

Knowledge Management System For The Selection Of High-Yielding Rice Variety and Seeds

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Abstract--- This research covers the problem of the lack information for Farmers regarding rice seeds and high-yielding variety. Moreover, there is limitation for experts in sociality knowledge regarding high-yielding rice variety and seeds. The purpose of this research is to develop a Knowledge Management System For The Selection Of High-Yielding Rice Variety and Seeds. The method used is the Linear Life Cycle model by Giarrantano and Riley. This method consists of six stages, including planning, knowledge definition, knowledge design, code & checkout, knowledge verification, system evaluation. The system implementation use PHP and MySQL. The result in this research consist of varieties knowledge stored in search forms based on names, and parameters have been determined. Consultation knowledge stored in the post comments, e-mail and yahoo messenger.

Index Terms--- Knowledge, Seeds, Varieties, Linear Life Cycle Model.

1 INTRODUCTION

High-yielding varieties of paddy are developed more and more by plant breeding and if the requirement is completed, those varieties will be launched by the ministry of agriculture [1].

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High-yielding varieties strongly affect towards plants' height, amount of productive generations, clumps of rise height, quantities of unhulled rice per clumps, percent of filled unhulled rice per clump and 1000 seeds weight [2]. Furthermore, the farmers are enthusiast when they know about the high-yielding varieties or certified. They are interested to utilize the high-yielding varieties or certified seeds [3]. The aim of the researches are developing knowledge management system for the selection of high-yielding rice variety and seeds. It was done to develop farmers knowledge about selecting the fit seeds and the fit yielding rice varieties. Result of developing the selection of high-yielding rice variety and seeds by knowledge management system was saved in database. Thus, the farmers can choose a type of variety which will be used for available parameter.

2 PREVIOUS WORK

By optimization of knowledge center function integrated to internet system, users can adopt any information and needed knowledge easily and fastly [4]. Development knowledge sharing culture in the government of DKI Jakarta for managing knowledge of each person, both of tacit and explicit wrapped in digital document and need knowledge sharing among employers for triggering the employers performances by exploring the knowledge assets and utilization of information and technology [5]. Knowledge levels of farmers are determined by knowledge management modalities. It means, farmers are assumed have high level if farmers have enough understandings of agriculture, believed knowledge, and learn in group to apply and develop any agricultural innovation [6]. Basic of strong knowledge by knowledge system management based information technology, consists of potential actor of system and implication, knowledge selection and

formalization, and mean computational feature of knowledge server [7].

3. METHODOLOGY

This research was conducted at Computer Science Laboratory, Bogor Agricultural University, in January 2012 until July 2012. The specific study of the research was conducted in Balai Besar Tanaman Padi (BBTP) Bogor and Balai Besar Tanaman Padi (BBTP) Lampung. In this research, to design any diagram for describing any flow charts, it utilized Microsoft Visio 2007. To build website application, it used Web Server Apache version 2.5.2. In addition, source code was processed by PHP version 5.2.1 and edited by Macromedia Dreamweaver 8. Furthermore, MySQL was utilized as database. The materials of this research consist of seed and paddy varieties BBTP Bogor, BBTP Lampung and Bogor Agricultural University. Linear Life Cycle model by Giarrantano and Riley method was used as the method of the research. This method consists of six stages, including planning, knowledge definition, knowledge design, code & checkout, knowledge verification, system evaluation. (Figure 1).

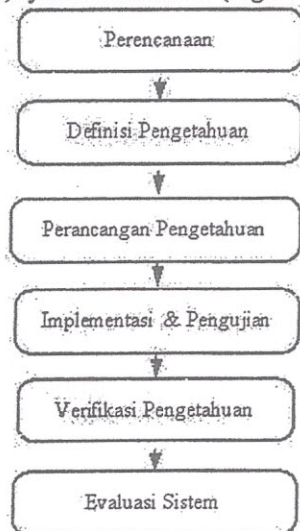


Figure 1. Research Method

1. Planning This was done by step feasibility assessment, resource management, scheduling and describing initial function system.
2. Knowledge definition There are two steps of knowledge management. They are identification and selection knowledge source. This step determine who and which relevant knowledge is, both tacit and explicit. The relevant knowledge determine priorities scale of knowledge source and selected source knowledge based on priorities. The second is acquisition, analysis, and knowledge extraction. The acquisition was done by relevant literature study, interview and observation. The analysis

processes by identification and determine knowledge elements and classify and select knowledge parameter which will become knowledge parameters in determining seeds and paddy varieties knowledge. Knowledge extraction determine by taking and extracting core of result analysis which will be done and got.

