

## IDENTIFICATION CLASSIFICATION OF SATISFACTION USE OF CONTRA WAR APPLICATION IN PLKB BASED ON DECISION TREE

Mursyidul Ibad\*<sup>1</sup>, Hari Basuki Notobroto<sup>2</sup> and Diah Indriani<sup>3</sup>

<sup>1</sup> Student of Biostatistics Major, Faculty of Public Health, Airlangga University,

<sup>2,3</sup> Department of Biostatistics and Demography, Faculty of Public Health, Airlangga University

**Abstract-** The advancement of science and technology will bring great influence on various fields. Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) is a problem that Indonesia is facing. Maternal deaths were caused by bleeding (28%), hypertension / eclampsia (24%), infection (11%), old partus (16%) and uncomplicated abortion (10%). Steps taken to cope with early detection of prospective mothers who will either have a baby or not have a baby plan. The program proposed in 2015 is the use of Contraceptive for Women at Risk application or commonly abbreviated as CONTRA WAR. This research uses cross sectional design, with design using Artificial Intelligence (AI). Research respondents used all Family Planning Field Officers in Malang Regency as many as 98 people. The result is there is a final node (End Node) 21 pieces with 8 dissatisfied, 12 satisfied and 1 very satisfied. Accuracy of 89.1% with P-Value 0,002765 and Kappa 0,717900. The sensitivity was 94.9% and the specificity was 79.2% at the satisfied level.

**Keywords-** Artificial Intelligence, Data Mining, Decision Tree, Satisfaction

**Correspondent Author:** \*

### I. INTRODUCTION

Zamroni (2009) advances in science and technology will bring great influence on the economic, political, health and military. Developing countries like Indonesia need the advancement of science and technology one of them in the field of statistics in order to solve various problems. Issues currently facing Indonesia are still high Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR).

Referring to health profile data in Indonesia in 2012, maternal deaths were caused by bleeding (28%), hypertension / eclampsia (24%), infection (11%), old partus (16%) and uncomplicated abortion (10%). Of the 24% of mothers suffering from preeclampsia / eclampsia, 30% died in the hospital. This occurs because of the complications of anatomic and physiological changes in various body tools such as the kidneys, as well as the hemodynamic system (Kemenkes, 2012).

The Office of Population and Family Planning (DPPKB) Malang regency recorded the case of infant mortality in Malang Regency has also been under the national target. In 2011 as many as 5.42 cases per 1000 live births, then in 2012 decreased cases of 4.31 cases per 1000 live births. Lastly in 2013 there was a case of infant mortality of 4.02 cases per 1000 live births. The number of cases makes Malang regency alert to avoid the trend of infant mortality rate (IMR), especially on the cause of low birth weight baby (LBW).

Steps taken by early detection of prospective mothers who will either have a baby or not have a baby plan. Detection includes risk factors for maternal and infant deaths. The program proposed in 2015 is the use of Contraceptive for Women at Risk application or commonly abbreviated as CONTRA WAR. The hope with the program is expected to reduce the Unmet Need, Maternal Mortality Rate and Infant Mortality Rate significantly.

The implementation of CONTRA WAR is still constrained by the complex problems, among which the most basic is the level of health officer compliance with service procedures. Based on data

from CONTRA WAR in January to March 2018 it was found that prospective acceptors who are still in waiting status are served as much as 72%. One of the causes of the high number of pending acceptor candidates served is the lack of mentoring and the use of existing functions in the application of CONTRA WAR (DPPKB Malang, 2014)

De Lone (1992) states that the satisfaction of the existence of information systems as an indicator data a successful information system. Factors that influence the perception of satisfaction is the quality of information, quality of the system and the main quality. So with the lack of use of existing functions in the application CONTRA WAR caused the user satisfaction in the application is less ..

