An Overview of Bibliometric Indices and Keyword Classification in Shift Scheduling

Ezzah Suraya Sarudin, Wan Noor Hayatie Wan Abdul Aziz, Syadatul Syaeda Mat Saleh, Roslah Arsad

College of Computing, Informatics and Media, Universiti Teknologi MARA, Perak Branch, Tapah Campus, 35400 Tapah Road, Perak, MALAYSIA.
Corresponding Author Email: ezzahsuraya@uitm.edu.my

Abstract
Bibliometric analysis is an important method for evaluating the impact and productivity of scholarly literature. Therefore, this research aims to conduct a bibliometric analysis and a visual analysis to analyze the previous publications about shift scheduling in Google Scholar. This study will use Publish and Perish (PoP) to retrieve all related publications from Google Scholar and then visualize the results in VOSviewer software. Initially, there are about 600 articles that are retrieved from Google Scholar, which were published in the years of 2018–2023. After the screening process, only 297 articles will proceed to categorize and visualize the related matrices in VOSviewer software. With help from VOSviewer, there are 11 keywords that successfully clustered in 3 categories which sort by using the cooccurrences of the terms in the 297 chosen publications. In addition to the occurrence of keywords used, popular journals, and publishers that have published articles related to shift scheduling were also investigated in this study. The result of this study can help researchers identify keywords, top journals, and publishers, which will assist in making decisions about research strategies and collaborations.
Keywords: Bibliometric Analysis, Matrices, Shift Scheduling, Publish and Perish, Vosviewer

Introduction
In numerous organizations, staff scheduling or workforce scheduling is a crucial component of human resource management. Van den Bergh et al (2013) stated that staff scheduling can be divided into three main parts. There are including shift scheduling, a day off schedule, and tour scheduling. Shift scheduling describes the process of giving employees work schedules that ensure a sufficient amount of work hours while minimizing the negative impact of shift work on employee health and well-being. Manufacturing, transportation, and healthcare are a few examples of industries that require round-the-clock staffing. These industries are making shift scheduling even more crucial. Effective shift scheduling in these situations can support organizational goals by lowering absenteeism and turnover rates, and at the same time, it will improve worker satisfaction and efficiency. This has been proved by Nasir et al (2022) who used a goal programming method to solve a shift scheduling problem by

developing the best schedule for the workers over a 28-day period at a McDonald's restaurant in Kelantan. Moreover, Fujita and Amasaka (2015) were also successful in developing the Total Shift Scheduling Model (TSSM) by keeping personnel costs to a minimum in order to create restaurant shift schedules that may ensure service quality while reducing expenses. Fujita et al (2016) also successfully proposed a shift scheduling model that effectively caters to non-regular jobs that specialize in providing food and beverages in hotel restaurants. These are examples of the previous studies related to shift scheduling technically. However, this topic is rarely discussed in the bibliometric analysis review method.

Bibliometric analysis, meta-analysis, and systematic review are three major review methods suggested by Donthu et al (2021) which differ based on the scope size and dataset. Generally, the bibliometric analysis focuses on the patterns and trends of scholarly communication, while systematic review aims to provide a comprehensive and unbiased summary of the available evidence on a particular topic, and meta-analysis aims to provide a more precise and accurate estimate of the magnitude and direction of the association between variables than any single study. Based on studies by Merigó and Yang (2017), White and Borgholthaus (2022); Zhou (2023), bibliometric analysis is a quantitative research method that uses bibliographic data to map the patterns and trends of scholarly communication within a particular field or discipline. It involves the analysis of publication and citation data, such as the number of publications, authorship patterns, citation networks, and impact factors, to evaluate the scientific output and influence of individuals, institutions, and countries.

Meanwhile, Merigó et al (2016) state that bibliometric analysis is a multidisciplinary science that uses mathematical and statistical techniques to analyse all types of knowledge. This analysis is a commonly used technique to track the development of a particular field (Merigó et al., 2016; Železnik et al., 2017). The origins of bibliometrics can be traced back to the early twentieth century when Cole and Eales analysed the growth of literature in comparative anatomy through bibliographic citations (Osareh, 1996). In 1969, Allen Richard, the famous British scientist proposed the term "bibliometrics" to replace "statistical bibliography," which marked the formal establishment of bibliometrics. Nowadays, bibliometrics has attracted increasing attention from researchers due to its ability to study specific research areas by analysing citations, co-citations, geographical distribution, and word frequency, which allows scholars to draw valuable conclusions (Liao et al., 2018). Up to now, bibliometrics has found extensive application in various research areas such as identifying the research trend (Nandiyanto et al., 2023), analysing co-authorship patterns (Mishra & Dwibedi, 2023), examining co-citation patterns (Bronk et al., 2023) and understanding the growth and development of the entire subject (Awli & Lau, 2023).

