Jurnal TAM *(Technology Acceptance Model)*
Jurnal TAM, Volume 14, Number 2, December 2023
E ISSN: 2579-4221; P ISSN: 2339-1103, pp. 206-212
Accredited SINTA 4 Number 225/E/KPT/2022
https://jurnal.ftikomibn.ac.id/index.php/JurnalTam/index

DEVELOPMENT OF AN INTERCTIVE MEDIA APPLICATION GUIDE TO PLANTING HYDROPONIC VEGETABLES AS AN EFFORTS TO EMPOWER PEJAMBON VILLAGE FARMERS GROUP

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Article history:
Received: November 22, 2023
Revised: December 07, 2023
Accepted: December 13, 2023

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Keywords:
Learning Guide;
Interactive Multimedia;
Hydroponics.

Abstract
Hydroponic farming has emerged as an innovative solution to enhance agricultural productivity and environmental sustainability. This research aims to introduce an interactive media application as a guide for cultivating hydroponic vegetables, with a focus on empowering farmer groups in the village of Pejambon . The research methodology involves an initial survey phase to assess the level of knowledge and needs of the farmer groups, followed by direct observation of their farming practices. The development of the application incorporates information technology and communication, featuring step-by-step guides, video tutorials, and discussion forums. The application is designed to provide in-depth information on the selection of plant types, hydroponic techniques, and the management of nutrients. The research outcomes are expected to improve the practical knowledge and skills of the farmer groups in implementing hydroponic methods, while facilitating information exchange among group members. Consequently, the development of this interactive media application is anticipated to serve as an effective empowerment tool, supporting increased crop yields and the well-being of the farmer groups in the village of Pejambon. In conclusion, the implementation of this application is expected to be a positive step in promoting sustainable agriculture and empowering local farmer groups in the region. The development of an interactive media application for hydroponic vegetable cultivation using the MDLC (Multimedia Development Life Cycle) method has had a positive impact on empowering the farming community in Pejambon Village. The stages of analysis in aligning the application with user needs ensure that the content is suitable for their knowledge and skills. The intuitive interface and diverse multimedia elements in the design phase aim to enhance understanding and make the learning experience more engaging.

I. INTRODUCTION

Agriculture is one of the sector important in Indonesian economy, and many group farmers in villages fight For reach independence economy they. One of approaches that emerge and develop in agriculture is cultivation vegetables hydroponics. Hydroponics is method agriculture without land that utilizes water-rich media nutrition for grow plant. Superiority main hydroponics is efficiency more water use height and yield harvest which are more-faster and more-big compared to with agriculture conventional[1], [2]. A multimedia application is an

application that is designed and built by combining elements such as: documents, sound, images, animation and video[3]–[6].

Pejambon Village is one of the rural areas that has potency for development hydroponics. Although So, there is a number of challenges faced by the group farmer local. Most of the farmer here Still use method agriculture traditional, limited knowledge and access to modern technology, as well constraint in marketing results agriculture they.

Several research studies discuss multimedia applications for hydroponic learning media, such as those carried out by [7] The research begins with extracting data and information about yard agricultural inotek which is displayed at Taman Agro Inovasi, followed by multimedia design, multimedia project creation, validation by supervisors and experts, and multimedia feasibility testing. Based on the validation results from media experts, material experts and target users, it shows that the multimedia products produced are very feasible to be used and developed for the dissemination of home garden agricultural technology as demonstrated at Taman Agro Inovasi BPTP Jawa Tengah. [8] The methodology used to design applications for farming using hydroponic techniques is to use Rapid Application Development (RAD) as one of the interactive developments in conveying this information. The advantages obtained from using this method are speed, accuracy and relatively lower costs, as well as involving users directly in every process, so that user needs can be met properly. Based on the results obtained from this research, it is able to overcome the limited number and type of conventional reference sources that can be anticipated with this application, and all the information presented in this application is made based on the actual method and reinforced with video tutorials, so that the public can understand grow it yourself at home.[5] The application aims to help the community to distinguish between organic vegetable seeds and hydroponic vegetables that they want to grow so that the vegetables planted have treatment according to the procedure and the media. There is material about the definition, planting media, shape & structure, types of vegetables, the benefits of vegetables and the advantages & disadvantages of organic vegetables and hydroponic vegetables. This research method uses a qualitative method which is carried out by observing organic and hydroponic seeds, as well as collecting data in the cultivation of organic vegetables and hydroponic vegetables.

Development interactive media applications for guide plant vegetables hydroponics is relevant and important steps in increase well-being group farmers in Pejambon Village. Application This will facilitate Enhancement Knowledge, Ease of Access, Development Skills, as well increase Productivity Farmers. So that Development interactive media applications This will be a very worthwhile endeavor in empowerment group farmer in, Pejambon Village, which in the end will give contribution positive to growth economy local and improvement quality life they.

II. RESEARCH METHODS

2.1. Method of collecting data

Interview Method [9] is an acquisition process information for objective study with how to answer questions between advance between interviewer with Respondents interviewed, here writer will do interview to Farmer groups as distribution targets interactive media applications, after the author will too do interview to Farmers Hydroponics as source knowledge to the application will made.

