

Expert System For Identification Dhapur Of Java Keris

Heribertus Ary Setyadi, Dwi Kuncoro, Bambang Eka Purnama

Abstract: In the world of keris, especially the Java's keris has a variety of forms and types that can be classified based on dhapur, pamor and tangguh. Indonesian society has much to forget the original culture of Nusantara, especially local culture. There are fewer a keris expert who really mastered or understood correctly the ins and outs of the Java's keris. With the collaboration of the latest technology in the form of application identification Java's tosan aji is expected to restore the love of local culture and Indonesia and more and more people know the type of keris owned Nusantara especially Java. The purpose of the research is to produce an expert system application that can replace an expert in determining the type of keris Java based on dhapur so that it can facilitate the society to recognize the keris, at least their own keris. This research uses forward chaining method to apply expert system and the system can identify dhapur of keris according to the input of the user.

Index Terms: Forward Chaining, dhapur keris, Java, Expert System

1 INTRODUCTION

Keris is a native cultural object of the archipelago because it is believed to have existed before the religion entered to Nusantara. In some research the keris is found to be made at the time of Buddhism entered to Nusantara, but until now has not found the same cultural objects with keris in other cultures. So it can be said that the keris is a cultural object typical of Nusantara. Related to the cultural recognition of this keris, UNESCO gives awards to the keris as a masterpiece of world heritage. The award was awarded by UNESCO at 2005 as A Masterpiece of Oral and Intangible Heritage of Humanity. In 2017 Joko Widodo president of Indonesia inaugurated the keris museum at Surakarta. In his inauguration speech, Jokowi hopes the museum will touch the younger generation who are getting away from the original Indonesian art. Establishment of Keris Nusantara Museum at Surakarta to be one effort of Indonesia to continue to maintain, preserve the nation's cultural heritage. In this decade the observers and lovers of keris and tosan aji have revived the cultural values contained in tosan aji. In Java's tosan aji has a wide variety of shapes and types that can be classified based on dhapur, pamor and tangguh. Dhapur is a tosan aji which is widely spoken in the form of straight and winding (Luk in Javanese). Kinds of luk from 3 (three) to 29 (twenty nine). Dhapur is the name used to refer to the type of tosan aji. By saying dhapur of keris, people who have understood will immediately know what kind of keris is meant. There are 120 kinds of dhapur keris is standard or follow the existing standard. Of the hundreds types of dhapur that there are many people have difficulty to recognize the type of tosan aji it has, most asked to people who understand keris (a keris expert) in addition to open the internet to find information about their keris [1]. To help ordinary people who want to know the type of their keris should be made a system that can produce information about keris.

One branch of science in information systems is an expert system that is computer-based information systems that use expert knowledge to attain high-level decision performance in a narrow problem domain [2]. The purpose of the research is to produce an android based system that can replace an expert in determining the type of Java's keris based on dhapur so it can facilitate the community to recognize the keris, at least their own keris.

2 LITERATURE

2.1 References

Hybrid Method and Similarity to Recognize Javanese Keris [3], in this research, Canny algorithm is combined with basic morphological method for image segmentation. Image segmentation is a process to divide an image into smaller segment (collection of pixel or superpixel). The result of image segmentation and edge detection is combined by using similarity models to recognize image of javanese keris. Analysis Value of Character Education in Javanese Keris (Study of the Value of Character Education on Pamor, Luk, and Dhapur java's Keris Based on Symbolic Meaning), Discusses the symbolic meaning of a keris based on pamor and dhapur. The result is as a whole indicate that the value of character education in the keris is a representation of the symbolic meaning of the keris which is the true meaning is the prayer or hope of the keris maker and the keris orderer. The value of character education in keris can be used as a character education material within the scope of formal, informal and non-formal education based on nine pillars of character education [4]. Research titled the Meaning of Keris Design in Javanese Culture [5], discuss about tangguh keris of Java is the master of each era, the meaning of keris from dhapur and pamor side. Discussion of tangguh keris which is the most difficult in the identification of a keris. The existence of the meaning contained in the prestige and dhapur keris Java. Software For Identification Pattern Pamor Keris Java By Implementing Kohonen Neural Network [6], Discusses the identification of Javanese keris based on pamor. Many theories about pamor in this study that can be used as a reference. Result of this research is recognizing a pattern of Javanese keris, quality of keris can be identified. The application focused on how to recognize the name of the pamor pattern. Multazam and Bambang Eka Purnama (2015) Researching about Google Page Rank and number of visitors.