Therefore, this study will apply the steps suggested by Sudrajat et al (2022) which will retrieve all related publications from Google Scholar through Publish and Perish (PoP) software and then will be categorised and visualised using VOSviewer software. Publish or Perish is a free software tool that enables users to retrieve and analyse publication and citation data from various databases, such as Google Scholar, Crossref, PubMed, Scopus, and Web of Science (Harzing, 2007). While, VOSviewer software is software that enables users to create maps and network diagrams of scholarly literature, based on co-citation and co-authorship data (Van Eck & Waltman, 2023). By combining these two tools, researchers can gain a comprehensive understanding of the impact and productivity of scholarly literature in their field. This

approach can help researchers and other stakeholders identify key authors, institutions, and journals, as well as the relationships between them. Overall, bibliometric analysis using Publish or Perish and VOSviewer can provide valuable insights into the structure and dynamics of scholarly communication and assist in making informed decisions about research strategies and collaborations.

Data and Methodology
Bibliometric analysis is the main analytical technique used in this study. The information related to the selected keywords will be collected from the Google Scholar database. As mentioned by Ahmar et al (2018), Google Scholar is a useful resource for researchers that gives them access to a variety of scientific materials, including books, journal articles, conference papers, patents, and other publications. Since Google Scholar is one of the leading web-based paper indexers globally, it allows researchers to disseminate their findings and facilitates other scholars to cite their work through its indexation. Through the findings from PoP software, the information that will be extracted is publication type, year of publication, author names, subject, publisher's name, source type, and language, as suggested by (Ahmi et al., 2019).

The data collection is started by entering the suitable chosen keywords into the PoP software. Following data collection, VOSviewer will be employed to carry out a bibliometric analysis of shift scheduling. Yang et al (2019) state that VOSviewer is a bibliometric software that can transform research data into knowledge maps. Unlike other software, VOSviewer can conduct clustering analysis, generating three types of knowledge maps that include Network Visualization, Overlays Visualization, and Density Visualization (Van Eck & Waltman, 2023). These maps exhibit pertinent nodes that form a cluster and are classified based on different colors. Additionally, the size of each node indicates the significance of each item, which can represent the number of documents and citations (Li et al., 2021). The study will apply the five phases as illustrated in Figure 1 which was proposed by (Hudha et al., 2020).
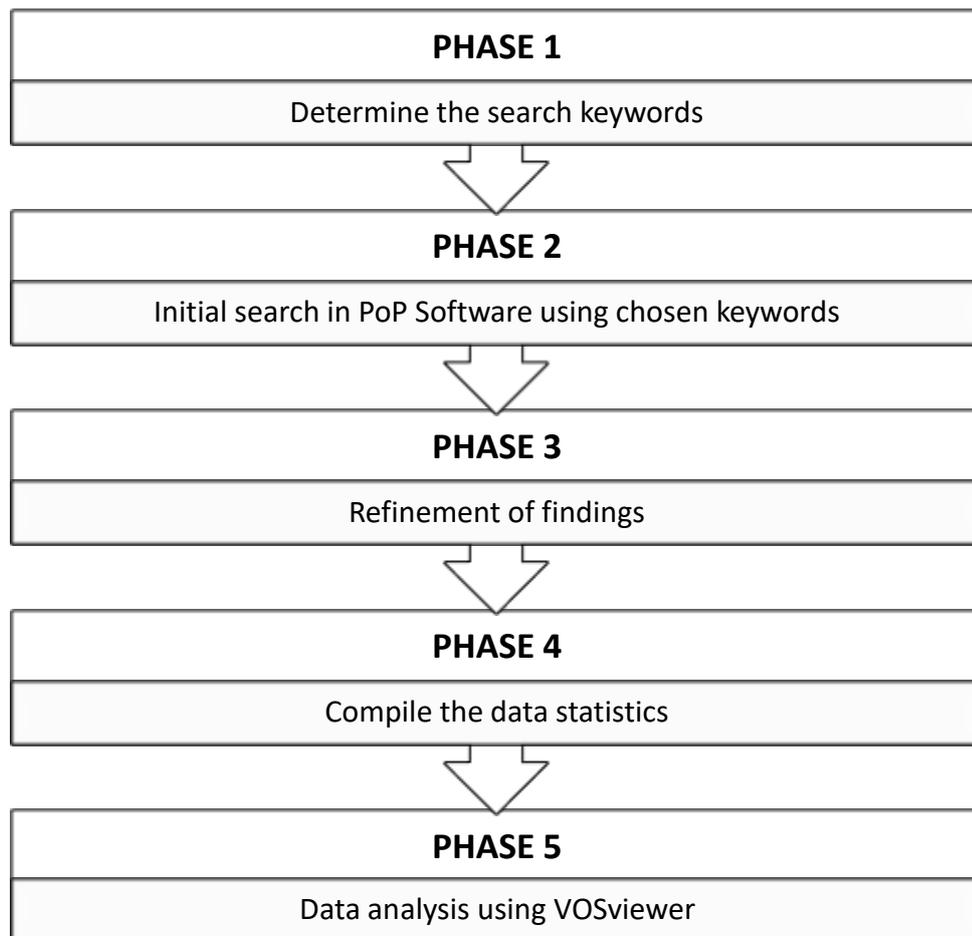
Figure 1 Phases in bibliometric analysis

