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Inheritance Sharing Expert System

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Abstract

One of the computer-based information systems is a website, usually this web information system is in offline or online form. Dissemination or delivery of information carried out on online information systems can be accessed by anyone and anywhere with the provision that they must have an internet connection. The purpose of this study is to provide a solution through the study of several theories and observations in the design of a web-based inheritance distribution expert system. The author uses the forward chaining method in designing an expert system. The application development methodology that I use is the ESDLC (Expert System Develop Life Cycle) method. The expected result of this research is the creation of an application design that can simplify the process of calculating inheritance in accordance with Islamic perspective because inheritance is often crucial which sometimes triggers disputes and causes rifts in family relationships and crime. Therefore we need an expert system that can assist in performing calculations.

Keywords: Expert System, Heirs, Forward Chaining

Introduction

In the era of revolution 4.0, computers are now helping to solve various problems. One of the rapid developments in computers is the expert system. An expert system is a branch of artificial intelligence that makes extensive use of specialized knowledge for expert human-level problem solving. Expert systems work by using knowledge and analytical methods that have been defined by experts in accordance with their field of expertise. The role of an expert system is the same as an expert who must have knowledge, experience in solving problems.

The division of inheritance is crucial and can cause family problems, it can become complex where the heirs want to take the entire inheritance, so that it can cause harm to others and can even lead to crimes such as robbery and murder. In a Hadith narrated by Ibn Majah and Ad-Darquthni Prophet Muhammad Shallallahu Alaihi Wassalam which means "Learn the science of faraid and teach it to others, because verily, science of faraid is half knowledge; it will be forgotten and it is the first knowledge that will be raised from my ummah" (H.R. Ibn Majah and Ad-Darquthni).

With this background, it is hoped that this program can benefit the wider community, especially Muslims in the distribution of inheritance in accordance with Islamic law as described in the Al-Qura'an Al-Hadith. In this study, the author wants to present the adoption of human thinking (in this case the heirs expert) into an Inheritance Expert System program.

Method

The research subject is the Inheritance Expert System. This study is limited to determining the number of inheritance rights with the specified criteria. The research was conducted using the Expert System Development Life Cycle (ESDLC) development method. This method contains the appropriate stages of expert system development starting from assessment, knowledge acquisition, design, testing, documentation and maintenance. The complete method in this research is as follows:

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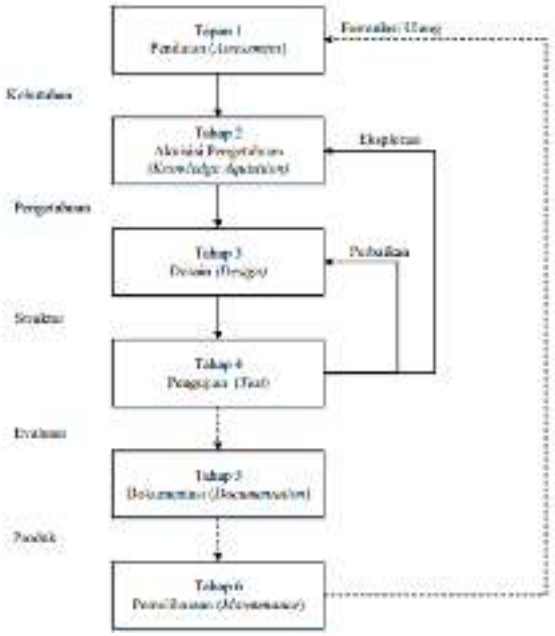

Figure 1: Expert System Development Life Cycle development method

Assessment (Assessment)
The assessment stage is carried out to determine important matters as the basis for the problem of inheritance distribution. the steps taken are distribution, availability of experts, software feasibility.

Knowledge Acquisition (Knowledge Acquisition)
In this stage, data collection is carried out regarding the chapters of inheritance, the parts of the heirs and their arguments. Knowledge is obtained by direct interviews with heirs and from several books that support research on inheritance distribution. Furthermore, it will be merged so that it becomes a knowledge base table, and a tree diagram of the heirs.

Design (Design)
At the design stage, the results of the knowledge acquisition stage will be used as the basis for determining the design. In this stage, the things that are done are the basic table, the relation diagram of the inheritance chapter, the parts of the heirs, and the solution, the decision table, the knowledge representation, the inference engine, the menu structure design, the interface design, and then the construction.

Testing
The fourth stage in the ESDLC model is divided into two stages according to the supporting method used in the research in the form of ESDLC testing to users, testing will continue to be carried out until it becomes a complete expert system that deserves to be developed and increased its expert knowledge, namely as follows: System Testing Testing is the stage where the application will be run. The testing phase is needed to be a measure that the system can run as intended. System testing is done by conducting tests on a web-based system. This expert system is also tested on several computer devices, where this test focuses on the PHP5 programming language to run this expert system.
User Acceptance Test (UAT) is a type of test using a questionnaire or questionnaire containing questions about the application of the Expert System for the diagnosis of tropical disease infection disorders. This stage will document the error code that usually appears in a software problem.

