



FLASH GAME WITH MYSQL DATABASE DEVELOPMENT

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ABSTRACT

This research is intended to develop a model of multimedia application, particularly a puzzle game for Interactive Multimedia Course. This model should encourage students to integrate all information resources to develop a multimedia application particularly puzzle game. The puzzle game application generates input and processed data as a server-side with Adobe Flash. Flash is a powerful and dynamic front-end and great interface for server-side applications. PHP can launch server-side script using Flash as a front-end to pass data and variables between the MySQL database, PHP, and Flash to manage databases. Subjects of the research are computer education, visual communication, and software engineering experts in preliminary field testing, the informatics students at School of Multimedia Technology Cendekia Abditama for implementation of the revised model in the main field testing. Data are analyzed using the analytic descriptive method and interpreted in a narrative way based on the research findings.

Keywords: *Puzzle Game, Server-Side Flash, Flash Interface, Multimedia*

1. INTRODUCTION

Learning is a necessity in life, since his birth till the ends. As a human, we learn to be able to achieve our independence and to adapt to various environmental changes [1]. Nowadays, due to globalization and proliferation of technology, computer education in Indonesia becomes great demand for students. One favorite subject in computer education is multimedia technology using Adobe Flash software, which is now held in many courses as main and optional subject. Interactive Multimedia course is a one of the courses at School of Multimedia Technology Cendekia Abditama. Puzzle Game topic using Adobe Flash software, sample of Game Development, is part of Interactive Multimedia course which was held at the tenth session of the fifteen attendance. While the same course named Multimedia is held in computer education at other universities, and Game Development is part of Multimedia course.

One of the multimedia application is a computer puzzle game. A computer game is a game played on a personal computer, rather than on a video game machine. Computer games have evolved from the simple graphics and game of early games to a wide range of more visually advanced games [2]. According to Mohler, puzzle game can be developed with Adobe Flash including timer, feedback, and score [3]. Flash cannot communicate with database to store the score that is gained by the

user.

Therefore one of solutions is creating PHP script to pass variable from Flash to MySQL database. Flash is great interface for server-side and dynamic front-end applications. PHP can launch server-side script using Flash as a front-end and pass variables back and forth between Flash and the PHP pages. Data can be stored in MySQL database and later retrieve it [4].

This study aims to develop a multimedia application particularly puzzle game which is a part of the Interactive Multimedia course, with storing data in MySQL database. Lecturers can present the model in teaching how to develop multimedia application particularly puzzle game. By studying the learning materials, it is expected to enhance students to make particularly a puzzle game and develop generally multimedia applications. Making a puzzle game is one of the competency needed to be a multimedia programmer.

2. METHOD

The system design can be seen in Figure 1 and the playing game process is presented in Figure 2. First the user input his/her name and email into text fields. The next step is playing game by the user. Computer stores the score of the game if the user place a piece of puzzle at the right place. Puzzle game is finish if the user drags all of the pieces of puzzle to the right places or the timer is over. The value of the score of the game, name, and email of

the user are stored in MySQL database. Figure 2 also shows how variables in Flash are passed to PHP script and then are stored in MySQL database. The command in the ActionScript `loadVariablesNum` send the variable value from Flash to PHP script.