Phase 1: Determine Search Keywords

The keywords that will be used in this study are "shift scheduling", "optimization" and "mathematical model". The search for the previous studies was done in April 2023 through PoP software, which was set to retrieve data from Google Scholar since it is the largest database.

Phase 2: Initial Search

All publications in the Google Scholar database that contain the keywords "shift scheduling", "optimization" and "mathematical model" from 2018 to 2023 will be included in the search conducted through PoP software. The search is set to be limited to 1,000 publications due to the restriction of the PoP software. The initial search yielded 600 publications, and the results will be saved in a Research Information System (RIS) format. The pertinent metrics, such as the paper title, the author's name, the number of citations, the name of the publication, and the publisher, will be saved along with the results.

Phase 3: Refinement Search

Initially, there were 600 publications retrieved from the Google Scholar database that contained the decided keywords. With this number of publications, the elimination process was carried out. All publications with missing information such as publication year, publication name, or publisher name are removed. The review publications, proceeding papers, websites, reports, book chapters, and non-English publications are also removed from

the findings list. After the selection phase, 297 publications proceeded to further analysis. These findings will then be saved in RIS format and Comma Separated Values (CSV) format.

Phase 4: Compiling Data

After finishing the refinement search phase by utilizing the PoP software, the collected information will be stored in the RIS format and CSV format. This data then will be analysed in VOSviewer software by exporting the RIS file. While the CSV file will be converted into a Microsoft Excel file. The relevant data such as author names, publication titles, publisher names, year of publication, and number of citations will be extracted.

Phase 5: Data Analysis

The data collected from the PoP software will be examined using VOSviewer software in order to determine the most frequently used keywords in prior studies. As stated by Hudha et al. (2020), VOSviewer software is a commonly used tool for processing large data sets and offers a variety of visualizations, analyses, and investigations.

Results and Discussions
Selection of related publication

The VOSviewer software is utilized to analyse the data obtained from the PoP software and determine the commonly used keywords in previous studies. The number of frequently used keywords varies based on the data collection and analysis requirements. To create bibliometric maps, VOSviewer produces three visualizations: network visualisation, overlay visualisation, and density visualisation. After the initial search using the keyword "shift scheduling & optimization & mathematical model" in the Google Scholar database, the PoP software discovered about 600 publications from 2018 to 2023 with a total of 3977 citations, or roughly 795.40 citations per year. Following that, a refinement search was conducted by excluding certain articles, such as incomplete resource data, a book chapter, non-English articles, proceeding papers, and patents. As a result, there are only 297 publications with 2857 citations (an average of 571.40 citations per year). Table 1 presents the comparison of metric data from publications retrieved before and after the selection phase.

Table 1
Metrics Comparison

Metric Data	Initial Search	Refinement Search
Source	Google Scholar	Google Scholar
Keywords	"shift scheduling" & "optimization" & "mathematical model"	"shift scheduling" & "optimization" & "mathematical model"
Publication year	2018-2023	2018-2023
Papers	600	297
Citations	3977	2857
Cites/year	795.40	571.40
Cites/paper	6.63	9.62
Author/paper	2.72	3.17
h_index	31	28
g_index	48	40
hI_norm	17	15
hI_annual	3.40	3.00
hA-index	14	13

The primary focus of this research is the number of citations, which was determined by a refinement search that resulted in 297 selected publications. The top 10 research articles based on total citations are presented in Table 2, with all 10 having a minimum of 46 citations. The paper with the highest number of citations is "Developing an applied algorithm for multi-trip vehicle routing problems with time windows in urban waste collection: A case study" with 98 citations, while the paper with the lowest number of citations is "A three-stage mixed integer programming approach for optimizing the skill mix and training schedules for aircraft maintenance" with 46 citations.