Maintenance
At the maintenance stage, a stage will be carried out to return to the previous stages in order to improve the inheritance distribution expert system so that the knowledge content of the inheritance distribution expert system program increases. This maintenance stage is very important so that the system that is built is not out-of-date, always iterating to meet the information needs of the user (user).

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Forward Chining Method

Forward chaining is a method of searching / reasoning conclusions based on existing data or facts towards a conclusion, the search starts from the existing facts and then moves forward through the premises to get to the conclusion. Forward chaining performs a search from a problem to a solution.

Forward chaining is an inference method that makes reasoning from a problem to its solution. If the premise clause matches the situation (value TRUE.) then the process will be declared a conclusion.

Forward chaining is a tracing process that begins by displaying a collection of convincing data or facts towards the final conclusion Forward chaining is a matching of facts or questions starting from the left side first (IF first) in other words reasoning starts from the facts first to test the truth of the hypothesis .

Result

An expert in Islamic inheritance law usually resolves each case of inheritance distribution by tracing certain conditions. Then the information obtained is recorded to be matched with the knowledge base it has. From the data obtained, it can be concluded that the people who are entitled to become heirs and determine how many rights will be received by each heir. The following is a framework for determining heirs:

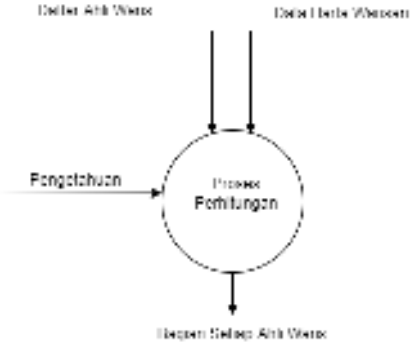
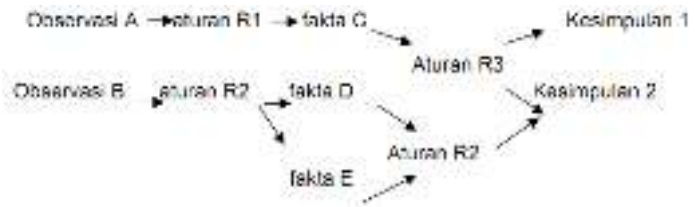


Figure 2: Inheritance expert system framework

Forward Chining can also be called forward tracing or data-driven search, so the search starts from the input or premises (IF) first and then goes to the conclusion or derived information (THEN). This method is performed from the right.



Gambar 3 : Metode *Forward Chaining*

According to the Qur'an, heirs clearly have several parts that are determined as heirs, namely children, parents, husband or wife, half-brothers, and siblings or half-brothers. However, the scholars have determined that there are fifteen men and ten women who are entitled to inherit rights.

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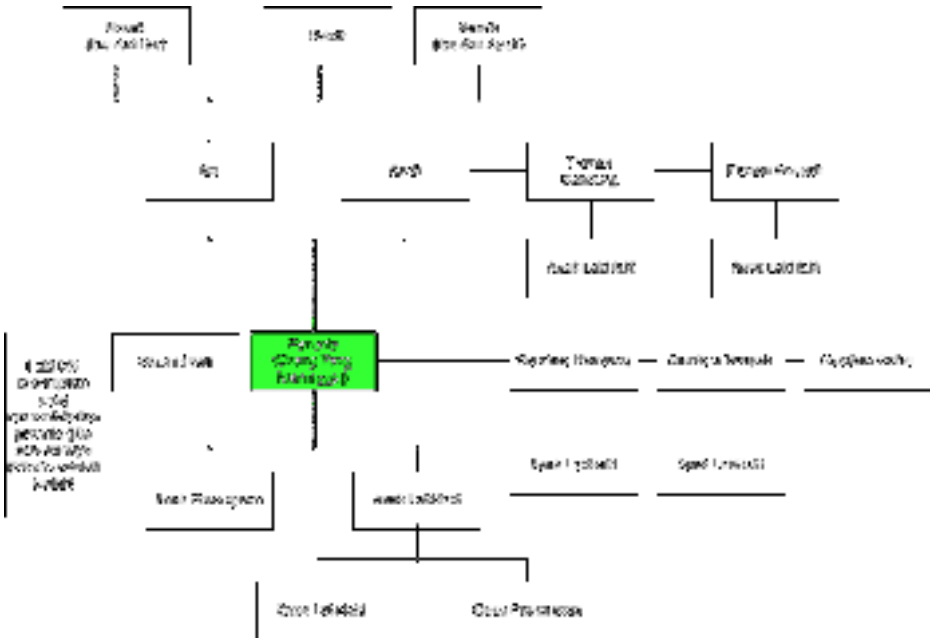

Figure 4: Tree of inheritance distribution

The following is a table of heirs and their code:

