Determining The Location Detection on Several Sectors to Support The Business Center: Literature Review

Marita Prasetyani[1*], *R. Rizal* Isnanto[2], and *Isnaini* Rosyida[3]

[1]Doctoral Program of Information System, Diponegoro University, Semarang, Indonesia
[2]Department of Computer Engineering, Diponegoro University, Semarang, Indonesia
[3]Department of Mathematics, Semarang State University, Semarang, Indonesia

Abstract. Determining a business location is an important aspect in making strategic decisions in various business sectors. In this review, we analyze the location determination of some sectors and the method used, with emphasis on the weighting used in the research reviewed. We collect and review relevant journal articles for different sectors, including business, construction, energy, environment, health, hotel, industry, logistics, military, and transportation. Further, we analyze the methods used in decision-making and provide a better understanding of preferences and relevant criteria and focusing on the weightings applied involves the process of assigning relative weights to the factors that are relevant in determining locations. Most of the sectors in the location determination research are in the Energy sector, and the method used is mostly MCDM with Objective weighting. GIS is used to map geographic data and consider topographical factors, and distances. By leveraging this information, organizations can make more informed, effective, and preference-based location decisions.

1 Introduction

Business is a type of activity and effort to make a profit by providing the goods and services needed for the economic system [1]. The geographical location of a business has an influence on the economic production system because it will affect operating costs. Determinants of business location include community environment, human resources, markets that have many consumers, availability of raw materials, transportation, land for expansion, nature, culture, government regulations, taxes, smooth running of water, and electricity. The selection of alternative locations should consider of costs incurred and the level of profit to be obtained [2]. According to [3–5], the first the factor that is taken into consideration in choosing a location for the first business is the rate of population growth. The second is transportation. Ease of access to transportation will increase the number of visitors to business locations, for example, due to proximity to train stations, bus stations, and other public transportation.

* Corresponding author: marita.prasetyani@gmail.com

Another important part of establishing a business activity center is to give a rank of the locations that have been selected. The ranking of the selected locations is usually categorized as a problem of Multi-Criteria decision-making (MCDM) and is considered a systematic approach in addressing both quantitative and qualitative factors [6]. EK Zavadskas, since 1976 has continued to work on the development and improvement of the method of MCDM [7]. The site selection process requires identification, analysis, choice between alternatives, and evaluation, which are influenced by many qualitative and quantitative criteria or parameters [8–10]. It can be said that site selection represents a Multi-criteria decision-making (MCDM) problem [9,10] and provides collection of algorithms to determine the best choice [11]. and provides a collection of algorithms to determine the best choice [11].
MCDM can be categorized into two distinct branches, Multi- objective Decision -making (MODM) and multi-attribute decision -making (MADM) [12]. The evaluation process using the MCDM approach has four steps: defining alternatives and criteria related to the problem, determining the weight of each measure, assigning individual performance to each option on each measure, and evaluating alternatives based on the aggregate performance of all criteria [13,14].
A literature review of the methods of MCDM is an important component of this research process because it will help make the best choice for the location of the business center. The literature reviews help us broaden understanding, build basic theories, prevent duplication and errors, identify the need for further research, and support research validity.
The rest of the paper is organized as follows: in section 2, show the method used in this paper. Section 3 is about paying for locations by sector, method, and weights used. Finally, conclusions are presented in section 4.

2 The Review's Method

The literature review is an approach used in research to collect, study, and analyze relevant literature in a particular field. The method used involves searching, selecting, and synthesizing published literature sources, such as journal articles, books, theses, and research reports. Setting objectives, developing research questions, conducting a literature search, selecting literature, analyzing literature, synthesizing literature, conducting a literature review, citing and referring are all steps taken.
The search process to get as many publications as possible was carried out from 2019-2023 in reputable journals such as Scopus, Science Direct, and IEEE. Search based on appropriate keywords such as "Business Location, Location Planning, Site Selection, and Location Selection". The number of articles that were obtained were 4.645 articles.

