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Conference Proceedings

**INTERNATIONAL BUSINESS ECONOMIC TOURISM SCIENCES TECHNOLOGY
HUMANITIES SOCIAL SCIENCES AND EDUCATION RESEARCH CONFERENCE**

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INTRODUCTION

We would like to welcome our colleagues to the International Business Tourism Transport Technology Social Sciences Humanities Education Research Conference. It is the seven series in 2016 of Conference on Business Tourism and Apply Sciences was held in Amsterdam. As always many members of the ICBTS 2016 community look forward to meeting, sharing and exchanging their research ideas and results in both a formal and informal setting which the conference provides. Likewise, the concept of alternating the international conference every one month on April to November between Europe and the rest of the world is now well established. This year's event in London (UK) Paris (France) Munich (Germany) Amsterdam (Netherlands) Boston (USA) Toronto (Canada) London (United Kingdom) Zurich (Switzerland) Berlin (Germany) Tokyo (Japan) and another continues with the cultural following the very successful and productive event held in London-Zurich in August 2016 in the field of various types for international academic research conference on Business Economics Social Sciences Humanities Education and Apply Sciences. As usual The ICBTS 2016 brings together leading academics, researchers and practitioners to exchange ideas, views and the latest research in the field of Business Tourism and Apply Sciences.

The theme of this event The 2016 ICBTS International Business Tourism Social Sciences Humanities and Education Research Conference is "Opportunities and Development of Global Business Economics Social Sciences Humanities and Education" It is also represents an emerging and highly challenging area of research and practice for both academics and practitioners a like, The current industrial context is characterized by increasing global competition, decreasing product life cycles, Global Business, Tourism Development, Social Sciences Humanities Education Apply Sciences and Technology collaborative networked organizations, higher levels of uncertainties and, above all, and customers. In our view holding this event in Tokyo represents a timely opportunity for academics and researchers to explore pertinent issues surrounding Business Economics Tourism Social Sciences Humanities Education Sciences and Technology.

Potential authors were invited to submit an abstract to the International Conference Session Chairs. All abstracts were reviewed by two experts from the International review committee and final papers were further reviewed by this volume with 30 contributing authors coming from 18 countries. This book of proceedings has been organized according to following categories:

- Business
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TOPSIS METHOD TO SELECT LOCATION OF GRASS FLOWER IN WAREHOUSE

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ABSTRACT

The goal of this paper is to study the location selection of warehouse of grass in Chiang Rai province using multiple criteria decision making (MCDM) which is technique for order preference by similarity to ideal solution (TOPSIS) for location selection of warehouse of grass in Chiang Rai Province. The grass flowers entrepreneur is imperative build the warehouse of grass and increase the customer satisfaction. For location selection, the seven criteria were used as follows; size of property, property cost, labor cost, public utility, mode of transportation, ability to access of location and distance from supplier. In this paper, using conjunctive constrain method to screen the alternative. There're 5 locations in 4 district Mae Jan district, Mae Sai district, Chiang Saen district and Chiang Khong district were used to selection. The decision making of location selection was made by Technique for Order Preference by Similarity to Ideal Solution (TOPSIS). As a result, Tambon Pa Sang Mae Chan district is appropriate location for warehouse of grass flower in Chiang Rai province.

Keywords: Warehouse, Topsis, Chiang Rai, Grass Flower

INTRODUCTION

Regarding the necessity of the inventory, entrepreneurs may not want the much inventory in the stock because of the economic liquidity and the cost of the organization. But, in terms of inefficient logistic management and range and duration of transportation management, there will have the space of time condition. If the distance is longer, there will take longer time for transportation, as well as higher cost of transportation. That are causes to have the inventories to reduce the cost, and the warehouse is also important to store the inventories.

Brooms are important to clean the house and the life of broom may not long, so the demand is also high continually. Form the demand, the production and income of brooms are also high. This is the new business to earn more money for the villages in Northern and Northeastern Thailand. The supporting evidences show that there are more brooms producers. Also, the producing of the broom will use many elements, especially grass which is the main elements of the brooms. The grass will be collected only in one season from November to March. During this period, the grass will be cheaper. The entrepreneur has to store the grass for further demand all year. There is more demand in the market each year and the entrepreneur has to buy the grass at a higher cost because of higher demand. From the mentioned problem, the entrepreneur needs to find the new appropriate location to store the grass in Chiang Rai Province to increase the capacity of the storage and reduce logistic cost.