Table 2
Top 10 most cited research articles

No	Year	Authors	Title	Journal	No of Citation	Publisher
1	2019	Erfab Babaee Tirkolaee, Parvin Abbasian, Mehdi Soltani, Seyed Ali Ghaffarian	Developing an applied algorithm for multi-trip vehicle routing problem with time windows in urban waste collection: A case study	Waste Management Research	98	journals.sagepub.com

2	2020	Mageed Ghaleb, Hossien Zolfagharinia, Sharareh Taghipour	Real-time production scheduling in the Industry-4.0 context: Addressing uncertainties in job arrivals and machine breakdowns	Computers & Operations Research	87	Elsevier
3	2018	Wenbo Wang, Haidong Yang, Yingfeng Zhang, Jianxue Xu	IoT-enabled real-time energy efficiency optimisation method for energy-intensive manufacturing enterprises	International Journal of Computer Integrated Manufacturing	71	Taylor &Francis
4	2018	Ahmed Ali El Adoly, Mohamed Gheith, M. Nashat Fors	A new formulation and solution for the nurse scheduling problem: A case study in Egypt	Alexandria Engineering Journal	65	Elsevier
5	2018	Jan Hochdörffer, Marc Hedler, Gisela Lanza	Staff scheduling in job rotation environments considering ergonomic aspects and preservation of qualifications	Journal of Manufacturing Systems	65	Elsevier
6	2020	Andisheh Abdi, Anita Abdi, Navid Akbarpour, Amirhossein Salehi Amiri, Mostafa Hajiaghaei-Keshteli	Innovative approaches to design and address green supply chain network with simultaneous	Journal of Cleaner Production	60	Elsevier

			pick-up and split delivery			
7	2019	Seyed Esmaeil Moussavi, Morad Mahdjoub, Olivier Grunder	A metaheuristic approach to the integration of worker assignment and vehicle routing problems: Application to home healthcare scheduling	Expert Systems with Applications	57	Elsevier
8	2020	Ramin Barzanji, Bahman Naderi, Mehmet Atilla Begen	Decomposition algorithms for the integrated process planning and scheduling problem	Omega	53	Elsevier
9	2021	Erhaneh Nikzad, Mahdi Bashiri, Babak Abbasi	A metaheuristic algorithm for stochastic home health care planning	European Journal of Operational Research	52	Elsevier
10	2018	Philippe De Bruecker, Jeroen Beliën, Jorne Van den Bergh, Erik Demeulemeester	A three-stage mixed integer programming approach for optimizing the skill mix and training schedules for aircraft maintenance	European Journal of Operational Research	46	Elsevier

Besides the total number of citations, the study explored the popular publishers that have contributed the most publications on the topic of "shift scheduling, optimization and mathematical model". Instead of solely focusing on the total number of citations, the top 5 publishers out of the 297 articles were analyzed, and their findings are presented in Figure 2. The most popular publisher was found to be Elsevier with 86 articles, followed by Springer with 51 articles, and mdpi.com with 26 articles.
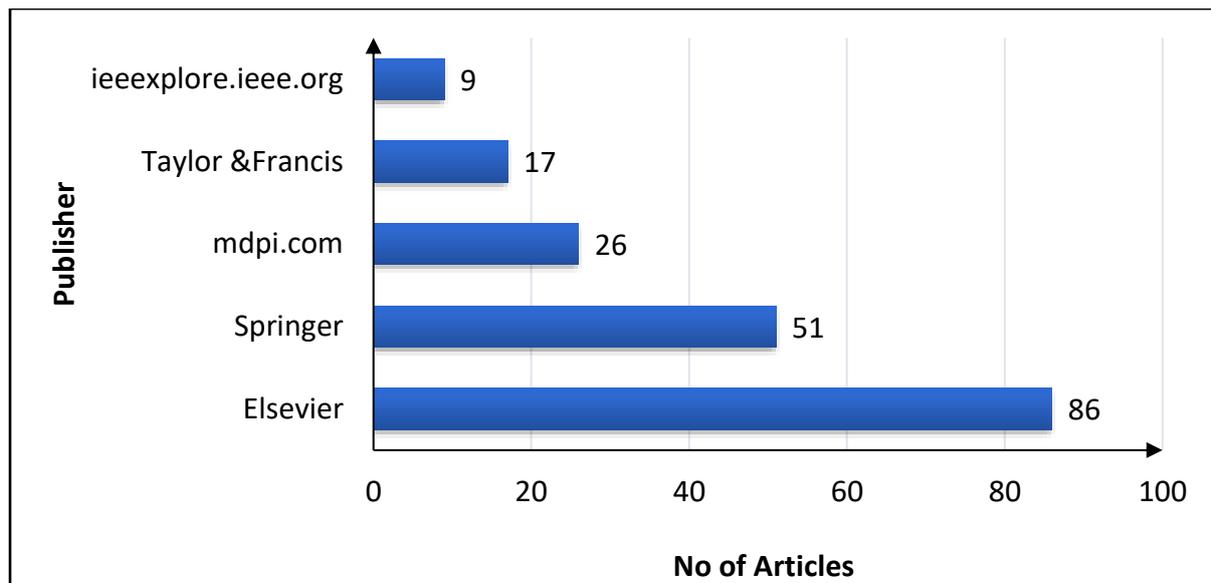
Figure 2 Top 5 publishers who publish research articles related to shift scheduling topic

