

opción

Revista de Antropología, Ciencias de la Comunicación y de la Información, Filosofía,
Lingüística y Semiótica, Problemas del Desarrollo, la Ciencia y la Tecnología

Año 35, 2019, Especial N°

19

Revista de Ciencias Humanas y Sociales

ISSN 1012-1587/ ISSNe: 2477-9385

Depósito Legal pp 198402ZU45



Universidad del Zulia
Facultad Experimental de Ciencias
Departamento de Ciencias Humanas
Maracaibo - Venezuela

Cleanliness Assessment of Sub-District in Regency Using Technique for Order Preference by Similarity to Ideal Solution

**Phong Thanh Nguyen¹, Herman², Quyen Le Hoang Thuy To Nguyen³,
I Wayan Suparta⁴, Vy Dang Bich Huynh⁵**

¹Department of Project Management, Ho Chi Minh City Open University, Vietnam. phong.nt@ou.edu.vn

²Department of Information Systems, STMIK Pringsewu, Lampung, Indonesia.

³Office of Cooperation and Research Management, Ho Chi Minh City Open University, Vietnam. quyen.nlhtt@ou.edu.vn

⁴Economic Department, Economic and Business Faculty, Lampung University, Indonesia. marselina@feb.unila.ac.id

⁵Department of Learning Material, Ho Chi Minh City Open University, Vietnam. vy.hdb@ou.edu.vn

Abstracts

Cleanliness is a human need to be healthy. In Tanggamus Regency the cleanliness still very lacking, but the government continues to strive so he cleanliness can be promoted by each district in Tanggamus. The problem in assessing cleanliness between sub districts in Tanggamus is very difficult. Because there are many sub-districts in the Tanggamus area, so there needs to be a system that can assist in the assessment. This Decision Support System was made to assist the hygiene assessment process using the TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) method by the Sanitation and Gardening Department (DKP). The existence of this system can help district employees in the assessment of cleanliness between sub district in Tanggamus regency.

Keywords: cleanliness, regency, district, topsis method

Evaluación De Limpieza Del Subdistrito En Regencia Utilizando La Técnica De Preferencia De Orden Por Similitud Con La Solución Ideal

Resumen

La limpieza es una necesidad humana para estar sano. En Tanggamus Regency la limpieza todavía es muy escasa, pero el gobierno continúa esforzándose para que cada distrito de Tanggamus pueda promover la limpieza. El problema para evaluar la limpieza entre subdistritos en Tanggamus es muy difícil. Debido a que hay muchos subdistritos en el área de Tanggamus, debe existir un sistema que pueda ayudar en la evaluación. Este Sistema de Apoyo a la Decisión se creó para ayudar al proceso de evaluación de la higiene utilizando el método TOPSIS (Técnica para Preferencia de Orden por Similitud con la Solución Ideal) del Departamento de Saneamiento y Jardinería (DKP). La existencia de este sistema puede ayudar a los empleados del distrito en la evaluación de la limpieza entre el subdistrito en la regencia de Tanggamus.

Palabras clave: limpieza, regencia, distrito, método de topsis.

1. Introduction

1.1 Research Background

Though the infrastructure is adequate it still requires public responsibility [1-5] to reduce the risk of floods. Cleanliness has to be part of the culture and ingrained as a responsibility. Besides maintenance issues, floods could happen if the public were negligent in cleanliness resulting in the drainage system getting clogged up. Cleaning and Gardening Service (DKP) Tanggamus Regency is an agency that manages the Tanggamus Regency area in terms of cleanliness. Tanggamus Regency is divided into twenty sub districts (bahasa: Kecamatan (Kec.)) including Kec. Air Naningan, Kec. Samuong State Airport, Kec. Bulok, Kec. Cukuh Balak, Kec. Gisting, Kec. Gunung Alip, Kec. Kelumbayan, Kec. Kelumbayan Barat, Kec. Kota Agung Barat, Kec. Kota Agung Pusat, Kec Timur Timur City, Limau Kec, Pematang Sawa Kec, Pugung Kec, Panggung Island Kec, Semaka Kec, Sumberejo Kec, Talang Padang Kec, Ulubelu Kec, and Kec. Wonosobo. In the context of evaluating [6-10], appreciating, and improving the performance [11-15] of the cleanest subdistricts, the Tanggamus Regency Sanitation and Parks Agency conducts the best subdistrict selection in the category of cleanliness which is held annually. In addition, the selection of

