

Adobe Authorware 7 as Programming Tool

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Abstract – Growing need for education by the great number of users of different ages can be satisfied by distance learning. Implementation of the new technologies has greatly affected the development of the education technologies which can assure that education is taking place independent of the time or the location of the students. Educational design and the quality of the instructional materials are the deciding factors if distance learning is to be successful. Applications full of multimedia content with implemented interactivity are actually used to compensate for the lack of the active lecturer.

Adobe Authorware 7 is a software tool for making applications filled with multimedia content. Its implemented interactivity does not enable direct usage of the software commands for decision, branch and loop that are necessary to make more complex applications. Therefore this text presents some of the ways to implement those software commands by using Adobe Authorware's implemented interaction. Results are presented in the application made in Adobe Authorware 7.

We believe that this text can help the authors of the education software to build more complex education products.

I. INTRODUCTION

Distance learning enables education for every user independent of the time and a duration of the process of learning. Users are the ones that decide how much of the teaching content to learn at a time and how many times to repeat it. Telecommunication technology and especially computer technology have enabled transfers of large amounts of data over great distances in a short period of time. That being said we can forget about the problems of transferring the multimedia data over the Internet and we can concentrate on the quality of the teaching content.

Adobe Authorware 7 (AA7) is a software tool used to make interaction applications rich with multimedia content. AA7 is used to make applications for learning and therefore distance learning. Final versions of products being made in AA7 are usually implemented in some of the already existing education systems. In our opinion AA7 directly affects the quality of teaching content and keeps the pressure of the system for learning modules for implementation of education content filled with multimedia and interactivity. However AA7 doesn't directly support software commands for decision, branch and loop that are necessary to make more complex applications for learning (simulators, data analysis, data calculations etc.). This paper presents some of the ways how to implement those

software commands by some of the AA7 interactive elements. Results are presented in an application made in AA7.

Basic principles of Adobe Authorware 7 are shown in Section II. Program structure not implemented directly in Adobe Authorware 7 are shown in Section III. Implementation program structure is shown in Section IV. Application for learning is shown in Section V; conclusion in Section VI is followed by the reference list.

II. BASIC PRINCIPLES OF ADOBE AUTHORWARE 7

Adobe Authorware 7 is great software tool for making e-learning applications [1]. Users can use simple surrounding and intuitive interface to make interactive applications in quick and simple manner. Drag and drop option and simple placing of the icons on the timeline assure that users can develop and test their applications without the need to know any of the script languages. Simple order of the icons on the timeline determines the order of their performance.

Graphic, textual, audio and video objects can be used in icons and the logic behind the application performance is actually shown on the timeline. All the rerouting, branching or repeating of the certain application elements is accomplished with the help of interactivity [2].

AA7 interface consists of menu, toolbar, icon toolbar and the application window (fig. 1.). Properties window, picture library, functions window, variable window and knowledge objects window are used if necessary. Icon toolbar consists of the icons shown at the fig. 2. Icon's order on the timeline form the icon sequences which then form lecture order and then each of the icons gets its own multimedia content.

Icon sequences are grouped into larger groups to help programmers acquire better overview of the application. Clicking the icon that stands for group, another window will open and show the icon sequence of the group.

Application is performed and controlled by the user interaction. User activates the interactive elements by using two-way communication and by doing that he decides the way the application works. Interaction is performed by presenting the interactive elements to the user, who then reacts to it (button, answer, menu option etc.) and then as a result application performs an activity dependent on the user's reaction.

