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3rd ICETD 2014

28, 29 October 2014, Bandar Lampung, Indonesia

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Bandar Lampung University, Indonesia

In coorporation with :

THE UNIVERSITY OF KITAKYUSHU

3rd ICETD 2014

The Third International Conference On Engineering And Technology Development

28 -29 October2014
Bandar Lampung University (UBL)
Lampung, Indonesia

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Organized by:

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PREFACE

The Activities of the International Conference is in line and very appropriate with the vision and mission of Bandar Lampung University (UBL) to promote training and education as well as research in these areas.

On behalf of the Second International Conference on Engineering and Technology Development (3rd ICETD 2014) organizing committee, we are very pleased with the very good response especially from the keynote speaker and from the participans. It is noteworthy to point out that about 80 technical papers were received for this conference.

The participants of the conference come from many well known universities, among others : University Kebangsaan Malaysia – Malaysia, IEEE – Indonesia, Institut Teknologi sepuluh November – Indonesia, Surya Institute – Indonesia, International Islamic University – Malaysia, STMIK Mitra Lampung – lampung, Bandung Institut of Technology – Bandung, Lecture of The Malahayati University, B2TP – BPPT Researcher – lampung, University of Kitakyushu – Japan, Gadjah Mada University – Indonesia, Universitas Malahayati – Lampung, Lampung University – lampung,

I would like to express my deepest gratitude to the International Advisory Board members, sponsor and also to all keynote speakers and all participants. I am also gratefull to all organizing committee and all of the reviewers who contribute to the high standard of the conference. Also I would like to express my deepest gratitude to the Rector of Bandar Lampung University (UBL) who give us endless support to these activities, so that the conference can be administrated on time

Bandar Lampung, 22 October 2014

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IMPLEMENTATION CASE based reasoning in determining the rational prescription of TB drugs

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Abstract — **Case Based Reasoning has been widely applied in many artificial intelligence, expert systems and well shaped decision support systems that help decision-makers to take the right decisions. The use of CBR to diagnose the disease have also been made by several previous researchers. Yet another problem arises, namely the use of drugs that are not rational**.

Irrational drug use is the lack of proper drug administration and the administration of drugs that are not necessary, many factors underlying this happens, one of which is the lack of knowledge and experience as well as the insecurity of medical personnel in this recipe maker, so in need of a tool aids in the form of a system that can support decision-makers to make more rational prescribing.

Case based reasoning works by studying previous cases were collected in a General Knowledge which will be compared with the new case, Case Based Reasoning has four stages: Retrieve, Reuse, Revise and Retain, is a very powerful way to make an expert system were made into machine learning, which will automatically add or revise knowledge automatically into general knowledge.

Hopefully, by the application of Case Based Reasoning in this system can help decision-makers in this case is the

maker of prescription medical personnel to produce rational medicine, taken in this study is an example of a case of diagnosing and prescribing of tuberculosis (TB) in children, have been selected sample rates of the disease in Indonesia is quite large and are vulnerable to IRUD cases due to excessive consumption of antibiotics.

Key word — **IRUD, Case Based Reasoning, Tuberkolosis**

Medical cases in Indonesia has a fairly high rate, such as in the case of medication errors, misdiagnosis of the disease, and malpractice, one of the medical errors that

often there is Irrational Use of Drugs (IRUD) or irrational use of drugs. This is based on data compiled by

the World Health Organization (WHO) in 2010, more than 50% of the world's outstanding drug prescribed, supplied and sold with improper and more than 50% of patients using the drug inappropriately. (WHO, 2012).

IRUD is a serious problem in the field of health as it can cause side effects and negative impacts are very dangerous, health services and the prescription of a doctor, this is because the doctor has not applied the concept of rational use of drugs (rational use of drug / RUD). They are, consciously or not, it still applies the concept of irrational use of medicines (irrational use of drug / IRUD).

One of the factors of the emergence of this error, because most doctors are not sure or feel less confident to state that patients ill from a viral infection that does not require drug therapy, especially antibiotics. In another study conducted by Dr. Ambrose Isah other things that lead to this happening is the lack of education and training, inappropriate role models, lack of objective drug information, Generalization limited experience, Misleading beliefs about the efficacy of the drug (Isah, 2003).