the best sub-districts in this category of cleanliness can spur other sub-districts to work well again. In the selection of the best sub-district cleanliness category there are several criteria that must be fulfilled in order to be able to say that the best sub-district category of cleanliness includes the 3K program, road environmental cleanliness and environmental forage, drainage, the environmental conditions of residents' homes, work spaces, public awareness of public facilities, 3R waste management, and creative Eco. All of these criteria are an assessment carried out by the Department of Sanitation and Parks Tanggamus Regency in determining the best district cleanliness category. In the best sub-district selection process for this category of cleanliness, the Tanggamus Sanitation and Parks Service is still done manually and has not been computerized, it takes longer [16-20]. This is less effective and efficient while it is also feared that there will be an error in the calculation process that is done manually [21-25]. In the implementation of the best sub-district selection, this category of cleanliness is using the TOPSIS method (Technique for order preference by similarity to ideal solution) because this method is a multi-criteria decision-making method with weighting values on each criterion. This TOPSIS method has the concept that the chosen alternative is the best alternative that has the shortest distance from the positive ideal solution and the farthest distance from the negative ideal solution [26-30]. And the choices will be sorted by value so that the alternative that has the shortest distance with a positive ideal solution is the best alternative [31-35]. In other words, the alternative that has the greatest value, that's a good alternative to choose from. Based on the above problems, we need a system that can help to facilitate the process of selecting the best districts in cleanliness to be more effective. The purpose of this study is to design and implement the TOPSIS method for evaluation of cleanliness between districts in Tanggamus Regency. This research is limited to the selection or evaluation of the cleanest sub-district in Tanggamus Regency.

1.2 Research Problem

From the research background, it can be withdrawn the research question that can be solved, namely how to make a decision-making system using the TOPSIS method (Technique for Order Preference by Similarity to Ideal Solution). The practical decision-making system of the TOPSIS method has the concept that the chosen alternative is the best alternative that has the shortest distance from the positive ideal solution and the longest distance from negative ideal solution.

1.3 Research Limitation

In this study boundaries are needed to match what was planned before so the research objectives can be achieved. The boundaries of the problems discussed in this study are:

1. Data samples were carried out for research obtained from Bulok sub-district, Tanggamus.
2. The method used is Technique For Order Preference by Similarity to Ideal Solution (TOPSIS)
3. The cleanest inter-disability assessment system is implemented using Notepad ++ and PHP as a programming language and MySQL for database implementation.

1.4 Research Objective

The objectives of this study are:

1. Construct a decision-making model using the Technique for Order method preference by Similarity to ideal solution (TOPSIS) for solving problems in Tanggamus
2. To help provide alternatives to the process of best sub-district cleanliness categories evaluating

1.5 Benefit of Research

1. With the cleanest district selection system, it is expected to be able to help the Tanggamus Regency Sanitation and Parks Agency in determining the best subdistricts in cleanliness more effectively.
2. With the availability of a computerized system that is expected to facilitate decision making in the cleanest election selection
3. With this system it is expected to minimize human error
4. Can speed up the data processing in the cleanest district selection

2. Literature Review

2.1 The concept of practical decision making

The TOPSIS method was one of the first to be introduced by Yoon and Hwang in 1981. This method is one of the most widely used methods to solve the Practical decision making. TOPSIS has a concept where the alternative chosen is the best alternative that has the shortest distance from the positive ideal solution and the longest distance from the negative ideal solution. The huge factors need to be considered stimulates the difficulty in making a decision.

2.2 Technique for Order Preference By Similarity To Deal Solution

The TOPSIS method was used as an effort to resolve a multiple criteria decision making problem, because the concept is simple and easy to understand, has the ability to measure the relative performance of decision alternatives.

III. METODHOLOGY

3.1 Data Collection

In this study, interactive discussions and interviews were conducted with the Sanitation Service’s parties Tanggamus Regency Parking. This is done as a source of information and initial data collection needed for design that aims to simplify the system design process. The system is built using MySql.

3.2 Analysis stage

In this analysis stage, it is divided into 2 (two) that are, analysis of system currently underway and analysis of the system to be developed.