3. Knowledge design was done by define what will be done by system using use case diagram, connecting interaction between class and system by class diagram, determine the flow of system events using activity diagrams, and describe communication between users and system by using sequential diagram, make graphic user interface.
4. Code and checkout. Code was done by implementation knowledge design with PHP as source code and MySQL as database. The checkout was processed by blackbox principal.
5. Verification This step processes by User Acceptance Test (UAT).
6. Evaluation system was done by conclude result test and verification, recommend changing system, validate right system according to users need and user demand.

4. RESULTS

1. Planning. Planning define as build a knowledge management system in seeds selection and high-yielding varieties of paddy to help farmers to select and search fit seeds and varieties by desire criteria easily and fastly. Selected varieties function consist of seven criterias. They are, paddy type, age, rice texture, shape of unhulled rice, retention of pest infection, and land specification. Function of online consultation is provide consultation media for resolve faced problems fastly and easily.
2. Knowledge definition. • Users used this system are seed experts and paddy varieties, field technician, and mentor of field school (SLPTT), head of farmels group (Gapoktan). • Knowledge varieties can be got by selecting any desirable criterias and search according to varieties names. Searching result and selecting varieties result consist of selected number, plant breeding, types, age of plants, plant form, productive generations, foot's color, leaves surface, color leaves, leave position, height plants, flag leave, unhulled color, unhulled loss, fallen, rice texture, amilose concente, glycemic index, 1000 seeds weight, mean result, pest resistant, dessease resistant, plan recommend, plant breeding and launch year. • Seeds and high-yielding varieties devide into 7 criterias, they are type of paddy, land specification, rice texture, unhulled shape, pest retention, dessease retention, and age. In this research, paddy

texture consist of two main types, they are inhybrid and hybrid paddy. Land specification divide into 3 types, they consist of paddy field, dry paddy and swamp area. Texture of rice derived into 5 parts, they are pera, fluffier, middle (between pera and fluffier), strong fluffier and sticky rice. Unhulled shape divide into 4 shapes, they are rounded, slightly rounded, medium, and long-slender. Pest retention consists of chocolate bar hopper, stem borer and mice. Disease retention in this research consist of tungro, blast and bacterial leaf blight. Unhulled rice divide into 5 parts, they are ultra genjah (<95 days), extremely genjah (95-104 days), genjah (105-124 days), mid genjah (125-160 days), and age until >160 days. • Consultation knowledge done by chatting discussion with expert, send any complains or questions via email to experts.

3. Knowledge design. The detail design represented by use case, diagram activities, class diagram, and sequential diagram and graphical user interface. Use Case Use case was used for describing system from user point of view. Use case diagram shown at Figure 2. Diagram activity is used for determining general event flow. The diagram consist of selecting varieties, consultation, update varieties, user update. Class diagram will connect interaction class in system. The class consist of paddy class, admin class, consultation class and comment class (Figure 3). Sequential diagram used for determining what should do of the system. Sequential diagram consist of sequential in selecting variety, sequential diagram to consultation, sequential diagram to update varieties and sequential diagram to user update. Grafik User Interface This step was done by making plan of structure in designing graphic user interface and plan test of blackbox method. Planning of graphic user interface consist of home, selecting varieties consultation (Figure 4).
4. Code and Chekout. Code was done by implementation knowledge design with PHP as source code and MySQL as database. The checkout was processed by blackbox principal. The result code and checkout shown Figure 5 and 6.