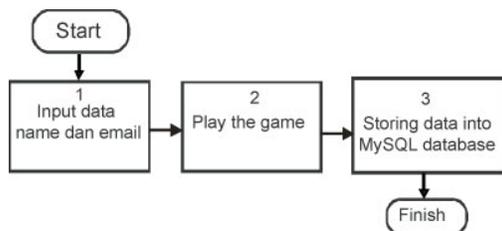


Figure 1. System design of puzzle game

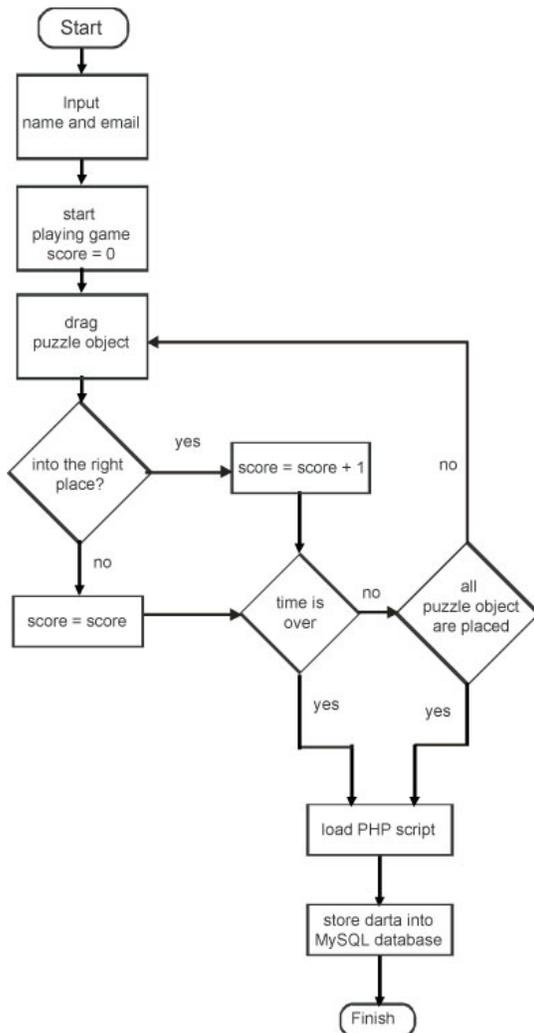


Figure 2. Flowchart of playing game process

3. DISCUSSION

3.1. Puzzle game

One of the game development is puzzle game development. Puzzle is so named because the picture, originally attached to wood and later to paperboard, was cut into its pieces with a jigsaw, which cuts intricate lines and curves. Puzzles are often contrived as a form of entertainment, but they can also stem from serious mathematical or logistical problems - in such cases, their successful resolution can be a significant contribution to mathematical research [5]. Solutions to puzzles may require recognizing patterns and creating a particular order. Puzzles based on the process of inquiry and discovery to complete may be solved faster by those with good deduction skills. William (2007) explained that the origins of jigsaw puzzles go back to the 1760s when European map makers pasted maps onto wood and cut them into small pieces. The "dissected map" has been a successful educational toy ever since. Children still learn geography by playing with puzzle maps of the world. The eighteenth century inventors of jigsaw puzzles would be amazed to see the transformations of the last 230 years. Children's puzzles have moved from lessons to entertainment, showing diverse subjects like animals, nursery rhymes, and modern tales of super heroes and Disney. But the biggest surprise for the early puzzle makers would be how adults have embraced puzzling over the last century. Another important development was the introduction of die-cut cardboard puzzles for adults. Mass production and inexpensive cardboard allowed the manufacturers to cut prices substantially. There was a vogue for advertising puzzles in mid-1932. [6]

3.2. Multimedia

Multimedia is a combination of text, images, sound, animation, and video delivered via computer or electronic and digital equipment [7]. Using together multimedia elements such as images and animation that are equipped with sound, video clips, and text, will be able give clear meaning to those who need it. Vaughan stated that multimedia can bring radical changes in the learning process, from passive student learning to active student learning.

The word multimedia is a combination derived from multiple and media [8]. Digital multimedia as any combination of text, graphic (still and animated), sound, and motion video delivered to the user by a computer. The computer is an intrinsic part of multimedia. All these elements - text,

graphics, sound, and video - are either computer-generated or transmitted through a computer. Multimedia systems are used for education, in presentations, information kiosks, and in the gaming industry. The power of computers allows users to interact with the programs. Since interactivity is such a powerful concept, many experts in the field of multimedia consider interactivity to be an integral part of multimedia.

In a multimedia system, if the user has the ability to control what elements are delivered and when, the system is called an interactive system [9]. There are different devices to provide end-user interactivity. Nearly all tools today support the use of keyboard and mouse, button, and some support touch screens. Buttons are on-screen objects that will produce some response when the end user clicks the mouse on them or touches them. The pushbutton control in Windows dialog boxes is an example of a button.

