

Mobile Multimedia Development: Flash Mobile Game with MySQL Database

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Abstract—This paper describes how to develop a coloring game for children that can be run on a mobile device. There are three steps to develop the coloring game, that are inputting data, playing the game and storing data. The input text with the score of the game that the player has gained are stored in database. The game is developed using Flash authoring and ActionScript programming. Because of Flash cannot communicate with database, the PHP script is important to be used for sending variables from Flash to MySQL database. During the first testing, the mobile game with interactivity tools is tested on variety resolutions of mobile devices. The next step is the testing with the subject of elementary school students for playing the game, and then data in the in MySQL database are analyzed. The children who start to play the game should input text into the mobile game, and then they play the game.

Index Terms—Multimedia, coloring game, flash, database, mobile.

I. INTRODUCTION

A. Mobile Game

According to Semiawan [1], people need to learn every time in order to survive their live in the community that always change. Computer education in Indonesia grows very fast, and makes it to be the favorite study among the students. There are many courses at computer science, i.e Algorithm and Programming, Multimedia Programming, Mobile Programming, etc. Developing mobile game is one of the topic in Multimedia Programming course. The development of the game can be coded using Flash, C++, Java, and other programming language. Because it is a part of Multimedia Programming course, game development is coded with Flash, rather than C++ or Java. Flash is multimedia authoring tools with object-oriented programing language called ActionScript.

Mobile game is a game that is played on mobile devices, can be one of the multimedia applications. Many years ago, early game on computer was developed in simple graphics, and recent game is provided with very interesting visual presentation [2]. Mohler explained that Adobe Flash can be used to develop game with mathematic and logic operation to make score, timer, and other part of the game. Adobe Flash with ActionScript cannot connect to database directly to store the data of the users [3]. One of the solution is using PHP script to support Flash in sending data to MySQL database

This paper describes how to develop a mobile game, and

the connection to MySQL database for storing data. After the students learned it, they can make some other multimedia application with Flash and storing data into database, and prove their programming competency. At the first testing, the mobile multimedia with interactivity tools is tested on variety resolutions. The second step is the field testing with the subject of elementary school students for playing the game.

B. Multimedia

Multimedia is used widely in education and other information systems. Information can be presented in the form of multimedia with the combination of text, images, sound, animation, and video. It can be displayed in web page, LCD projector, or other electronic and digital devices [5]. The meaning of the message will be easy to be understood if presented in multimedia objects, rather than text only. Vaughan said that the information that is delivered in multimedia objects can be supported to the implementation of the paradigm changes from teacher center learning to student center learning. In interactive multimedia system, students can interact with the program, because interactivity is an important part in the interactive multimedia system [6]. Multimedia system is provided with variety of interactivity devices, such as buttons and touchscreen. Authoring to access buttons and touchscreen involves defining the button appearance on screen, the location, and the action when clicked. Assembly tools that support the interactivity for buttons and touchscreen provides the features to do all the functions.

C. Mobile Multimedia

Information technology has developed for education, and learning enters the new era of education method such as blended learning and e-learning that can enhance students to understand what they learn easily. The learning materials are provided with elements of multimedia such as text, image, audio, and video. The mobile devices have grown up in using information system, and people use the mobile technology to develop variety applications that run commonly on desktop computers [7]. A new technology of teaching and learning with natural environment can implemented on mobile device. Mobile devices such as smart phones are widely used in education to support teaching and learning process.

Multimedia authoring for mobile application has never been easier since the using of the Flash Lite Player for mobile devices. Vector graphics game can be made to be played on any device with all operating systems and screen resolutions if the device is equipped with the Flash Lite Player. The game can run on computer with emulator, and can be played as a Flash movie on the Flash Player [8].

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D. Coloring Game

Yahya argued that most of preschoolers love to coloring pictures because it gives them a chance to control something and to express themselves. Coloring pictures is done by children using pencils or crayons on paper. Lately, coloring picture can be played on computer using mouse to select the color, then select the images to be colored [9]. Game creation requires creativity and programming skills. Creativity can be seen in the form of the coloring objects, animation, timer, and others. The coloring objects can be created from a simple square to complex shapes such as polygons with curved lines. Filling the part of an object with color need a computer program that is called code [10]

Coloring game that runs on a computer is a simple game, i.e. click one of the buttons with mouse to select color, and then click a specific part of the image. Figure 1 presents an image with its parts that can be filled with color, and some color buttons to be selected.