5. Verification Knowledge was done by farmers and admin with questioner helps. 1. Knowledge verification according to complete list variety IR 36, users selected IR 36 automatically a system shown detail knowledge varieties. Verification result was fit and right. 2. Knowledge verification by search varieties refer to categories. a. Paddy field type category • Users want to search knowledge varieties type inbrid paddy by selecting inbrid one. System shown 100 hybrid varieties, they are : Aek Sibundong, Air Tenggulang, Angke, Banyuasin, Batang Gadis, Batang Lembang, Batang Piaman, Batanghari, Batutege, Bondojudo, Celebes, Ciapus, Ciasem, Cibodas, Cibogo, Cigeulis, Ciherang, Cilamaya Muncul, Ciliwung, Cimelati, Cisadane, Cisantana, Cisokan, Ciujung, Conde, Danau Gaung, Dendang, Digul, Dodokan, Fatmawati, Gajah Mungkur, Gilirang, Indragiri, Inpago 4, Inpago 5, Inpago 6, Inpara 1, Inpara 2, Inpara 3, Inpara 4, Inpara 5, Inpara 6, Inpari 1, Inpari 2, Inpari 3, Inpari 4, Inpari 5 Merawu, Inpari 6 Jete, Inpari 7 Lanrang, Inpari 8, Inpari 9 Elo, Inpari 10 Laeya, Inpari 11, Inpari 12, Inpari 13, Ipb 1r Dadahup, Ipb 2r Bakumpai, Ipb 3s, Ipb 4s, Ipb Batola 5r, Ipb Batola 6r, Ir36, Ir42, Ir64, Ir66, Jati Luhur, Kalimas, Ketonggo, Konawe, Lambur, Logawa, Luk Ulo, Lusi, Margasari, Maros, Martapura, Mekongga, Memberamo, Mendawak, Pepe, Punggur, Sarinah, Setail, Siak Raya, Silugonggo, Sunggal, Singkil, Sintanur, Situ Bagendit, Situ Patenggang, Sunggal, Tapus, Towuti, Tukad Balian, Tukad Petanu, Tukad Unda, Way Apo Buru, Wera, Widas. Verification result was fit and right. • Users want to search knowledge varieties type hybrid paddy by selecting inbrid one. System shown 11 inbrid varieties, they are : Hipa 3, Hipa 4, Hipa 5 Ceva, Hipa 6 Jete, Hipa 7, Hipa 8 Pioneer, Hipa 9, Hipa 10, Hipa 11, Maro, Rokan. Verification result was fit and right.
6. Evaluation. To According to result knowledge test and verification, knowledge management system in selecting seeds and varieties are fit to user need and user demand served via web and report.