3.2.1 Ongoing Analysis Stage

Determination in the cleanest district evaluation this Tanggamus Regency, which is carried out by the Tanggamus Regency Sanitation and Parking Office is still done manually with a spreadsheet calculation process. This is less effective, because there is the possibility of an error in the calculation process, so the system development is needed [36-40]. The following is a representation of the system that is currently running at the Tanggamus Regency Sanitation and Landscaping Service.

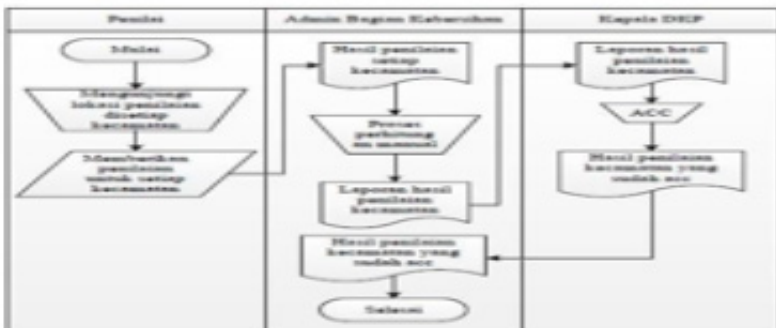


Figure 1. Representation of the System

3.2.2 Identification of Problems

Based on the results of the analysis of the system that is running and identify problems then it was concluded that at the Tanggamus Sanitation and Parking Office requires an application that can facilitate the cleanest sub-district assessment process. Therefore, the development of a system for assessment was built the cleanest sub-district in Tanggamus Regency.

3.2.3 System to be Developed

The cleanest subdistrict assessment system in Tanggamus Regency is still done manually, from the assessment calculation process is still done manually, this is less effective and efficient. In the cleanest sub-district evaluation system that will be developed, it has been computerized and no longer manually counts [41-45]. The calculation process will be entered MySQL database, then from the calculation process, an alternative data ranking will be generated [46-50]. The following is a representation of the system that will be developed at the Tanggamus District Sanitation and Park Service. Appraiser Admin DKP Head Cleanliness Section.

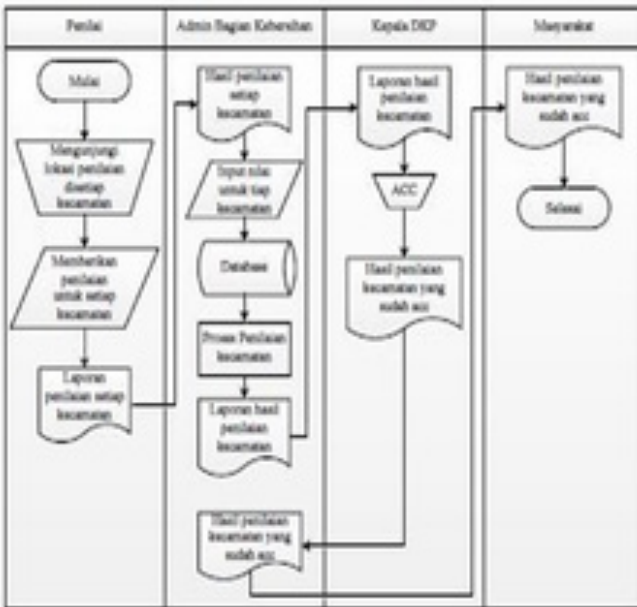


Figure 2. Developed System

3.2.4 Criteria Data

Table 1. Criteria Data

No	Criteria Name	Attribute	Weight
1	Program K3 Work	Benefit	10
2	Cleanliness environment	Benefit	15
3	Drainage	Benefit	10
4	Home condition	Benefit	10
5	Room	Benefit	10
6	Work	Benefit	10
7	Concern community to public facilities	Benefit	10
8	Processing 3R Garbage	Benefit	20
9	Eco Creative	Benefit	5

4. Results

4.1 Sub-district Assessment Results

This section shows the results of an analysis sub-district assessment in Tanggamus Regency. The cleanest sub-district appraisal data processing is using the TOPSIS method. The following is a display of the cleanest sub-district assessments in Tanggamus Regency.

