THE 11th

INTERNATIONAL RESEARCH CONFERENCE ON QUALITY, INNOVATION AND KNOWLEDGE MANAGEMENT

QIK 2014

CONFERENCE PROCEEDINGS

19th-21st FEBRUARY 2014
BANDUNG - INDONESIA

"Sustainable Research and Innovation"

**FACULTY OF ECONOMICS AND BUSINESS
UNIVERSITAS PADJADJARAN**

MONASH University
Business and Economics

CONFERENCE PROCEEDINGS

THE 11th INTERNATIONAL RESEARCH CONFERENCE ON QUALITY, INNOVATION AND KNOWLEDGE MANAGEMENT

QIK 2014

QIK 2014:
the 11th International Research Conference
on Quality, Innovation and Knowledge Management
Conference Proceedings
19th - 21st February 2014
Bandung - Indonesia
Sustainable Research and Innovation

Editors
Aldrin Herwany, SE., MM., PhD.
Assoc. Prof. Daniel Prajogo, B.Eng, M.Eng, Ph.D

www.qik2014.org

CONTENT

REVIEWERS

APPLICATION OF FORWARD CHAINING ON E-SURVEY DECISION MAKING MODEL FOR TRANSACTIONS

Agus Nursikuwagus[1], Yana Renggana[2]
[1,2]Informatic Department
ST-INTEN, Jl. Ir. H. Djuanda No.126B, Bandung, Indonesia
[1]agus235032@yahoo.com, [2] neorenggana@gmail.com

Abstract

This study purposes the application of IF- THEN rules in a decision model of the survey. The knowledge given to the system is through a user input that will make computer purchases. Knowledge will be designed into a decision model that is formed from the forward chaining models. Completion of this study is using the model of Simon, which consists of the intelligence phase, design phase, and choise phase. In the intelligence phase created a collection of knowledge about the purchase. Design phase is the implementation of IF- THEN rules are designed using forward-chaining rule. The choise phase is the last stage to make a decision by the user for transactions made. Result from this study is a survey models created in a web-based electronic forms, which give a decision based matching rules through forward-chaining rule. So, the system can show the results in transactions that would be required by the buyer.

Keywords: E-Survey; Model; Decision; forward chaining; Transaction;

1. Backgruond

Function and purpose has been the widespread use of computers, this is due to the role that has been easier every job and community activities in daily life. The intended use of the computer begins processing the job data documents, graphic work, multimedia facilities, educational facilities, job programming, provider of information and communication tools, game utilities, and as a server and client devices on the network. With much of the intended use and function, indirectly it has made on any grouping of hardware devices that computer.

Selection of appropriate hardware from the use of computers is an absolute thing in order to obtain computer performance beyond your expectation. But not all people would understand these issues; consequently many problems arise when the computer is being used. One of the problems often faced by users is an error in applying the software on its hardware. The result is a decrease in computer performance and often experience disruption process

1

(hang). For example, when the user wants the computer to run the latest 3D games, which often happens is an error in the determination of the hardware what to buy and right with the game. Such errors usually occur because of a lack of information and uncertainty when deciding which product (hardware) to be purchased.

The purpose of this study is to make a decision about purchasing the model with the help of IF-THEN rules and forward chainning inferencing.

In addition to the variable accuracy in the application of the hardware with the software in accordance with the purposes and functions of computer use, another important variable is the selling price of the hardware that will be used. When seen from the economical, in general, a new technology will be marketed with a high selling price. In effect, a new problem arises, namely the specification of the device according to the funds held by the prospective buyer. Losses arising from the price variable will be affected by any decision that has been set. When the decision-making process faced uncertainty of information and solutions, then the resulting loss will occur. To overcome the existing problems, then solving this study is only includes two coverage are: 1) the model includes the management and presentation of relevant information and knowledge, which will provide a solution in the purchase of computer equipment. 2) Users who will be using this system are limited only to buyers who already have a basic knowledge of computers

2. Methodology

Decision is choosing an activity or action strategies in solving the problem. The act of choosing a strategy or action that is believed to be the manager will provide the best solution for something that is called decision making. The purpose of the decision is to achieve certain targets or actions that must be performed [3]. Made the decision to take the following steps:

i.   Intelligence Phase.

ii. Design Phase.

iii. Choise Phase. .

3. Theory

3.1. The stage of decision support models

H. A. Simon is considered a pioneer in the development of models of human decision-making [2]. Individual work and research with A. Newell set the foundation for models of decision-making. The basic model describes the decision-making process as a three-level, among others, as follows: [1].