Adobe Flash is a multimedia platform originally acquired by Macromedia and currently developed and distributed by Adobe Systems. Since its introduction in 1996, Flash has become a popular method for adding animation and interactivity to web pages. Flash is commonly used to create animation, advertisements, and various web page Flash components, to integrate video into web pages, and more recently, to develop rich Internet applications [10]. Flash can manipulate vector and raster graphics, and supports bidirectional streaming of audio and video. It contains a scripting language called ActionScript. The Adobe Flash Professional multimedia authoring program is used to create content applications, i.e. games, presentation, and content for mobile phones and other embedded devices.

3.3. Puzzle Game Development

To create a puzzle game with Adobe Flash, some activities should be done [11]: (1) Make two input text fields with the two variables, that are name and email; (2) Make some pieces of image as movie clips, then put it into the stage. Create ActionScript that is used to drag the image to the right location; (3) Create a board where the pieces of puzzle should be placed; (4) Create an animated title and some graphics with color effects; (5) Create a timer with script that is needed; (6) Make feedback that tells to the player whether he succeeds or fails, and it is provided with sound effects accompanied by applause and the other form, and (7) Make score to calculate the score that is achieved by a player in the game; (8) Make PHP

script that passes variables from Flash to MySQL database; (9) Make a table in MySQL database with three field, that are name, email, and score; (10) Make script to send data to PHP script and then store the data into MySQL database.. Figure 3 shows some of the pieces of the image, a board where the images are placed, timer, and score.

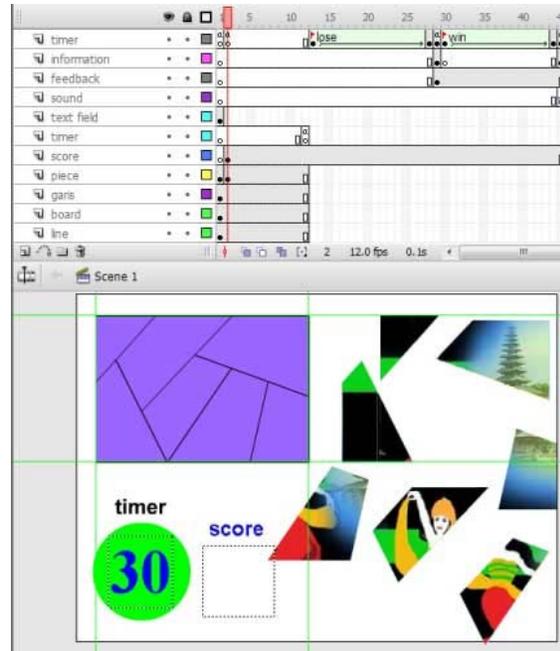


Figure 3. Layout of some components of puzzle game on the Flash document stage.

According to Mohler, the most urgent feature in making puzzle application added in Flash are the `startDrag` and `stopDrag` actions [3]. With them, any range of drag-and-drop games or other scenarios can be set up. A puzzle game is made by detecting the `_droptarget` upon release of a piece of the puzzle. Creating a drag-and-drop element and placed to a correct location requires script to be inserted. When the instance is pressed, it can be draggable. When it is released, it stops the drag operation and can place the pieces of puzzle instance to the correct location. Every puzzle game instance requires ActionScript as follows:

```
on (press) {
    if (_root.d1._visible == true){
        this.startDrag();
        xx = this._x;
        yy = this._y;
    }
}
on (release) {
```

```

this.stopDrag();
if (this._droptarget == "/d1") {
    this._x = _root.d1._x;
    this._y = _root.d1._y;
    if (_root.d1._visible == true) {
        _root.score ++;
        _root.d1._visible = false;
    }
    if (_root.score == 7){
        _root.gotoAndPlay("win");
    }
} else {
    this._x = xx;
    this._y = yy;
}
}
}