Case IRUD quite high in Indonesia, one of the diseases that are difficult to diagnose and determine the prescription is Tuberculosis, especially in children, Tuberculosis (TB) is a disease that can affect anyone, including children. But TB disease in children has not been considered an important health problem, although the percentage is quite high. In Indonesia amounted to 8.2 percent of all TB cases in 2012. (Compass, 2013)

Difficulties diagnosing TB in children is one of the most common reasons why this issue is often overlooked. Specific TB in children often used the base to provide TB treatment in children. Whereas many other diseases that have symptoms. Failure to thrive or weight does not go up, feeding difficulties, recurrent fever, frequent coughing or enlargement of small glands around the neck and the back of the head is a non-specific symptoms in children. But it appears in the daily practice of this disorder are often immediately suspected TB symptoms.

To overcome these problems required a tool in the diagnosis of diseases as well as prescription that will facilitate the diagnosis and determine the rational prescription, is to create an expert system based on Case Based Reasoning, method of case based reasoning is one method to build an expert system with decision-making of new cases based on the solution of the previous case. The concept of the method of case based reasoning is found from the idea of using documented experiences to solve new problems, with this method are expected to prescribers can use this system to help identify the recipe and can reduce misdiagnosis and determine rational medicine for the patient.

Literatur Review

Case Based Reasoning

case based reasoning is one method to build an expert system with decision of new cases based on the solution of the previous case. The concept of the method of case based reasoning is found from the idea of using documented experiences to solve new problems. The decisionmaker mostly use the experience of previous problem solving to resolve the problems facing today. (Aamodt and Plaza, 1994) .

CBR approach artificial intelligence (Artificial Intelligent) which emphasizes problem-solving based on the knowledege of the previous cases. If there is a new case, it is stored in the knowledge base so that the system will perform learning and knowledge possessed by the system will increase. In general, this method consists of four steps:

1. **Retrieve.**

This task begins with a description of one / some of the problems and ended when the previous cases have been found most suitable. Sub tasknya refers to the identification of features, initial matching, searching, and selection.

2. **Reuse**

In this process, the system will search the database of past problems through identification of new problems. Then reuse the information previous problems that have similarities to solve new problems.

3. **Revise**

In this process, the system will search the database of past problems through identification of new problems. Then reuse the information previous problems that have similarities to solve new problems.

4. **Retain**

This process consists of choosing what information will be stored on the case, stored in any form, how to prepare a case to be easy to find a similar problem, and how to integrate the new case in the memory structure. In the event of new issues, first the system will make the process Retrieve. Retrieve process will perform two processing steps, namely the introduction of equality issues and problems in a database search.

Once the process is completed Retrieve, then the system will make the process of reuse. In the process of reuse, the system will use the previous information with the same problem to solve new problems. On the Reuse process will copy, select, and complete the information will be used. Revise Later in the process, the information will be calculated, evaluated, and repaired to resolve errors that occur in new problems. In the latter process, the system will make the process of Retain. Retain process will index, integrate, and extract the new solution. Furthermore, the new solution will be stored into knowledge-base to solve the problems that will come. Of course, the issues to be resolved are issues that have in common with him.