Fig. 1. Sample coloring game that runs on computer

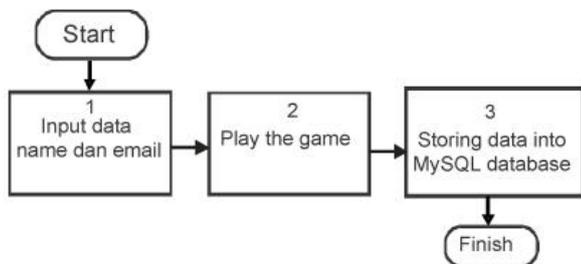


Fig. 2. Coloring game system includes three processes

II. METHOD

The coloring game system includes three processes, that are inputting data, playing the game and storing data, as presented in Fig. 2. At the first process, user fills his/her first name, last name, and email, and then plays the game. While the game is played, user can see the score of the game. When the game is finished, either the user fills all the part of image with color or the time is up, data will be sent to MySQL database. Fig. 3. presents the flowchart how the procedure of the game will be coded.

A. Coloring Game Development

To develop coloring game with Adobe Flash, take the following steps:

1) Create a new Layer named Play Game and then make white box content of three image movie clips. The images are chicken, dog, and rabbit. Every image movie clip

consists of ten parts of image as movie clips as shown in Fig. 4. Every movie clip needs script as follow:

```

on (release) {
    mc=new Color(this);
    mc.setRGB(_root.color)
    _root.score=_root.score + 10;
}
    
```

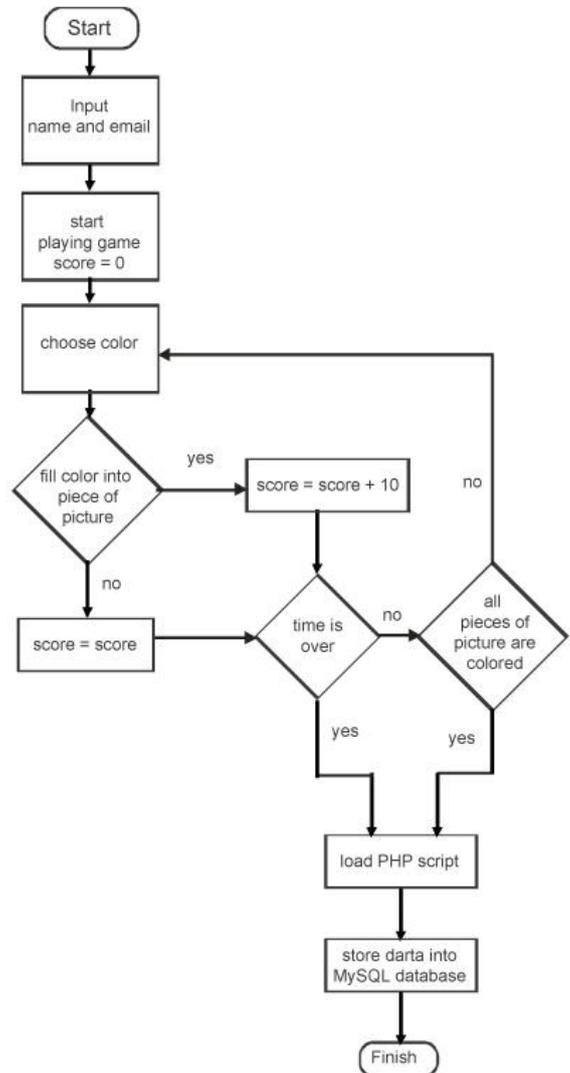


Fig. 3. Flowchart how the procedure of the game will be coded

The script indicates that score increase with 10 if the part of image has been colored. Hence total score is 100 if the user can fill all the part of an image with color.

2) Create 18 color buttons to choose color for filling in the image. One of the buttons needs script as follow:

```

on (release) {
    _root.color=0xAE0000;
    mycolor=new Color(_root.box);
    mycolor.setRGB(_root.color);
}
    
```

3) Create the script of all the buttons and change the color code 0xAE0000 to the other color codes to make some other colors.

