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1st Tarumanagara International Conference on the Applications of Technology and Engineering 2018

Preface

On behalf of the organising committee of 1st Tarumanagara International Conference on the Applications of Technology and Engineering (TICATE) 2018, I would like to welcome all delegates to the Campus of Universitas Tarumanagara (UNTAR) in Jakarta, Indonesia with great pleasure. Being held from November 22 to 23, 2018 the international conference is organized by UNTAR and technically sponsored by IOP Conference Series: Materials Science and Engineering (MSE).

Universities play an important role in facing the rapid development of technology and engineering in recent digital era. The rapid developments of technology and engineering impact various aspects of people's life in welcoming the era of Industry 4.0. The biggest challenge faced by universities due to these rapid developments is how the results of research and technological innovation can contribute to the people's prosperity. As a form of contribution from universities in responding this challenge, Universitas Tarumanagara hold the 1st TICATE 2018 with the theme of: "The Implementation of Research Results and Innovation for People's Prosperity".

This international conference activity is expected to be a forum of discussion, networking and exchanging ideas among researchers, academicians, and practitioners to work together to pursue research and technological innovation that can be used to contribute to people's prosperity.

Over 160 papers have been submitted to 1st TICATE 2018 from 6 different countries, those are Germany, France, Australia, Taiwan, Malaysia, and Indonesia. We categorized the papers under seven groups, namely Mechanical Engineering and Technology; Electrical Engineering; Industrial Engineering; Civil and Environmental Engineering; Food and Agriculture Technology; Informatic Engineering & Technologies; and Medical & Health Technology. All papers, regardless of their standing or initial classification, were available for general discussion at the committee's meeting.

Our special thank goes to our Rector, Prof. Dr. Agustinus Purna Irawan, who has initiated this conference, Dr. Svann Langguth as Head of Science and Technology Division from the Embassy of the Federal Republic of Germany in Jakarta, Prof. Dr. Mohd. Zulkifly bin Abdullah as Professor from Universiti Sains Malaysia, and Dr. Ir. Yono Reksoprodjo, DIC as Vice President Corporate Affairs of Sintesa Group, as our pleanary speakers and Bank DKI, Bank Mandiri, Tarzan Photo, Hyperzone Computer, as our patrons. I would like to give special thanks to all of you for the interesting keynote speech at this international conference.

We also thank all individuals and organisations such as the members of international editorial board, the conference organisers, the reviewers, and the authors, for their contribution in making TICATE 2018 as a successful international conference and a memorable gathering event. I am also grateful for the support of publication service of IOP Conference Series: Materials Science and Engineering (MSE).

We hope that the conference could present you wonderful memories to bring home in addition to new insights and friendship congregated during the event. We truly value your participation and support for the conference. We hope that you will enjoy TICATE 2018 and Betawi culture and tradition in Jakarta.

Dr. Hugeng, S.T., M.T. (SMIEEE)

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Relation between Transit Oriented Development (TOD) and the effect of electromagnetic field with fengshui on residential planning

IOP Conf. Series: Materials Science and Engineering **508** (2019) 012024 doi:10.1088/1757-899X/508/1/012024

Relation between Transit Oriented Development (TOD) and the effect of electromagnetic field with fengshui on residential planning.

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Abstract. The concept of Transit Oriented Development (TOD) began to emerge, this has resulted in the design of buildings that cross railways and roads. The method used is the analysis of TOD theories, electromagnetic fields and fengshui to see the relation between the three things and the planning of residential buildings on it: 1) What is the relation between TOD and electromagnetic fields; 2) How does the Electromagnetic field relate to fengshui; 3) What is the connection between TOD and fengshui. Understanding these three links will result in residential planning that provides optimal benefits for residents. The conclusion is: Electromagnetic fields that occur as a result of the movement of transport vehicles, especially transportation related to the rail, cause unstable electromagnetic fields that can hinder the occupants from growing optimally, so structuring TOD with good and true fengshui will provide higher benefits for its inhabitants. The ease of transportation due to the meetings from various modes of transportation at that point causes the people who live in TOD to have a shorter travel time for their travel activities, by getting "more" time, of course the level of productivity can be higher so that as a result, the level of welfare will be well. After knowing the danger of unstable (氣) *qi* due to the influence of electromagnetic fields that occur due to rail or road trajectories, hopefully TOD stakeholders can arrange their properties properly and correctly so that users can enjoy good fengshui and display optimal life performance for the sake of a more prosperous Indonesia.