Therefore, the location is very important to pay attention to the distance to the sources of production, the size of the area, land's price, the cost of wage, along with the pattern of transportation. All of these are factors of the new chosen location to set the warehouse to save the logistic cost. That means if the location is not appropriate, there will be following problems such as the logistic cost may be higher because of farther distance from sources of production and market. Moreover, there will be insufficient quality labors, elements or materials, along with other necessary factors. Generally, the location has no dominant advantage than

other areas. Only the best properties of the land towards the business will be paid attention for the least effect in the future. Generally, the efficient location for the business should be spent the cost of production and service as least as possible. Thus, many factors will be involved to choose the location of the business because the location is very important to the business of the organization such as transportation planning, investment, and income, etc. (Sudathip Tuntinikulchai and Sakda Hongthong, 2004).

LITERATURE & THEORY

In order to derive germane support for this study, as well as to place it in context of the existing research, some relevant former reviews related to TOPSIS method are summarized in this section.

The criteria to choose the location for the warehouse to gain the information for the study. The involving researches are started from Multi Criteria Decision Making. It is one of the popular criteria to choose to evaluate and analyze in various patterns such as (Kengpol, 2004) who adapted the AHP technique to create the model of transportation problems and analyze the investment to choose the warehouse. He compared 2 locations in Bangkok under the transportation legal regulation. (Thiengburanathum, et al., 2006)'s research who adapted AHP technique to evaluate the transportation route from Kunming, China to Bangkok. This criteria could indicate the significances of the importance of route in term of being the new route linked between Kunming, Yunnan Precinct and Bangkok, Thailand. Rather than AHP technique, there are many criteria from other researches which is the major decision. For example (Milan and Aura, 2002)'s research who adapted the 3 multi criteria decision making about the new center of air traffic of European Union, assigned to administrate the air traffic transportation business. All of 3 criteria decision making are SAW (Simple Additive Weighting Method), TOPSIS (Technique for Order Preference by Similarity to Ideal Solution), and AHP (Analytic Hierarchy Process). These criteria are a part of basic decision of alternative airlines. The used criteria will determine the proficient of the alternative airport, directly affected to choose or further consider the appropriate area. The results are found in many researches with Multi Criteria Decision Making techniques. For example (Nanthakarn Konthongkhum, 2006)'s research who use the ordinal analysis technique to choose the tertiary logistic services. (Patcheree Nimsrikul, 2009)'s research was mentioned in the literature review of capacity evaluation and logistical capacity development index, also used 4 multi criteria decision making such as TOPSIS, ELECTRE, PROMETHEE, and AHP to choose the destination province of the center logistic of product transportation from the North-South economic corridor and East-West economic corridor regarding to the route of Asian Development Bank (ADB). As well as (Ozcan T, et al., 2011)'s research, studied about the criteria to choose the area for warehouse by comparing the criteria of multi criteria decision making. The used criteria were AHP, TOPSIS, ELECTRE, and Grey. In the first procedure, the results from each theory were compared. After that, the locations were chosen by the criteria of AHP, TOPSIS, ELECTRE, and Grey. The best result was chosen. (Demirel T, et al., (2010)'s research studied about the location for products warehouse. The focused criteria are cost, labors, fundamental structure, and marketing. The weight of each criteria was set by researcher. When the data was analyzed by Fuzzy ANP technique, the location was finally chosen. Moreover, in many researches, multi criteria decision making were used to choose the location. For example (Chou Y. S, et al., 2008)'s research had used the fuzzy technique to choose the appropriate location. From the literature review, the multi criteria decision making can be adapted variously. So, the researcher would like to use the multi criteria decision making to choose the location of warehouse of grass in Chiang Rai Province.