The compilation of the top 10 journals that have published pertinent articles on the subject of "shift scheduling, optimization & mathematical model" is shown in Table 3. Information such as the number of articles published, the number of citations, and the average number of citations are all included in Table 3. With a total of 15 papers and 314 citations, the European Journal of Operational Research has published the highest number of articles on the related topic. However, the Journal of Cleaner Production, with an average of 32.25 citations per article, has the highest average number of citations.

Table 3
Top 10 journals that have relevant articles on the Shift Scheduling Topic

No	Journal Name	Total articles	Total Citations	Average Citation
1	European Journal of Operational Research	15	314	20.93
2	Omega	10	157	15.70
3	Mathematics	10	173	17.30
4	Computers & Industrial Engineering	9	145	16.11
5	Health care management science	8	56	7.00
6	Operations Research for Health Care	5	75	15.00
7	Annals of Operations Research	5	40	8.00
8	Applied Soft Computing	5	41	8.20
9	Journal of Cleaner Production	4	129	32.25
10	Flexible Services and Manufacturing Journal	4	48	12.00

Keywords Clustering
In academic writing, authors provide a brief summary of their research in the form of keywords. Analysing the keywords used in research papers within a particular field can

efficiently identify the current research trends and leads in the field of study. This enables researchers to locate and focus on the relevant areas of study (Huang et al., 2022). Therefore, in this study, the keyword co-occurrence has been done using VOSviewer. About 297 selected documents from Google Scholar were imported to VOSviewer by checking the co-occurrences in the title and abstract of the publications. About 11 main keywords with a minimum of 10 occurrences were detected from 1779 terms. Figure 3, 4, and 5 illustrate the term co-occurrence mapping in the area of shift scheduling after the keywords were clustered for analysis.
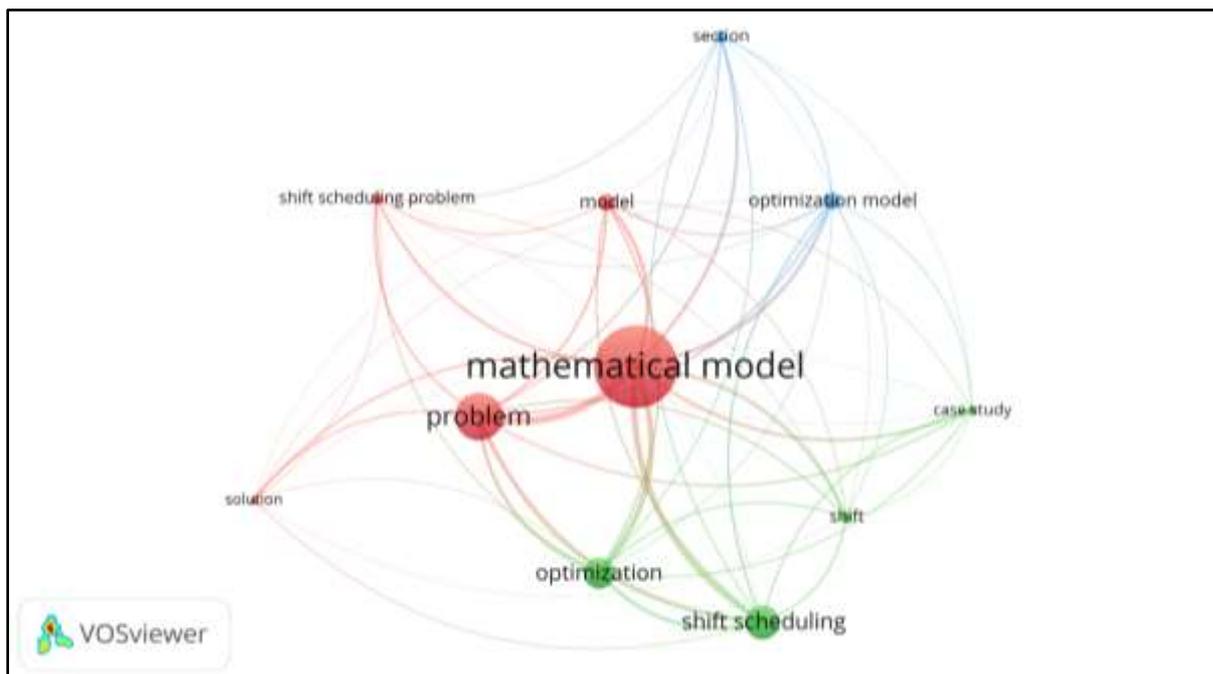

