel id="Z" URL="dvb://11e.1f24.3ae">
+ <channel id="K" URL="dvb://10a.1f21.3ee">
</multichannelstory>
multichannelstory
A wonderful day
MAKE YOUR CHOICE:
1) Drive home
2) Follow the girl
3) Ask the policeman
4) Phone Suzie
Selection Menu
MAIN
EXIT

Figure 4. XML representation of the outline

the relative event handling. During the vision of a *MultiChannelStory*, the Xlet saves all the selections made by the user into another XML file that is sent back to the remote tier, after the last choice.

The remote tier stores this information into a database. The aim of the remote tier is to process data derived by the viewer's choices in order to provide him a feedback during a successive vision. Typical feedbacks are: the items already selected, the number of remaining combinations, and the unseen ending.

5. Conclusion

We are experiencing a simple approach aimed to develop interactive narrative with iTV using the DVB-MHP platform. Our model could be used to telecast several kinds of contents. Because of that, both educational and entertainment fields could take advantages, for example producing multi-perspective documentaries or interactive fiction/film/cartoon. It would be a possible solution to one of the critical points in the transition process from analogue to digital TV, i.e. the need of broadcaster and content producers to develop and deliver new services and applications, able to attract new viewers. A future work will focus on the use of the standard MPEG7 to improve the experience of the *MultiChannelStory* vision. The use of these set of metadata will give additional information concerning the scene or the related episodes showed in the other channels.

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The HAVi Specification: *http://www.havi.org/technical/specifications.asp*