1. Intelligence (Intelligence): is the introduction of a problem (opportunity) that requires a decision and collection of relevant information for decision.
2. Design (Design): creation, development and analysis of a wide selection of action.
3. Elections (Choice): the selection of a course of action that has been available.

In the intelligence phase, problems (opportunities) are identified, classified, and reassembled (if necessary), and formed an ownership problem. [4].

3.2. Knowlede Representation and Forward Chaining Inference

Knowledge representation is the method used to encode knowledge in a knowledge-based model. Representation is intended to capture the essential properties of problems and make the information accessible to the troubleshooting procedure. Knowledge representation used is the IF-THEN rules and forward chainning inference.

Knowledge obtained from experts or from a set of data should be represented in a format that can be understood by humans and can be executed on a computer. In this case, the model will determine its own rules to be drafted. So, that IF-THEN rule which made a change from the last survey obtained. The most popular rule is the production of IF-THEN [4].
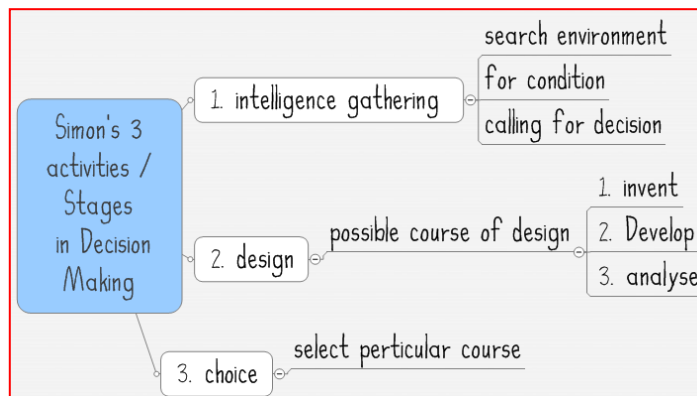
Figure 1. Retrieving a decision process [4]

3.3. E-Survey, Transactions. Forward Chainning

Electronics survey (E-Survey) as one in which a computer plays a major role in both the delivery of a survey to potential respondents and the collection of survey data from actual respondents [5]. E-Survey (electronic survey), and the technique currently receiving the most interest from researchers [6], is the Web-based survey. They are generally defined as those survey instruments that physically reside on a network server (connected to either an organization's intranet or the Internet), and that can be accessed only through a Web browser [7]. The term transactions is defined as activity between consumer and market. There are

many activities such as selling and buying, it will be tranformed to electronic models. So, it called e-survey.

To create a decision for helping the customer choose, e-survey is completed by kinds of process. These processes like representation of knowledge, databases, computer program, and inference enginee such as forward channing. Forward chainning is one of tools for retrieving the information and make the decision trees, whereas the decision will be two parts. This is simple to implement the decision with forward chainning inference. We only create a root of question, and then inference until the match between questions and databases. In another way, we called generate of knowledge representation.

4. Discussion

4.1. Intelligence Phase

The first step in the construction of this model is to identify the problem. To obtain the core of the problem which will become the main base in the construction of this model, we need a classification problem and eventually formed a statement of the problem. Thus, ownership of the problems is associated with the part to be built by the model, in order to conform to the problem owner. The issue of ownership process is done through the distribution of questionnaires.

Almost 30 questionnaires have been distributed, the percentage of respondents is known as one of the examples presented in the table below:

Table 1. Responder Answer for question "Where is you positions as a user of computer ? choices of answer are beginner, only operator, native, expert, expert with ability additions"

Anwer	Stactistics	
	frequency (f)	prosen(%)
Beginner	1	3.2
Only operator	20	64.5
Native	2	6.5
Expert	1	3.2
Expert With ability additions	7	22.6
summarize	31	100

Of the whole question that has been posed to prospective buyers, it can be concluded that the results obtained knowledge. Knowledge is stored in table form of knowledge, as below:

Table 2. Knowledge representation table about choosing computer

No	Questions	Topics	Kinds of computer					
			D	NB	NtB	TB	DB	S
9	How often you use a computer ?	mobility		X	X	X		
19	What the operating system used?	Operating Systems	X		X		X	
22	Are you interesting about stability of computer electricities ?	Stability of Electric	X				X	X
26	What interesting of the internet application used ?	Internet Application	X	X	X	X	X	
1	Where is you positions as a user of computer	Knowledge Users	X					

Abbreviations :

D   : Computer Deskstop

NB   : Computer NoteBook (complete with all peripheral)

NtB   : Computer NetNook (no CD's, only for browsing)

TB   : Computer Tablet

DB   : Computer Deskbook (Screen and Peripheral are unite on one machine)

