

# Increasing efficiency of use without sacrificing intuitiveness – a redesign of a TV set top box user interface

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## ABSTRACT

We had the task to take an existing user interface for a set-top-box to a next level of usability and design. The objective was to improve the user experience without totally changing the current implementation both technically and in terms of the basic interaction principles.

## Categories and Subject Descriptors

H.5.3 [User Interfaces]: *Ergonomics, Evaluation/methodology, Graphical user interfaces (GUI), Interactions styles, User-centered design.*

## General Terms

Design, Human Factors.

## Keywords

Redesign, Interaction Design, User Experience, iTV, Digital Television, Set-Top-Box, Remote Control

## 1. INTRODUCTION

In 2006, Premiere launched a new decoder for their pay-tv offering based on middleware from NDS. It included a totally new interface that was aimed to create a unique user experience. Due to external project pressure it was not possible to extensively test and evaluate the user interface and apply the changes before the launch. Nevertheless the tests in the process of the launch and the first feedback from customers brought up some weaknesses in the navigation principles.

## 2. IDENTIFIED PROBLEMS

The original user interface was based strongly on the principle of progressive disclosure [1]: Presenting only the most important information to users, revealing more information only when explicitly requested by the user or when users progress forward through functionalities. However, progressive disclosure was over-used in this case. The result was a navigation concept that forced users to perform a lot of keys presses both when navigating forward and backwards, and that lacked information on the next steps that it would take users to. It also relied on too many keys for basic navigation, forcing users to switch between keys on the remote very often.

In addition, the user interface involved lots of animations on screen transitions that hinted to navigation options that actually were not supported. These animations were not supporting a mental model of the navigation concept, but existed for their own purpose. A few users experienced them as rather distracting.

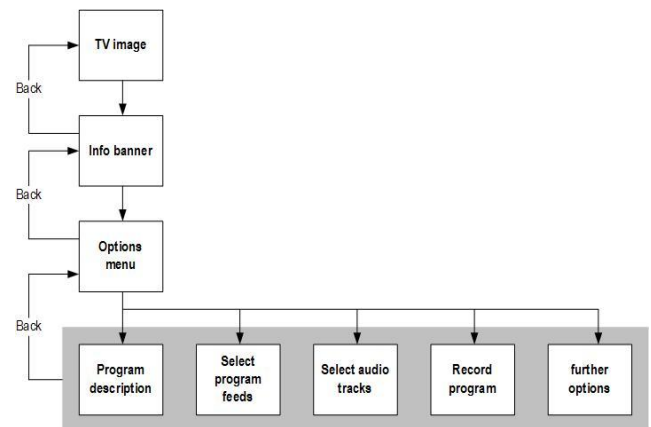


Figure 1. Navigation flow for the zapper in the original design. Returning from the last menu level to the TV image was experienced as awkward.



Figure 2. The option menu moves in from the right above the info banner with an animation, which strongly indicates a nonexistent navigation option to the right.

### 3. REDESIGN

On the base of the conducted usability tests and the customer feedback, Premiere teamed up with the user experience designers from UID in improving the user interface. The objective was to introduce improvements to the existing basis, i.e. to preserve the general UI principles and to avoid causing changes of the technical base behind it.

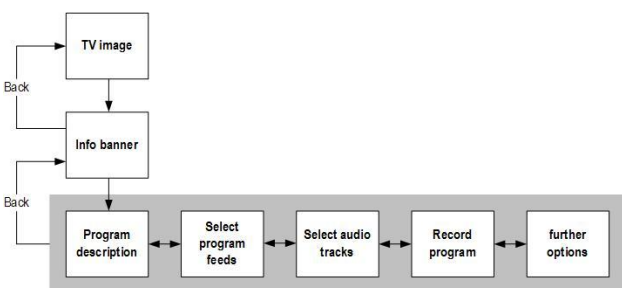
The redesign was leveraging on the strengths of the current implementation and focused on eliminating the above-mentioned issues. Several changes were implemented:

1) The 2-level option menu (see last levels illustrated in figure 1) involved a lot of navigation. The intermediate step of going back from level 4 to level 3 was eliminated by introducing a double focus, so that the user can navigate the main items and the sub items without having to confirm the main item.



**Figure 3. A double focus concept allows users to both navigate horizontally between the items in the options menu (“Inhalt”, “Tonauswahl”, etc.) as well as vertically between the sub-options of “Tonauswahl” (Audio tracks).**

It is now easier to inform oneself about the different options available (new users), to apply one of these options, and most important, to read the program information and apply any of the other options afterwards (recording or reminders most likely).



**Figure 4. The navigation flow for the zapper in the new concept. One level has been eliminated by introducing a double focus concept (compare to figure 1).**

In the old concept, users who read the program description for a movie or TV show and then decided that the program was worth to record, had to press the Back key on the description screen to get back to the options menu, navigate within the option menu to the recording option, and press the OK key to activate it. In the

new concept, they can simply press the right arrow key on the remote until they are at the option “Record program” (which is almost always just one key press).

2) In situations where the animation indicated a spatial navigation option, these options were introduced. It is now possible to navigate from the zapper to option menus and back by using the arrow keys on the remote, eliminating the need to use the Back key, or an Options or Info key. This allows quicker navigation due to less mental workload (less keys to think about) and less movement of the thumb on the remote (only the most central keys are required – the 4 way rocker key and sometimes the Back key).

3) Existing navigation options via the OK, Options and Info key were kept, so users already familiar with them are not forced to change their habits. Also, the Options key can be used as shortcut to functions that are important to access quickly in some situations.

4) Animations were tweaked to further support the affordance of these navigation options. They are now a means to improve both the pragmatic and hedonic quality [2].

5) The former EPG which comprised more of a mixture between a grid and a list EPG was redesigned completely due to its minor advantages to the zapper, which already provides a lot of information to users. Though previous studies have indicated that some users prefer list EPGs over grid EPGs, we decided to switch to a grid EPG, as users preferring a list presentation are getting this kind of presentation through the zapper [3]. So, from a user perspective it was tried to find the right balance between the EPG and the navigation in the zapper. The grid EPG now provides a graphical overview on the programming on different channels while the zapper shows the running and following program of one single channel while browsing through the channel list.

The new EPG is a grid that focuses on a visual overview of the upcoming program with visual indication of programs’ lengths and overlapping between programs, whereas the zapper provides information in a simplified list style on the current and most soon upcoming programs, with only little visual cues.



**Figure 5. The channel list giving preview on the programs that are on now and next on a specific channel.**

Further small improvements were introduced to the main menu and settings. Last but not least, the visual design has been changed to improve legibility of screens, as well as to better comply with Premiere brand guidelines.

#### 4. EVALUATION

One of the concerns was that the new user interface, in improving efficiency, would decrease the ease of learning to use it for new users. To evaluate if users understand the new navigation concept for the zipper and appreciate it, a Flash prototype was used to conduct quick friendly user tests. The testing indicated that users understand the new concept and will most likely adopt the changes fairly quickly. It was therefore decided to implement them, and a User Interface Specification was written.

#### 5. NEXT STEPS

First stable software versions on the set top box with the new user interface are expected to be available in August / September. We are currently planning usability testing with current users of the Premiere Interactive Receivers and users who are new to the Premiere user interface. We hope to be reassured in our estimation that existing users have no problems adopting the new boxes, and that the user interface is still easy to learn by new users.

By using the Attrakdiff inventory [4] we also plan to evaluate the perceived attractiveness of both solutions, due to the major

changes to the visual design and the tweaked animations. Any improvement possibilities identified during usability testing will be introduced in minor software updates after the release of the major software.

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