INTERACTIVE EDUCATIONAL MULTIMEDIA APPLICATION PRECAUTIONS OF THE DANGER FROM COMPUTER USE TOWARDS EYE HEALTH AND BODY

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ABSTRACT

Interactive educational multimedia application precautions of the danger from computer use towards eye health and body for active employees of computer users Communications and Information Agency of West Java. Thesis Informatics Program Tier 1 Indonesia Computer University Bandung. This research is motivated by the problems of the risks arising from work activity routine in front of the computer and the low level so that the consequences arising concern increasingly felt. Based upon a questionnaire given to 16 employees Diskominfo Jabar, stating feel impaired resulting in the eye and their bodies as a result of routine work long hours at the computer. Lack of knowledge and preventive measures to tackle the risk of becoming a major contributor to the problem. The purpose of this study is to establish a system of interactive multimedia applications that provide a means of education about the risks they face as well as other features for media countermeasures to mitigate risks that arise. This study uses the method waterfall (sommerfille), so that the construction is done gradually and sequentially. Data collection techniques such as by giving questionnaires and interviews to the subject of research in the beginning to know the problems perceived and in the end to find a response to the applications that have been built.

Key Words : Multimedia, Interactive, Health, , S1

1. INTRODUCTION

As the limitations of the research in the development of applications that I created, the Office of communications and Informatics in West Java has a majority of employees who use computers in everyday work. However, lack of awareness of the risks that arise can cause they are very vulnerable exposed health disorders caused by the length of sitting in front of the computer.

The absence of means of risk precaution reminder to also become constraints that have yet to be solved. Employees of the computer users in the Department of communication and Informatics in West Java are unable to predict when they recommended do prevention against the risk of their jobs, so recently realized when the symptoms felt the officers.

Careless disregard towards light or severe disease symptoms felt by the employees of the Department of communication and Informatics of West Java can be long for the health of employees. The risk of health problems in the near term as well as long can also affect the performance of the work. Therefore, an increased awareness of the risks they face in routine work activities of employees should be solved as soon as possible.

Increase awareness of the risk incurred is not enough to address the issue of the danger of the use of computer on health of the eyes and body for employee Communication and Informatics Office of West Java. Because at usually as they care about the problems they face in the world of work, they do not know exactly what they are supposed to do to keep health in addition to the routine work in front of the computer.

The absence of means of learning for knowledge against the dangers that arise to become one of the other barriers faced by employees of the Department of communications and Informatics in West Java. Presentation means the right and practical learning to cope with their problems become the best and quick to provide the education that they need.

In the detailed questionnaire which was distributed to some officials of the Department of communications and Informatics in West Java, all stated that they experienced the disorders that result in the eyes and their body, such as sore eyes and pain in the spine. List of perceived grievances officer Communications and Information Agency of West Java can be seen in the following table:

Table 1. The perceived grievances due to work long in front of the computer

The perceived grievances due to work long in front of the computer		
No.	Complaint	Employees
1.	Complaints On The Eyes	6

2.	Complaints Of Sore On The Body	6
3.	Dizziness	4
4.	Kidney Infection	1
5.	Don't Have A Complaint	4

List of people who feel distracted against perceived grievances can be seen in the following table:

Table 2. Diskominfo employees who are troubled by the perceived Impact

Diskominfo employees who are troubled by the perceived Impact		
No.	Complaints	Employees
1.	Deeply Disturbed	9
2.	Disturbed	4
3.	Sometimes Disturbed	2
4.	Not Bothered	0

This application is designed to arouse the awareness of the employees about the risks of sitting too long in front of the computer and also provide learning about some of the things that can prevent it so that the risk can be minimised or even eliminated. Therefore compilers create the means through Interactive Educational Multimedia application title is the prevention of the danger of the use of Computer on health of the eye and the body

2. ANALYSIS AND DESIGN OF MODEL IMPLEMENTATION

2.1 Application Development Method

The data analysis techniques in the creation of applications using paradigm software waterfall (Sommerfill2010).

Waterfall is a software development methodology which suggests an approach to systematic and sequential software that starts at the level of progress on the whole system analysis, design, coding, testing and maintenance.