S   : Computer Server

4.2. Design Phase

The evidence is suggests a relation of the circumstances and nature. A rule is expressed as a conditional sentence is a statement of fact instruction with the desire to get a conclusion. Therefore we need rules for representing knowledge, in order to be an inference engine that will be the basis of the model. Knowledge of tables in table 2, it can be made diagram semantics of the table. This diagram is to create rules that will be used in the selection of future expertise. Here's an example of the results of the acquired knowledge:
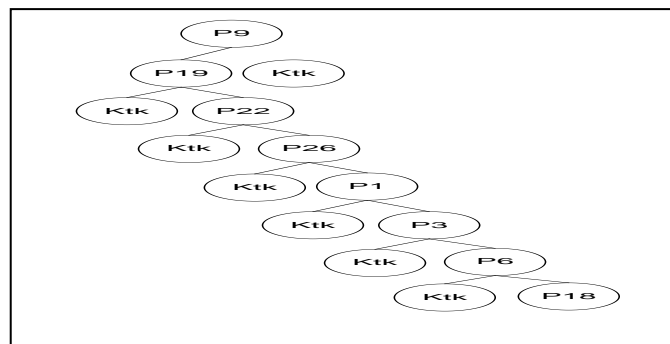

Figure 2. Instance of Semantic Diagram

Description : P1-P29: identification of key questions needs computer, Ktk: unknown computers.

Diagram semantics are made based on the suitability of the expected choice. Questions about the selection of a given computer is the computer Desktop, Notebook, Netbook, Tablet, Deskbook, and servers. From the results, semantic diagram is made the knowledge representation of each computer option. The following description is an example of the result of the representation of knowledge. The descriptios are made from IF-THEN Rules format.

Rule 1

IF more frequent use of computers at home or the office (P9) AND commonly used operating system Windows P19) AND Noting stability factor power supply (P22) AND Requires the use of Internet applications (P26) AND Knowledge novice users (P1) AND specification condition can be new or used computer or a combination thereof (P3) AND Covers all of the variables are as expected prerequisite computer (P6) AND Computer is suitable as a means to implement the development software (P18) AND can be used for computer business needs (P20) AND more affordable budget funding by all levels of society (P24) AND Can be used for security-based Systems (P29) AND Its role in facilitating the work (P2) THEN Desktop computers

Rule 2

IF use computers more frequently on the go (Mobile) (P9) AND Requires the use of Internet applications (P26) AND specification condition can be new or used computer or a combination thereof (P3) AND Covers all of the variables are as expected prerequisite computer (P6) (P20) AND Its role in facilitating the work (P2) AND All factors need to be met using the computer (P4) AND Design casing into consideration (P8) AND type Manufacturer diverse (P7) THEN Notebook Computer (Laptop)

Rule 3

IF use computers more frequently on the go (Mobile) (P9) AND commonly used operating system Windows (P19) AND Requires the use of Internet applications (P26) AND specification condition can be new or used computer or a combination thereof (P3) AND Can be used for internet usage with the usage of high frequency (P16) AND Qualified as computer

usage and network communication needs (P15) AND has a major task given (P5) AND type various monitor sizes (P21) THEN Netbook Computers

Rule 4

IF use computers more frequently on the go (Mobile) (P9) AND Requires the use of Internet applications (P26) AND computer meets all the prerequisites variables as expected (P6) AND can be used for computer business needs (P20) AND Its role in facilitating the work (P2) AND All factors need to be met using the computer (P4) AND can be used to transfer data with the use of high frequency (P14) AND can be used for internet usage with the usage of high frequency (P16) AND qualified as the use of computer communications and networking needs (P15) AND has a major task given (P5) THEN Tablet Computer.

Rule 5

IF more frequent use of computers at home or the office (P9) AND commonly used operating system Windows (P19) AND Noting stability factor power supply (P22)AND Requires the use of Internet applications (P26) AND Covers all of the variables are as expected prerequisite computer (P6) AND Using computer can be used for internet with the use of high frequency (P16) AND can be used to print high-resolution graphics data (P27) AND Qualified as use of computer communications and networking needs (P13)AND has a lot of media interfaces for data transfer (P23) AND has a major task given (P5) AND games more diverse themes (P11) THEN computer Desk-book (Hybrid computer).

4.3. Choise Phase

In this phase explains about the decision taken. Decisions made are based on user feedback. Classification of questions asked by the system will help determine the decision in purchasing a computer. The result is a computer model of the machine in accordance with user expectations to help daily tasks.

To modeling in this phase, we used many diagram. This diagram was proposed by OMG Group (Object Modelling group). There are twelve diagrams for contructing the computer applicaitons. In this resarch, we only use two diagrams, that is Use Case Diagram and Class diagram.