Table 2. Sub-district Assessment Results

No.	Sub District Name	Preference Value	Ranking
1	Bulok Air	0.199022	1
2	Naningan	0.187122	2
3	Bandar Negeri	0.186112	3
4	Cukuh Balak	0.185223	4
5	Gisting	0.184232	5
6	Gunung Alip	0.183321	6
7	Kelumbayan	0.182431	7
8	Kelumbayan Barat	0.178323	8
9	Kota Agung Barat	0.178323	9
10	Kota Agung	0.177543	10

11	Kota Agung Timur	0.167444	11
12	Limau	0.158234	12
13	Pematang Sawah	0.156123	13
14	Pugung	0.155222	14
15	Pulau Panggung	0.144589	15
16	Semaka	0.143421	16
17	Sumberejo	0.142657	17
18	Talang Padang	0.136454	18
19	Ulu Belu	0.134232	19
20	Wonosobo	0.132454	20

4.2 Report

This page is a display of the cleanest inter sub-district assessment reports. This page shows the cleanest sub district ranking in Tanggamus Regency. For results of the cleanest sub district assessment report, the admin can immediately print the report. The following is a display of the interagency assessment report the cleanest sub-district in Tanggamus Regency.



Figure 3. Sub-district Assessment Results

5. Conclusion

Cleanest inter sub-district assessment system in Tanggamus Regency was designed using Context Diagrams, DFD (Data Flow Diagrams), ERD (Entity Relationship Diagrams), and flowcharts. Entities of this rating system are admin, alternative, criteria, value, comments, and head. The cleanest inter Sub-district assessment system is implemented using Notepad ++ and PHP. As a programming language and MySql for database implementation. Based on the results of calculations, this system provides the appropriate results. The implementation of the TOPSIS method can help in the decision making process of several alternatives that must be taken and the criteria to be considered in this decision making process. As a suggestion this system needs to be developed with other methods such as Fuzzy Multiple Criteria Decision Making, Weighted Products, and other methods.

Acknowledgement

The authors acknowledge Ho Chi Minh City Open University, Vietnam, for helping this research.

References

- [1]. Ambika, P., Ayshwarya, B., Nguyen, P. T., Hashim, W., Rinjani, F., Muslihudin, M., . . . Maselena, A. (2019). The best of village head performance: Simple additive weighting method. *International Journal of Recent Technology and Engineering*, 8(2 Special Issue 3), 1568-1572. doi:10.35940/ijrte.B1286.0782S319
- [2]. Andriyani, N., Likhitrungsilp, V., & Chovichien, V. (2006). A framework of knowledge acquisition systems for governmental agencies in public construction projects. Paper presented at the Real Structures: Bridges and Tall Buildings - Proceedings of the 10th East Asia-Pacific Conference on Structural Engineering and Construction, EASEC 2010.
- [3]. Ayshwarya, B., Firdiansah, F. A., Alfian, F. Y., Nguyen, P. T., Hashim, W., Shankar, K., . . . Maselena, A. (2019). The best land selection using simple additive weighting. *International Journal of Recent Technology and Engineering*, 8(2 Special Issue 3), 1520-1525. doi:10.35940/ijrte.B1278.0782S319
- [4]. Bahrami, N., Liu, S., Ponkratov, V. V., Nguyen, P. T., Maselena, A., & Berti, S. (2019). Novel load management for renewable generation sources/battery system through cut energy expenditure and generate revenue. *International Journal of Ambient Energy*. doi:10.1080/01430750.2019.1636868
- [5]. Fitriana, A., Nguyen, P. T., Rema Devi, S., Shankar, K., Abadi, S., Hashim, W., & Maselena, A. (2019). Decision support system of employee performance evaluation. *International Journal of Engineering and Advanced Technology*, 8(6 Special Issue 2), 1007-1012. doi:10.35940/ijeat.F1307.0886S219
- [6]. Handayani, T. N., Likhitrungsilp, V., & Yabuki, N. (2019). A building information modeling (BIM)-integrated system for evaluating the impact of change orders. *Engineering Journal*, 23(4), 67-90. doi:10.4186/ej.2019.23.4.67
- [7]. Huda, M., Hashim, A., Teh, K. S. M., Shankar, K., Ayshwarya, B., Nguyen, P. T., . . . Maselena, A. (2019). Learning quality innovation through integration of pedagogical skill and adaptive technology. *International Journal of Innovative Technology and Exploring Engineering*, 8(9

Special Issue 3), 1538-1541. doi:10.35940/ijitee.I3321.0789S319

[8]. Huynh, V. D. B., Van Nguyen, P., Nguyen, Q. H. T. T., & Nguyen, P. T. (2018). Application of Fuzzy Analytical Hierarchy Process based on Geometric Mean Method to prioritize social capital network indicators. *International Journal of Advanced Computer Science and Applications*, 9(12), 182-186. doi:10.14569/IJACSA.2018.091227

[9]. Ioannou, P. G., & Likhitrungsilp, V. (2005). Simulation of multiple-drift tunnel construction with limited resources. Paper presented at the Proceedings - Winter Simulation Conference.