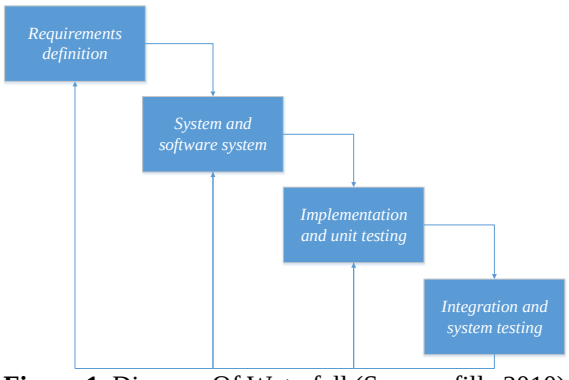


Figure 1. Diagram Of Waterfall (Sommerfille 2010)

2.2 Analysis Of The Running System Procedure

The following is an overview for systems that are running can be seen in Figure 2.

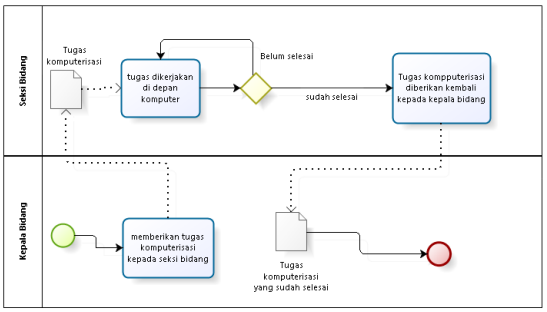


Figure 2. BPMN Process Work Employees Diskominfo in front of the computer

Of the system that runs above there are several weekness:

1. Absence of the activities of the prevention dangers of computer use towards eye health and body.
2. The incidence of the risk of health problems due to long work at the computer on a regular basis.
3. Lack of education that is delivered for the prevention against risk arising, there is only the activities of work in front of computers.

2.3 Analysis And Design Of Architecture

The following is an outline of Architectural Design that can be seen in Figure 3.

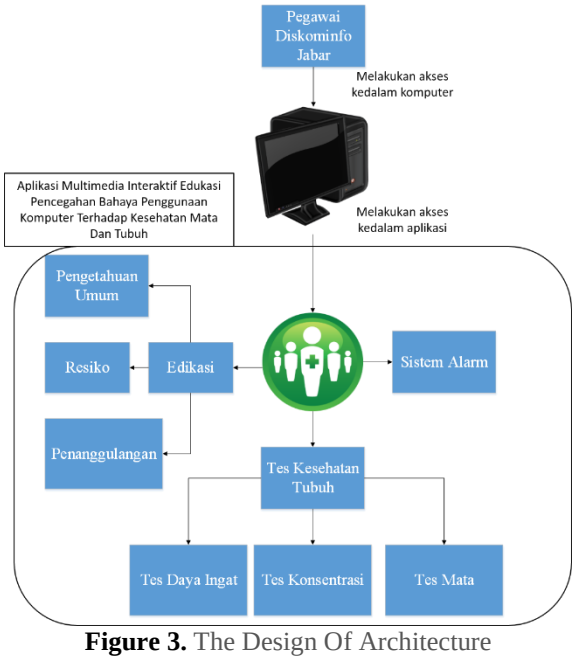


Figure 3. The Design Of Architecture

Employees of the Department of communication and Informatics of West Java computer users in their daily work as a means of access to each computer, interactive multimedia applications for further education for the prevention of dangers of computer use towards eye health and

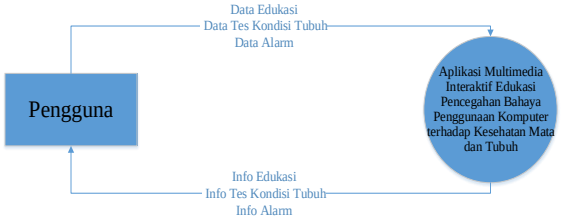
body accessible to enable its current status. In the application there is data to be accessible when the application is activated. The data contained in the application is text data, images and audio that will be combined so that it becomes an interactive multimedia system can be used as a means of education for the prevention of the danger of the use of computer on health of the eye and the body.