- Heribertus Ary Setyadi, Bina Sarana University, Indonesia – setyadi.1371@gmail.com
- Dwi Kuncoro, Bina Sarana University, Indonesia – dwikuncoro4691@gmail.com
- Bambang Eka Purnama, Bina Sarana University, Indonesia – bambang@bsi.ac.id

In his research concluded that by updating regularly our posts will appear on the Google search engine page. With our posts easily found it will cause our posts to be in front

2.2 Luk And Dhapur

The name of luk is used for keris blades that are not straight, but winding or grooved. Luk on the keris is always odd, never even, from three to thirteen. Dhapur is a term used to describe type of keris blades. Dhapur is a lot of keris that made straight and curved (luk in Javanese). By calling name of dhapur, people who understand will know right away what kind of keris is meant. There are 120 kinds of dhapur keris is standard or follow the existing standard. To know dhapur keris must know the ricikan that owned keris [7].

3 METHODS

3.1 Research Framework

In order for research conducted more focused then the steps undertaken in this research procedure begins by identifying the problem and then analyze the problems in the system consisting of determining the criteria type of keris. The next step is to analyze the system design and drawing conclusions from this research. The conceptual framework of research can be seen in Figure 1.

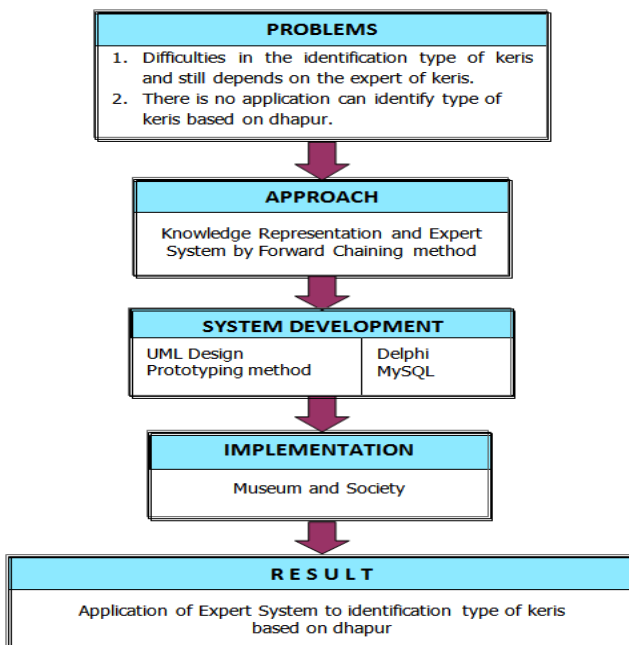


Fig. 1. Conceptual Framework Of Research

3.2 Types And Data Sources

The type of data used in this study is qualitative data. Qualitative data is a type of data that can be measured directly or can be calculated. The data collected in this study comes from two data sources, they are :

1. Secondary data required are images of keris of various types Which will be examined.
2. Primary data in this research is data obtained from some keris experts to determine dhapur keris and data from literature needed. Experts used as interviewees of this research are :
 - a. Drs. GPH Dipokusumo, Chairman of Museum

Radya Pustaka Surakarta who is also a nobleman from Kasunanan Surakarta.

- b. KRT. Suharyadi Purwanto, a keris expert from Kasunanan Surakarta Palace.
- c. Basuki Teguh Yuwono, Lecturer of ISI Surakarta as well as keris expert, keris maker and founder of Brojobuwono Hermitage.
- d. RM. Hadiningrat, he is a nobleman and a keris expert from Kasultanan Yogyakarta Palace.

Expert systems determine the type of keris using knowledge base, rule base and inference engine to know the name dhapur keris by using ricikans. The data that becomes input on this system is a fact obtained from an expert, book and internet that has been matched with an expert's research. Knowledge base data required by the system are dhapur, ricikan and data of luk.

3.3 Systems Development Method

1. Identification of problems

The first step in this research is to identify the problem to build an expert system as a solution. During this time many people especially who have a keris should find out to someone who understands about keris to know the type of her or his keris. Most of the successor generation is less familiar with one of Indonesia's cultural richness of the keris.

2. System Requirement Analysis

Input : Supporting data to determine the type of keris of Java that are ricikan, amount of luk and physical form of keris. Process : create a knowledge base of the criteria to determine the type of keris, determine the relation of the knowledge base that has been created, creating a rule base from a knowledge base that has been created with a predetermined relationship. Output : Kind of keris wanted to know based on dhapur.

3. System Design

Activities performed at this stage is to translate the analysis into the form of interface design (interface), database design, and data flow diagram. This stage aims to provide a description that should be done and how the look of expert systems to determine the type of keris will be built.