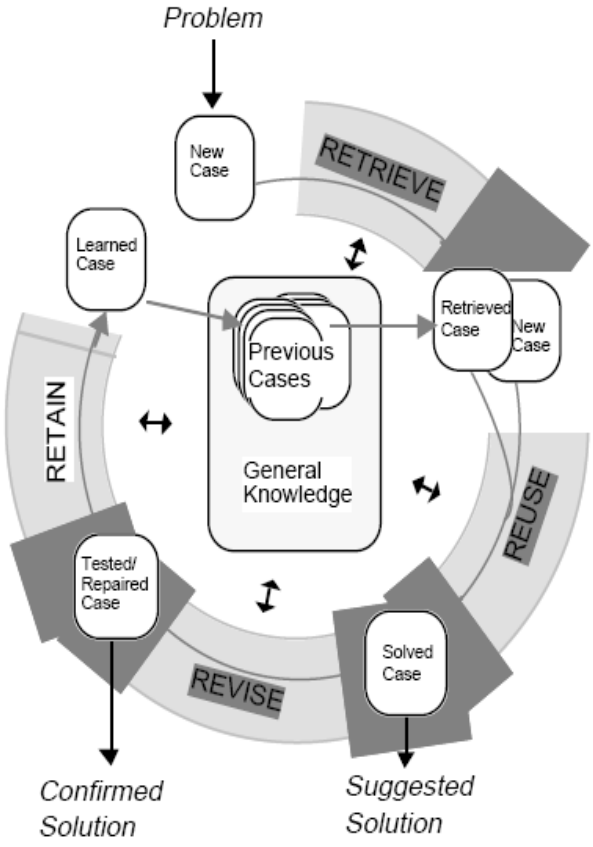

Fig 1 . Model CBR

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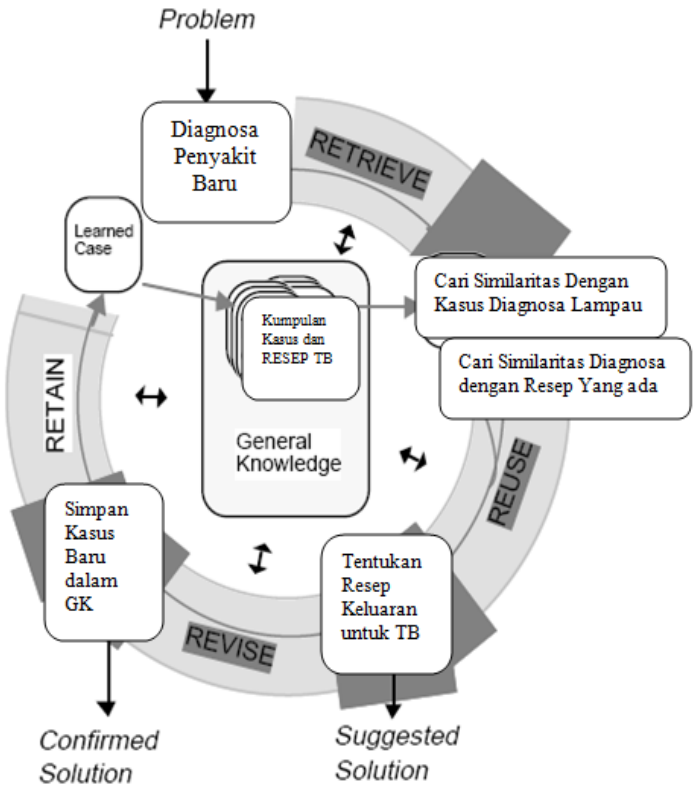


fig. 2 . Model CBR

The main advantages of CBR compared with rule-based systems (rule base system) is in terms of knowledge acquisition, where the CBR system can eliminate the need to extract a model or set of rules, as required in the model / rule-based systems. The acquisition of knowledge on CBR present in a collection of thoughts / previous cases. In addition, the CBR reasoning can still be performed if there is data that is incomplete or inaccurate. When the retrieval process is done, there is the possibility of a new case with the old cases on the basis of similar cases. However, from the similarity measure can still be done to evaluate the reasoning and the incompleteness or inaccuracy of the data provided. (Pal and Shiu, 2004).

Method

CBR-Based Expert System Model For Prescription Tbc

chart of case based reasoning will be designed following mode

The process of data retrieval will be done by collecting the following table with a general knowledge retrieval table as follows:
Gender (X1), age (X2), Height (X3), Weight (X4), intensity of coughing (X5), Pressure Breathing (X6), Body Temperature (X7), Level of anorexia (X8),

The specific symptoms
• TB skin / Scrofuloderma (X9)
• Bone and joint tuberculosis:
- The spine (spondylitis): gibbus (X10)
- Pelvis (koksitis): limping, swelling in the hip (X11)
- The bones of the knee: a limp and / or swelling (X12)
- Foot and hand bones (x13)

• TB of the brain and nerves:
- Meningitis: the symptoms of irritable, stiff neck, vomiting and decreased consciousness. (X14)
• Eye symptoms:
- Conjunctivitis phlyctenularis (X15)
- Choroid tubercles (only visible by fundoscopy) (X16)