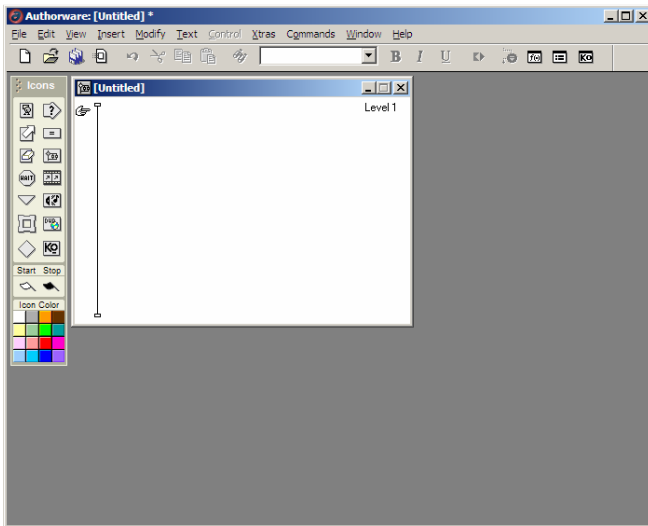


Fig. 1. Adobe Authorware 7 interface

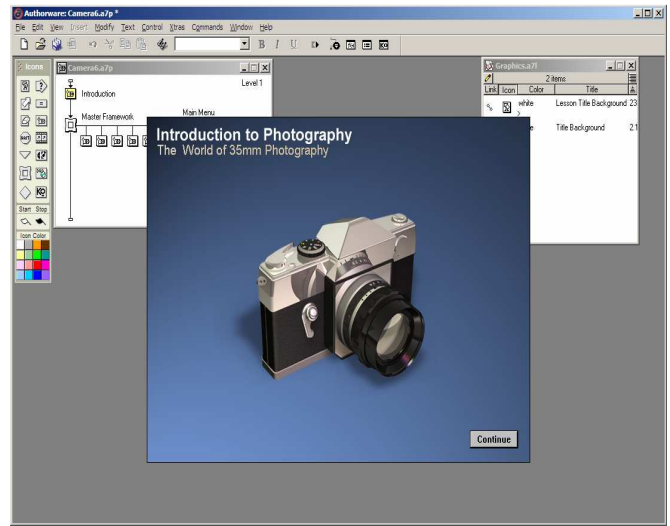


Fig 3. Adobe Authorware 7 Application test

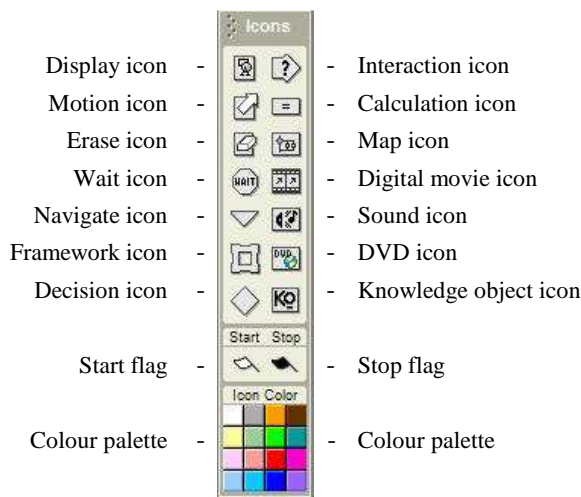


Fig. 2. Icon Toolbar

Sequence of the icons can be started at any time during the making. That enables testing and corrections of the application at any time (fig 3.).

Any of the elements properties can be altered in the properties window. Clicking on any of the available options for properties of the elements decides how will that element behave and therefore how will the application perform also. AA7 consists of installed objects that can also be installed in an application (quizzes, database windows, e-mail services etc.). Installed objects are used with the help of wizard tool and no special user knowledge is needed to use them.

After making and testing the application next step is publishing. Publishing forms the application into the final product easily used by the users. That can be done by:

- storage on hard disk or CD/DVD media (executable file), which gives better quality but takes larger amounts of data space and is not appropriate for distance learning because of the larger upload time
- through web browser by using Authorware Web player (smaller size of the files appropriate for the Internet transfer)

Published application is used either on its own or as integrated part of the distance learning system. In published application version user has no insight in how the application was made and cannot alter it neither way.

III PROGRAM STRUCTURE

Positioning of any of the icons on the timeline creates interactivity and adding icons to the interaction icon decides the type and the way of performing the interaction (fig. 4.) [3].