METHODOLOGY

This research is the adaptation of the multiple criteria decision making to choose the warehouse of grass in Chiang Rai Province. Chiang Rai province is the appropriate strategic province to set the warehouse. There are many resources in each year, and there is on the important economic route to export the products

to nearby countries. If the warehouse is set in Chiang Rai Province, it will be convenient to transport the grass to other provinces in Northern Thailand all years and there will be the storage of the materials from nearby countries. There will be the logistics efficiency of the location. There may be more than one appropriate location so the multi criteria decision making will be the assistance to choose the best location of the warehouse as indicated below. TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) TOPSIS, developed by Hwang and Yoon in 1981, is a simple ranking method in conception and application. The standard TOPSIS method attempts to choose alternatives that simultaneously have the shortest distance from the positive ideal solution and the farthest distance from the negative-ideal solution. The positive ideal solution maximizes the benefit criteria and minimizes the cost criteria, whereas the negative ideal solution maximizes the cost criteria and minimizes the benefit criteria. TOPSIS makes full use of attribute information, provides a cardinal ranking of alternatives, and does not require attribute preferences to be independent (Chen and Hwang, 1992; Yoon & Hwang, 1995). To apply this technique, attribute values must be numeric, monotonically increasing or decreasing, and have commensurable units.

TOPSIS method to the location selection warehouse of grass in Chiang Rai province. TOPSIS is a multiple criteria decision making methodology (MCDM) which determines solution alternatives from a finite set in the basis of maximizing the distance from the negative ideal point and minimizing the distance from the positive ideal point. (Olson, 2004) TOPSIS is interesting with its need for decision maker's limited number of subjective input. Only subjective input is in the criteria weighting phase. The model algorithms steps of TOPSIS (Olson, 2004) and its practice in the case study is as follows

Step 1: Construct normalized decision matrix

$$R_{ij} = \frac{X_{ij}}{\left(\sum_{i=1}^M X_{ij}^2\right)^{\frac{1}{2}}}, \quad i = 1, 2, 3, \dots, m, j = 1, 2, 3, \dots, n \quad (1)$$

Where X_{ij} and R_{ij} are original and normalized score of decision matrix, respectively.

Step 2: Construct the weights normalized decision matrix

$$V|V_{ij}| = |w_i * r_{ij}|, \quad i = 1, 2, 3, \dots, m, j = 1, 2, 3, \dots, n \quad (2)$$

Where W_j is the weight for j and $\sum_j W_j = 1$

Step 3: Determine the positive ideal and negative ideal solutions

$$V^+ = \{v_1^+, \dots, v_n^+\} = \{(\max v_{ij}, i \in I), (\min v_{ij}, i \in I)\} \quad (3)$$

$$V^- = \{v_1^-, \dots, v_n^-\} = \{(\max v_{ij}, i \in I), (\min v_{ij}, i \in I)\} \quad (4)$$

Step 4: Calculate the separation measures for each alternative. The separation form positive ideal alternative is:

$$S_i^* = \sqrt{\sum_j^m (v_{Aj} - v_j^*)^2}, \quad j = 1, 2, 3, \dots, n, \quad (5)$$

Similarly, the separation form negative ideal alternative is:

$$S_i^- = \sqrt{\sum_j^m (v_{Aj} - v_j^-)^2} \quad , j = 1, 2, 3, \dots, n, \quad (6)$$

Step 5: Calculate the relative closeness to the ideal solution V_i^- V_i^+

$$C_i = \frac{S_i^-}{(S_i^* + S_i^-)} \quad , i = 1, 2, 3, \dots, m \quad (7)$$

Where $C_i^* = 0 \leq C_i^* \leq 1$ Where $C_i^* = 0$ When $V_i^- = V_i^+$

And $C_i^* = 1$ When $V_i^- = V_i^*$

Select the Alternative with C_i^* closest to 1

RESULTS

The results stated that the criteria are depended on the appropriate to the research's objectives. So, the appropriate criteria were synthesized from the involving researches' reviews. Moreover, the proper criteria were set by considering from the possible choices to choose the warehouse of grass in Chiang Rai Province. From the reviews of involving literatures and the evaluation of the location's surroundings, there are 7 criteria were set to choose the location covered all concerns as below. Size of property (X1), Property cost (X2), Labor cost (X3), Public utility (X4), Mode of transportation(X5), Ability to access of Location (X6) and, Distance from supplier (X7)

The basic of criteria for the location of warehouse of grass in Chiang Rai Province is Conjunctive constrain method. The filtering factors are as below.

