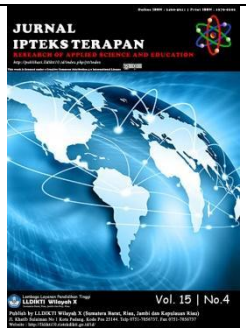

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PREDICTION ANALYSIS OF DIVORCE RATE USING THE DECISION SUPPORT SYSTEM METHOD

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Abstract

The existence of divorce actually results in the separation of husband and wife bonds. This study aims to examine and examine the influence of divorce factors in the city of Padang. In this problem, the author predicts the divorce rate that will occur in the city of Padang in 2021 by reviewing divorce data in 2020. The method used in this study is normative juridical research by conducting observations, field notes, and interviews with related parties at the research location. .The results of this study will provide benefits for the Padang Class IA Religious Court to make a breakthrough that is able to reduce the divorce rate. The analysis in this problem also uses two methods of decision support systems, namely Single Moving Average (SMA) and Analytical Hierarchy Process (AHP). Based on manual calculations, the researcher can conclude that continuous disputes in the household can trigger divorce. Therefore, the Padang Class IA Religious Court can make a breakthrough in the form of education about the impact of divorce and education in solving a problem. The application of the Single Moving Average method can predict accurately for January 2021 as many as 96 cases for 5 period predictions with a MAPE of 11%. In the calculation of the Analytical Hierarchy Process method, the final calculation is 0.32 which shows that continuous disputes can lead to divorce.

Keywords : Divorce, Decision Support Systems, Single Moving Average, Analytical Hierarchy Process

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INTRODUCTION

The household is the smallest unit in the composition of community groups[1]. The household is also the basic connection to promote and achieve the emergence of a large group like the state. Family is the goal of everyone's life starting from the marriage relationship. In a happy and comfortable family for family members, the family must be built by husband and wife on the basis of internal and external cohesion between the two parties. In what happens in a husband and wife relationship, not everyone can form the family we want. That's because there is a divorce, whether it's divorce, divorce, or divorce ordered by the judge..

Often husband and wife quarrels often occur in families, both economically, ideologically, etc. Real problems can be resolved peacefully, but constant quarrels and fights lead to divorce[2].

According to data from the Religious Court Class IA Padang, the most important factor behind divorce is the ongoing disputes and quarrels, with the number of divorces reaching 788 cases, followed by 429 cases, causing one of the parties to leave. Based on these data, the authors aim to analyze and predict the divorce rate in the city of Padang by standardizing the factors causing divorce so that the resulting data can be used by Type IA religious courts on individuals and general social organizations.

RESEARCH METHODS

Divorce

Divorce is governed by Article 117 of Islamic Law[3], which emphasizes that "divorce is the husband's oath before a religious court, which is one of the causes of the dissolution of a marriage". NS. Problems that arise between husband and wife can be due to many causes and factors that will be the root cause of problems in the family such as: economic, biological, psychological factors, different views of life, etc.[4]. Overcome every problem that occurs to each partner (husband and wife) based on the magnitude of the problem from the point of view and how to find a solution, and many of these couples feel that the marital relationship The causes that occur cannot be sustained for long. again, in other words, they decided to end the problems in their relationship household in case of divorce

Analitical Hierarcy Process (AHP)

AHP is a method that is able to solve quite complex problems, which takes a long time to be completed manually, and is simplified by using a model designed with efficiency in mind[5]. This AHP method uses mathematical equations, and is grouped into parts of the system based on different levels, so that problems can be solved in each part and problem solving becomes easier to solve[6]. Evaluation is done by comparing each of the criteria in the AHP method which is carried out randomly to provide a consistent assessment of each criterion[7], the degree of consistency of the criteria is calculated according to the following equation[8]:

$$CI = (\lambda maks-n)/(n-1) \quad (1)$$

Where :

CI = Consistency Index

λmaks = The largest eigenvalue of a matrix of order n

The consistency ratio can be formulated:

$$CR = CI/RI \quad (2)$$

Single Moving Average (SMA)

The single moving average method is a forecasting method using a number of

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actual data[9] and looking for a new value that is assumed to be the forecast value for the next period[10]. The characteristics of this method are[11]:

a. Requires data over a certain period of time to forecast future data.

b. The smoothing effect affects the calculation of the moving average timeframe.

The equation used is as follows[12]:

$$F_{t+1} = \frac{Y_t + Y_{t-1} + Y_{t-(n+1)}}{N} \text{.....(3)}$$

Where :

F_{t+1} = period forecast value t+1

Y_t = actual data period t

RESULT

The data used in the AHP and SMA methods are divorce data from the Religious Courts Class IA Padang which can be seen in the table below:

Table 1. Padang City Divorce Data 2020

Month	Moral	Leaving obligations	Dispute	Other
January	0	7	49	0
February	0	10	78	3
March	2	7	68	2
April	2	11	69	5
May	0	6	59	5
June	0	10	55	4
July	0	18	62	6
Agust	0	17	71	1
September	0	15	86	4
October	0	19	91	3
November	0	13	74	5
December	1	12	62	5

Analitical Hierarcy Process

Based on the data in the table above, the steps that must be taken are as follows::

1. Compile and add up each criterion value in the form of a paired matrix.

Table 2. Paired Matrix

Criteria	T1	T2	T3	T4
T1	1.00	3.00	3.00	5.00
T2	0.33	1.00	2.00	3.00
T3	0.33	0.50	1.00	3.00
T4	0.20	0.33	0.33	1.00