Observation [10] to farmer is method important in study This like understand practice agriculture them, challenges faced, responses to technology and evaluation level knowledge member group farmer about practice modern agriculture as well is they has accept specific educational training.

2.2. MDLC method

MDLC (Multimedia Development Live Cycle) is study used for develop something designed application[11]–[13]. This method is appropriate study for designing as well as develop something media applications from combined a number of animation images, video, audio. In stages There are 6 points that are mandatory We do.

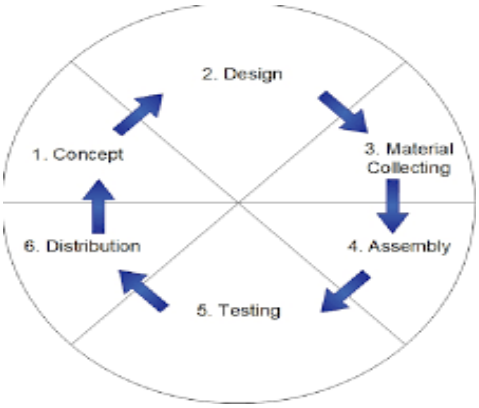

Figure 1. MDLC (Multimedia Development Live Cycle)[14], [15]

1. Concept
   Stages This done with determine objective the application will developed with gather various data from principal discussion taken. _
2. Design
   Represents stage making appearance, style, architecture projects, and materials for project. In stages This made with in detail Possible. so on stage next taking decision new No required Again.
3. Material Collecting
   In stages This is a collection process material in accordance need. Material can be in the form of graphics, clipart, animation, video and audio.

4. Assembly
   Stages making is stages merger from the data that has been collected. Materials that have been collected assembled become something application based on the story board that has been made designed and compiled at the design stage .
5. Testing
   Stages testing can done after stages making finished or you can carried out in the middle of the process stage making. The stages done for test is function from application walk with Good in accordance desire or No.
6. Distribution
   In stages This application will stored on a storage medium certain, if the storage media No Enough so will done compression to application the.

III. RESULTS AND DISCUSSION

3.1. Interface Design

Furthermore is results as well as discussion related with the Multimedia Development Live Cycle regarding Concept, design, Material Collecting, Assembly, Testing, and Distribution.

1. Stage Results (Concep)

Interactive media This will addressed to Farmer Group in Pejambon Village which is at stage furthermore will held percentage as means interaction for introduce Applications that have been created, as well make Application the learning for they. Following explanation detailed about Required concepts: _

Table 1. Concept of Learning Media

NO	Draft	Information
1	Title	Development Planting Guide Interactive Media Application Vegetables Hydroponics As an Empowerment Effort Pejambon Village Farmers Group
2	Objective	Introducing modern agriculture to Pejambon Village Farmers Group as well as make Application as receptacle knowledge for they .
3	User	User Application This is Pejambon Village Farmers Group
4	Material Guidelines	Material from Application This sourced from various journal that has been writer collect.
5	Media Type	Text, audio, images , as well as animation
6	Material Contents	Planting Material vegetables Hydroponics
7	Picture	Images use JPG, JPEG, and PNG formats
8	Ways of making	Using Adobe Flash CS5 software, then publish it as exe
9	Outputs	Public results application This saved on CD/DVD
10	Interactive	There is various type buttons that go to menus, sub menus, materials, and so on animations others. Button that can used for move between frame and scan. Home button for return to the main menu.

2. Stage Results Design _

In building application naturally We will designing the initial design, such as appearance page login, main menu and others in accordance what are we need. Following is details Initial design results for the application:

a) Homepage

Appearance beginning application after We open will going to page beginning contains title The application that we created, and there are also buttons available for enter to the main menu.

Figure 2. Main Page Design

b) Main Menu Page

On the Main Menu there are several various sub menus type vegetables that will chosen.

Figure 3. Main Menu Page Design

c) Planting Yard

On the material planting there is a number of object like picture selected vegetables as well as There are also several available knob like home, next, and buttons Back button, next design plans built.

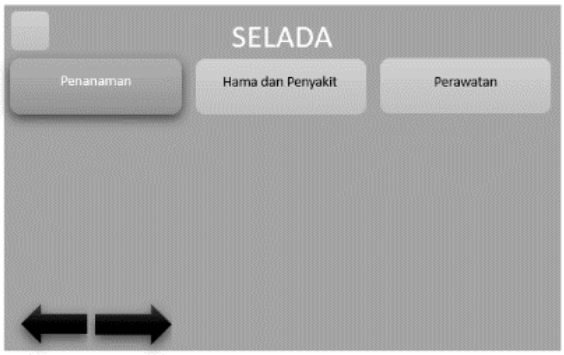

Figure 4. Planting Menu Page Design

d) Pests and Diseases Page

The Pests and Diseases page is also available a number of required button like previously.