[10]. Kokkaew, N., & Likhitrungsilp, V. (2018). Comparing Life Cycle Cost of Public and PPP Transportation Infrastructure in Thailand: An Empirical Evidence. Paper presented at the ICCREM 2018: Construction Enterprises and Project Management - Proceedings of the International Conference on Construction and Real Estate Management 2018.

[11]. Kumar, R., Ayshwarya, B., Muslihudin, M., Nguyen, P. T., Alfian, F. Y., Hashim, W., . . . Maselena, A. (2019). Into the furniture woods: Analytical hierarchy process method. *International Journal of Recent Technology and Engineering*, 8(2 Special Issue 3), 1562-1567. doi:10.35940/ijrte.B1285.0782S319

[12]. Likhitrungsilp, V., Handayani, T. N., Ioannou, P. G., & Yabuki, N. (2018). A BIM-enabled system for evaluating impacts of construction change orders. Paper presented at the Construction Research Congress 2018: Construction Information Technology - Selected Papers from the Construction Research Congress 2018.

[13]. Likhitrungsilp, V., & Harinthajinda, P. (2008). Assessment of contractors' risk response in tunneling projects. Paper presented at the EA-SEC-11 - Eleventh East Asia-Pacific Conference on Structural Engineering and Construction.

[14]. Likhitrungsilp, V., & Ioannou, P. G. (2004). Risk-sensitive decision support system for tunnel construction. Paper presented at the Geotechnical Special Publication.

[15]. Likhitrungsilp, V., & Ioannou, P. G. (2005). Economic assessment of site exploration programs using stochastic dynamic programming. Paper presented at the Construction Research Congress 2005: Broadening Perspectives - Proceedings of the Congress.

[16]. Likhitrungsilp, V., & Ioannou, P. G. (2009). Risk allocation in standard forms of general conditions for tunneling contracts. Paper presented at the Building a Sustainable Future - Proceedings of the 2009 Construction Research Congress.

- [17]. Likhitruangsilp, V., & Ioannou, P. G. (2012). Analysis of risk-response measures for tunneling projects. Paper presented at the Construction Research Congress 2012: Construction Challenges in a Flat World, Proceedings of the 2012 Construction Research Congress.
- [18]. Likhitruangsilp, V., Ioannou, P. G., & Leeladejkul, S. (2014). Mapping work process and information exchange of construction entities for BIM implementation: Case study of an academic institute. Paper presented at the Computing in Civil and Building Engineering - Proceedings of the 2014 International Conference on Computing in Civil and Building Engineering.
- [19]. Likhitruangsilp, V., Le, H. T. T., Yabuki, N., & Ioannou, P. G. (2019). Integrating building information modeling and visual programming for building life-cycle cost analysis. Paper presented at the ISEC 2019 - 10th International Structural Engineering and Construction Conference.
- [20]. Likhitruangsilp, V., & Praphansiri, K. (2010). Identifying risk factors in equipment procurement of power plant projects. Paper presented at the COBRA 2010 - Construction, Building and Real Estate Research Conference of the Royal Institution of Chartered Surveyors.
- [21]. Likhitruangsilp, V., & Prasitsom, A. (2008). Construction joint venture contracting. Paper presented at the COBRA 2008 - Construction and Building Research Conference of the Royal Institution of Chartered Surveyors.
- [22]. Likhitruangsilp, V., Putthividhya, W., & Ioannou, P. G. (2012). Conceptual framework of the Green Building Information Management System. Paper presented at the Construction Research Congress 2012: Construction Challenges in a Flat World, Proceedings of the 2012 Construction Research Congress.
- [23]. Likhitruangsilp, V., & Sarutirattanaworakun, R. (2006). Dynamic resource allocation for tunnel construction by discrete-event simulation. Paper presented at the Construction and Professional Practices - Proceedings of the 10th East Asia-Pacific Conference on Structural Engineering and Construction, EASEC 2010.
- [24]. Long, L. D., Tran, D. H., & Nguyen, P. T. (2019). Hybrid multiple objective evolutionary algorithms for optimising multi-mode time, cost and risk trade-off problem. *International Journal of Computer Applications in Technology*, 60(3), 203-214. doi:10.1504/IJCAT.2019.100299
- [25]. Luong, D. L., Tran, D. H., & Nguyen, P. T. (2018). Optimizing multi-mode time-cost-quality trade-off of construction project using op-

position multiple objective difference evolution. *International Journal of Construction Management*. doi:10.1080/15623599.2018.1526630

