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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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Table Of Content

ISSN 2301 - 6590

Evaluation of Pedestrian Way's Comfort Case Study: Jl. Z. A. Pagar Alam, Bandar Lampung

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Abstract— **The phenomenon of many pedestrians, especially students who use the road into the background of this research. Allegations that the walkers feel comfortable with walking on the body road and many similar case that found. This study was aimed to evaluate and determine the factors that influence the comfort of the pedestrian way users on Jalan Zainal Abidin Pagar Alam (hereinafter referred as the ZAPA Street) as well as to know the expectations of the convenience factors from the respondents. This study used qualitative methods which were content analysis and comparative analysis.**

This study found that discomfort occurs due to physical, non-physical, and obstacle factors. Discomfort on physical factors such as the design aspect (width, continuous, flatness, modernity, aesthetic, and not slippery) and treatment aspect (damaged, holes, and drainage holes). Discomfort on non-physical factors such as safety aspect (hazards, advertisements, roof spans, and curves) and aspect sensory responses aspect (heat/rain, smell, vegetation, and dirty). While discomfort on the obstacles such as permanent aspect and non-permanent aspect.

The dominant physical discomforts were shown by the damages, holes which were found in the walkway, height of elevation, surface flatness, slope, and un-finished parts. Meanwhile the dominant non-physical discomforts were shown by the dirtiness of the walkway and the span of billboards and roof structures.

Keywords—**evaluation, comfort, pedestrian way**

I. INTRODUCTION

Pedestrian way is a designated pathway for pedestrians as to support their walking activities. This pathway connects various functions in a particular area. It is similar to cycleway, railway or highway. The difference is that pedestrian way is supposedly to be used without the use of any kind of motorised vehicles.

Pedestrian way has been widely applied in cities including Bandar Lampung. The existence of pedestrian way is very important considering the increase of motorised vehicles that cause traffic jams and pollution. So there is a need of comfortable pedestrian way that can lead the culture of the society for using this urban facility.

Studies on the pedestrian way have been carried out in many cities of Indonesia with the object at a certain areas and have different characteristics as well. Previous research has shown that important aspects in a pedestrian way are safety and comfort (Iswanto, 2006), freeinterruption and has greeneries (Parliana et al, 2014), as well as a multipurpose space that can accommodate activities other than walking activity (Rusadi et al, 2014)

Pedestrian facilities should be planned in accordance with other provisions including: ease of accessibility, safe from motorised vehicles, lane continuity, not slippery, and shaded with trees (Directorate General of Bina Marga, 1995).

The study was conducted in an education area atJalan Zainal Abidin Pagar Alam (hereinafter referred as the ZAPA Street).The boundary of the case study area is defined as from the Mall Bumi Kedaton (MBK) until the UNILA intersection which was within 2.5 kilometres in length. Along the ZAPA Street, there are several educational institutions

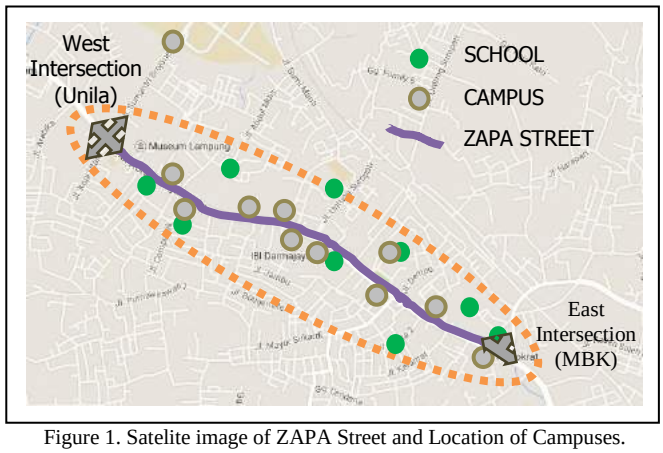

Figure 1. Satelite image of ZAPA Street and Location of Campuses. Source: Google Map, 2014.

The phenomenon that occurs in this education area, The number of pedestrians who uses the road on their activity. This case certainly disturbs the use of vehicle and danger for the pedestrians.