2.4 Functional Needs Analysis

Functional requirements describe the need analysis system that will be built on the application of interactive Educational Multimedia computer usage Danger Prevention against eye health and body. As for the functional needs of the application to be built with this structured modelling. Structured modeling is software that is used in the construction of this application with the tools Microsoft Office Visio Diagram that consists of context (Context Diagram), DFD (Data Flow Diagram). There is also a Process Specification describes the data flow from the flow DFD (Data Flow Diagram) and a Data Dictionary.

2.4.1 Context Diagram

Context diagram are diagrams that describe the input, process and output of the system software will be built. The following Diagram is the context of the application of Multimedia Interactive Educational computer usage Danger Prevention against eye health and body can be seen in Figure 4.



Gambar 4. Context Diagram

2.4.2 Data Flow Diagram (DFD)

Data Flow Diagram is a medium that is used to describe the flow of data that flows on an information system. In Data Flow diagrams (DFD) consists of the outer entity, the flow of data, the processing and data storage. Here's a DFD of Multimedia application Interactive Educational computer usage Danger Prevention against eye health and body:

a. DFD Level 1 Main Menu

DFD Level 1 of the main Menu on the application of interactive Educational Multimedia computer usage Danger Prevention against eye health and body comprised of education, test the condition of the body and the alarm. Those processes can be seen in Figure 5.

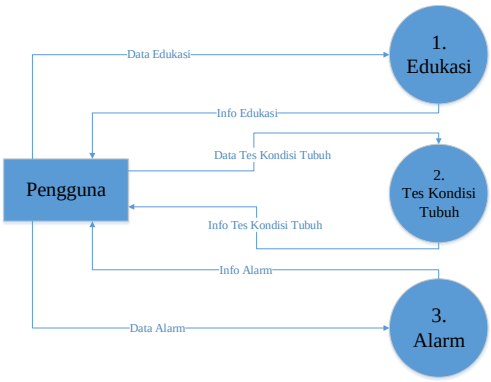


Figure 5. DFD Level 1 Main Menu

b. DFD Level 2 Education

DFD Level 2 education can be seen in Figure 6.

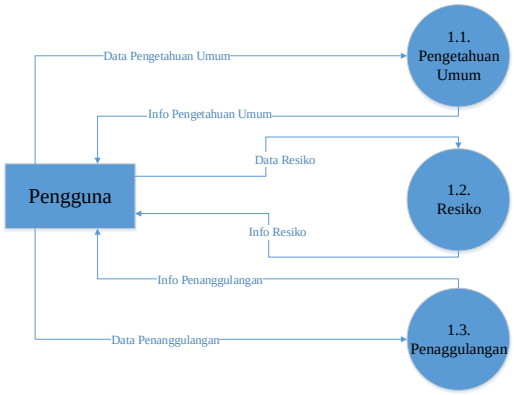


Figure 6. DFD Level 2 Education

c. DFD Level 2 Test Condition

DFD Level 2 test condition can be seen in figure 7.

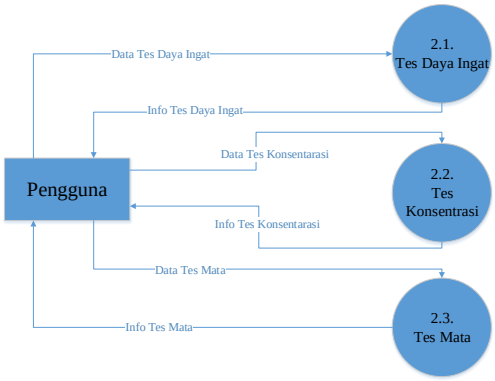


Figure 7. DFD Level 2 Test Condition

d. DFD Level 2 Alarm

DFD Level 2 alarm can be seen in figure 8.

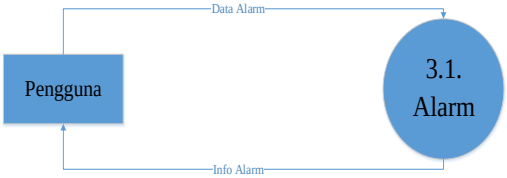


Figure 8. DFD Level 2 Alarm

3. SYSTEM IMPLEMENTATION

System implementation is the stage translate the design based on the results of the analysis. The purpose is to confirm the implementation of programs that have been designed on the perpetrators of the system so that users can provide feedback to the developers of the system. System implementation describes the needs of hardware and software used.