Information:
T1 = Moral
T2 = Leaving Obligations
T3 = Dispute
T4 = Other

2. Calculate the vector value of each criterion.

Table 3. Criterion Weight Vector Values

Criteria	T1	T2	T3	T4	Total	Average
T1	0.54	0.62	0.47	0.42	2.05	0.51
T2	0.18	0.21	0.32	0.25	0.95	0.24
T3	0.18	0.10	0.16	0.25	0.69	0.17
T4	0.11	0.07	0.05	0.08	0.31	0.08

3. Check the value of paired matrix consistency

Table 4. Paired Matrix Consistency Value

Criteria	T1	T2	T3	T4	Total
T1	0.51	0.71	0.52	0.39	2.13
T2	0.17	0.24	0.34	0.23	0.99
T3	0.17	0.12	0.17	0.23	0.70
T4	0.10	0.08	0.06	0.08	0.32

4. Calculating the value of the criteria

Table 5. Lambda Criteria

Criteria	Lamda
T1	4.17
T2	4.15
T3	4.04
T4	4.06
Sigma Total	16.42
Lamda Max	4.10

5. Testing the consistency ratio using the equation (1) and (2):

Ci = (Lamda max-n)/(n-1)
= (4.1-4)/(4-1)
= 0.03

CR = Ci/Ri
= 0.03 / 0.9
= 0.04 (<0.1, consistent)

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After getting the results of the CI and CR calculations from the criteria comparison matrix, the next step is to find the CI and CR values for each alternative comparison matrix.

1. Matrix Comparison of alternatives to moral criteria
   Ci = (Lamda max-n)/(n-1)
   = (4.11-4)/(4-1)
   = 0.04
   CR = Ci/Ri
   = 0.04 / 0.9
   = 0.04 (<0.1, consistent)
2. Matrix Comparison of alternatives against the criteria for leaving the obligation
   Ci = (Lamda max-n)/(n-1)
   = (4.07-4)/(4-1)
   = 0.02
   CR = Ci/Ri
   = 0.02 / 0.9
   = 0.03 (<0.1, consistent)
3. Matrix of Comparison of Alternatives to Dispute Criteria
   Ci = (Lamda max-n)/(n-1)
   = (4.01-4)/(4-1)
   = 0.005
   CR = Ci/Ri
   = 0.005 / 0.9
   = 0.01 (<0.1, consistent)
4. Matrix Comparison of alternatives against other criteria
   Ci = (Lamda max-n)/(n-1)
   = (4.06-4)/(4-1)
   = 0.02
   CR = Ci/Ri
   = 0.02 / 0.9
   = 0.02 (<0.1, consistent)

After getting the CI and CR values for each ratio matrix, the next step is to find the final result value by multiplying the matrix between the criteria priority vector values against the alternative weight vectors.

Table 6. Comparison Matrix Vector

Criteria Priority Vector	Alternative Weight Vectors to Criteria			
	Moral	Leaving Obligations	Dispute	Other
0.52	0.16	0.56	0.27	0.56
0.24	0.11	0.27	0.48	0.13
0.17	0.50	0.06	0.16	0.23
0.08	0.23	0.11	0.09	0.08

Table 7. Manual Calculation Final Result

Criteria	Matrix Multiplication Results				Total
Moral	0.08	0.13	0.05	0.04	0.31
Leaving Obligations	0.06	0.06	0.08	0.01	0.21
Dispute	0.26	0.01	0.03	0.02	0.32
Other	0.12	0.03	0.01	0.01	0.16

Based on the manual calculations in the table above, the researcher can conclude that divorce that often occurs in the household is caused by continuous disputes between husband and wife. Therefore, the Class IA Padang Religious Court can make a breakthrough in the form of education about the impact of divorce and education in solving a problem.

Single Moving Average (SMA)

In performing calculations using the single moving average method, the steps we must take are to calculate predictions with different period scales. Based on the data in table 1 above, the researchers performed calculations using a 3-period scale and a 5-period scale. The results of these calculations can be seen in the table below.

Table 8. Prediction Result

Month	Time Indeks (t)	Actual Demand (A)	(Ft MA3)	(Ft MA5)
January	1	56	-	-
February	2	91	-	-
March	3	79	-	-
April	4	87	75	-

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May	5	70	86	-
June	6	69	79	77
July	7	86	75	79
Agust	8	89	75	78
September	9	105	81	80
October	10	113	93	84
November	11	92	102	92
December	12	80	103	97
January(2022)	13		95	96

Based on the prediction results in the table above, the next step is to find the error value from the prediction results. For more details, see the table below.

Table 9. Error Calculation Results

t	At	Ft MA3	eror MA3	Ft MA5	eror MA5	MAPE MA3 (%)	MAPE MA5 (%)
4	87	75	12	-	-	13	0
5	70	86	16	-	-	22	0
6	69	79	10	77	8	14	11
7	86	75	11	79	7	12	8
8	89	75	14	78	11	16	12
9	105	81	24	80	25	23	24
10	113	93	20	84	29	17	26
11	92	102	10	92	0	11	0
12	80	103	23	97	17	29	21
Total						158	102
MAPE						18	11

Based on the results of the error calculation above, it can be concluded that the single moving average method is able to predict using an output of 3 periods ft (MA) of 95 issues & MAPE of 18% and an output of 5 periods ft (MA) of 96 issues and MAPE of 11%.

CONCLUTION

1. The application of the Single Moving Average method can predict accurately for January 2022, 96 problems with a 5-period prediction scale which produces MAPE at 11%.
2. In calculating the Analytical Hierarchy Process, the final calculation is 0.32 which explains that every continuous event can be applied to divorce.

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