Table 1: Recipients of the heirs and their codes

No.	Kode	Heir
1.	A1	Boy
2.	A2	Girl
3.	A3	Father
4.	A4	Mother
5.	A5	Husband
6.	A6	Grandson
7.	A7	Granddaughter
8.	A8	Grandpa
9.	A9	Grandmother
10.	A10	Siblings
11.	A11	Brother Seayah
12.	A12	Seibu Brothers
13.	A13	biological uncle
14.	A14	Biological Cousin
15.	A15	Wife

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Berikut ini adalah rule atau aturan dari hak pembagian waris:

Table 2 : *rule* atau aturan dari hak pembagian waris:

No.	Heir	Rule
1.	Husband	If there are A1 = none and A2 = none and A6 = none and A7 = none Then A5 =
2.	Husband	If A1 = exists or A2 = exists or A6 = exists or A7 = exists then A5 =
3.	Wife	If A1 = none and A6 = none then A15=
4.	Wife	If A1 = exists or A6 = exists then A15 = 1/8
5.	Mother	If there is A1 and there is A2 and there is A6 and there is A7 or (There is A10 and sum =2)
6.	Mother	then A4 = 1/6
7.	Grandmother	If (A1 = None and A2 = None and A6 = None and A7 = None) and ((A10 = Yes and total = 1) or (A10 = None)) then A4 = 1/3
8.	Brothers and sisters of one mother	If A4 = none and A3 = None then A9=1/6
9.	Brothers and sisters of one mother	If sum = 1 and A1 = None, A2 = none and A6 = none and A7 = None and A3 = None and A8 = None then A12 = 1/6
10.	Father	If the sum > 1 and A1 = None, A2 = none and A6 = none and A7 = None and A3 = None and A8 = None then A12 = 1/3
11.	Father	If A1 = Yes or A2 = Yes or A6 = Yes or A7 = Yes, then A3 = 1/6
12.	Grandpa	If A1 = None and A6 = None then A3 = Remainder
13.	Grandpa	If (A1 = Yes or A2 = Yes or A6 = Yes or A7 = Yes) and A3 = No
14.	Girl	then A8 = 1/6
15.	Girl	If A1 = None and A2 = None And A6 = None and A7 = None and A3 = None then A8 = remainder
16.	Girl	If sum = 1 and A1 = None then A2=1/2
17.	Granddaughter	If sum > 1 and A1=None
18.	Granddaughter	If Total > 1 and A1 = None and A2 = None And A6 = None then A7 = 2/3
19.	Granddaughter (A7)	If (A2 = Yes and Total 1) and A1 = None and A6 = None. Then A7= 1/6
20.	Siblings (A11)	If Total = 1 and A11 = None and A3 = None And A8 = None and A1 = None and A2 = None then A11 = 1/2

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21.	A's biological sister(11)	If Total > 1 and A11 = None and A3 = None And A8 = None and A1 = None and A2 = None then A11 = 2/3
22.	Seafather's Sister (A12)	If Total = 1 and A10 = None and A3 = None And A8 = None and A1 = None and A2 = None then A12 =1/2 then A12 =1/
23.	Seayah's Sister	If Total > 1 and A10 = None and A3 = None And A8 = None and A1 = None and A2 = None and A11 = None then A12 = 2/3
24.	Seafather's Sister (A12)	If Total = 1 and A10 = None and A3 = None And A8 = None and A1 = None and A2 = None and (A11 = Yes and sum = 1) then A12 = 1/6
25.	Boy (A1)	Boy = remainder
26.	Grandson (A6)	If A1 = None then A6 = remainder
27.	Brother (A10)	If A1 = None and A6 = None and A3 = None A8 = None then A10 = remainder
29.	Uncle (A13)	If A1 = None and A6 = None and A3 = None A8 = None and A10 = None then A13 = remainder

Simulation

After all the rules and all the systems we can apply the example:

Case 1

A person dies by passing away and leaving a total inheritance that has been valued in the form of money worth RP 150,000,000.00

Abandoned heirs:

1. Boy 1 person
2. Girls 2 people
3. Wife
4. Siblings

Case Discussion

1. 1 son and 2 daughters are Ashabah (getting the remainder from the division).
2. The wife gets 1/8 of the inheritance because the deceased has children.
3. Siblings veiled (obstructed) because the deceased had offspring.

a. Ashhabul furudh

1. Wife's share is: 150,000,000.00 x 1/8 = Rp. 18,750,000

b. Ashabah

Ashabah gets the rest of the inheritance that has been distributed to Ashhabul Furudh in the amount of Rp. 131,250,000.

The calculation for the distribution of ashabah is that 1 (one) boy gets 2 (two) times as much as a girl. Since there are 1 son and 2 daughters, it is assumed that there are 16 daughters. So each child's share is, One boy gets 7/16 * 131.25 million = Rp. 65.625.000 and each girl gets 7/16 * 131.25 million = Rp. 32,812,500

Conclusion

Based on the above discussion that has been described above, it can be concluded: (i) This inference method is suitable for controlling or controlling and diagnosing problems. (ii) The output of this system is the right information received by the heirs based on the calculation of the calculation of inheritance according to Islamic law.

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