3.1 Application Implementation

Application of Interactive Multimedia computer usage Danger Prevention Against eye health And this body does not require installation, simply by doing a double access-click on the application (executable). However, it should be remembered, on the windows operating system should be installed Adobe Flash CS 6, so that the application can run. When Adobe Flash CS 6 is not yet installed, then this application cannot run.

3.2 Implementation of Display Interface

Implementation of the interface is the display-display of Interactive Multimedia application interface on the prevention of the danger of the use of Computer on health of the eyes and body, here is a list of display interface :

1. Interface Home Page



Figure 9. 1. Interface Home Page

Displays the start page of the application for the next heading in the main menu, the alarm will be active when the application is activated.

2. Interface Main Menu



Figure 10. Interface Main Menu

Displays the main menu page where there are 3 options menu to go to the desired page.

3. Interface Education Menu

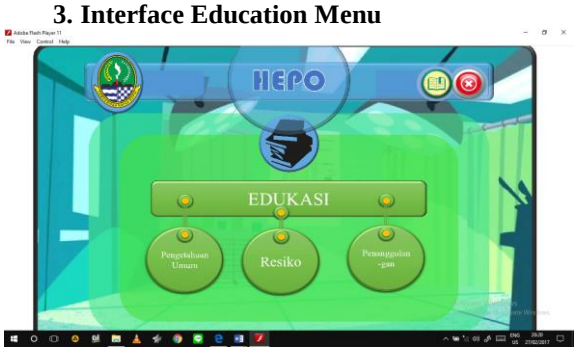


Figure 11. Interface Education Menu

Displays a menu of educational page where there are 3 options menu to go to the desired page.

4. General Knowledge Education Interface

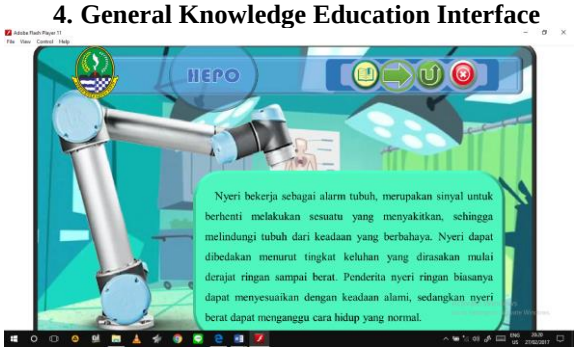


Figure 12. General Knowledge Education Interface

Display the page education material delivery of common knowledge to common knowledge

1. Risk Knowledge Interface



Figure 13. Risk Knowledge Inface

Showing risk education to display the material risks.

2. Countermeasures Knowledge Interface

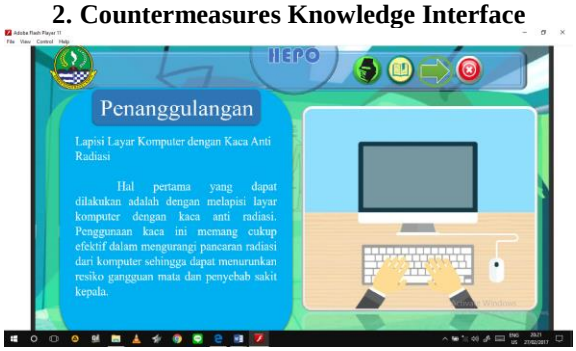


Figure 14. Countermeasures Knowledge Interface

Showing page educational countermeasures to display materials countermeasures

1. Body Condition Test Menu Interface



Figure 15. Body Condition Test Menu Interface

Test menu page displays the condition of the body where there are 3 options menu to go to the desired page.

2. Reserved Memory Test Interface



Figure 16. Reseved Memory Test Interface

Display the page reserved for the display of memory test question tests.