4. Coding a Program

The results of system design will be converted into a form that is understood by the machine that is into the programming language that has been determined through the writing the program process. Making the system in research using Delphi XE 8 programming language.

5. Integration And Testing System

System created per class and then integrate into a main menu. The system has been built will be tested to see whether the system is in accordance with the planning and design before. System testing method using Black Box and White Box as system testing method. [8]

4 RESULT

Knowledge base that required for system are dhapur, ricikan and luk. Knowledge base of dhapur can be seen in table 1, there are 116 dhapurs can be obtained. Knowledge base of ricikan shown at table 2 and there are 41 ricikans at this

research. Relation of knowledge base between dhapur, luk and ricikan shown at table 3.

TABLE 1
Knowledge Base Of Dhapur

Code	Dhapur Name	Code	Dhapur Name
D001	Semar bethak	D060	Kidung mas
D002	Jamang murup	D061	Balebang
D003	Brojol	D062	Crubuk
D004	Puthut	D063	Jaranguyung
D005	Wora – wiri	D064	Nagakeras
D006	Jakatuwa	D065	Sempana punjul
D007	Bethok	D066	Bungkem
D008	Regol	D067	Sabuktampar
D009	Tilamupih	D068	Caritakanawa
D010	Mesem	D069	Butoijo
D011	Semar tinandu	D070	Sempanaklenthang
D012	Laler mengeng	D071	Kidang mas-masan
D013	Mayat miring	D072	Sempana
D014	Marak	D073	Jarudeh
D015	Tilam sari	D074	Panimbak
D016	Jakaloka	D075	Carangsoka
D017	Kebo teki	D076	Kidangsoka
D018	Sempaner	D077	Paniwen
D019	Jalak dinding	D078	Jaruman
D020	Jalak ngore	D079	Panjisekar
D021	Sangu tumpeng	D080	Pandangan
D022	Dungkul	D081	Tundungmungsu
D023	Jalak semelang	D082	Caritabungkem
D024	Mangkurat	D083	Waluring
D025	Kalam munyeng	D084	Jakawuru
D026	Pinarak	D085	Sabuktali
D027	Jalak tilam sari	D086	Caritagandu
D028	Panjanom	D087	Caritaprasaja
D029	Jalak nguwh	D088	Caritakaprabon
D030	Ron teki	D089	Caritadaleman
D031	Sujen empel	D090	Caritagenengan
D032	Pasopati	D091	Sabuk inten
D033	Condong campur	D092	Naga kiki
D034	Mendarang	D093	Naga ngiki
D035	Kamatinanding	D094	Kantar
D036	Sinom	D095	Parungsari
D037	Kalamisani	D096	Johanmangankala
D038	Jangkung pacar	D097	Caluring
D039	Mahesasuka	D098	Lunggandu
D040	Mahesa nempuh	D099	Sepokal
D041	Mayat	D100	Karawelang
D042	Jangkung	D101	Bhimakurda
D043	Tebu sauyung	D102	Naga seluman
D044	Bangodolog	D103	Sangkelat
D045	Larmotha	D104	Nagasasra
D046	Campurbawur	D105	Sedet
D047	Winotan	D106	Ragapasung
D048	Sinarasih	D107	Caritabuntala
D049	Pudaksategal	D108	Carangbuntala
D050	Pulanggeni	D109	Ragawilah
D051	Pandawa	D110	Ngamperbuta
D052	Anoman	D111	Cancingan
D053	Kebodengen	D112	Trimurda

Code	Dhapur Name	Code	Dhapur Name
D054	Kalandah	D113	Kalatinantang
D055	Pandowo lare	D114	Indrajid
D056	Urap – urap	D115	Tirsirah
D057	Nagasasira	D116	Bhima kurda

TABLE 2
Knowledge Base Of Ricikan

Code	Ricikan Name	Code	Ricikan Name
R01	Pesi	R22	Sraweyan
R02	Sirah Cecak	R23	Ripandan
R03	Waduk	R24	Thingil
R04	Buntut	R25	Jenggot
R05	Ganja	R26	Ganja sebitrotan
R06	Lambe gajah	R27	Ganja cecak
R07	Greneng	R28	Ganja tekek
R08	Wadidang	R29	Ganja huceng mati
R09	Bungkul	R30	Ganja cankem
R10	Pejetan	R31	Ganja dungkul
R11	Gandik	R32	Ganja wilud
R12	Kembang kacang	R33	Ganja kelap lintah
R13	Jalen	R34	Ganja sepang
R14	Tikel alis	R35	Sogokan ngarep
R15	Sogokan	R36	Sogokan mburi
R16	Sor-soran	R37	Gusen ngarep
R17	Gulamilir	R38	Gusen mburi
R18	Kruwingan	R39	Larpaksi
R19	Gusen	R40	Petitnaga
R20	Ada-ada	R41	Lis – lisan
R21	Kudup		