4.4. Use Case Diagram

Use case diagram is a diagram that describes typical user interaction with the system based on the point of view of people who are outside the system. Its purpose is to explain the functionality and how the system interacts with the outside world. Figure 3 is a use case diagram and Figure 4 is a class diagram. Class diagram is useful to show the connectedness between classes with another class. Figure 4 is a depiction of a class diagram of the application is made:
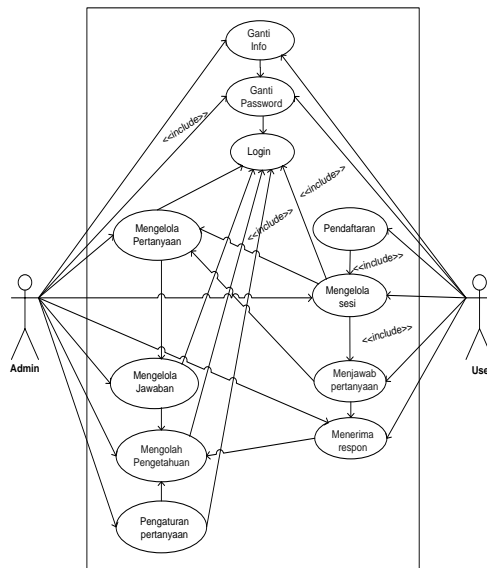
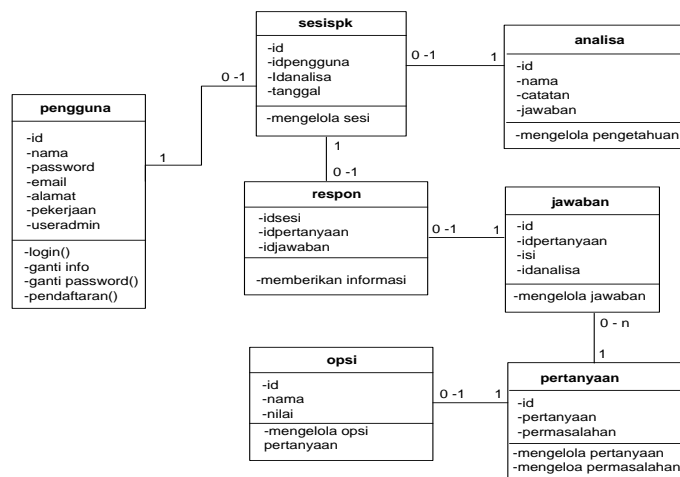Figure 3. Instance of Use Case Diagram

Figure 4. Instance of class diagram

5. Implementation and Conclussions

5.1. Implementation

The results of this study are grouped in software modules using PHP scripting language. If the application is executed in accordance with the input from the user, then the system will make the appropriate decisions pattern matching with user expectations. Overall, the implementation of the system can be seen in Table 3. Figure 5 and Figure 6 is a view that executed the implementation of previous exposure to the discussion.

In Figure 5, there is a menu:

- Home, this menu to return to the main page.
- Response, this menu to perform the model analysis.
- Admin, this menu to manage questions, answers, knowledge and setup knowledge base.
- Change the info, this menu to make changes to user information and change keywords.
- Help this menu to provide technical information site usage.
- On site, this menu to provide information on the construction site

Table 3. Application Program of E-Survey

No	Modul	File
1.	Database Connection	mysqldbo.php
2.	Admin Login & User Login	login.php
3.	Session	sesi.php
4.	Analysis Remains	sesidetil.php
5.	Response	sesi.php, modifysesi.php, sesidetil.php, response.php
6.	Change Info	changeuser.php, changepassword.php
7.	Update Password	changepassword.php
8.	List	createuser.php
9.	Authentication User	auth.php, authrequired.php
10.	Home	index.php
11.	User Root Menu	header.php, index.php, footer.php,
12.	Administrator Root Menu	header.php, index.php, footer.php, adminmenu.php
13.	Admin	listquestion.php,

|		modifyquestion.php, listanswer.php, modifyanswer.php listknowledge.php, modifyknowledge.php option.php, adminmenu.php
14.	Knowledge base	listknowledge.php, modifyknowledge.php
15.	Knowledge Management	option.php
16.	Questions	listquestion.php , modifyquestion.php
17.	Answer	listanswer.php, modifyanswer.php
18.	Help	help.php
19.	About Site	about.php
20.	Logout	logout.php
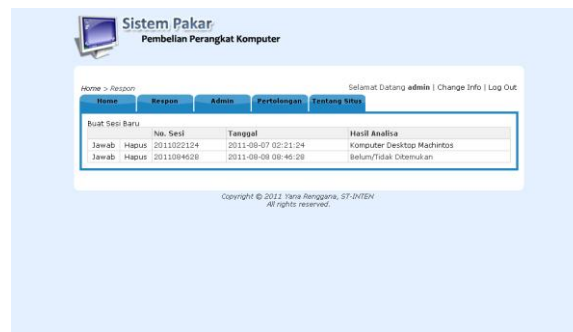
Figure. 5. Example of Administrator Application