The development of science aims to facilitate human in solving various problems encountered, one of them in the world of health. Technically in the health world is familiar with the existence of data mining so that it can become a potential information. The field of medical records for example, has been using modern data mining techniques in some cases that are against classification and predictive data. (Murtanto, 2014)

Classification And Regression Tree (CART) developed by Leo Breiman, Jerome H. Friedman, Richard A. Olshen and Charles J. Stone in 1993, is a classification technique with binary recursive reconciliation algorithms where the sorting is performed on a group of data collected in a space called node / node into two child nodes (Lewis, 2000 in Seftiana, 2014). So the purpose of this study is to identify the classification of satisfaction of the use of contra war application on PLKB using Decision Tree.

## II. MATERIALS AND METHODS

This research uses cross sectional design, with design using Artificial Intelligence (AI). Research respondents used all Family Planning Field Officers in Malang Regency as many as 98 people. Implementation of research activities from May to July 2018.

The research predictor variables consist of Perceived Ease of Use, Perceived of Usefulness, Interests, Attitude, Facility Support, Monitoring and Evaluation, Reward and Punishment. The response variable is the satisfaction of PLKB towards the use of contra war application. Primary data collection using questionnaires that have been tested for validity and reliability. Secondary data were obtained from BPS of Malang Regency, Population and Family Planning Control Office and BKKBN.

The research analysis used univariate and bivariate analysis using data mining. Data mining category used is classification with Decision Tree analysis technique. The program used is Microsoft Excel 2013 and Program R.

## III. RESULT AND DISCUSSION

### 1. Characteristics of Respondents

Table 1 shows that male respondents with balanced women are 50% for men and 50% for women. The average age of respondents is 50.74 years with a standard deviation of 6.06 years. Minimum age of respondents for 27 years with a maximum age of 58 years.

**Table 1. Characteristics of Respondents**

Sex	N	%
Man	49	50,0
Women	49	50,0
Total	98	100,0
Average Age of Respondents and SD		50,74 ± 6,06 year
Minimum Age of Respondents		27 year
Maximum Age of Respondents		58 year

## 2. Data Distribution of Satisfaction Variables

According to DeLone and McLean (1992) the success of an information system can be seen from various aspects of taxonomy in information systems success. At the technical level where at the stage of manufacture, the category that can be a success is the quality of the system. Then at the semantic level where at the stage of the finished product, the category that can be a success is the quality of information. While at the level of effectiveness or influence on the stage of acceptance, the category that can be a success is the use. At the same level as the stages of influence on users, the usable categories are user satisfaction or effects on users. At the stage of influence on the system, the category that can be used is the effect on an organization.

Research related to user satisfaction of information system has been done. Reza Vaezi (2013) conducts research for related and comprehensive attributes to information system satisfaction. Variables from the research used in this research are facility support, internet signal accessibility, perceived ease of use and perceived of usefulness.

Zviran and Erlich (2003) published a review of user information system user satisfaction. The published journal also discusses the implications of user satisfaction that affect the organization. According to Zviran and Erlich (2003) user satisfaction of information systems is strongly related one with the attitude and interest of a person to information and technology.

Research related to reward punishment and evaluation monitoring conducted by Pratama et al (2015). The study aims to see whether a person is satisfied with the use of information and technology if there is a reward punishment and evaluation monitoring. The result of these two variables gives a significant value to the satisfaction of workers related to their performance.

Table 2 shows descriptions of all the results from both predictor and response variables.

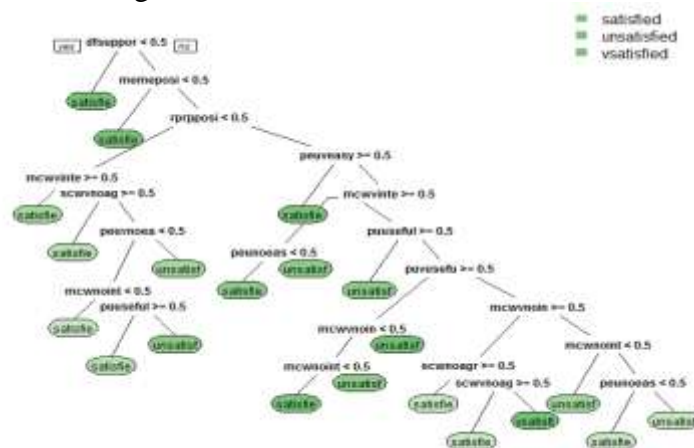
**Tabel 2. Frequency of Variable Responses**

Category	n	%
Very Satisfaction	4	4,1
Satisfaction	68	69,4
Not Satisfied	26	26,5
Total	98	100,0

Research respondents have been largely satisfied with the services and features contained in the Contra War. Respondents who are very satisfied with Contra War are 4 (4.1%). Then the contra war satisfied as many as 68 people (69.4%). While respondents who are not satisfied with the service or features contained in the Contra War as many as 26 people (26.5%).