TABLE 3
Relation Of Knowledge Base Dhapur, Luk and Ricikan

Dhapur	Luk	Ricikan
D001	L01	R11
D002	L01	R15
D003	L01	R10
D004	L01	R11
D005	L01	R19
D006	L01	R15, R14
D007	L01	R11, R14
D008	L01	R11, R24
D009	L01	R10, R14
D010	L01	R06, R12
D011	L01	R12, R15
D012	L01	R11, R12
D013	L01	R15, R19
D014	L01	R15, R07
D015	L01	R19
D016	L01	R15, R07
D017	L01	R06, R12, R07
D018	L01	R12, R14, R23
D019	L01	R10, R24, R19
D020	L01	R10, R22, R07
D021	L01	R15, R22, R24
D022	L01	R05, R11, R15
D023	L01	R15, R24, R22
D024	L01	R15, R23, R19
D025	L01	R22, R23, R15
D026	L01	R15, R11, R05
D027	L01	R18, R24, R19
D028	L01	R14, R15, R22, R07

Dhapur	Luk	Ricikan
D029	L01	R10, R24, R19, R20
D030	L01	R12, R11, R06, R15
D031	L01	R06, R12, R25, R23
D032	L01	R12, R06, R15, R19, R23
D033	L01	R06, R12, R15, R07, R19
D034	L01	R06, R12, R15, R22, R07
D035	L01	R11, R12, R10, R15, R23, R07
D036	L01	R06, R12, R14, R15, R22, R23
D037	L01	R06, R12, R14, R15, R07, R18, R19
D038	L02	R06, R12, R25, R15
D039	L02	R06, R12, R15, R25
D040	L02	R07
D041	L02	R12, R15, R22, R23, R07
D042	L02	R12, R17, R15
D043	L02	R22, R07
D044	L02	R06, R12
D045	L02	R11, R39, R40, R23
D046	L02	R12, R25, R15
D047	L02	R12, R25, R15
D048	L03	R12, R23, R19, R20
D049	L03	R12, R15, R22, R16
D050	L03	R22, R07
D051	L03	R12, R23, R22, R15
D052	L03	R12, R06, R23, R15
D053	L03	R05, R11, R06, R12
D054	L03	R15, R22, R23
D055	L03	R06, R12, R22
D056	L03	R12, R15, R19, R41
D057	L03	R11
D058	L03	R15
D059	L03	R06, R12, R10, R14, R15, R22, R23, R24, R07
D060	L04	R12
D061	L04	R06, R12, R15, R22
D062	L04	R06, R12, R22, R07
D063	L04	R10, R24
D064	L04	R12, R07, R16
D065	L04	R11, R12, R22, R23
D066	L04	R12
D067	L05	R12, R15, R22, R06, R23
D068	L05	R12, R15, R22, R06, R07, R14, R18, R19
D069	L05	R12, R15, R22, R23
D070	L05	R12, R23, R14
D071	L05	R23, R07
D072	L05	R12, R06, R07
D073	L05	R12, R15, R06, R25
D074	L05	R12, R15, R22, R23
D075	L05	R12, R06, R22, R23
D076	L05	R12, R06, R22, R23
D077	L05	R12, R15, R22
D078	L05	R15, R22
D079	L05	R12, R15, R22, R23
D080	L05	R12, R07, R10
D081	L05	R12, R07, R10
D082	L06	R12
D083	L06	R12, R15
D084	L06	R10, R23
D085	L06	R15, R22
D086	L06	R12, R25, R22, R23
D087	L06	R06
D088	L06	R06, R12, R14, R15, R07, R22, R19, R18
D089	L06	R06, R12, R14, R15, R07, R19, R18, R22, R25
D090	L06	R06, R12, R14, R15, R07, R19, R18, R22, R25
D091	L06	R06, R12, R15, R22, R23
D092	L06	R06, R10
D093	L06	R06
D094	L07	R06, R15, R15, R22