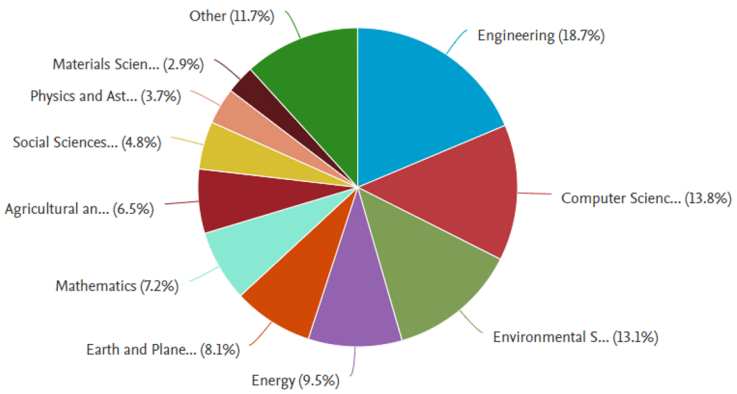

Fig. 1. Literature Document By Subject Area (2019-2023).

The data is filtered using the following query:
TITLE-ABS-KEY ((("Business Location") OR ("Location Planning") OR ("Site Selection") OR ("Location Selection"))) AND LIMIT-TO (PUBYEAR , 2023) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019)) AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "cp")).

Literature documents regarding location determination in 2019–2023 are based on the most subject areas regarding engineering, computer science, and the environment.

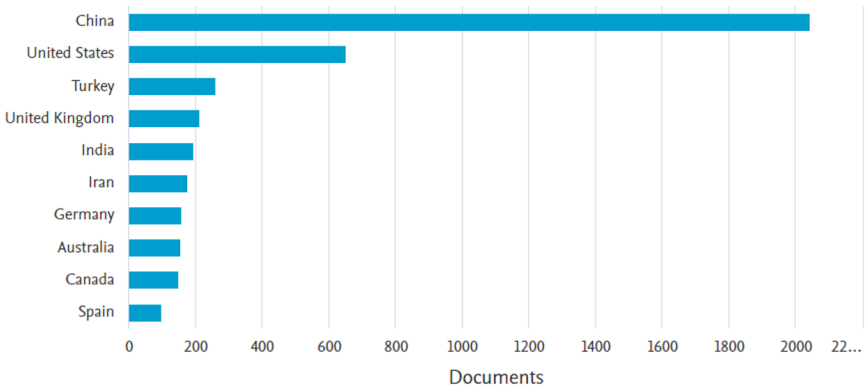

Fig. 2. Literature Document By Country (2019-2023).

Literature documents regarding location determination in 2019–2023 based on the largest number of countries in China.

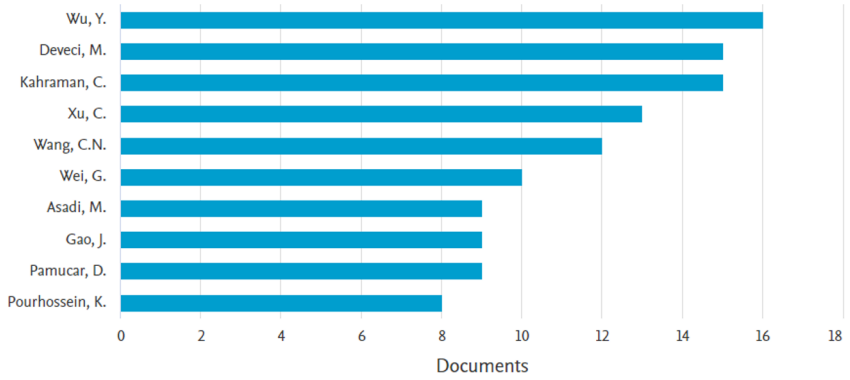

Fig. 3. Literature Document By Author (2019-2023).

Literature documents regarding location determination in 2019–2023 based on Authors are mostly done by Wu, Y.

3 Result and Analysis

Equations VOSviewer is a versatile application widely used in the field of bibliometrics and scientometrics for analyzing and visualizing bibliographic data. Cluster analysis in VOSviewer provides insights into the structure and organization of scientific disciplines.

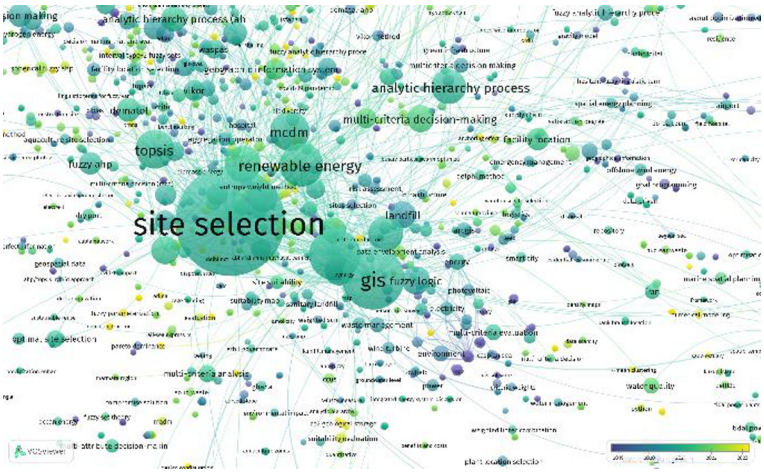

Fig. 4. The Topics of Research and Maps.