Knowledge Base

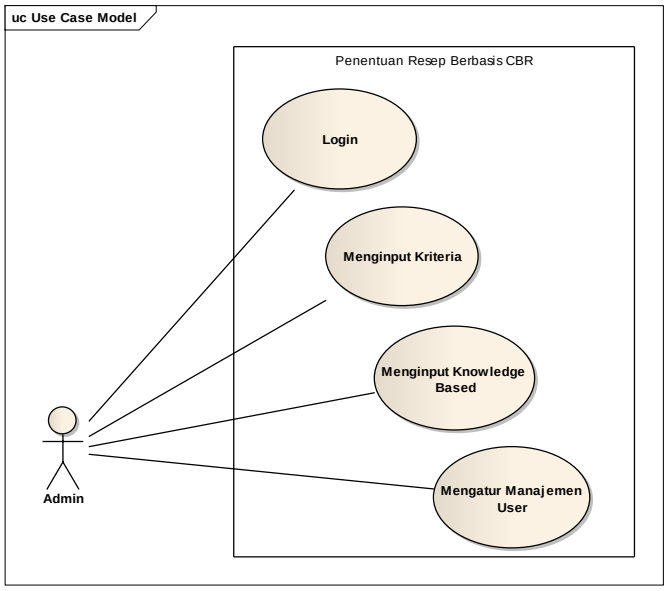
Case Code	X 1	X2	X 3	X. .	X16	Type of TB	Receipe Code
K01	L	<3	32	..	1		R01
K02	P	<5	30	..	0		R02
K03	L	<10	33	..	1		R03
K04	P	<12	34	..	0		R04
K05	L	<12	34	..			R05
K..	....	....	....	....	....	....	R..
KN	L						RN

table 1. General Knowledge

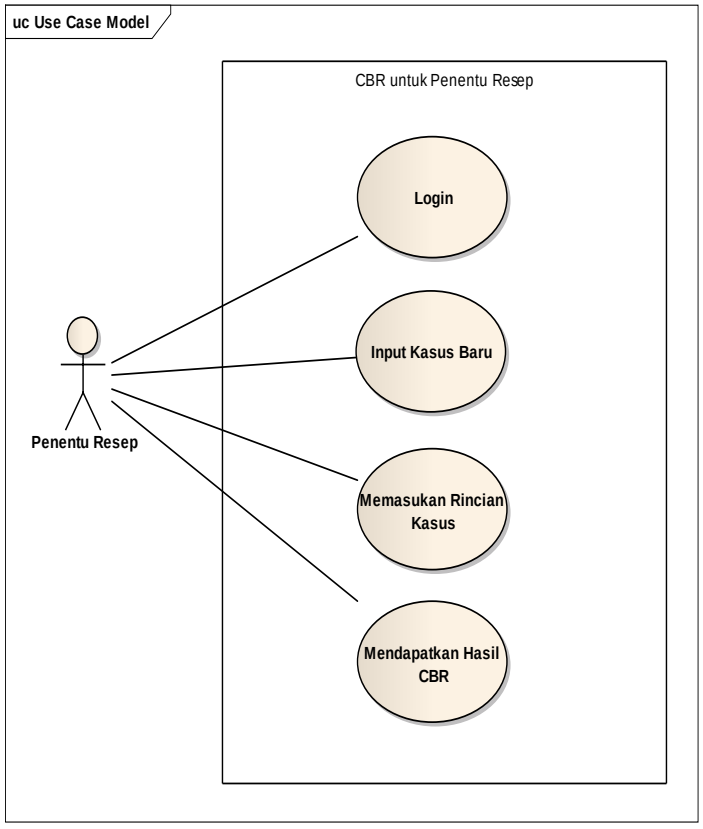
One important step in the CBR cycle is the retrieval (retrieval) of the previous cases that can be used to solve new problems. One of the fundamental questions is on the ground / retrieval consideration of what was done. One thing that is taken into consideration in many studies is the assessment of similarity (similarity assessment). There is some similarity assessment approach (similarity assessment) for retrieval, among others: (Mantaras et al, 2006)