[26]. Mukhlis, H., Ayshwarya, B., Nguyen, P. T., Hashim, W., Hardono, Maesaroh, S., . . . Maselena, A. (2019). Boarding house selection using SAW method. *International Journal of Recent Technology and Engineering*, 8(2 Special Issue 3), 1500-1505. doi:10.35940/ijrte.B1275.0782S319

[27]. Muslihudin, M., Ayshwarya, B., Effendi, Yusufika, D., Pribadi, M. R., Susanto, F., . . . Vellyana, D. (2019). Application of weighted product method for determining home renovation assistance in Pringsewu district. *International Journal of Recent Technology and Engineering*, 8(2 Special issue 2), 385-391. doi:10.35940/ijrte.B1063.0782S219

[28]. Muslihudin, M., Trisnawati, Mukodimah, S., Hashim, W., Ayshwarya, B., Nguyen, P. T., . . . Maselena, A. (2019). Performance of saw and wp method in determining the feasibility of motorcycle engineering workshop for competency test of vocational high school student. *International Journal of Recent Technology and Engineering*, 8(2 Special Issue 2), 348-353.

[29]. Nguyen, P. T., Huynh, V. D. B., & Nguyen, Q. L. H. T. T. (2019). Using fuzzy analytical network process approach to develop job search success model of engineering graduates. *International Journal of Recent Technology and Engineering*, 8(1), 366-369.

[30]. Nguyen, P. T., & Likhitrungsilp, V. (2017). Identification risk factors affecting concession period length for public-private partnership infrastructure projects. *International Journal of Civil Engineering and Technology*, 8(6), 342-348.

[31]. Nguyen, P. T., Likhitrungsilp, V., & Onishi, M. (2018). Prioritizing factors affecting traffic volume of public-private partnership infrastructure projects. *International Journal of Engineering and Technology (UAE)*, 7(4), 2988-2991. doi:10.14419/ijet.v7i4.13357

[32]. Nguyen, P. T., Van Nguyen, P., To Nguyen, Q. L. H. T., & Huynh, V. D. B. (2016). Project success evaluation using TOPSIS algorithm. *Journal of Engineering and Applied Sciences*, 11(8), 1876-1879. doi:10.3923/jeasci.2016.1876.1879

[33]. Nguyen, P. T., Vo, K. D., Phan, P. T., Huynh, V. D. B., Nguyen, T. A., Cao, T. M., . . . Le, L. P. (2018). Construction project quality management using building information modeling 360 field. *International Journal of Advanced Computer Science and Applications*, 9(10), 228-233. doi:10.14569/IJACSA.2018.091028

[34]. Nguyen, P. T., Vu, N. B., Van Nguyen, L., Le, L. P., & Vo, K. D.

(2019). The Application of Fuzzy Analytic Hierarchy Process (F-AHP) in Engineering Project Management. Paper presented at the 2018 IEEE 5th International Conference on Engineering Technologies and Applied Sciences, ICETAS 2018.

[35]. Nguyen, P. V., Nguyen, P. T., Nguyen, Q. L. H. T. T., & Huynh, V. D. B. (2019). Extended fuzzy analytical hierarchy process approach in determinants of employees' competencies in the fourth industrial revolution. *International Journal of Advanced Computer Science and Applications*, 10(4), 150-154.

[36]. Nguyen, T. A., Nguyen, P. T., & Peansupap, V. (2015). Explaining model for supervisor's behavior on safety action based on their perceptions. *ARNP Journal of Engineering and Applied Sciences*, 10(20), 9562-9572.

[37]. Pham, C. P., Nguyen, P. T., Vo, K. D., Phan, P. T., Huynh, V. D. B., & Nguyen, Q. L. H. T. T. (2019). Fuzzy logic with engineering application of housing construction licensing service quality. *International Journal of Recent Technology and Engineering*, 8(1), 361-365.