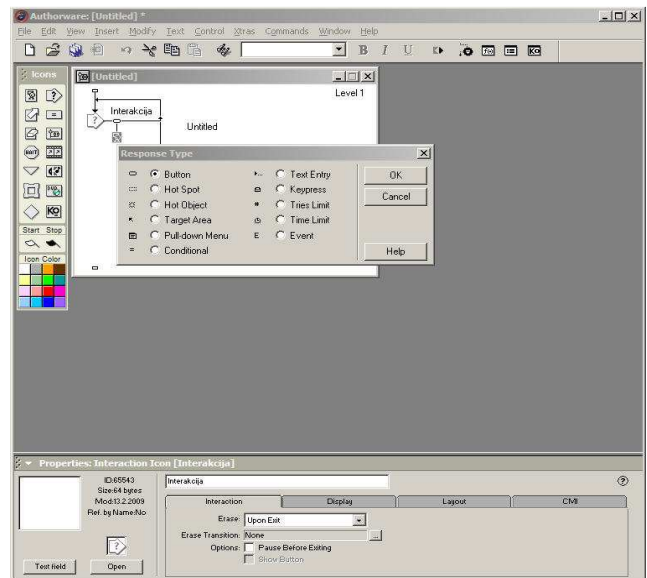


Fig.4. Interaction usage

Types of user interaction are shown in Table 1. Some of the extra icons for interactivity implementation are decision icon and calculation icon. Decision icon enables branching of the application dependent on the value of a variable that changes from one to another integer value (1,2,...), while calculation icon enables defining of the variable value and scripting. Calculation icon can consist any of the program

Table 1. Types of interaction

Interaction	User's reaction
Button	Click on button
Hot spot	Click on hot spot
Hot object	Click on hot object
Target area	Dragging the object to the location
Pull-down Menu	Choosing one of the options from the menu
Text entry	Text entry
Key press	Pressing the key

structures written in the form of script (if, for and while loop), but it is used only by experienced programmers.

Average user does not have enough knowledge to use scripts by the means of calculation icon. Complex applications usually need:

- branching dependant on the logic condition → IF command
- branching dependent on the variable value → SELECT command
- repetition of exact order of actions for an exact number of times → FOR loop
- repetition of exact order of actions until an exact condition is met → WHILE loop.

Select command can be performed by using decision icon, but only in its contained form because values of the variable must be of integer value (1,2,3,4...), and the rest of program commands are not directly implemented in Adobe Authorware.

IV. IMPLEMENTATION OF PROGRAMME STRUCTURE

Program commands in AA7 implementation is defined by connection of the interaction icons with calculation icons and decision icons.

1. IF command implementation

IF command is implemented by using calculation icon and interaction icon (fig 5.). Calculation icon contains command to define variable value involved in checking the terms of IF command. Interaction icon contains two conditional elements. Logic expression that determines whether condition of the IF command is fulfilled is defined as the first conditional element while the second conditional element contains negation of the logical expression of first element. Depending on the variable value that we are checking with the IF command performance will be diverted to either first or second conditional element. If icon map for the second conditional element consists of other elements then it is actually IF-ELSE command.

2. SELECT command implementation

Implementation is based on IF command implementation but with the catch that there is a number of conditional elements associated with the interaction icon which respond to the number of conditions of the SELECT command (fig. 6.). Every conditional element contains one condition of the SELECT command.

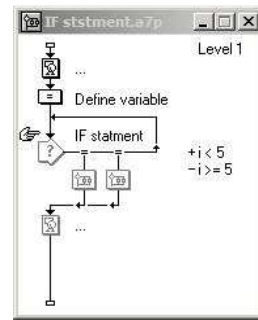


Fig. 5. IF command implementation

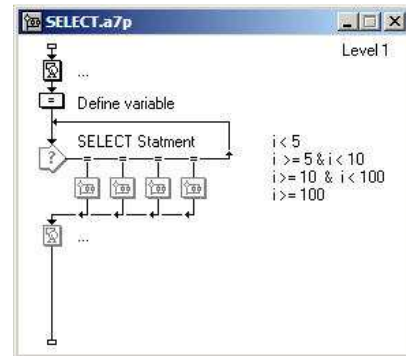


Fig. 6. SELECT command implementation

3. FOR loop implementation

This implementation realized by using the interaction icon which consists of two conditional elements (fig. 7.). Start value of the FOR loop variable is set within the calculation icon. First conditional case contains the case to end the FOR loop. Second conditional case contains calculation icon with command to raise the variable in FOR loop. While checking the conditional terms second conditional element is performed and therefore FOR loop variable is raised and its commands are performed. When FOR loop ending term is fulfilled, first conditional element is performed and interaction icon action is over.

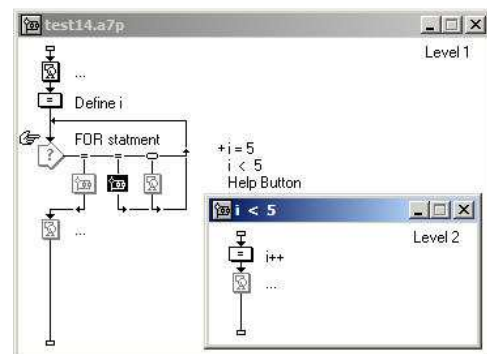


Fig. 7. FOR loop implementation

4. WHILE loop implementation

Implementation is realized by the interaction icon which consists of conditional element and at least one element that contains calculation icon which defines variable value that ensures to fulfil the condition of the WHILE loop (fig. 8.).

