

Diagnosis Specialist System at Palm Oil

Norhasniza Hassan¹, Zalmiah Zakaria¹, Zuraini Ali Shah¹, Noryusliza Abdullah², Shahreen Kasim^{2,*}

¹School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia

²Faculty Computer Science and Information Technology (Web Technology), Universiti Tun Hussein Onn Malaysia, 86400, Parit Raja, Batu Pahat, Johor, Malaysia

*shahreen@uthm.edu.my

* corresponding author

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ABSTRACT

The project that was developed is a computerize system that will be able to diagnose problems happened to palm oil tree. Generally, there is two main problem that always happened to palm oil tree; disease and pest. This system developed to store the knowledge in the related field into a knowledge base to help the newcomer in this field to make a decision to settle the problem faced. To solve this problem, data driven search technique applied to search for the symptom stored in the knowledge base. The system developed using expert system concept. Based on this concept, a knowledge base was built to store all the knowledge compiled. Inference engine used to search the knowledge in the knowledge base. The knowledge based was stored in MySQL database and the inference engine was developed using PHP language.

1. Introduction

In managing an oil palm plantation, there are many problems that apply at all times. Good control over attacks pests and diseases are necessary in improving the productivity of a farm at any time. However, the skills and experience in this area are very much is required in determining the appropriate action taken for each problems that occur. Lack of workforce with formal training in this area certainly reinforce the dissemination of knowledge and advisory services to manage oil palm plantations. The problem arises primarily for certain individuals who work on it. This plant is private. In line with the rapid development of technology, then a computerized system is proposed to program expertise in in this area to benefit its users. The objectives identified in this project are to undertake a process of acquiring knowledge to gain knowledge experts to design knowledge bases. Then, design, build and develop a knowledge base for delegating informational information about the disease on palm trees which encourage knowledge well to reduce complexity reasoning engine. The developed system is a system capable of creating detection of problems in palm oil based on lawsuits physically identified and incorporated into the system as input in 'Yes' and 'No' format as well as suggesting actions should be taken for the detected problem. The symptoms involved are the symptoms that are stored in the databases. The accuracy of the results generated by the system is dependent on the accuracy of the data entered by the user as input to the system. The system to be developed is online. A study has been done on the expert system that has been available for the purpose of analysis and comparison. Among the aspects studied are system goals as well as techniques used in representation of knowledge, reasoning and techniques argument. MYCIN, CASEY and Diagnostic System of Dengue have been studied. MYCIN is an expert system that has developed to diagnose Spinal Meningitis and blood infections which is caused by bacteria. MYCIN has the ability to diagnose more or less 100 types of diseases. MYCIN was developed as a rule-based system where nearly 500 production rules are represented in the form of IF.

THEN. System using backward chaining in search performing a search function. In addition, he also has the ability to explain the reason which is done where the user of this system can interact with the system through the question of how and why. Casey was developed to identify the risk of heart failure. CASEY specializes in ailments that affect the heart organ cardiac disease. Knowledge of illness is represented by past cases and stored in the system memory. CASEY basically incorporates case-based techniques and techniques argument with expert system based on model. The process of conclusion of this system involving three main steps namely case matching, case assessment, and case resolution.

This expert system is developed with the aim of diagnosing the symptoms which occurs in dengue patients. There are four main modules in this system is diagnostic modules, information modules, patent update modules and list modules users. Users need to answer a set of questions related to the symptoms dengue. Answers from users are processed through the engine of reason for produce a decision whether the patient is infected or not. In this system, knowledge is represented by spending rules. . The settings are encoded with if-then statement (IF..THEN). Rules arranged according to plant parts. Input provided by the user is used to match the knowledge base to get the results diagnosis. Search backwards is used for search functionality to perform matching

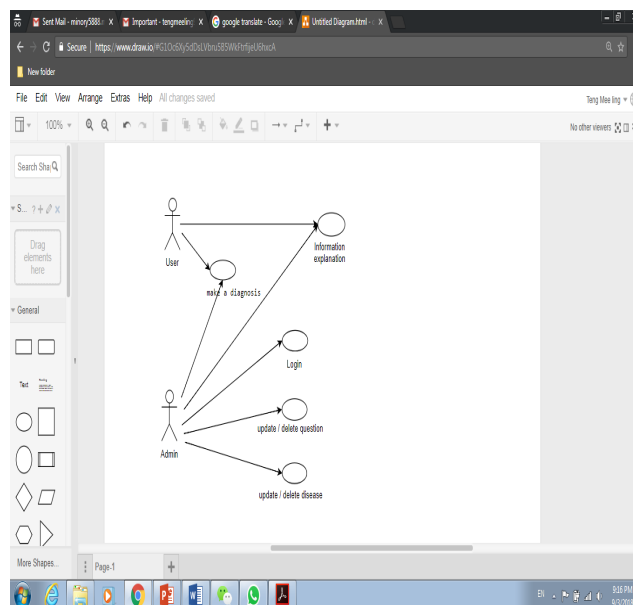



Figure 1: Use Case for the Entire System

2. Implementation

Make a Diagnosis is a use case that used by system users to make diagnosis of palm trees based on identified symptoms. User can also get a brief description of the symptoms that have been identified by clicking on info links next to the question. Information explanation is a use case provides an overview of general information in the field of plantation palm. Among the information that can be viewed in this case are botanical description, varieties on recommendation, agro climatic needs, cultural practices, harvest results and economics. Login is a case used so that