Figure 5. Pest and Disease Menu Page Design

e) Maintenance Page

Not far different from several previous menus, on the page treatments are also available a number of necessary buttons, which differentiates only fill from each of these menus.

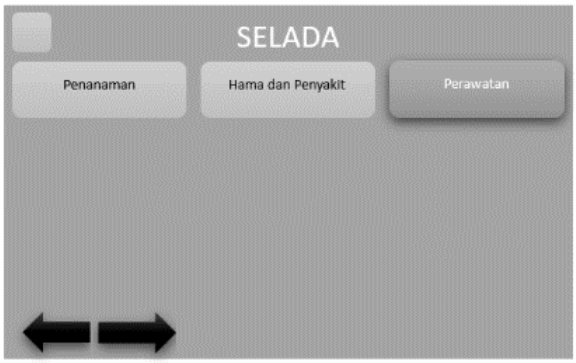

Figure 6. Maintenance Menu Page Design

In designing the application design There is a number of tools used includes software and hardware:

a. Software

For the software used for make Interactive Media Applications here writer using Adobe Flash, as deep editing tools make framework applications which include, Interface Display, creating Buttom, as well add some video, audio, as well animation others.

b. Hardware

For device required hardness there is a number of required specifications for run Adobe Flash software.

Table 2. Hardware Decisions

No	Specification	Need
1	CPU/ Processor	2.5GHz
2	HARD DISK	500GB
3	RAM	4 GB
4	Monitors	14 Inch
5	OS	Windows 7

3. Stage Results Material Collection

In collection material, author need some data is required for build interactive media applications like clip art, graphics, animation, video and audio. Following is a number of requirements for the icon used for build application.

Figure 7. Material Collection

4. Stage Results Manufacturing *(Assembly)*

After get a number of need previously like concept, design and colleting materials, next writer will do stage making using Adobe Flash CS5 software. Following is the manufacturing process application in a way details:

a. Homepage

On the page beginning there is title Application drag available knob For enter to the main menu .

Figure 8. Home page

b. Main Menu Page

Main course there is various type knob for towards each variety vegetables that have been available.

Figure 9. Main Menu Page

c. Planting Yard

Planting page containing about procedures planting vegetables from beginning until harvest, yard this is also available various knob such as Home, next, as well Back button.

Figure 10. Planting Page

d. Pests and Diseases Page

Pests and Diseases Page containing about a number of information about pest as well as diseases of various kinds selected plants. _

Figure 11. Pests and Diseases Page

e. Maintenance Page

On the page maintenance There is a number of required information related maintenance plant nor maintenance installation hydroponics That Alon

Figure 12. Maintenance page

5. Testing

Testing application focus on requirements functional device soft. Black box testing is possible engineering device soft get complete set of inputs use all condition functional For a program, where black box testing attempted find :

- Functions that are not Correct
- error
- Error performance
- Error performance
- Error initialization and purpose end

6. *Distribution*

After series procedures that have been done including testing application has finished, then completed application made will enter the procedure publicist where the file will be changed to in file form *exe. the file furthermore will saved to on DVD/CD for done distribution to Pejambon Village Farmers Group .

3.2. Research Results

Development interactive media applications guide plant vegetables hydroponics use the MDLC (Multimedia Development Life Cycle) method [16]–[19] has been bring impact positive with empowerment group Pejambon Village farmers. Stages analysis alignment application with need users, make sure that the context in accordance with level knowledge and skills they. With between Intuitive and diverse interface Multimedia elements at the design stage aim for increase understanding and making learning become more interesting. Development application introduce features such as discussion forums and tutorials, providing user experience more interactive deep. Through stage implementation optimal performance before implemented to environment real group farmer. Evaluation during and after implementation showing response positive from user, improvement knowledge, and effectiveness guide in support practice hydroponic farming. Overall, implementation MDLC method proves self as a holistic and effective approach in ensure interactive media applications no only fulfil objective technical but also provide impact positive in the group farmer, support empowerment they in adopt practice modern agriculture.

Implementation application need careful implementation and testing for ensure optimal performance. Success implementation This furthermore can assessed through evaluation that includes response user, improvement knowledge, and effectiveness guide in increase results agriculture. With thus, through application MDLC method, manufacturing interactive media applications guide plant vegetables hydroponics No only fulfil need user but also brings positive to empowerment Pejambon Village Farmers Group.

IV. CONCLUSION

In the making interactive media applications with use MDLC (Multimedia Development Life Cycle) method, can concluded that development process This involves systematic and needs-oriented stages user. MDLC covers analysis, design, development implementation, and evaluation, each of which provides contribution important in create effective and responsive application. Stage analysis play role key in understand needs and hopes user. With detail need Pejambon Village Farmers Group, application This can adjusted to suit the level knowledge and skills they in agriculture hydroponics. Application design directed at creating between intuitive and easy interface used. Use multimedia elements such as images, animations, and guides step by Step aim for increase understanding and facilitating learning interactive. Stage development introduce functionality and features applications, including discussion forums and tutorials. Continuity in development done through literacy and improvement based on bait come back user.

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