1. Introduction

Infrastructure development is being accelerated by the Indonesian government on a large scale throughout the archipelago so that it brings a new trend in urban and rural development that results in the concept of developing TOD (Transit Oriented Development), especially in big cities in Indonesia, there are two types of TOD, namely Urban TOD and Neighborhood TOD. This discussion limits itself only to discuss urban TOD from the perspective of fengshui. A good TOD, of course, is a TOD that meets criteria such as pedestrians who are friendly, attractive, safe, and have a good space experience [1]. TOD is an interesting and fast-growing trend in creating a vibrant, livable and sustainable community. This is the creation of a compact, pedestrian, walkable and versatile community centered around a high-quality train system [2]. This criterion produces a mass composition as a residential tower placed on a rail, either LRT, MRT or commuter train.

While in the view of fengshui practitioners, we are expected to have a residence that (氣) *qi* is relatively stable, a stable (氣) *qi* can be obtained, among others, by the location of buildings that are not

too close to high voltage, as we know that electromagnetic field radiation around high voltage is not very good for health [1].

According to Erdogan: All matter has vibrations called (氣) *qi. Qi* (氣) is intangible energy and, according to the Chinese people, spread from all objects of various sizes and shapes with their own specific templates [3].

2. Material and Method

Today, the highway is gone; urban transit system ". TOD is designed to overcome traffic congestion and protect the environment. This is a trick to overcome transportation problems which is a hot topic. At present, the urban transit system already exists so the highway will be closed [2]:

- The return on transit investment is twice that of highway investment
- Transit can provide new market forces through population density so as to create new sub-centers that are efficient and minimize the spread.
- Transit allows cities with an orientation system in the corridor, making it easier to provide infrastructure
- Transit increases the economic efficiency of the city, so that less car use is expected to use transit as the main route, so it spends less on transportation costs [4].

There are guidelines for TOD planning in districts and neighborhoods. Density, details and designs are based on projects that depend on the location, context, availability of rebuilding properties, surrounding development etc. 10 of these principles are:

1. The station is located at the highest potential driver and the opportunity for developers
2. Radius 0.5 Miles around the station is for mixed and pedestrian use
3. Making a shared density starting from the highest in the station, taping down into the surrounding area.
4. Design a station using unhindered pedestrian walks[1]
5. There is a plaza on the side or front of the station
6. There is a pedestrian arcade to the main entrance with retail and cafe on each side
7. Reduce parking at the station, the parking location is one or two blocks away through the shopping arcade
8. Increase easy, direct and convenient monetary connection in the form of an '*intermoda'* connection
9. Combining different users by providing a bicycle path and its parking lot
10. The station is used as a catalyst for surrounding development

Geomagnetic fields have been known since ancient times, but their development is slow. *Geomagnetics* was closely related to legends and supernatural powers. Most writings on compass began in China in 250 BC. Gilbert published a book on *geomagnetics* in 1600, in which he concluded that the earth behaved like a great magnet. In the early 19th century, Gauss discovered magnetic field analysis [5].

The interaction between signal and electromagnetic energy is based on the phenomenon of vibration and resonance. The vibrating resonance system transmits vibrations. Electromagnetic vibration transmits the electromagnetic frequency. This allows other vibrations at distances that are smaller or larger with the same frequencies to also vibrate. When the resonance vibrates then it also receives the same frequency vibrations from other sources, with the intensity (amplitude) of the vibration increasing, so that resonance becomes more powerful [6].