3. Multiple Choice Memory Test Interface

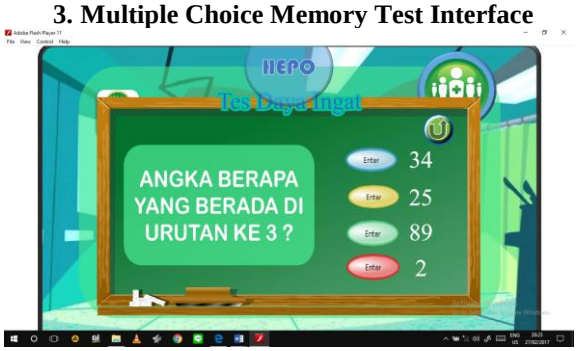


Figure 17. Multiple Choice Memory Test Interface

Multiple choice test page display memory to display multiple choice tests.

4. Memory Test Score Interface



Figure 18. Memory Test Score Interface

Displays the memory test scores page to display the test score.

5. Concentration Test Interface

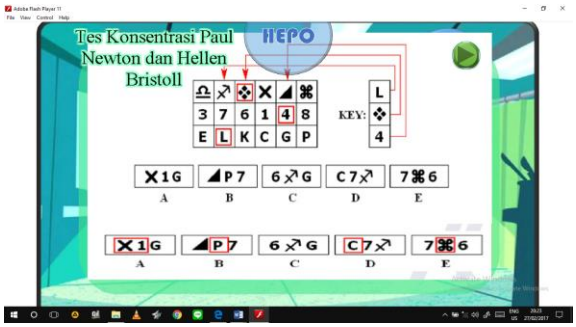


Figure 19. Concentration Test Interface

Display the page reserved for showing the concentration of test question tests.

6. Multiple Choice Concentration Test Interface



Figure 20. Multiple choice Concentration Test Interface

Multiple choice test page showing the concentration to display reserved tests.

7. Concentration Test Score Interface



Figure 21. Concentration Test Score Interface

Display the page to display a concentration test score question tests.

8. Amsler Grid Test Interface



Figure 22. Amsler Grid Test Interface

Display the amsler grid eye test page to display test.

9. Amsler Grid Interference Interface

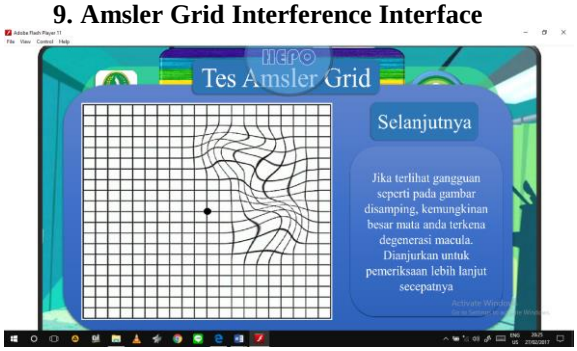


Figure 23. Amsler Grid Interference Interface

Display the amsler grid disturbances affected page to display the test results.

10. Partial Color Blindness Test Interface



Figure 24. Partiar Color Blindness Test Interface

Display the page reserved for partial color blindness eye tests to display the partial color blindness test question.

11. Partial Color Blindness Test Score Interface



Figure 25. Partial Color Blindness Test Score Interface

Display the page test score partial color blindness eye to display partial color blindness test score.

12. Alarm Menu Interface

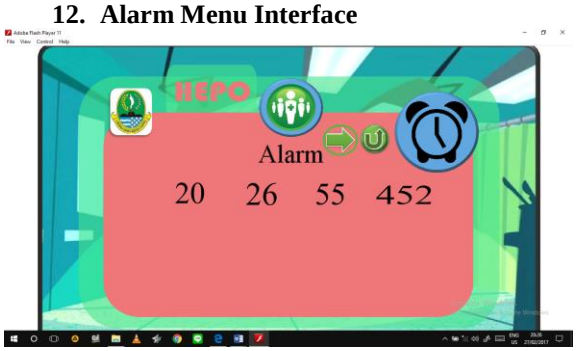


Figure 26. Alarm Menu Interace

Showing page alarm to display alarm and clock functional now.

13. Notification Interface



Figure 27. Notification Interface

Display notification page to display material notice.