[38]. Phong, N. T., Likhitrungsilp, V., & Onishi, M. (2017). Developing a stochastic traffic volume prediction model for public-private partnership projects. Paper presented at the AIP Conference Proceedings.

[39]. Phong, N. T., & Quyen, N. L. H. T. T. (2017). Application fuzzy multi-attribute decision analysis method to prioritize project success criteria. Paper presented at the AIP Conference Proceedings.

[40]. Phong, T. N., Phuc, V. N., & Quyen, T. T. H. L. N. (2017) Application of fuzzy analytic network process and TOPSIS method for material supplier selection. In: Vol. 728. *Key Engineering Materials* (pp. 411-415).

[41]. Prasitsom, A., & Likhitrungsilp, V. (2012). Design of administrative structures for construction joint ventures. Paper presented at the Joint Ventures in Construction 2: Contract, Governance, Performance and Risk.

[42]. Rusliyadi, M., Kumalasari, R. T., Nguyen, P. T., Hashim, W., & Maseleno, A. (2019). Potential *Jatropha curcas* (*Jatropha curcas* L.) germplasm by exploration in gorontalo province Indonesia. *International Journal of Recent Technology and Engineering*, 8(2 Special Issue 3), 1617-1624. doi:10.35940/ijrte.B1295.0782S319

[43]. Suyatno, Nguyen, P. T., Dinesh Kumar, A., Pandi Selvam, R., & Shankar, K. (2019). Examination of information system design for student's scoring processing. *International Journal of Engineering and Advanced Technology*, 8(6 Special Issue 2), 1143-1147. doi:10.35940/ijeat.F1312.0886S219

- [44]. Sy, D. T., Likhitrungsilp, V., Onishi, M., & Nguyen, P. (2017). Different perceptions of concern factors for strategic investment of the private sector in public-private partnership transportation projects. *ASEAN Engineering Journal*, 7(2), 66-86.
- [45]. Sy, D. T., Likhitrungsilp, V., Onishi, M., & Nguyen, P. T. (2017). Impacts of risk factors on the performance of public-private partnership transportation projects in Vietnam. *ASEAN Engineering Journal*, 7(2), 30-52.
- [46]. Van Nguyen, P., Nguyen, P. T., Huynh, V. D. B., & Nguyen, Q. L. H. T. T. (2017). Critical factors affecting the happiness: A Vietnamese perspective. *International Journal of Economic Research*, 14(4), 145-152.
- [47]. Van Nguyen, P., Nguyen, P. T., Nguyen, Q. L. H. T. T., & Huynh, V. D. B. (2016). Calculating weights of social capital index using analytic hierarchy process. *International Journal of Economics and Financial Issues*, 6(3), 1189-1193.
- [48]. Vo, K. D., Nguyen, P. T., Pham, C. P., Huynh, V. D. B., Nguyen, Q. L. H. T. T., Vu, N. B., & Le, L. P. (2019). Measuring individual job performance of project managers using fuzzy extended analytic method. *International Journal of Recent Technology and Engineering*, 8(2 Special Issue), 86-90. doi:10.35940/ijrte.a1379.078219
- [49]. Wahyudi, A., Zulela, Marini, A., Choirudin, Ayshwarya, B., Nguyen, P. T., & Shankar, K. (2019). Government policy in realizing basic education metro. *International Journal of Innovative Technology and Exploring Engineering*, 8(9 Special Issue 3), 113-116.
- [50]. Yunita, D., Ayshwarya, B., Ridhawati, E., Huda, M., Hashim, A., Teh, K. S. M., . . . Maselena, A. (2019). Application of analytical hierarchy process method in laptop selection. *International Journal of Recent Technology and Engineering*, 8(2 Special Issue 3), 1603-1607. doi:10.35940/ijrte.B1291.0782S319



**UNIVERSIDAD
DEL ZULIA**

opción

Revista de Ciencias Humanas y Sociales

Año 35, Especial N° 19, 2019

Esta revista fue editada en formato digital por el personal de la Oficina de Publicaciones Científicas de la Facultad Experimental de Ciencias, Universidad del Zulia.
Maracaibo - Venezuela

www.luz.edu.ve

www.serbi.luz.edu.ve

produccioncientifica.luz.edu.ve