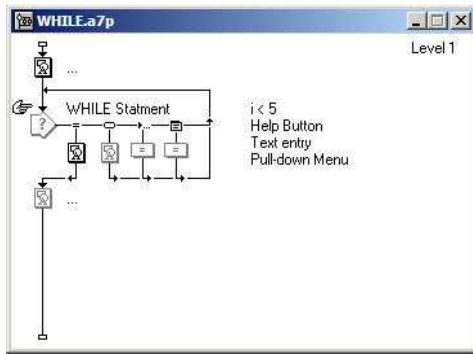


Fig. 8. WHILE loop implementation

V APPLICATION FOR LEARNING

In this chapter one part of application for learning that we made is going to be elaborated a bit. By taking a look at that part we will see what are the possible options of Adobe Authorware 7 and will practically confirm all the facts that we wrote about in the previous chapters. Application was aimed at average developer of educational software and helps them to use some of the more complex program functions. We assume that users that will test this application already know the basics of AA7, the whole process of making an application will not be explained into the details [4,5].

Fig. 9. shows application's start menu. On it we can see what are the topics in the application and these are:

- Uvod (Introduction) – describes what exactly is application about
- Programske strukture (Program structures) – this chapter mentions all the structures shown in the application, how does each of them function and where it is used
- Implementacija (Implementation) – most interesting part and most relevant to this paper. We are going to look into it in more details.
- Ponavljanje (Repetition) – shows once more in short details what application is about and most important facts
- Kviz (Quiz) – test of knowledge about everything we learned or should have learned from the application.



Fig. 9. Start menu

On start menu we pick the option – Implementacija (Implementation) – and link takes us to the new menu (Fig. 10.) at which we can choose which of the functions we would like to see in details. In this paper we have taken WHILE loop for example. Therefore clicking on the last option WHILE petlja (WHILE loop) link takes us to another new page. On it (Fig. 11.) we can see on the left side which of the functions we are looking at. Below it there is short textual description how it is made and on the right side we can see how to practically make it on AA7 timeline. Same as it is shown in an example of WHILE loop it is written for all the other functions with their own descriptions and look on the timeline.



Fig. 10. Program functions menu

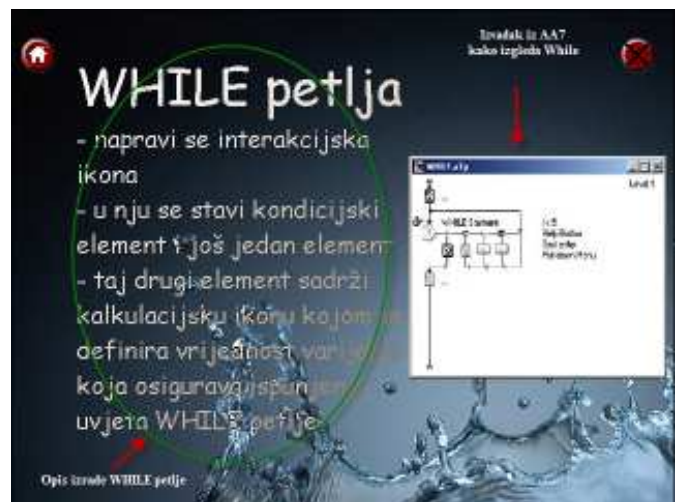


Fig.11. WHILE loop

VI CONCLUSION

Multimedia applications with implemented interactivity are definitely helping to raise quality of distance learning. Adobe Authorware 7 is a software tool that enables simple creating of learning applications supported with multimedia and interactions which are then integrated into distance learning systems. AA7's contained interactivity however does not enable direct apply of some of the program

commands like those of decision, branching and loops which are necessary when creating some of the more complex applications. This paper presents possibilities of implementation of those commands by using that same interactivity and is therefore aimed at the wider circle of users with an average knowledge in computer science.

Application for learning made in AA7 presents the results and offers the possibilities of learning how to, step by step implement program commands in AA7.

We believe that this paper can and will be useful to the authors of education software in their attempts to create more complex education software and help to raise the quality of those same products.

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