## 3. Application of Decision Tree Algorithm

Decision tree in this research using CART (Classification and Regression Tree) algorithm. The proportion of training data used is 0.7 or 70% of the total data collected. While the method uses 3 and 10 times the repetition and gini index method. The results can be seen in Figure 1.



**Figure 1. Decision Tree Application Results**

Research data indicate that respondents mostly at the time feel easy or very easy to use application will be satisfied in its use. The results of this study are supported by Mandasari and Giantari (2017) where perceived ease of use gives impact to customers in determining their satisfaction when using an online motorcycle taxi service. Another supportive study conducted by Tananjaya (2012) also indicates the user's decision to accept an accounting software is indicated by the degree of satisfaction of the use of the software that is affected by perceived ease of use.

Perceived usefulness (perceived of usefulness) in the results of the study also shows that someone who has a perception of useful to it will feel satisfied in the use of contra war applications. The results of this study are supported by Mandasari and Giantari (2017) where perceived of usefulness gives impact to customers in determining their satisfaction when using an online motorcycle taxi service. Other studies that support Amin et al. (2014) stating that perceived usefulness has a significant effect on mobile website users in Malaysia. This reinforces the value rules and usefulness of technology in gaining customer satisfaction and loyalty.

The results showed that respondents who said they had supported the facilities felt very satisfied with the use of contra war application. Support in question is the presence of mobile phones and their applications, no trouble at the time of use and the existence of allowances for the purchase of internet packages. Then other support is in the form of a help desk that stand by and can be contacted easily and the use of training. The results of this study in accordance with research from Nuryasin (2012) in which the support system quality and service quality provide a positive impact on satisfaction on users of academic information systems. Other supporting researches are conducted by Reza Vaezi (2013) where the attribute of quality system and service support significantly affects the satisfaction of e-commerce users.

The development of attitudes toward information and technology starts from the concept of TAM as a form of acceptance or rejection as an impact when a person uses a technology in his work. This result is in accordance with research conducted by Mellinda (2017) where attitudes refer to job satisfaction of his work on workers of PT. Pos Indonesia Surakarta.

The results showed that interested respondents had high satisfaction with the use of contra war. Respondents also mostly have a good interest to use contra war applications. The research that supports these results is done by Eastin and LaRose (2000) that define repurchase interest as a recurring interest of internet buyers to purchase products or services delivered by web-based shopping centers.

Research shows that rewards and punishment have an impact on the satisfaction of PLKB when using contra war. These results are supported by Pratama et al. (2013) research, where there is an influence of reward and punishment on the satisfaction of bank workers. Satisfaction is due to the use of information systems while doing the work process.

The application of decision tree is evaluated based on the accuracy, sensitivity, specificity of the decision tree. The accuracy value generated from the decision tree is 89.1% which is already in the high category. This is in accordance with the results of research from Prasetyo et al (2013) which states that the accuracy of existing levels in the Decision Tree included into the high category in producing accuracy. Research by Si Si et al (2018) also explains that the Decision Tree with the use of bootstrapping can improve the output of ouptput with high dimensions.

#### **IV. CONCLUSION**

The number of men as many as 49 people (50%) and women 49 people (50%). In addition, respondents dominated over 40 years old as many as 91 people (92.9%). While the respondents under the age of 30 years there are only 7 people (7.1%). Respondents who are very satisfied with Contra War are 4 (4.1%). Then the contra war satisfied as many as 68 people (69.4%). While respondents who are not satisfied with the service or features contained in the Contra War as many as 26 people (26.5%). Final node (End Node) 21 pieces with 8 dissatisfied, 12 satisfied and 1 very



satisfied. Accuracy of 89.1% with P-Value 0,002765 and Kappa 0,717900. The sensitivity was 94.9% and the specificity was 79.2% at the satisfied level.