admin users can reach the module. In this case, the name and password information entered by the admin user will be matched with the information in the database. If the information confirmed is correct, access will be provided to the user for modifying knowledge base. Use case Update /

Delete Questions is a case allows admin users to delete knowledge that is no longer needed or updating the knowledge that is still in database based on current research and technology. Use case Update / Remove Disease is the case that allows admin users to eliminate the list of diseases

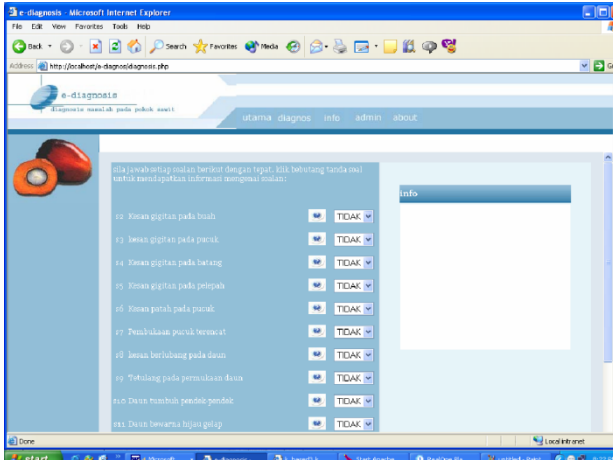


id penyakit	penyakit	penuliharaan	proses	
P1	Seraang Kumbang (Oryctes Rhynchoceros)	Kawalan kimia: 2 bahagian BHC (Agrocide 25 D.F)+10 bahagian clamp sawdust dimasukkan ke dalam lubang habitat kumbang, memberikan carbofura (furadan 3G) atau carbaryl (sevin 5G) 10) pohon dengan interval 2 bulan sekali. Kaedah biologi: menggunakan Metarhizium anisopliae fungus (for biological control). Atau penggunaan pnermome sintetik-baldi plastik+	hapus	kemaskini
P2	Seraang Ulat Burgisus (Mahasena Dorbitt)	Semburan: 7triklorofen, Cypermethrin, Diflubenzuron, Bacillus thuringiensis (BT) Suntikan batang: methamidophos, monothroopos. kawalan biologi: penanaman casia cobanensis di bahagian tepi-tepi jalan.	hapus	kemaskini
P3	Seraang tikus (Rattus Tomanicus)	Bacun: waferfa /rod-facum, coumachler /coumatetraly Biological: penggunaan burung hantu Pemasaan rinki/ aluminium/ dawai gantung dikehilang batang pokok	hapus	kemaskini
P4	Seraang Ulat Bula (Nettie Caterpillars)	Semburan: 7triklorofen, Cypermethrin, Diflubenzuron, Bacillus thuringiensis (BT) Suntikan batang: methamidophos, monothroopos. kawalan biologi: penanaman casia cobanensis di bahagian tepi-tepi jalan.	hapus	kemaskini
P5	Kekurangan Nitrogen	Tambah Urea pada tanaman kelapa sawit, aplikasi Nitrogen pada kondisi tanah lembab, manganol	hapus	kemaskini

Rajah 6.3: Antaramuka Bagi Kemaskini Penyakit

Figure 2: Interface for update Disease

which is not relevant so that the knowledge base is well organized. Figure 2 shows the interface for update disease while figure 3 shows the interface diagnosis:



Diagnosis masalah pada pokok sawit

utama: diagnosis info admin about

Sila jawab setiap soalan berikut dengan tepat. Klik bekutang tanda soal untuk mendapatkan informasi mengenai soalan:

10. Kesan gigitan pada buah
11. Kesan gigitan pada pucuk
14. Kesan gigitan pada batang
15. Kesan gigitan pada penehal
16. Kesan gigitan pada penehal
17. Penubuhan pucuk teramat
18. Kesan bertubang pada daun
19. Tumbuh pada permukaan daun
20. Daun berubah pendar
21. Daun bewarna bijan gelap

Figure 3: Interface for Diagnosis

3. Results and Discussions

Testing phase is carry out to test on the input and output of the system. Testing phase is important to ensure the functions is meet the requirements and objectives of the project. Figure 4 till 8 show the testing result for the entire system.