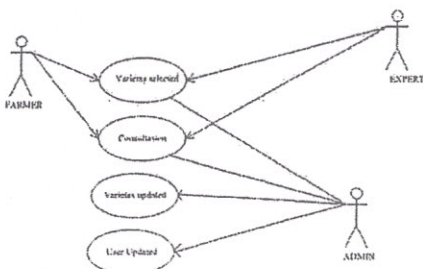


Figure 2. Use Case Diagram

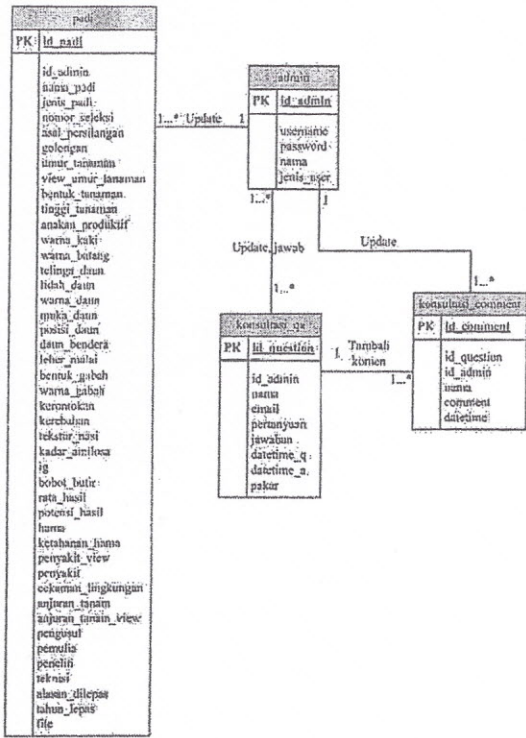


Figure 3. Class Diagram

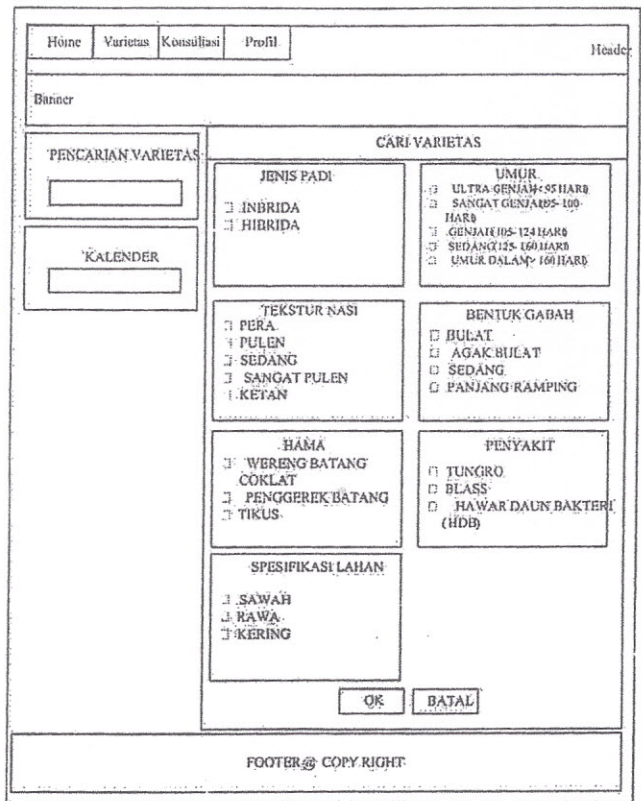


Figure 4. Grafik User Interface

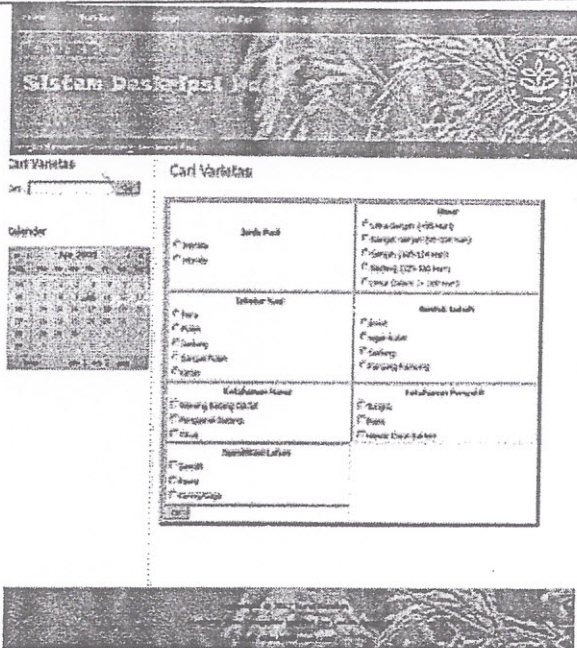


Figure 5. Form selected varieties and seeds paddy

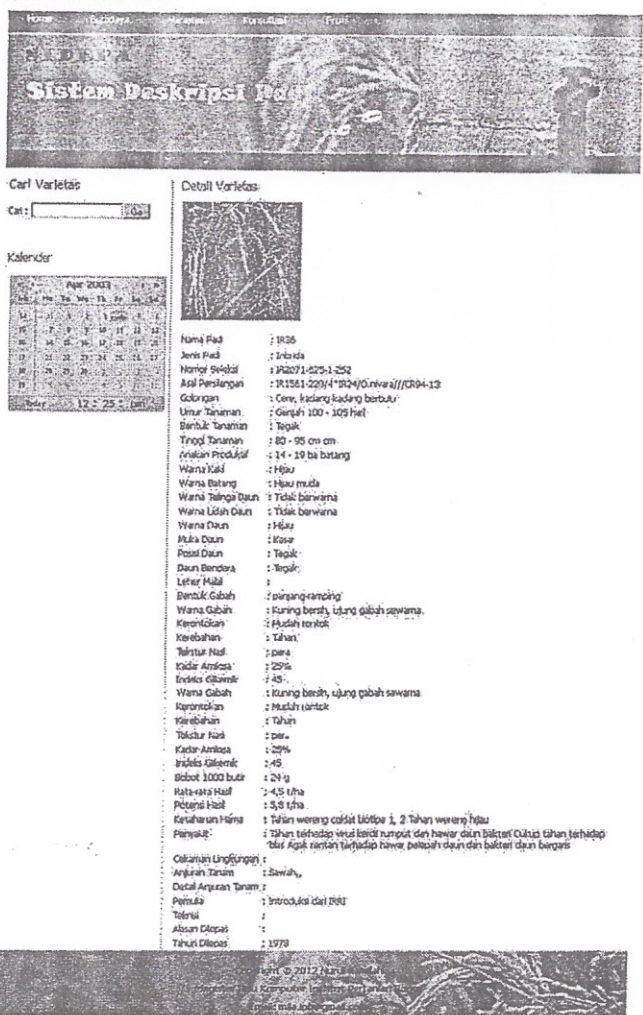


Figure 6. Result Selected Seed and Varietis Paddy

5 CONCLUSIONS

Knowledge management system for the selection high-yielding rice varieties and seeds are integrations between technologies with mechanism to help the farmers and other humanity in getting knowledge rice seeds and varieties. In the other hand, this system can help the government especially the experts and consoller to the farmers. It is by implementation with PHP as source code and MySQL as database. Seeds and high-yielding varieties divide into 7 criterias, they are type of paddy, land specification, rice texture, unhulled shape, pest retention, disease retention, and age. In this research, paddy texture consist of two main types, they are inbrida and hybrid paddy. Land specification divide into 3 types, they are consist of paddy field, dry paddy and swamp area. Texture of rice divide into 5 parts, they are pera, fluffier, middle (between pera and fluffier), strong fluffier and sticky rice. Unhulled shape divide into 4

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