## V. ACKNOWLEDGEMENTS

I am highly thankful to Regional Population Control and Family Planning Department of Malang District, East Java, all research respondents and all the people who have helped this research.

## REFERENCES

- [1] Chen, Yue-Yang dkk.2010. Confirmation of Expectations and Satisfaction with the Internet Shopping: The Role of Internet Self-efficacy. *Journal*. Vol. 3, No. 3; August 2010. Computer and Information Science
- [2] Han, J dan Kamber, M. 2006. *Data Mining Concepts and Teqniques – 2nd Ed*. San Fransisco: Elsevier Inc
- [3] Hancock. 1996. *Metal Complexes in Aqueose Solution*. New York: Plenum Press
- [4] Johnson, N. dan Lilford RJ. 1992. Using Decision Analysis to Calculate the Optimum Treatment for Microinvasive Cervical Cancer. *Journal*. Pubmed 65:717–722
- [5] Johnson, R.A and Dean W.W. 2007. *Applied Multivariate Statistical Analysis Sixth Edition*, Prentice Hall International Inc, New Jersey
- [6] Kabra, Gaurav. 2017. Understanding Behavioural Intention to Use Information Technology: Insights from Humanitarian Practitioners. *Journal*. Volume 34 Tahun 2017. Telematics and Informatics
- [7] Larose, D.T. 2005. *Discovering Knowledge in Data: An Introduction to Data Mining*. New York: Wiley
- [8] Lewis, W., Agarwal R, Sambamurthy. 2003. *Sources of Infulence on Beliefs about Information Technolgoey Use: An Empirical Study of Knowledge Workers*. MIS Quarterly
- [9] Mellinda, Ayu. 2017. Pengaruh Penggunaan Teknologi Informasi Terhadap Kepuasan Kerja Karyawan (Studi Kasus pada PT. Pos Indonesia (Persero) Surakarta). *Skripsi*. Universitas Muhammadiyah Surakarta
- [10] Nuryasin. 2012. Kontribusi Teknologi Informasi Terhadap Kepuasan dan Kinerja Pengguna Studi Kasus: Sistem Informasi Akademik (SIA) Universitas Mercu Buana. *Journal*. Vol. 5 Januari 2012. Studia Informatika
- [11] Prasetyo, Eko dan Rr Ani Dijah Rahajoe. 2013. *Perbandingan K-Support Vector Nearest Neighbor Terhadap Decision Tree dan Naive Bayes*. [http://eprints.upnjatim.ac.id/4762/1/085-094\\_Eko\\_Prasetyo\\_Universitas\\_Bhayangkara\\_Surabaya.pdf](http://eprints.upnjatim.ac.id/4762/1/085-094_Eko_Prasetyo_Universitas_Bhayangkara_Surabaya.pdf) (access in 10 Februari 2018)
- [12] Pratama, Faisal Arif. Pengaruh Imbalan dan Hukuman Terhadap Kepuasan Kerja dan Kinerja Karyawan (Studi Pada Karyawan Departemen Statistik Bank Indonesia Jakarta). *Journal*. Vol. 22 No. 1 Mei 2015. Jurnal Administrasi Bisnis
- [13] Si Si, dkk. 2018. *Gradient Boosted Decision Trees for High Dimensional Sparse Output*. <http://download.portalgaruda.org/article.html> (access in 10 Februari 2018)
- [14] Sumathi, S. 2006. *Introduction to Data Mining and Its Applications*. Germany: Springer Verlag Berlin Heidelberg
- [15] Yu, Hsiang-Fu, Jain, Prateek, Kar, Purushottam, and Dhillon, Inderjit S. 2014. *Large-Scale Multi-Label Learning With Missing Labels In ICML*
- [16] Zviran, Mosche. 2003. Measuring IS User Satisfaction: Review and Implications. *Journal*. Volume 12. Communications of the Association for Information Systems