Figure 2. The Use of The Road
Source: Author

This study was important because the education area is an area with high number of users of public transport thusit needs the existence of pedestrian way. In addition, the university and high school students are the largest users of the pedestrian way (Mashuri & Ikbal, 2011). Similar findings were concluded by Mauliani (2010) that the amount of commuting flow from the outside to the campus and vice versa showed its significancy for the fulfilment of the pedestrian way in the education area.

This study was a preliminary evaluations. research because it steel needs further research that is confirmative to obtain deeper knowledge. This study aimed to determine the factors that influence the comfort of pedestrian way users. This study also aimed to determine the other expected comfort factors from the pedestrian.

I. METHODS

This study used qualitative method. Data collection was divided into two stages. The first stage was done by distributing questionnaires to students in one of the existing campus in ZAPA Street. While the second phase of data collection was in the form of site observation which was done directly by authors.

The first phase of data collection was a questionnaire containing open-ended questions so that the respondents were free to answer and to write reasons related to the comfort of the designated pedestrian area. Respondents comprised of 37 students from the University of Bandar Lampung. Origin and number of respondents were considered to have been representing the students in the area of ZAPA Street because then authors only needed to find keywords related to pedestrian comfort (content analysis).

The second phase of data collection was in the form of site observation conducted by the researchers in order to have better understanding and feel the real comfort condition of the pedestrian area. Both data were then analysed using comparative analysis. Comparative analysis was used to compare the results of content analysis with the result of direct observation. This analysis aimed to confirm and complement the keywords that have been found in the content analysis.

II. DISCUSSION

II.1 Analysis of Respondents

All respondents stated that the pedestrian way along the ZAPA Street is uncomfortable (less comfortable). This indicated that respondents felt discomfort on existing condition of the pedestrian way. Factors of discomfort derived from the content analysis showed that there were three categories: physical factors, non-physical factors, and obstacles. The diagram below showed that the most mentioned discomfort by respondents were drainage holes (physical factor), dirty (non-physical factors), as well as the street merchants / vendors (obstacles).

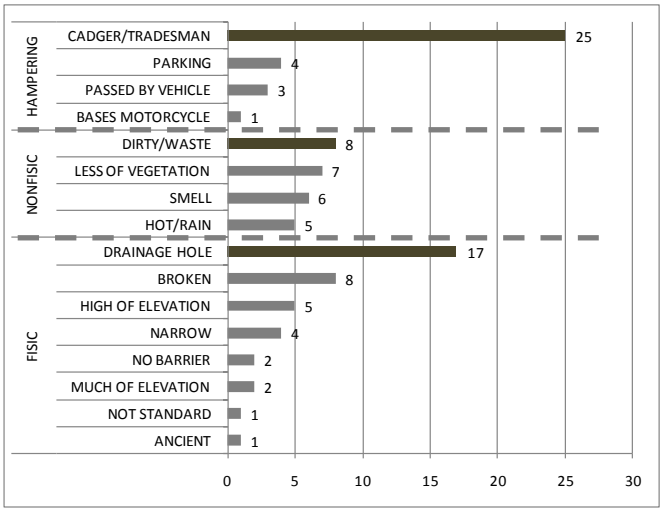

Diagram 1. Diagram of Distribution of Comfort Factor towards Pedestrian Way
Source: Author

Discomfort caused by the drainage holes was found due to the large number of drainage holes along the ZAPA Street. The presence of many uncovered holes affectthe pedestrian safety level which can lead to accidents (slipping). The level of harm is high because the drainage has a significant depth

Figure 3. Drainage Hole
Source: Author

Discomfort caused by the dirtiness of the walkway was found due to the commercial activities by traders at night leaving traces of their activities. Left-over garbages such as food waste, burning stains, and also the scent. This condition

causes discomfort on the pedestrian due to its visual and non-visual traces.

Figure 4. Visual and Non-visual Waste
Source: Author

Discomfort caused by the street merchant (PKL) was found in the situation when the pedestrian has to make extra effort to hinderor avoid them. This certainly raised significant fatigue. In addition, it is also dangerous situation for the pedestrian because of potential contact with the motorised vehicle. Thus, the level of danger caused by the presence of street merchant is quite high.

Figure 5. Street Vendor
Source: Author

II.2 Direct Observation

Direct observation indicated that the most common physical conditions that caused discomfort were damage, un-finished, elevation, and drainage holes.