- 4) Create a button Left to choose the image that will be colored by pressing with the script:

```

on (release) {
    _root.index--;
    if(_root.index<0) { _root.index=2;}
    _root.chicken._visible=false;
    _root.dog._visible=false;
    _root.rabbit._visible=false;
    switch(_root.index){
        case 0: _root.chicken._visible=true;break;
        case 1: _root.dog._visible=true;break;
        case 2: _root.rabbit._visible=true;break;
    }
}

```

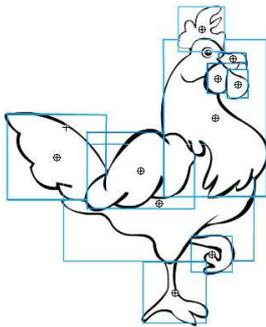


Fig. 4. An image movie clip consists of ten movie clips

- 5) Create a button Right to choose the image that will be colored by pressing with the script as the same as the script of button Left, but it must be a line changed. The second line `_root.index--;` should be changed with `_root.index++;`
- 6) Create a box with Rectangle Tools, and convert it to be a movie clip symbol named Color Box. Its instance on the stage should be named box by filling the name at the window Properties.
- 7) Create a Dynamic Text with the label Time on the top of the stage. The variable of the text named displayTime. On the frame corresponds to it needs script as follow:

```

stop();
var color;
var index;
index=0;
_root.dog._visible=false;
_root.rabbit._visible=false;
_root.score= 0;
timeView = 25;
count = function () {
    timeView = timeView - 1;
    if ( timeView == 0 ) {
        clearInterval(timer);
        gotoAndPlay("You Loose");
    }
}
timer = setInterval(count, 1000);
if ( timeView == 0 ) {
    gotoAndPlay("You Loose");
}

```

```

if(score >= 100){
    gotoAndPlay("You Win");
}

```

The script indicates that the first number on display time is 25 with decreasing to 0. If the time equal to 0, then the game is over. Score = 0 indicates that the score value is set up to 0 at the beginning of the game.

Fig. 5. presents the layout of the stage and timeline in Flash Document, and Fig. 6. presents the Flash document that is run on Adobe Device Central CS4 emulator uses a mobile device Nokia X6. At the end of the game, the data first name, last name, email, and score are read by PHP script and then inserted to a table in MySQL database. Fig. 7. shows the storing the value of the variables in MySQL database. The ActionScript command below is used to send data to PHP script, because ActionScript cannot communicate with database directly, hence PHP script is used to pass the ActionScript variables into database:

```

loadVariablesNum("http://localhost/game.php", 0, "GET");

```

Flash sends the variables value to PHP script with the command `loadVariablesNum`, and PHP script can identify the variable Flash by the same name of variables in PHP. The variable names that are sent from Flash are `fName`, `lName`, `eMail`, and `score`. PHP script receives Flash variables and inserts them into a table in MySQL database, as follows:

```

<?php
$server="localhost";
$username="";
$password="";
$flashbase="artShop";
$custable="coloringgame";
$con = mysql_connect($server, $username, $password);
mysql_select_db($flashbase,$con);
$sql="INSERT INTO $custable (fName,lName,eMail, score) VALUES('$fname','$lname','$email', '$score)";
mysql_query($sql,$con);
echo "confirm = Data confirmed.";

```



Fig. 5. Application run on variety resolution of mobile devices



Fig. 6. Layout of stage and timeline in flash document

B. Testing

After the application is developed, it should be tested the coloring game in two steps. At the first step, it is run on

variety mobile devices. The second step is user testing with the subject of elementary school students for playing the game, and then analyze the stored data in MySQL database.