Figure 3 Network visualization on Google Scholar database related to shift scheduling topic (https://tinyurl.com/2f7jbwxu)

The nodes in Figure 3 and 4 portray the keywords, with their size proportional to their frequency. The lines connecting these nodes represent the instances in which these keywords occur together. Based on the color-coding of the keyword nodes in Figure 3, keywords can be categorized into three distinct topics. As shown in Figure 3, there are three clusters of terms identified by their respective color-coded networks: cluster one (red), cluster two (green), and cluster three (blue).

The red cluster, which refers to cluster 1 consists of 5 keywords such as "mathematical model", "model", "problem", "shift scheduling problem", and "solution". The "mathematical model" is the most frequent keyword used in recent years of publications, with 232 co-occurrences and the total link strength is 478. The second cluster is marked using the green colour. This cluster 2 consists of 4 keywords. There are "optimization", "case study", "shift" and "shift scheduling". In this cluster 2, "shift scheduling" is the most frequent keyword used with a number of occurrences is 98 and the total link strength is 240. While, the third cluster which uses a blue colour, focuses mainly on the keywords "optimization model" and "section". The number of occurrences and total link strength for each keyword for each cluster can be summarized in Table 4.

Table 4

Keyword representing each cluster determined by VOSviewer

Cluster	Keyword	Occurrences	Total Link Strength
First cluster (Red)	Mathematical model	232	478
	Problem	136	304
	Model	48	113
	Shift scheduling problem	32	71
	Solution	16	43
Second cluster (Green)	Shift scheduling	98	240
	Optimization	87	200
	Shift	32	85
	Case study	25	75
Third cluster (Blue)	Optimization model	47	109
	Section	32	78

Furthermore, by using the same nodes and keywords in Figure 3, Vosviewer has visualized and coloured all the keywords according to the average year of publication in Overlay Visualization (Figure 4). Since the year of publication for all 297 articles is between 2018 to 2023, the average year of publication has been calculated by VOSviewer and displayed in Figure 4. The average year of publication is between 2020.4 to 2020.7.
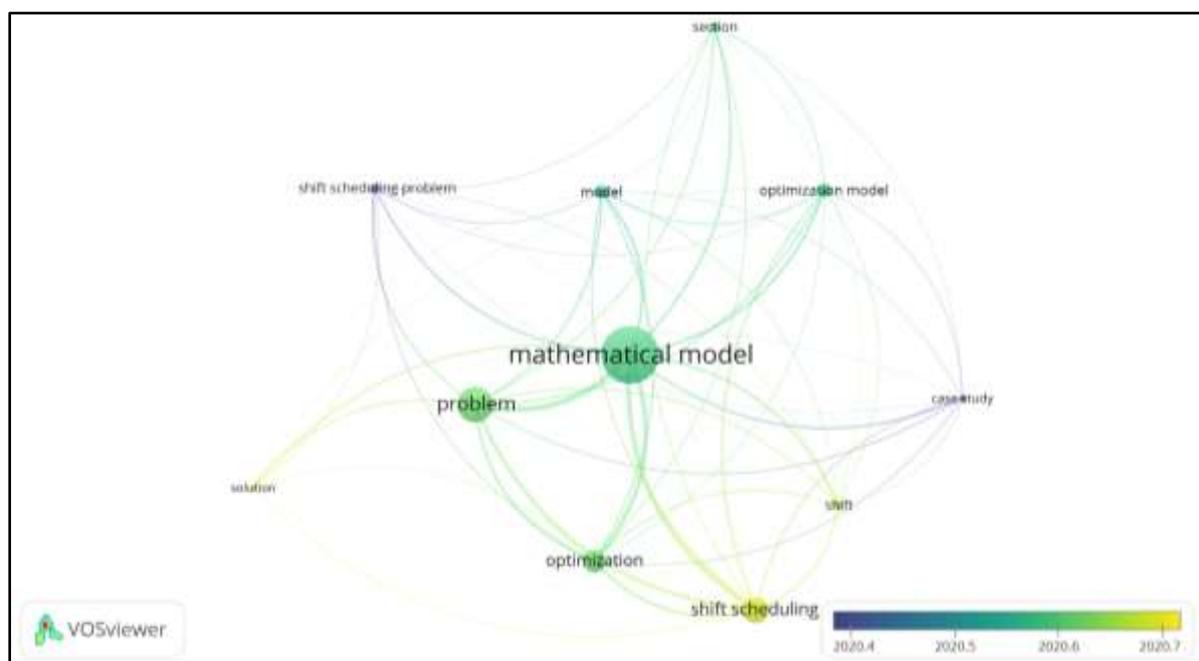