```

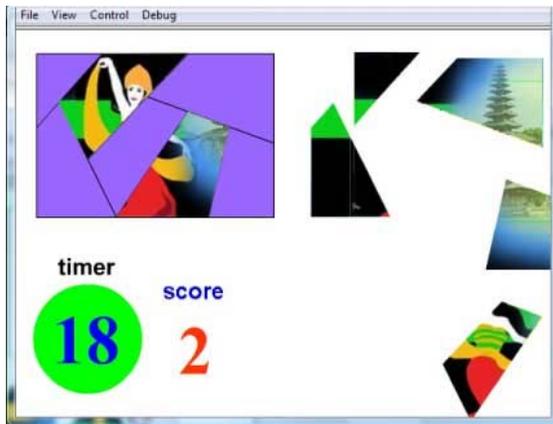


Figure 4. Executing puzzle game

Figure 4 shows the executed puzzle game movie with some pieces of puzzle are placed to the correct location, and the score indicates how many pieces of puzzle are placed. When game is over, either user has succeed or fail, the data name, email, and score are passed to PHP script and send to MySQL database. Sending data from Flash to PHP script requires ActionScript as follow:

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

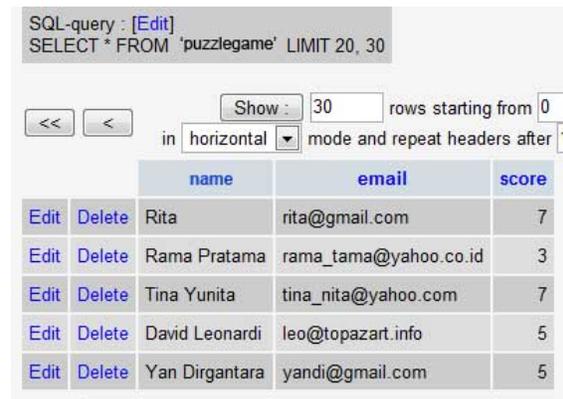
The command in the ActionScript loadVariablesNum send the variable value from Flash to PHP script. The variable names of Flash movie are recognized by the same variable names in PHP. The variable names that are passed from Flash to PHP are name, email, dan score, hence PHP script should have identic variable names. PHP script that pass variables to MySQL database, and the value of the variable is stored in MySQL database, as follows:

```

<?php
$flashbase = "flashbase";
$server = "localhost";
$conn = mysql_connect($server, "", "");
if ($conn) {
    mysql_select_db($flashbase);
    echo $nama.$email.$score;
    $sql = "INSERT INTO puzzlegame
VALUES ('$nama', '$email', '$score)";
    mysql_query($sql, $conn);
    mysql_close($conn);
}
?>

```

Figure 5 shows the table in MySQL database that stores the variable value of name, email, and score.



	name	email	score
Edit Delete	Rita	rita@gmail.com	7
Edit Delete	Rama Pratama	rama_tama@yahoo.co.id	3
Edit Delete	Tina Yunita	tina_nita@yahoo.com	7
Edit Delete	David Leonardi	leo@topazart.info	5
Edit Delete	Yan Dirgantara	yandi@gmail.com	5

Figure 5. Storing variables value in MySQL database

3.4. Testing

We have performed our experiment in two phases, preliminary testing and main field testing. At the first phase, the system is evaluated by peers and experts. The subjects research for implementation of the revised model in the main field testing are informatics students.

3.4.1. Preliminary testing

Evaluation of peers who have sufficient competence in the field of computer education, visual communication design, and information technology conduct during the production process is almost complete.

After the product is complete, the next step is the evaluation by three experts, who expert in computer education, visual communication and information technology. Computer education and visual communication experts did not comment anything about the learning materials, while the