Result And Discussion
Use Case Diagram

Use case Admin



Use case Penentu Resep

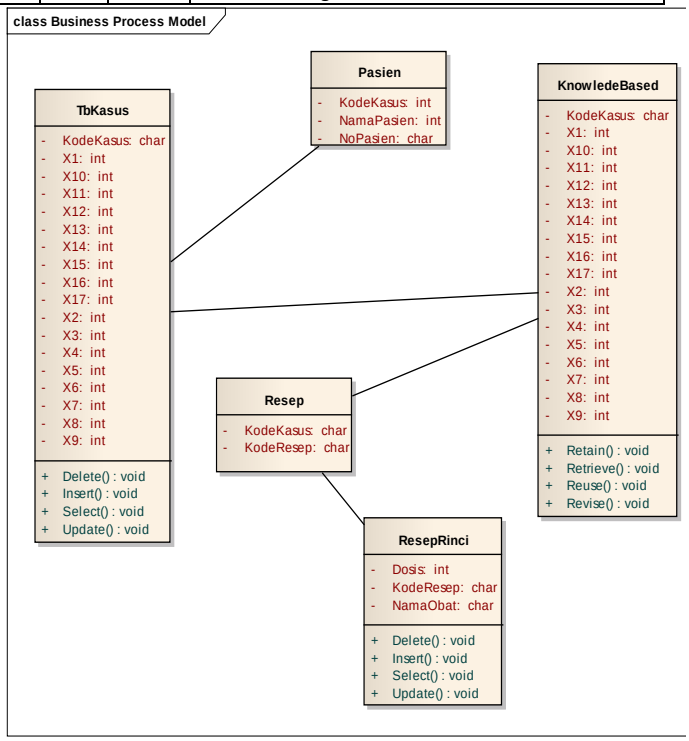


Class Diagram

The first step in the method of profile matching is to determine the variables that will be used as a point assessment of the patient's diagnosis of cases that occur, in the literature and the results of observations required variables are as follows:

No	variable name	Code
1	sex	X1
2	age	X2
3	height	X3
4	weight	X4
5	Cough intensity	X5
6	pressure Breath	X6
7	Body temperature	X7
8	cough with phlegm	X8
9	cough Dengue	X9
10	The Chest Pain	X10
11	old Fever	X11
12	cold sweat	X12
13	Weak and Sluggish	X13
14	Cloudy urine	X14
15	Less Appetite	X15
16	Weight Decreased	X16

No	Gap	Value	explanation
1	0	6	No Gap (diagnostic value as needed)
2	1	5,5	Individual diagnostic value exceeds 1 level / level
3	-1	5	Individual diagnostic value less 1 level / level
4	2	4,5	Diagnostic value of individual excess 2 level / level
5	-2	4	Individual diagnostic value less 2 level / level
6	3	3,5	Diagnostic value of individual excess 3 levels / levels
7	-3	3	Individual diagnostic value less 3 levels / levels
8	4	2,5	Diagnostic value of individual excess 4 levels / levels
9	-4	2	Individual diagnostic value less 4 levels / levels
10	5	1,5	Excess of 59 individual values diagnosis rate / level
11	-5	1	Individual diagnostic value less 5 levels / levels



Determining variable

The gap value

$NSF=\Sigma NS/\Sigma IS$

Explanation :

NSF : average of *secondary factor*

NS : summary value *secondary factor* (aspek 1, aspek 2, aspek 3.)

IS : sum of *item secondary factor*

5. Calculating the Total Value Every Aspect

From the results of the calculation of each of these aspects is then calculated based on a percentage of the total value of the core factors and secondary factors that are expected to affect the performance of each profile. The calculations can be seen in the formula: Total = 60% + 40% NCF NSF

Remarks:
NCF: The average value of core factor
NSF: The average value of the secondary factor

6. End Results Calculating (Ranking)

The end result is a profile matching the ranking of candidates that can be used as a patient can receive treatment patterns or particular recipes. Ranking refers to the results of certain calculations, such calculations can be shown in the formula:

HA = (x) % N1 + (x) % N2 + (x) % N3 + (x) % N4 +…

Remarks:

HA:		Final		Results
N1:	Total	Value	Aspect	1
N2:	Total	Value	Aspect	2
N3:	3	Aspect	Total	Value
N4:	Total	Value	Aspect	4

(x)%: The percent of the final results of the formula (total 100%)

After each patient get the final result, it can be determined ranking or the ranking of each patient based on the greater value of the outcome, the greater the opportunity for career planning, and vice versa.

Conclusion

case based reasoning can be applied in an expert system for rational drug prescription, retrieval process can use a profile matching that closeness new cases can be easily found. in the retrieval process should be made more density gap, so that the calculation will be more accurate.

References

[1] WHO (2012). "The Pursuit of Responsible Use of Medicines: Sharing and Learning from Country Experiences", Switzerland

[2] Ambrose Isah (2003). "Problems of Irrational Drug Use", WHO, Nigeria

[3] http://health.kompas.com/read/2013/04/23/16261473/Tuberkulosis.pada.Anak.Perlu.Perhatian, diakses pada tanggal 8 Desember 2012.

[4] Juan F. De Paz, Sara Rodríguez, Javier Bajo, Juan M. Corchado (2010), "CBR System for Leukemia Patients Diagnosis", Universidad de Salamanca, Spain

[5] Aamodt, A., dan Plaza, E., (1994), "Case-Based Reasoning: Foundational Issues, Methodological Variations, and System Approaches", AI Communications, Vol. 7.