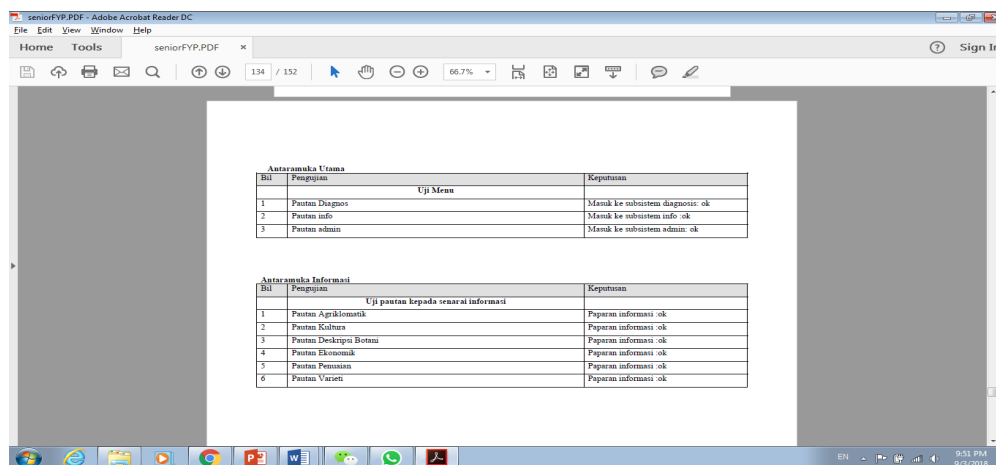
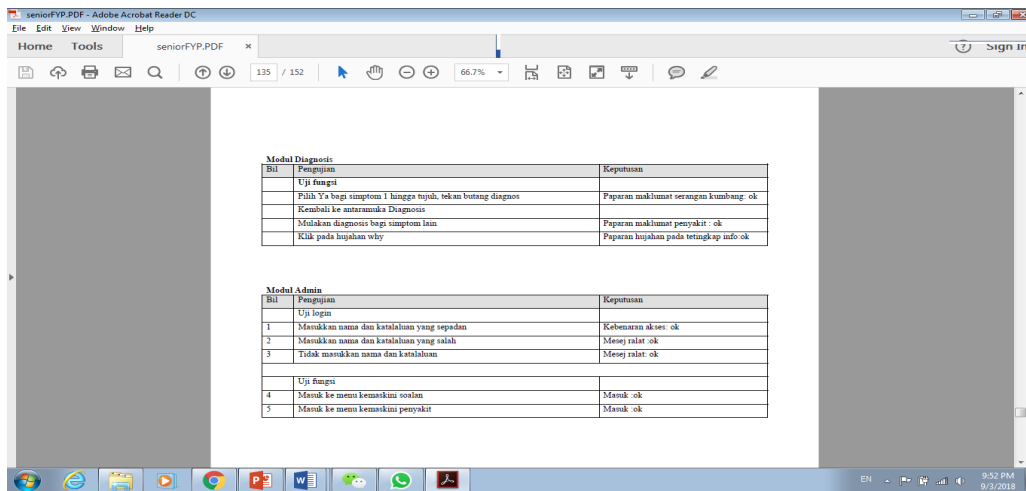