3.3 Testing System

Testing system is the most important thing is being done to find flaws or errors in software that is tested. Testing is intended to find out the software made it already meets the criteria as appropriate. Testing is done by way of the alpha that is using Black box testing methods and Beta testing the system in a way that is tested by doing the interview and gave a detailed questionnaire to users.

After being tested by using black box testing against application functionality then obtained the results of applications can already go well with their functionality.

As for the beta testing is the testing that was done objectively. Beta testing is done to the satisfaction of the user regarding the content of point with user friendly terms for further distribution to users. Beta testing is done by giving the format of questionnaires against 24 officers of the Department computer user active communication and Informatics of West Java and an interview with one of the employees

Table 3. Question 1

Whether the content of this Multimedia application presented is in compliance with the required material?		
No.	Response	Employees
1.	Strongly Agree	2
2.	Agree	20
3.	Regular Course	2
4.	Less Agree	0
5.	Do Not Agree	0

Table 4. Question 2

This interactive multimedia application can serve as a risk reduction tool?		
No.	Response	Employees
1.	Strongly Agree	2
2.	Agree	22
3.	Regular Course	0
4.	Less Agree	0
5.	Do Not Agree	0

Table 5. Question 3

Whether navigation and button placement in this application can be understood and used?		
No.	Response	Orang
1.	Strongly Agree	4
2.	Agree	16
3.	Regular Course	4
4.	Less Agree	0
5.	Do Not Agree	0

Table 6. Question 4

This interactive multimedia applications are easy to use and understand?		
No.	Response	Employees
1.	Strongly Agree	6
2.	Agree	11
3.	Regular Course	7

4.	Less Agree	0
5.	Do Not Agree	0

Table 7. Question 5

Whether existing Simulations in the application is easy to use as an understanding on the practice?		
No.	Response	Employees
1.	Strongly Agree	4
2.	Agree	13
3.	Regular Course	5
4.	Less Agree	2
5.	Do Not Agree	0

Table 8. Question 6

Do the instructions audio, text and images on the application easy to understand?		
No.	Response	Employees
1.	Strongly Agree	4
2.	Agree	14
3.	Regular Course	6
4.	Less Agree	0
5.	Do Not Agree	0

Table 9. Question 7

This interactive Multimedia Applications are already making you better understand the dangers of computer use towards eye health and body?		
No.	Response	Employees
1.	Strongly Agree	4
2.	Agree	19
3.	Regular Course	1
4.	Less Agree	0
5.	Do Not Agree	0

Table 10. Question 8

Whether educational prevention given easily understood?		
No.	Response	Employees
1.	Strongly Agree	0
2.	Agree	22
3.	Regular Course	2
4.	Less Agree	0
5.	Do Not Agree	0

The conclusions from the results of testing the questionnaire with observations made then it can be inferred that the majority of the resulting in a using Interactive Educational Multimedia application Precautions Danger the use of Computer on health of eyes and Body already meets the criteria in an attempt to do education and prevention about the dangers of computer use on a regular basis. This application can be used as a learning tool that is more interactive and facilitate active employee computer Diskominfo Jabar in understanding the dangers they face, but in the submission is still not fully understood to do practice

4. CLOSING

4.1 Conclusion

The results obtained from the research that has been done in the preparation of a thesis under the title "Interactive Educational Multimedia application prevention of the danger of the use of Computer on health of the eyes and body" and refers to research purposes, then it can be inferred.

1. This interactive learning applications can help educate employees Diskominfo Jabar on the dangers of computer use towards eye health and body in the activities of their daily work long in front of the computer.
2. This interactive learning applications can help employees Diskominfo Jabar and pengurangi in an attempt to tackle the risk incurred due to work long in front of a computer through a series of tests and alrm features available.

4.2 Advice

Based on all of the results that have been achieved to date, Interactive Educational Multimedia Applications that prevention of the danger of the use of Computer on health of the eye and the body is still far from perfect and there are still many shortcomings. Therefore, the need for further development and refinement in order to meet the needs of the user. As for the suggestions towards the development of this application for the future are as follows:

1. The presence of the addition of more specific material about a disease that inflicted on employees Diskominfo Jabar due to work long in front of the computer
2. The presence of the addition of a simulation to clarify things to do in preventing the danger of the use of the computer

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