Humans have an electromagnetic regulatory system, which features such scopes and importance that shocked experts in physiology and medics. Therefore, it can be expected that this research has found a place in medical research, but this has not happened. Research in this field is still looking for identity in

[1] The perfect arrangements of the station complex is very important to determine the desirable patterns, and influence factors such as pedestrian and bicycle use, traffic density around the station, the development quality, the location of cafes and shops, and the overall benefits of the railway system [2].

medical science. There are several reasons for this, first, in the current medical paradigm the molecular level is seen as the deepest level of regulation in the body. A disease which is considered to be the basis of deregulation of molecular processes and therapy (pharmacological) consists of molecular intervention. "The paradigm is that there is nothing under the molecule" The bio-medical paradigm that exists is very strict in material and natural. There is no place given for endogenous electromagnetism [6].

In general, the potential for health problems due to electromagnetic radiation in humans, in the form of: (1) long-term effects, in the format of potential degenerative and malignant processes (cancer), and (2) hypersensitivity effects, with various manifestations. The potential for degenerative and malignant processes depends on the exposure limits of electric fields and magnetic fields in units of time. While the hypersensitivity effect does not have to depend on the exposure limit [7].

Talking about the electromagnetic field is certainly not detached from the discussion of the compass, 24 (twenty four) directions used in the 羅盤 *luopan* (fengshui science compass) consisting of four trigrams, namely 乾 *Qian*, 坤 *Kun*, 艮 *Gen* and 巽 *Xun*, eight heavenly stems namely 甲 *Jia*, 乙 *Yi*, 丙 *Bing*, 丁 *Ding*, 庚 *Geng*, 辛 *Xin*, 壬 *Ren*, and 癸 *Gui*, and twelve earthly branches are 子 *Zi*, 丑 *Chou*, 寅 *Yin*, 卯 *Mao*, 辰 *Chen*, 巳 *Si*, 午 *Wu*, 未 *Wei*, 申 *Shen*, 酉 *You*, 戌 *Xu* and 亥 *Hai* [8].

William Gilbert (1544-1603) in his treatise on magnets which said that "the Earth has a magnetic soul. Earth is a giant magnet and the earth's magnetic field moves from the south pole of the earth to the north pole of the earth" [9].

Zhu Xi (1130-1200 AD), a neo-Confucian philosopher said that the patterns of change that exist in nature follow the principles of Li and Qi, Li is the law that governs all forms from the top to the root of all things that exist, while (氣) *qi* is the most vital thing of all things [10].

The aspect of the earth is the environment around us such as mountains, buildings, rivers, roads, as well as buildings where we live and work. As explained earlier, the earth is a large magnet with two poles, namely the north and south poles. Therefore, orientation, direction and location are included in this aspect of the earth. This aspect can be optimized by arranging buildings according to the rules of Feng Shui. An arrangement that is in harmony with nature presents a balanced life and brings many benefits [9].

So based on the description of the above theory, the research method was prepared to find the Transit Oriented Development (TOD) Link and the Effect of Electromagnetic Fields with Fengshui on Residential Planning namely; 1) What is the relation between TOD and electromagnetic fields; 2) How does the Electromagnetic field relate to Fengshui; 3) What is the connection between TOD and Fengshui. Understanding these three links will result in residential planning that provides optimal benefits for residents.

3. Results and Discussion

Based on the analysis method of TOD, electromagnetic fields and fengshui, three groups can be seen with the following descriptions; 1) What is the relation between TOD and electromagnetic fields; 2) How does the Electromagnetic field relate to Fengshui; 3) What is the connection between TOD and Fengshui.

Based on this method, a good and true residential planning will be analyzed which will provide higher benefits for the occupants.

3.1. Relation between TOD with Electromagnetic Field.

In the analysis of TOD linkages with electromagnetic fields, we can see how closely the intermoda nodes occur in a TOD so that the traffic flow is of course also very high, the current transport currents cause good waves in the form of vibration), sound and electricity (via rail).

As seen in Figure 1, the influence of the movement of trains passing through buildings with residential buildings on it is a real case, this certainly disrupts the stability of the electromagnetic field of the building.

Figure 1. Chongqing Flat
Source: https://www.dailymail.co.uk/news/article-4330102/Train-goes-centre-block-flats.html, Retrieved on October 19, 2018

3.2. Relation of Electromagnetic fields with Fengshui.

As written by Jong Koo Han and Tong So Park in the journal entitled Geomagnetic Field Analysis of Poong Soo (Feng-shui) at Jongmyo, the earliest writings about compass navigation are credited to the Chinese and dated to 250 years B.C. When Gilbert published in the textbook on Geomagentic Field in 1600, we can see the difference in time between the knowledge of compasses between Chinese civilization and Western civilization.