Based on the following diagram of data distribution of physical conditions, those four conditions were the most often mentioned by respondents. This indicated that respondents felt more or the encountered most frequent those conditions when passing through it.

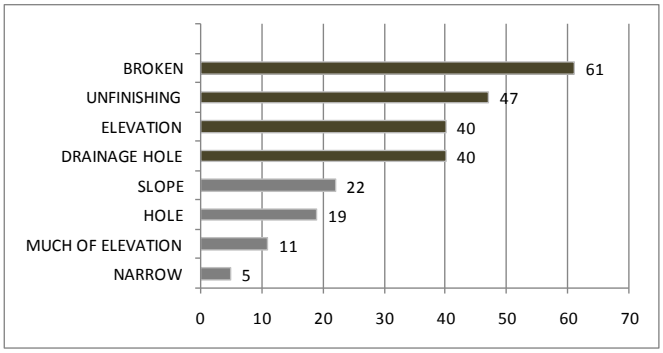

Diagram 2. Distribution of Physical Condition
Source: Author

The high number of damages on pedestrian area indicates lack of attention from local government in monitoring and following up of this condition. These damageswere most likely caused by street merchant carts, motorcycles, and cars parked up on the pedestrian area.

Another discomfort was caused by the presence of un-finished pedestrian spot. The un-finished condition was seen in the form of rough concrete blocks and also totally un-finished (soil / sand / gravel). It was considered to be very disruptive to pedestrian activity by potentially causing slipping (falling).

Figure 6. Unfinishing Condition
Source: Author

The next discomfort was the elevations which exceed the height of the standards of comfort for elevation. The height of the comfortable elevation is in the range of 16-18 cm for Indonesian society. While the existing elevation of the pedestrian area reaches more than 30 cm. The difference in number was very significant in affecting pedestrian comfort.

Figure 7. The High Elevation Condition
Source: Author

The last discomfort that was encountered is the number of drainage holes. In the ZAPA Street, which has the length of

2.5 km or two sides of the pedestrian areas which has the length of five kilometres, there were 40 drainage holes. Thus, on average, there was a drainage hole in every 125 cm. In the drainage holes which were casted, the cause of this condition could not be known with certainty. This condition could be caused within the construction of pedestrian or by other irresponsible party which intentionally take them for certain purposes. Other conditions showed that the drainage holes were open because of damage, low quality concrete, and finishing without a cover.

Figure 8. Drainage Hole Condition
Source: Author

Distribution diagram of non-physical condition data distribution diagram below showed the most common non-physical discomfort is the dirty condition of the pedestrian area. The dirtiness of pedestrian area also caused bad odour. This was similar to condition that most of the respondents mentioned dirty as the most felt uncomfortable factor.

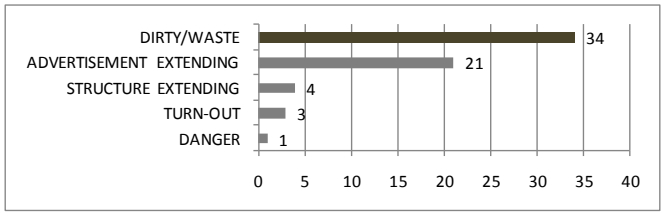

Diagram 3. Distribution of Nonphysical Condition
Source: Author

Data distribution diagram of obstacle condition below shows the most common encountered obstacles such as street merchants (vendors), trash bins, and vegetation. The number of merchants met by the authors during observation was also in line with the respondents' answers. This indicated that respondents were very disturbed with the presence ofstreet merchants when walking in a pedestrian area.