Figure 4 shows the topic of regional research and mapping with a search for publications related to determining business locations, the data is filtered using the following query: TITLE-ABS-KEY ((("Business Location") OR ("Location Planning") OR ("Site Selection") OR ("Location Selection"))). The name of the journal and the number of articles that were obtained were 65 articles.

Table 1. Journal name and articles in literature.

Jurnal	Amount	Jurnal	Amount
Environmental Science and Pollution Research	4	IEEE Xplore	1
Applied Soft Computing Journal	2	Informatica	1
Energy	2	International Journal of Industrial and Systems Engineering	1
Energy Strategy Reviews	2	ISIE	1
Expert Systems with Applications	2	Journal of Civil Engineering and Management	1
Information Sciences	2	Journal of Cleaner Production	1
Internatioanl Journal of Hydrogen Energy	2	Journal of Environmental Sciences	1
International Journal of Strategic Property Management	2	Journal of Transport Geography	1
Procedia Engineering	2	Jurnal Manajemen Industri dan Logistik	1
Renewable and Sustainable Energy Reviews	2	Land Use Policy	1
Scientific Reports	2	Measurement	1

Sustainable Cities and Society	2	Ocean & Coastal Management	1
Arabian Journal of Geosciences	1	Operational Research in Engineering Sciences: Theory and Applications	1
Artifcial Intelligence Review	1	Renewable Energy	1
Axioms	1	Reports in Mechanical Engineering	1
DASA	1	SN Applied Sciences	1
Decision Making: Applications in Management and Engineering	1	Socio-Economic Planning Sciences	1
Decision Science Letters	1	Sustainability	1
Desalination	1	Sustainable Energy Technologies and Assessments	1
Economic Research-Ekonomska Istrazivanja	1	The Asian Journal of Shipping and Logistics	1
Energy Policy	1	Transport	1
Engineering Management in Production and Services	1	Transportation Engineering	1
Euro-Mediterranean Journal for Environmental Integration	1	Transportation Research Part D	1
GeoJournal	1	Transportation Research Part E	1
Hydrogen Energy	1	Transportation Research Procedia	1

Table 1 provides an overview of a few relevant journals in a variety of research fields, including environmental science, soft computing, energy, industrial systems, energy policy, transportation, and many more. In conducting a literature review, it is important to involve these various journals to gain a comprehensive understanding of the research topics.
The articles used in this study include several focus areas of research. First, what sectors are related to the problem on location determination. Second, how are the methods used in determining the locations. Third weightings in decision making from each criterion used.

Table 2. Location determination method and sector

Topic / Sector	Method
Business	ANA, VL, MCD, and LPAA [15]; Approximation Algorithms [16]; (ANA), mixed multinomial logit model with ANA [17]; Machine Learning [18]; K- Means [19].
Construction	COPRAS [20]; SWARA, COPRAS [21]; TOPSIS, SAW, ELECTRE-1, MOORA, GRA [22]; CFA, MACBETH, PROMETHEE [23]; WASPAS [24]; Fuzzy CODAS [25]; Analytical quantitative approach[26] ; FUCOM, MABAC [27]; GIS, AHP[28] .