NO	RESPONDENT	Design					Animation				Programming			Score	
		A11	A12	A21	A22	A3	B11	B12	B2	B3	C11	C12	C2		C3
1	Student 1	1	1	1	1	1	1	1	1	1	1	1	1	0	medium
2	Student 2	1	1	0	1	1	1	1	1	0	1	1	1	1	basic
3	Student 3	1	1	1	1	0	1	1	0	0	1	1	1	0	basic
4	Student 4	1	1	0	1	0	0	1	1	0	1	1	0	0	not competent
5	Student 5	1	1	0	1	0	1	0	0	1	1	1	0	0	not competent
6	Student 6	1	1	1	1	1	1	1	1	1	1	1	1	1	smart
7	Student 7	1	1	1	1	1	1	1	1	1	1	1	1	0	medium
8	Student 8	1	1	0	1	0	1	1	0	0	1	1	1	0	basic
9	Student 9	1	1	1	1	1	1	1	1	1	1	1	1	0	medium
10	Student 10	1	1	1	1	1	1	1	1	1	1	1	1	0	medium
11	Student 11	1	1	0	1	0	1	1	1	0	1	1	1	0	basic
12	Student 12	1	1	1	1	1	1	1	1	1	1	1	1	1	smart
13	Student 13	1	1	1	1	1	1	1	1	1	1	1	1	1	smart
14	Student 14	1	1	0	1	0	1	1	0	1	1	1	1	0	basic
15	Student 15	1	1	0	1	1	1	1	0	1	1	1	1	0	basic
16	Student 16	1	1	1	1	1	1	1	1	1	1	1	1	1	smart

Table 1. Student's competency in puzzle game development

Design

A11 = Capable to make simple pieces of puzzle
 A12 = Capable to make object contras
 A21 = Capable to make polygon pieces of puzzle
 A22 = Capable to make continuous design
 A3 = Capable to make complex pieces of puzzle

Animation

B1 = Capable to make animation
 B2 = Capable to make animation effect
 B3 = Capable to make button

Programming

C11 = Capable to make draggable object
 C21 = Capable to make timer, feedback, score
 C2 = Capable to make MySQL database
 C3 = Capable to make PHP script

software engineering expert said that the material should be focused in the programming of puzzle game development.

Computer education expert said that the installation of the application is easy, but the timer is too short, hence it is not easy to drag all of the pieces of puzzle to the stage in the defined time. According to the visual communication design expert, the screen presentation should be provided with an explanation of each item that is displayed.

Based on the comments and suggestions from the computer education, visual communications, and software engineering experts, researcher revised the application.

3.4.2. Main field testing

Main field testing was conducted at School of Multimedia Technology Cendekia Abditama involving 16 students of fourth or sixth semester who are studying Multimedia course and two lecturers. The lecturers explained the guideline for developing multimedia application especially puzzle game, then students try to make a puzzle

game based on the application.

Student should have competency in making puzzle game. The three competency should be achieved by students are basic, medium and smart. Student who has basic competency should be able to make simple pieces of puzzle, object contras, animation, program to drag pieces of puzzle, timer, feedback, and score. Student who has medium competency should have basic competency and be able to make polygon pieces of puzzle, continuous design, animation effects, and MySQL database. Student who has smart competency should has medium competency and he or she should be able to make PHP script, hence data of the variables name, email, and score can be inserted into a table in MySQL database.

Table 1 shows the assessment of students that there are 2 students (12.5 per cent) who are not competent, 6 students (37.5 percent) in the basic competency, 4 students (25 per cent) in the medium competency, and 4 students (25 per cent) in the smart competency. It means that there are 25 per cent of students in the medium competency who



can develop puzzle game with storing data in MySQL database. They can use ActionScript and PHP to communicate with MySQL database.

4. STUDY LIMITATION

This research has limitation such as the application is developed with Adobe Flash CS3 and ActionScript 2.0.

Flash as server-side and dynamic front-end applications does not send variables to PHP and MySQL database in web server, but it is done in localhost/

5. CONCLUSION

Based on the evaluation of peers, experts and practitioners, puzzle game development model is considered good and can improve student's ability in making computer puzzle game.

Through this paper the development of a puzzle game has have been presented. Some details about Flash technology used in the interactive experiments have been described. The course in its interactive has been well tested by the students at School of Multimedia Technology Cendekia Abditama. The project proves that multimedia front-end particularly Flash can be used in MySQL database application.

6. SCOPE FOR FUTURE WORK

The study shows that some aspects of Flash front-end and server-side, which we can classify into design factor, multimedia factor, and database programming factor, succeeds in localhost application. Each aspect contains some activity that should be involved in multimedia development methodology. For further research, the application requires to be implement as a web-based application and the data are stored in MySQL database in web server.

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