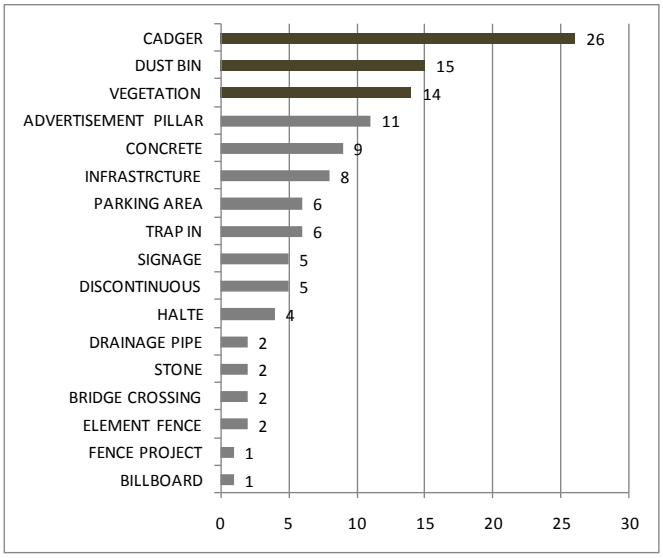

Diagram 4. Distribution of Restriction Condition
Source: Author

In the other hand, related to the presence of trash bin, the obstacle was indicated by the placement of the trash bin in the pedestrian area by building users and merchants in the surrounding. So that this problem can be easily solved by the concerned parties through direct communication with users or merchants around.

In regard to vegetation condition, authors found that there were vegetation planted in the middle of the pedestrian and the existence of the pot (permanent and non-permanent) in the area. This was presumably due to the widening of the road which has shifted the pedestrian area.

Figure 9. Obstacle Condition
Source: Author

II.3 Expectations

The diagram of expectation distribution showed more keywords were to be found such as: physical factors (patterned/beautiful, not slippery), facility factors (seating, street merchant area, and cycleway), additional factors such as fines for pedestrian area nuisances. The above showed that although there were many inconvenience factors, respondents still expect some facilities in addition to comfort that they need at the pedestrian area.

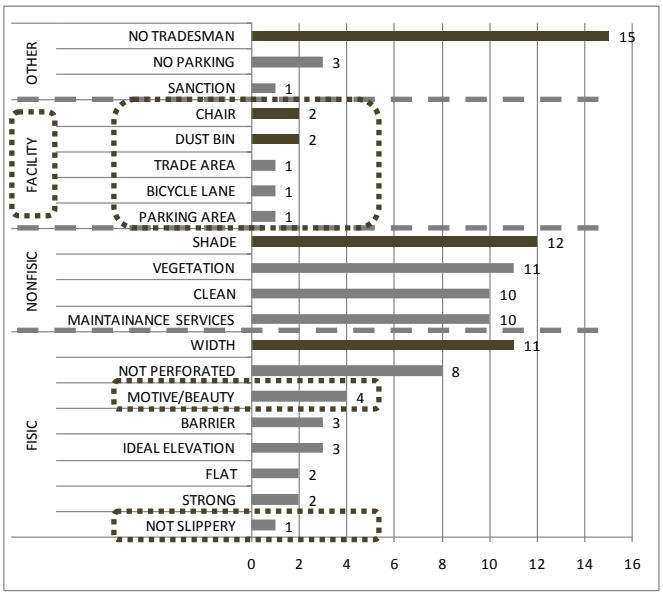

Diagram 5. Expectation Factor of Pedestrian comfort
Source: Author

The above discussion showed the aspects of safety and security are important to the pedestrian area. Potential hazards caused by the discomforts range from; mild hazards (e.g. un-finished, causing slip/fall), medium hazards (e.g. the height of elevation), as well as high hazards consisting of all the obstacles that force the pedestrian to go down to the road.

III. Conclusions

The study found that many factors affected the comfort of pedestrians include physical factors such as the design aspect (width, continuity, flatness, height of elevation, divider, finishing, modernity, aesthetic, and not slippery) and aspects of care (damaged, holes, and holes drainage). Secondly, the non-physical factors consisted of safety aspects (hazards, billboards span, roof span, and curves) and aspects of sensory responses (hot/rain, smell, vegetation, and dirty). The third is the obstacle factors (permanent, non-permanent). And the fourth factor is the facility factors such as pedestrian and non-pedestrian aspects as well as comfort factors that become the user's expectations.

The findings above are very important to note especially when planning a safe and convenient pedestrian area to avoid the harmful effects caused by the discomforts. In addition, the role of government as the provider of public facilities is expected to be better in maintaining the safety of the users from the community through the provision and oversight role.

Research on the theme of pedestrian area is expected to continue in view of the need for a wide range of design criteria related to pedestrian. Thus, further research is expected to bring up the design criteria as well as a prototype that can be used as a reference for the next pedestrian planning.