The time difference from this discovery certainly has an impact on the knowledge of the influence of the earth's electromagnetic field on building structure which in this case is applied through fengshui science.

3.3. Relation between TOD with Fengshui.

One of the things that planners often worry about is that the architect's design is out of sync with the input given by practitioners of Fengshui, but from my experience as a Fengshui practitioner as well as an Architect, there is arguably not a single problem that cannot be solved technically, the synergy of the two sciences will not reduce the demands for efficiency and effectiveness of space and the aesthetic value of a building.

Figure 2. Gate Tower
Source: https://en.wikipedia.org/wiki/Gate_Tower_Building, Retrieved on October 19, 2018.

4. Conclusion

Ideally, a high-rise residential building is not crossed by a rail on the underside. According to fengshui principles, the adding of railway under the building is not a good idea because (氣) *qi* at the base of the building becomes unstable. The existing railway can be arranged so that it is not located under the residential tower building, as we do not want any underground water flowing through our buildings.

According to Fengshui, traffic in the form of vehicles, LRT, MRT or commuter trains will have an effect similar to a river, this will cause (**氣**) qi to become very unstable, so that the occupants of the building will be affected and lead to unexpected life potential and most likely they will experience difficulties in life.

Building arrangements that apply the ideal TOD concept are not only merely considering the high level of efficiency without regard to intangible disturbances to the occupants. It would be unfortunate if the TOD concept which was intended to facilitate the lives of its inhabitants, would instead have a negative impact on its inhabitants due to the bad (氣) *qi* that occurs so they cannot live optimally.

The application of feng shui that is good and true in arranging TOD will certainly provide higher benefits for its inhabitants who have benefited from transportation facilities due to the meetings of various modes of transportation at that point. By obtaining time efficiency in transportation, productivity will increase, and a result, of course, the level of welfare will be better.

After knowing the danger of unstable (氣) *qi*, hopefully the TOD stakeholders can arrange their properties properly and correctly so that users can enjoy good feng shui and display optimal life performance for the sake of a more wealthy and prosperous Indonesia.

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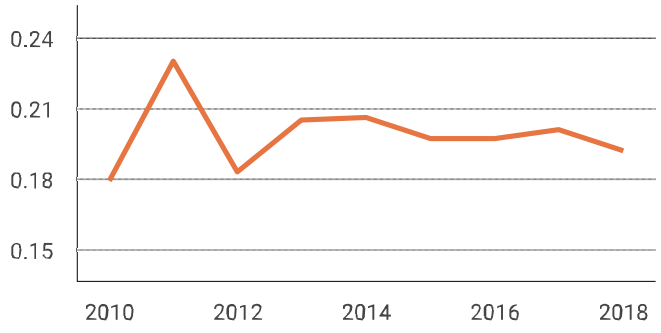

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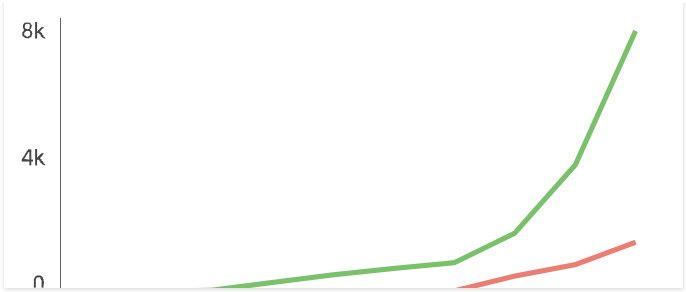