Figure 4: Testing on Main Page

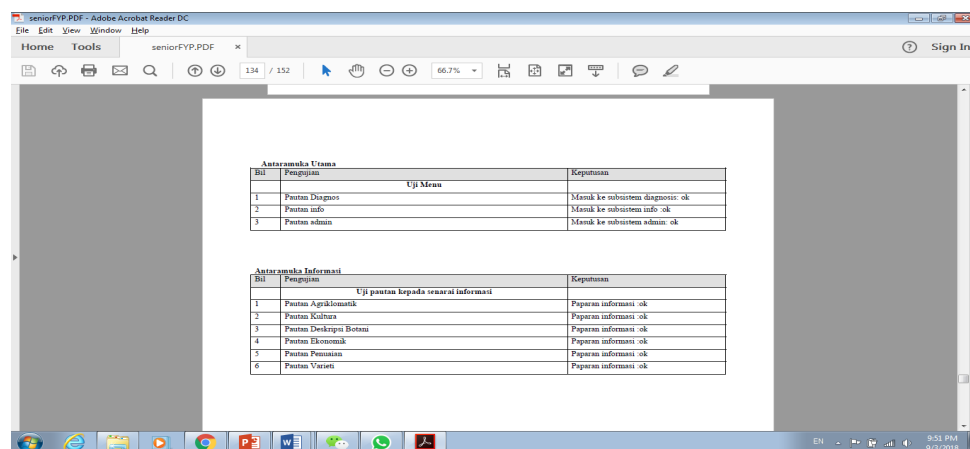


Figure 5: Testing on Information Page

Figure 6: Testing on Diagnose Module

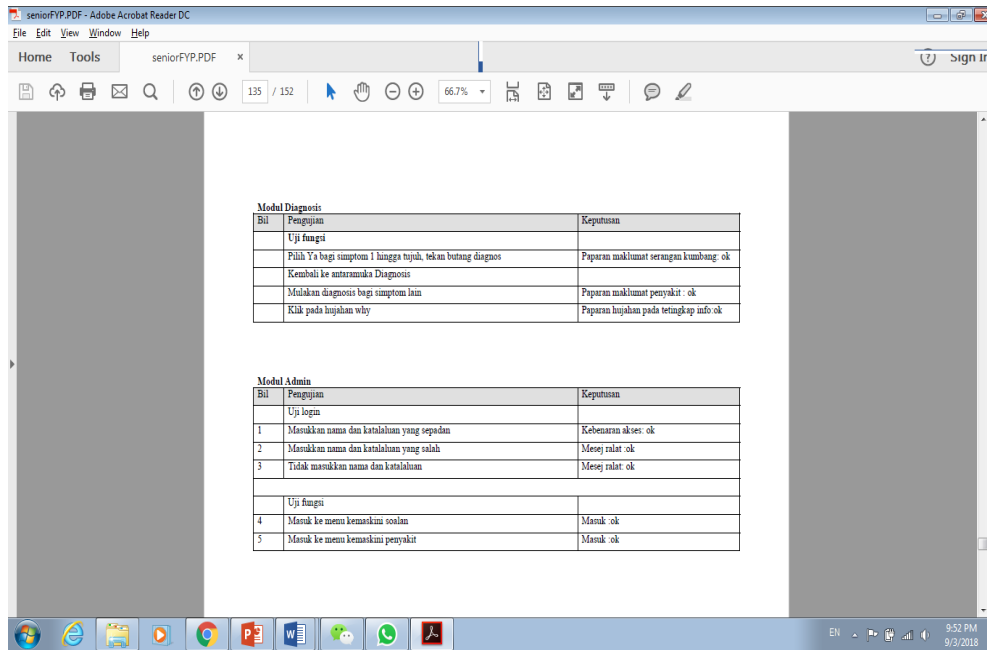


Figure 7: Testing on Admin Module

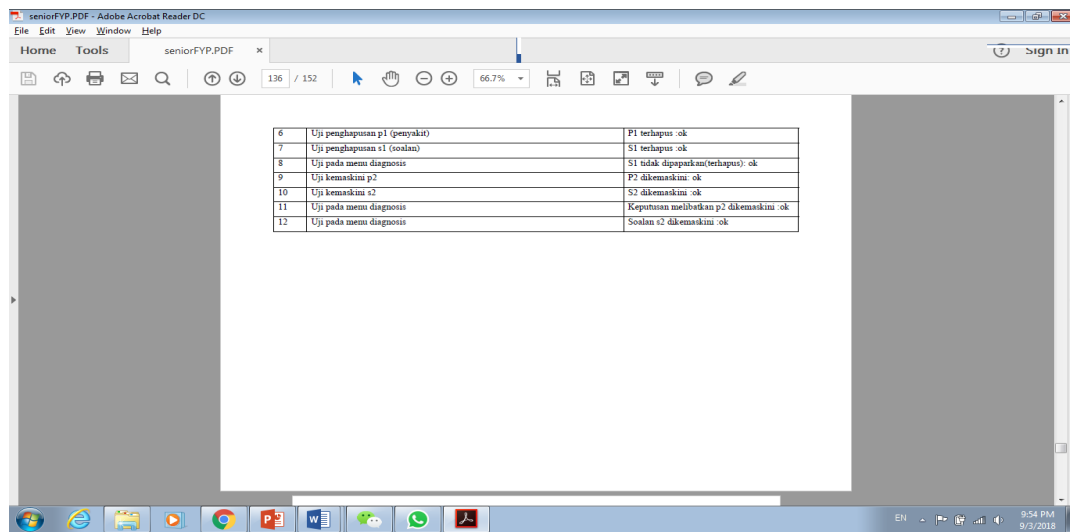


Figure 8(continue): Testing on Admin module

4. Conclusion

Development of this Palm Oil Problem Problem system online has taken a long time since it was an attempt to using expert system concepts along with PHP technology. System development is based on the prototype methodology starting from phase analysis until the implementation and testing phase. Design aid tools have been used to develop models involved in the system development process. The main tools used is Rational Rose C ++ 2000 and Microsoft Visio in view of this system modeled using Unified Modeling Language (UML) modeling method. The system is able to make decisions based on the symptoms entered by user. The system also has the ability to provide recovery recommendations for problems detected. It is more of a suggestion or advice. Hopefully, this system will be able to help the users involved in managing their agricultural areas.

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