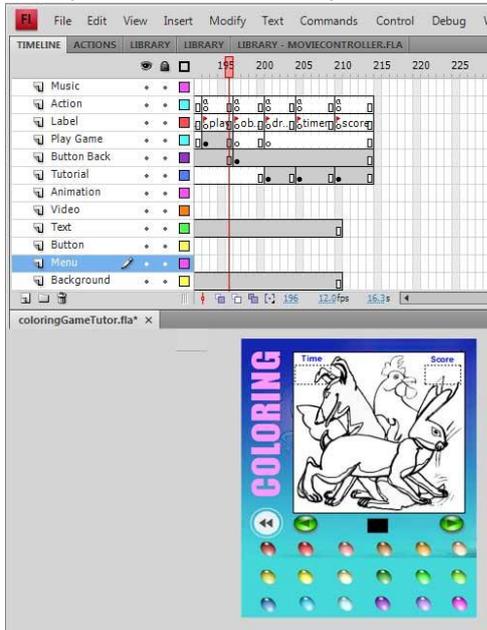


Fig. 7. Running coloring game on an emulator

Showing records 23 - 36 (36 total)

SQL-query : [Edit]
SELECT * FROM `coloringgame` LIMIT 23, 30

Show: 30 rows starting from 0 in horizontal mode and repeat headers after 100 cells

	id	fname	lname	email	score
Edit Delete	24	Rina	Yuliantanto	lina@gmail.com	90
Edit Delete	25	Rudy	Gunawan	rudi@yahoo.co.id	100
Edit Delete	26	Gorge	Fredrik	georgef@gmail.com	70
Edit Delete	27	Antonius	Dewanga	tonius@yahoo.com	100
Edit Delete	28	Rangga	Trisnawan	ranggatris@yahoo.com	70
Edit Delete	30	Agung	Nugroho	agungnu@yahoo.com	100
Edit Delete	31	Hendro	Gunawarman	henbrogu@yahoo.co.id	80
Edit Delete	32	Hari	Nugroho	harri@yahoo.co.id	90
Edit Delete	33	Dina	Mariana	mariadina@gmail.com	90
Edit Delete	34	Evi	Kumalasari	evikumala@gmail.com	70
Edit Delete	35	Chaterine	Santos	cathy@gmail.com	90
Edit Delete	36	Dona	Angelina	angeldona@rocketmail	90
Edit Delete	37	Cinta	Pragantha	cpraghanta@yahoo.com	70

Fig. 8. Storing the value of the variables in MySQL database.

C. First Testing

At the first testing, the mobile multimedia is tested on variety resolutions, interactivity tools of mobile devices. The sources of mobile multimedia are copied into variety mobile devices. The application can run on the devices with keypad or touch screen as the interactive tools if they are provided with Flash Lite Player. The mobile devices with the resolution different from 360 x 640 pixels cannot display the application well, there is blank areas on the device or the application is cropped. Fig. 8. presents the application run on some different resolution of mobile devices.

application is cropped. Fig. 8. presents the application run on some different resolution of mobile devices.

D. Second Testing

The second testing was conducted at an elementary school involving 13 students with guiding by teachers. The application run on workstations in local area network, and the students play the game using Nokia X6 emulator. Students should type their first name, last name, and email, then they play the coloring game during the fixed time. While the students played the game they could watch the score they earned. If the game was over, data was stored into the database. At the second testing, only three students could fill all of the pieces of image with coloring, it was indicated that the timer was too short for playing the game. Figure 8 shows the players with their score that was stored in database. Teachers argued that the coloring game should be revised, hence the time is enough for children to play the game.

III. CONCLUSION

Through this paper developing coloring game for mobile device has been presented. Some details about creating vector graphics, movie clips, and scripting have been described. According to the research finding, there are some conclusions:

- 1) Mobile multimedia can be easily developed using Adobe Flash Professional CS4 with ActionScript 2.0 and Flash Lite Player 3.0.
- 2) Mobile multimedia can be implemented on variety mobile devices either with touch screen or keypad as interactive tool, but the application runs well on 360 x 640 pixels mobile device.
- 3) Flash movie that is provided with ActionScript 2.0 language can be used as interface to communicate with MySQL database application through PHP script.

IV. SCOPE OF FUTURE RESEARCH

Some recommendation to future research are:

- 1) This mobile game was developed with Adobe Flash CS4 and ActionScript 2.0. For future research, it can be developed with other programming language, and run on all mobile devices with variety of screen resolution.
- 2) The application was run on computer in local area network. For future research, it can be developed as an online game, and all data is stored in a web server.

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