Figure 4 Overlay visualization on Google Scholar database that related to shift scheduling topic

Meanwhile, Figure 5 shows the density of keyword occurrences for each term given in Figure 3. As in Figure 5, the keyword "mathematical model" has the brightest colour. This shows that the keyword "mathematical model" is the most popular keyword among the other keywords with 232 occurrences and 478 total link strength.
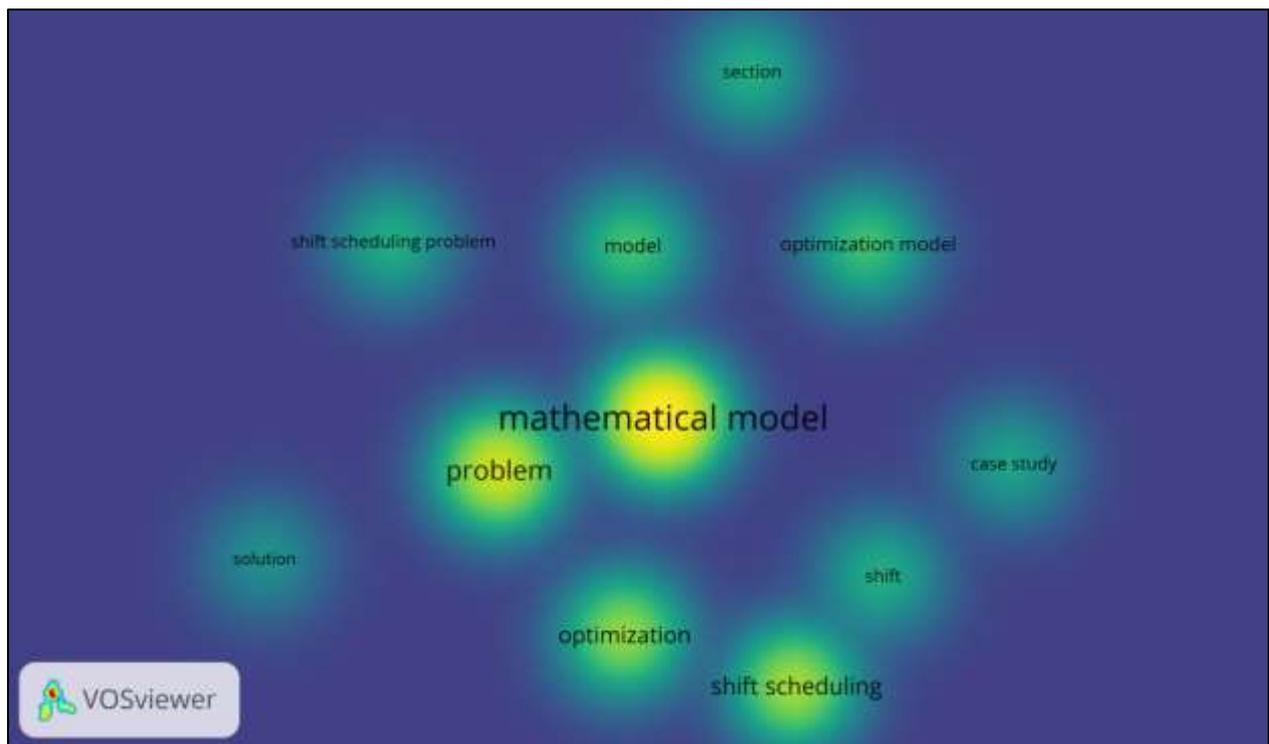
Figure 5 Density visualization on Google Scholar database related to shift scheduling topic

Conclusions

Over the past few years, the field of shift scheduling has witnessed a surge in literature and practical applications. This can be seen by the initial search through Google Scholar, where only 600 publications and practical applications have the keyword "shift scheduling, optimisation & mathematical model". Therefore, in order to contribute to this area of knowledge, this paper employs PoP and VOSviewer to search, screen, visualize and analyse various aspects such as the publication year, author, highly cited articles, top publishers, and journals that have published the related articles and keyword popularity. The key themes in the field of shift scheduling research which are visualized in maps have been successfully identified. These maps demonstrate that each cluster is associated with a distinct keyword, which highlights the significant research directions in the shift scheduling field. Thus, it will help future researchers to develop new research scope related to this study area by utilizing the results in this research as a case study to examine the importance of conducting additional research on shift scheduling.