[6] Pal, S. K. dan Shiu, S. C. K, (2004), "Foundation of Soft Case-Based Reasoning", John Willey and Sons, Inc., oboken,New Jersey.

[7] Mantaras, R.L.; Mcsherry, D.; Bridge, D.; Leake, D.; Smyth, B.; Craw, S.; Falting, B.; Maher, M.L.; Cox, M.T.; Forbus, K.; Keane, M.; Aamodt, A.; Watson, I., (2006)," Retrieval, reuse, revision and retention in casebased reasoning, The Knowledge Engineering Review, Cambridge University Press, United Kingdom.

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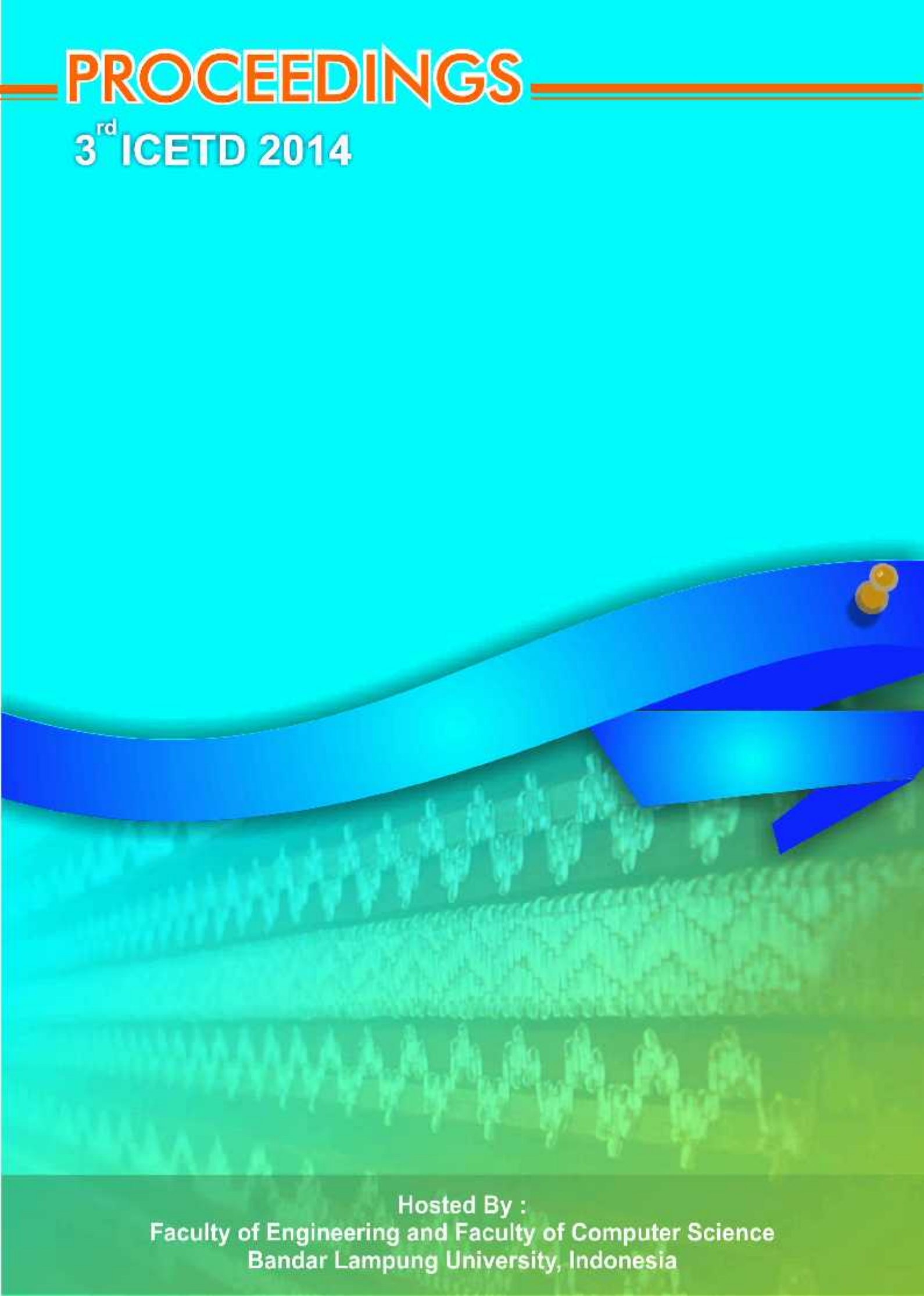

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