Dhapur	Luk	Ricikan
D095	L07	R06, R15, R25, R10, R14, R15, R22, R23, R07
D096	L07	R17, R15, R07
D097	L07	R22, R23
D098	L07	R06, R12, R25, R22, R23
D099	L07	R22
D100	L07	R06, R12, R15, R23
D101	L07	R12, R25, R22, R23
D102	L07	R05, R11
D103	L07	R06, R12, R22, R23
D104	L07	R11, R07
D105	L08	R06, R12, R15, R23
D106	L08	R14, R07
D107	L08	R12, R25, R22, R23
D108	L08	R06, R12, R22, R23
D109	L08	R06, R12, R07
D110	L09	R06, R12
D111	L09	R12, R16
D112	L10	R14
D113	L11	R06, R12, R15, R07
D114	L11	R06, R12, R22
D115	L11	R06, R14, R15
D116	L13	R06, R12, R15, R23
D117	L14	R06, R12, R15, R23
D118	L15	R06, R12, R15, R23

Expert systems that have been created could input data of dhapur, ricikan, luk, knowledge about pamor and tangguh. When knowledge base of luk, dhapur and ricikan has to be done then creating the relation of knowledge base. From this relation, expert system can make a decision from the answer from user. Expert system a questions that it must be selected by user one by one until the last question. Expert system will give information about dhapur keris based on knowledge that fill in system before. Figure 2 is a view of input knowledge base form. The most important form is consultation about dhapur of keris. Figure 3 is a view of consultation form. User will be asked every ricikan her/his keris that has been compiled knowledge base. One by one question gived to user until expert system found the answer of dhapur keris. The answer will conical in the grid and the final answer is displayed in the label.

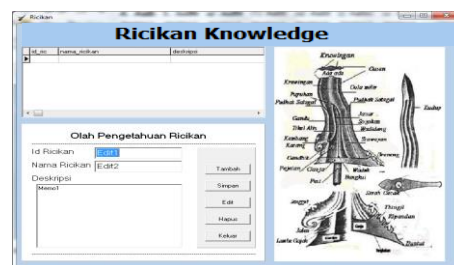


Fig. 2. Knowledge Base Of Ricikan Form



Fig. 3. Consultation Form

5 CONCLUSION

Expert system has been created to determine the type of keris by using Delphi XE 8 and MySQL as a database to store some knowledge of an expert. The system can provide additional information about pamor and tangguh. To produce answers from the keris will known must required a knowledge base of dhapur, luk and ricikan. Knowledge base data has been created, there are dhapur, luk and ricikan that become a reference to give information about dhapur. The system can give answers of the keris being asked with 90% accuracy. The most user or people who have tried this expert system feel helpful in identifying the keris owned and add knowledge about keris.

6 REFERENCES

- [1] Harsrinuksmo , Bambang, Keris Encyclopedia, Jakarta : Gramedia Pustaka Utama, 2007.
- [2] Turban, Efraim, Decision Support System and Intelligent Systems, Yogyakarta : Andi, 2009.
- [3] H.B. Santoso and R.P.Hardjon, "Hybrid Method and Similarity to Recognize Javanese Keris", International Journal of Advanced Computer Science and Applications, vol.6, pp.108-114, Sept, 2015, doi :10.14569/IJACSA.2015.060914.
- [4] Rojali, Said, "Analysis Value of Character Education in Javanese Keris (Study of the Value of Character Education on Pamor, Luk, and Dhapur java's Keris Based on Symbolic Meaning (Translation Journal Style)), vol.5, pp.1-11, Nov, 2016, <http://journal.student.uny.ac.id/ojs/index.php/ecraft/article/download/5109/4772>.
- [5] Wardo, "The Meaning of Keris Design in Javanese Culture (Translation Journal Style)", Komunika vol 2, pp.17-22, Jan, 2016, <http://ejournal.iainpurwokerto.ac.id/index.php/komunika/article/view/814>.
- [6] Hasanah, Uswatun, "Software Painting Pattern Patriotic Java Keris By Implementing Kohonen Neural Network (Translation Tesis Style)", Jakarta : Informatic Engineering UIN Syarif Hidayatullah, 2014, pp.3-6.
- [7] Haryoguritno, Haryono, Jananese Keris Between Mistic dan Logic, Jakarta : Indonesia Kebangsaanku, 2007
- [8] Kasmui, "Expert System To Identification Javanese Keris With CF (Certainty Factor) Method (Translation Tesis Style)", Jakarta : Universitas Islam Negeri Syarif Hidayatullah, 2011, pp.1-5
- [9] Multazam, M. and Purnama, B.E., 2015. INFLUENCE OF CLASSIFIED AD ON GOOGLE PAGE RANK AND NUMBER OF VISITORS. Journal of Theoretical & Applied Information Technology, 81(2).