Energy	Fuzzy Entropy [29]; SAW, TOPSIS, COPRAS [30]; Fuzzy ANP, Fuzzy ELECTRE, Fuzzy DEMATEL [31]; PROMETHEE IV [32]; DEMATEL, ANP, MABAC [33]; Fuzzy AHP [34]; WASPAS, TOPSIS [35]; AHP [36]; AHP, MOORA [37]; AHP & TOPSIS [38]; classification and conceptual models [39]; a selection methodology & A common-sense method [40]; IAHP & VIKOR [41]; MCLP [42]; GIS & AHP [43]; FVIKOR and FMCDM [44]; AHP [45]; GRA and CRITIC [46]; FANP, TOPSIS[47] ; AHP[48] ; ANP, EWM, and OWA[49] ; GIS and Intuitionistic Fuzzy [50] ; AHP, Fuzzy VIKOR[51] ; GIS, AHP, TOPSIS [52].
Environment	fuzzy logic , AHP, and WLC [53]; WLC, OWA, AHP, Fuzzy AHP, TODIM, Fuzzy TODIM, ANP [54]; FAHP-SVM, FAHP-RF, Machine learning [55]; FMCDM, AHP, FTOPSIS, GIS [56]; GIS [57].
Health	AHP, RAFSI [58]; BWM & G-MARCOS [59].
Hotel	SWARA, WS PLP [60]; BWM, WASPAS [61].
Industry	AHP [62]; MODA & MADA [63]; SF-AHP and CoCoSo [64].
Logistics	Electra III/IV [65]; Fuzzy DEMATEL, Fuzzy ANP, Fuzzy VIKOR [66]; Hesitant AHP, GRA [67]; P-Median [68]; R-FUCOM & R- CoCoSo [69]; TOPSIS [6]; SWARA II, MEREC, WASPAS [70]; SVCNSs , TOPSIS [71]; AHP & CODAS [72]; MAGDM [73]; BWM, EDAS [74]; IVIF DEMATEL [75]; AHP, WASPAS [76].
Military	AHP, PROMETHEE, VIKOR[77]
Transportation	Artificial intelligence (AI)[78]

Various methods used in determining the location for each sector are presented in Table 2. This analysis can help in understanding the approach used in determining the location of various sectors. Reviews of relevant journal articles for various sectors, including business, construction, energy, environment, health, hotel, industry, logistics, military, and transportation. Most of the sectors in the location determination research are in the Energy sector, and the method used is mostly MCDM.

Table 3. The articles related to determination of the locations of various sectors during 2019-2023.

Author's	**Weighting**		**Method**		**GIS**	**GIS aspect**
	Subjective	**Objective**	**MCDM**	**Non MCDM**		
Yildiz and Tuysüz [67]; Popovic et al. [60]; Zolfani et al. [61]; Karasan et al. [25]; Božanic et al. [27]; Yazdani et al.[69]; Moradi et al. [45]; Chien et al. [47]; Quynh et al. [71]; Tadic et al. [72]; Rezaeisabzevar et al. [54]; Özmen & Aydoğan [74]; Slave et al. [75]; Zarin et al. [53]; kieu et al. [64]; Keshavarz-Ghorabaee [79]; Gao et al. [49]; Alossta et al.[58]		√	√			

Messaoudi et al. [48]; Xu et al. [41]; Turk et al. [50]; (Saha & Roy [28]; Mohsin et al. [55]		√	√		√	Topography, Distance
Solangi et al. [51]; Mihajlovic et al. [76]; (Liu & Li[73]			√			
Alaskar et al. [19]; Balbontin and Hensheer ; [15]_ (Fadhil et al. [68]; Wei et al. [46]; (Zeng *et al.* [16]; Balbontin and Hensher [17]; Iyer [78]; Kellner and Schroder [18]				√		
Diaz and Guedes Soares 2020) [40]; Zafar, Bayram, and Bayhan 2021) [42]; Wu, 2021) [57]; AlFanatseh & Sababhi, 2023)[26]				√	√	Topography, Point location, Distance
Ocampo et al., 2020 [6]; Rezaei *et al.* 2021[44]	√		√			
Spyridonidou & Vagiona , 2020) [52]; Ali et al. , 2021[56]; Hossein Dehshiri and Hosseini dehshiri 2022 [43]	√				√	Topography, Distance
Torkaish et al. 2021 [59]	√		√		√	Topography

In Table 3, we present various methods of MCDM (Multi- Criteria Decision Making) and Non-MCDM) in determining the locations of diverse sectors during 2019-2023. The weighting method is carried out (subjectively, objectively) to measure and compare the relevant criteria in determining the location. Several studies used the Geographic Information System (GIS) to determine the locations. GIS is used to map geographic data and takes topography, distance, and other GIS aspects into account in the decision-making process.

4 Conclusions

Determining the location is a critical step in making strategic decisions in various sectors. Most of the sectors in the location determination research are in the Energy sector, and the method used is mostly MCDM with Objective weighting. GIS is used to map geographic data and consider topographical factors, and distances. This study provides valuable insights for practitioners and researchers in understanding the methods that can be used in determining the location by sector, as well as the importance of weighting in the decision-making. Good location decisions are based on a good understanding of preferences and relevant criteria within each sector. By considering the appropriate methods and applying the proper weighting, organizations can make more informed and effective location decisions. Technology and innovation: Technological advances provide new opportunities in

determining business locations so that they can help identify patterns and trends that are relevant for selecting optimal business locations.

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