Figure 6. Example of User Application

On Figure 6, there is a menu:

- ✓ Home, this menu to return to the main page.
- ✓ Response, this menu to analyze the model and create a session

✓ Change the info, this menu to make changes to user information and change keywords.

5.2. Conclussion

The forward chaining that is built making easy to inference each steps. With collecting the knowledge into groups will be easier to search and to divide be fraction into left and right on the trees. The knowledge that creates is breakdown from user requirement that needs the computer system. For further, we gather the knowledge and make representation table which as summary about the knowledge. We create the system which is dynamically build the trees align within user input and many facilities that provide beginning survey form, login, and binary tree structure.

Literatures

1. Adam, Frédéric & Patrick Humphreys,"Encyclopedia of Decision Making and Decision Support Technologies", Information System Reference IGI Global, USA, vol 1-2, 2008.
2. Ahituv & Neumann, "Management Information System", W.C Brown Publisher, USA, 3rd edition, 1990.
3. Kusrini, "Model of theory and application", ANDI Publishing, Yogyakarta, Indonesia, 2006.
4. Turban, E.,et.al, " Decision Support Systems and Intelligent Systems", Prentice Hall, 2005.
5. Karen, J. Jansen, et al, "E-Survey Methodology", IGI, 2007.
6. Zhang, Y. ," Using the internet for survey research: A case study. Journal of the American Society for Information Science", 51, 57-68, 2000.
7. Green, T. M. ," The refusal problem and nonresponse in on-line organizational surveys", Unpublished Doctoral Dissertation, University of North Texas, Denton, TX, 1995.

STEERING COMMITTEE

Dr. Nury Effendi, SE., M.A
(Universitas Padjadjaran, Indonesia)

Prof. Amrik Sohal
(Monash University, Australia)

Prof.Dr.H. Yuyus Suryana Sudarma, SE,MS
(Universitas Padjadjaran, Indonesia)

ORGANIZING COMMITTEE PRESIDENT

Erie Febrian, SE., MComm, PhD.
(Universitas Padjadjaran, Indonesia)

ORGANIZING COMMITTEE VICE PRESIDENT

Diana Sari, SE.,M.Mgt,. Ph.D
(Universitas Padjadjaran, Indonesia)

COMMITTEE SECRETARY

Mrs Kathy Cooper
(Monash University, Australia)

ORGANIZING COMMITTEE

Dr. Wa Ode Zusnita Muizu, S.E.,M.Si   (Universitas Padjadjaran, Indonesia)
Wardhana, SE., M.Bus   (Universitas Padjadjaran, Indonesia)
Budi Harsanto, SE., MM.   (Universitas Padjadjaran, Indonesia)
Sunu Widianto, SE., MSc.   (Universitas Padjadjaran, Indonesia)
Aditia Febriansyah, SE.   (Universitas Padjadjaran, Indonesia)
Ade Maulana Rahman Hidayat, SE.   (Universitas Padjadjaran, Indonesia)
Aninda Desvianti, SE   (Universitas Padjadjaran, Indonesia)
Ahmad Hamdie, SE.   (Universitas Padjadjaran, Indonesia)
Intan Puspa Pradini, SE.   (Universitas Padjadjaran, Indonesia)
Achmad Hadyan Zihni Djunet, SE.   (Universitas Padjadjaran, Indonesia)
Mahir Pradana, SE., M.Sc   (Universitas Padjadjaran, Indonesia)
Wahyudio Mahesa   (Universitas Padjadjaran, Indonesia)

SCIENTIFIC COMMITTEE

Aldrin Herwany, SE., MM., PhD.
(Universitas Padjadjaran, Indonesia)

Yudi Azis, S.E., S.Si., S.Sos., MT., PhD.
(Universitas Padjadjaran, Indonesia)

Ass. Professor Daniel Prajogo, B.Eng, M.Eng, Ph.D
(Monash University, Australia)

Dr. Hj. Umi Kaltum, SE.MS
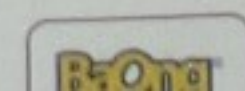(Universitas Padjadjaran, Indonesia)

www.qik2014.org