1. It must less than 50 kilometers far from material source.
2. It must be located on main transport routes.
3. It has main road linking the area.

From the initial screening by the above constrained conditions, the choices were cut into 5 districts, including.

1. Tambon Krung Mae Chan Chiang Khong District (A1)
2. Tambon Sri Don Chai Chiang Khong District (A2)
3. Tambon Ban Saew Chiang Saen District (A3)
4. Tambon Mae Chan Mae Chan District (A4)
5. Tambon Pa Sang Mae Chan District (A5)

When the TOPSIS adjust the weight to a standard, it will calculate the weight factor by multiplying the available information to make a smooth adjustment to the weighting normalize and identifying positive ways. And negative by calculating \square_{\square}^* and \square_{\square}^- of the numerical consideration the weight for this study using the Ratio Weighting, which is the weight of the value Geometric Mean of each factor. In order to apply for the \square_{\square}^* \square_{\square}^- and \square_{\square}^*

Table 1
Result of weighting normalize and identifying positive ways. And negative

Criteria	A1	A2	A3	A4	A5	\square^*	\square^-
X1	0.0787	0.0525	0.0899	0.0630	0.1049	0.1049	0.0525
X2	0.0804	0.0764	0.0402	0.0402	0.0563	0.0804	0.0402
X3	0.0316	0.0316	0.0190	0.0253	0.0316	0.0316	0.0190
X4	0.0365	0.0365	0.0122	0.0243	0.0243	0.0365	0.0122
X5	0.0145	0.0435	0.0145	0.0290	0.0290	0.0435	0.0145
X6	0.0199	0.0199	0.0133	0.0199	0.0199	0.0199	0.0133
X7	0.0169	0.0169	0.0169	0.0084	0.0084	0.0169	0.0084

Table 2
Results of TOPSIS show that \square^* \square^- and \square^* and rank of results

Alternative	\square^*	Rank	\square^-	Rank	\square^*	Rank
A1	0.0580	2	0.0657	3	0.5312	2
A2	0.0649	3	0.0695	2	0.5174	3
A3	0.0939	5	0.0390	5	0.2936	5
A4	0.0715	4	0.0590	4	0.4519	4
A5	0.0356	1	0.0886	1	0.7134	1

From the result of TOPSIS method to choose the location of the warehouse of grass in Chiang Rai Province through the 7 criteria, the results stated that Tambon Pa Sang Mae Chan District (A5) is the interesting place to be the location of the warehouse. The runner-up district is Tambon Krung Mae Chan Chiang Khong District (A1), Tambon Sri Don Chai Chiang Khong District (A2), Tambon Mae Chan Mae Chan District (A4) and Tambon Ban Saew Chiang Saen District (A3) respectively.

CONCLUSION AND FUTURE WORK

This paper provides a structured overview of the location selection of warehouse of grass in Chiang Rai province using multiple criteria decision making (MCDM) which is technique for order preference by similarity to ideal solution (TOPSIS) procedure, consisting of 7 criteria; the size of area, the land's price, the cost of wage, public utility, transportation, the ability to reach the area, and the distance from the raw materials. From the analysis, the results stated that the appropriate location to be the warehouse of grass in Chiang Rai Province is tam bon Pa Sang Mae Chan district which the location is appropriate to the needs of entrepreneurs. It is also land prices are not too high, transport facilities adjacent to major transportation routes R3A, easily accessible entrance is quite wide and it is not far from the source material. The selected location Storage of grass in Chiang Rai is the factor in selecting all seven factors. For the further researches, researcher would like to recommend to use the various criteria such as AHP SAW, and WPA to compare the results to the results of TOPSIS. The Fuzzy Theory have to use to analyze, too.

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