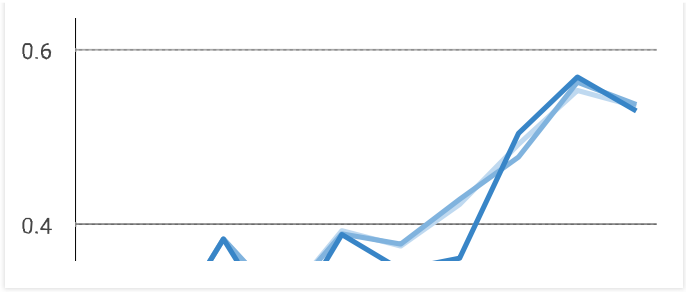

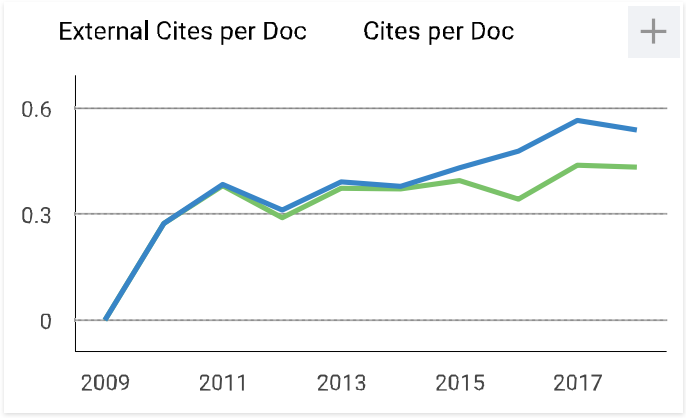

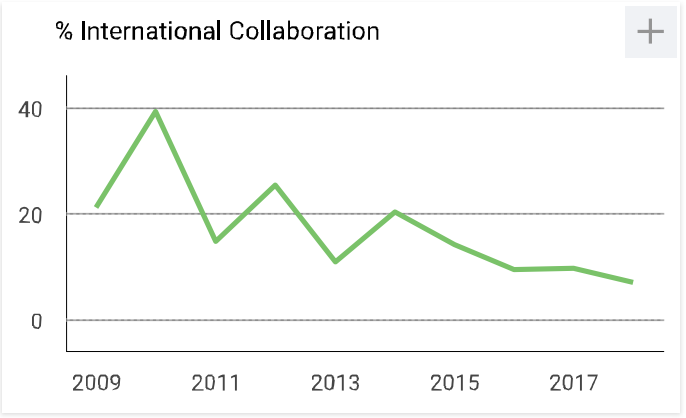

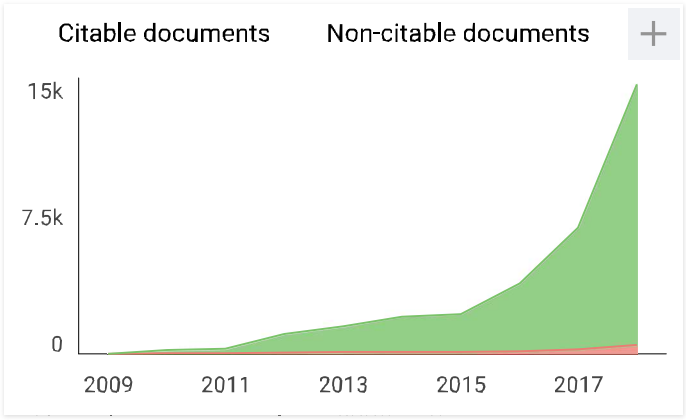

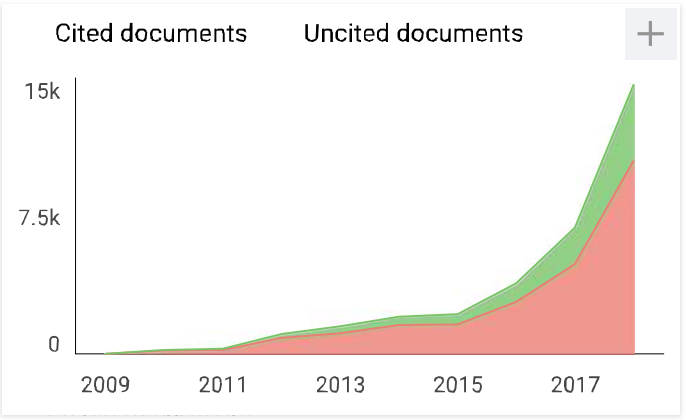

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