IV. Acknowledgment

We would like to acknowledge the students participating in the subject of Metodologi Penelitian dan Perancangan Permukiman (Architecture Program-UBL), Himpunan Program Studi Akutansi (HMPSA-UBL), and several other UBL students who have participated in answering the questionnaires and also at the time of the field survey.

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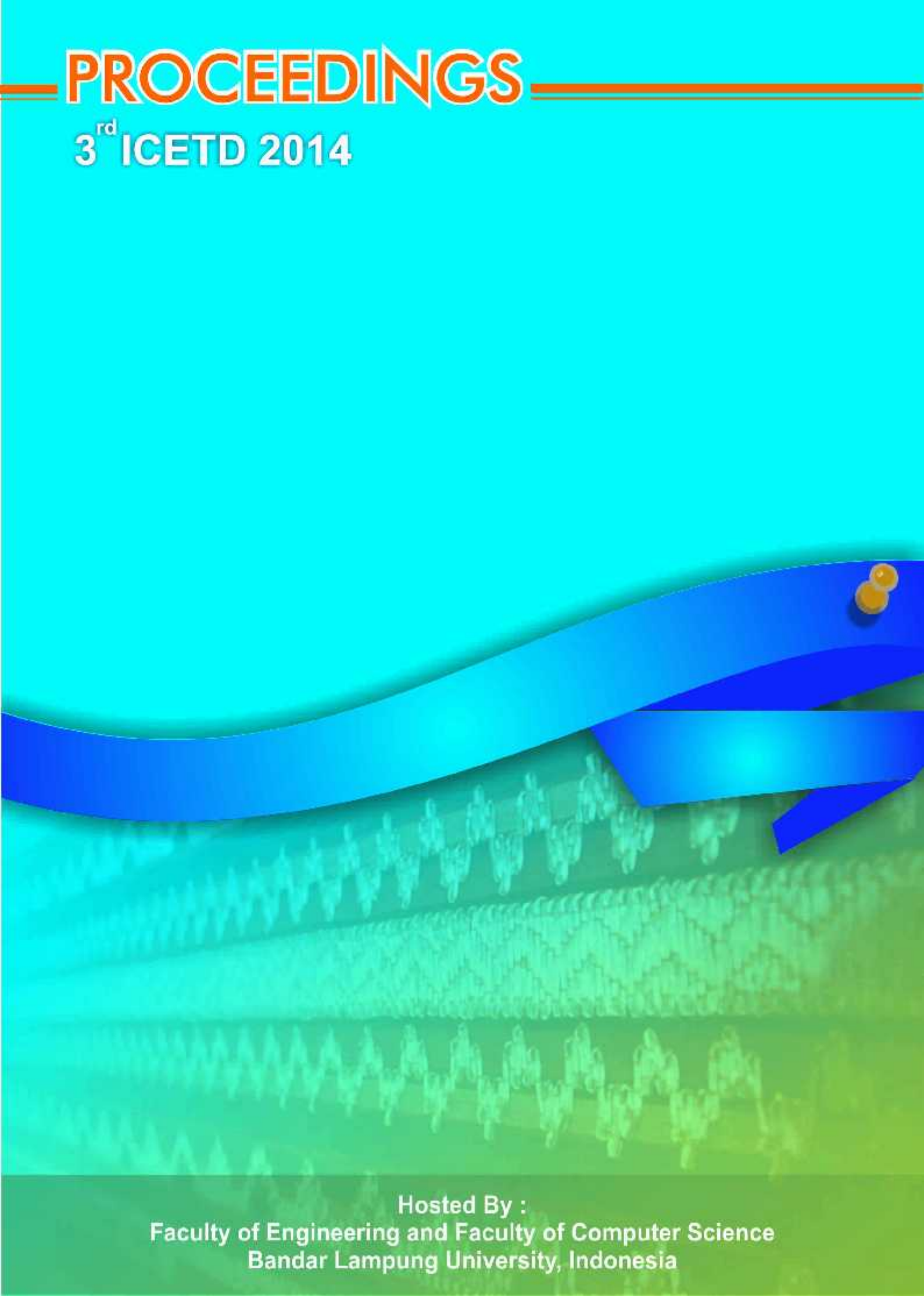

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