This study has several limitations that need to be acknowledged. Firstly, the search was restricted to documents indexed in Google Scholar, which is one of the largest and most comprehensive global databases, whereas there are other international databases such as Scopus, PubMed, and Web of Science. Secondly, the search of the related publications employs PoP software, which has a limitation of a maximum number of publications retrieved of up to 1000. Therefore, to ensure more extensive coverage of relevant publications, other databases through other searching software are recommended in future studies. Overall, this study delivers insightful information about the current status of shift scheduling research and provides guidance for future research.

References

Ahmar, A. S., Kurniasih, N., Irawan, D. E., Sutiksno, D. U., Napitupulu, D., Setiawan, M. I., Simarmata, J., Hidayat, R., Busro, Abdullah, D., Rahim, R., & Abraham, J. (2018). Lecturers' understanding on indexing databases of SINTA, DOAJ, Google Scholar, SCOPUS, and Web of Science: A study of Indonesians. *Journal of Physics: Conference Series*, *954*. https://doi.org/10.1088/1742-6596/954/1/012026

Ahmi, A., Elbardan, H., & Ali, R. M. R. H. (2019). Bibliometric analysis of published literature on industry 4.0. *ICEIC 2019 - International Conference on Electronics, Information, and Communication*.
https://doi.org/10.23919/ELINFOCOM.2019.8706445

Awli, O., & Lau, E. (2023). Digital and Sharing Economy for Sustainable Development: A Bibliometric and Systematic Review. *Economies*, *11*(4), 105. MDPI AG. Retrieved from http://dx.doi.org/10.3390/economies11040105

Bronk, K. C., Reichard, R. J., & Qi Li, J. (2023). A co-citation analysis of purpose: trends and (potential) troubles in the foundation of purpose scholarship. *The Journal of Positive Psychology*. https://doi.org/10.1080/17439760.2023.2168563

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, *133*. https://doi.org/10.1016/j.jbusres.2021.04.070

Fujita, K., & Amasaka, K. (2015). CREATION OF TOTAL SHIFT SCHEDULING MODEL IN RESTAURANT SERVICE – AN EXAMPLE OF THE HIGHLY CLASSICAL LUXURY HOTEL RESTAURANT. *International Journal of Technical Research and Applications*, *3*(4), 188-192.

Fujita, K., Murakami, K., & Amasaka, K. (2016). A shift scheduling model introducing non-regular employees for hotel restaurants. In *The Journal of Japanese Operations Management and Strategy, 6*(1), 17-33.

Harzing, A. W. (2007). Publish or Perish, available from https://harzing.com/resources/publish-orperish

Huang, Y. J., Cheng, S., Yang, F. Q., & Chen, C. (2022). Analysis and Visualization of Research on Resilient Cities and Communities Based on VOSviewer. In *International Journal of Environmental Research and Public Health, 19*(12). https://doi.org/10.3390/ijerph19127068

Hudha, M. N., Hamidah, I., Permanasari, A., Abdullah, A. G., Rachman, I., & Matsumoto, T. (2020). Low carbon education: A review and bibliometric analysis. In *European Journal of Educational Research, 9*(1). https://doi.org/10.12973/eu-jer.9.1.319

Li, Z., Lu, J., Wang, G., Feng, L., Broo, D. G., & Kiritsis, D. (2021). A Bibliometric Analysis on Model-based Systems Engineering. *ISSE 2021 - 7th IEEE International Symposium on Systems Engineering, Proceedings*. https://doi.org/10.1109/ISSE51541.2021.9582526

Liao, H., Tang, M., Luo, L., Li, C., Chiclana, F., & Zeng, X. J. (2018). A bibliometric analysis and visualization of medical big data research. *Sustainability (Switzerland)*, *10*(1). https://doi.org/10.3390/su10010166

Mishra, J., & Dwibedi, P. (2023). Performance and Science Mapping Analysis on Service Quality in the Healthcare Sector: A Bibliometric Analysis Using Scopus Database. In *Handbook of Research on the Interplay Between Service Quality and Customer Delight* (pp. 290-313). IGI Global.

Merigo, J. M., & Yang, J. B. (2017). A bibliometric analysis of operations research and management science. *Omega (United Kingdom)*, *73*.

https://doi.org/10.1016/j.omega.2016.12.004

Merigo, J. M., Cancino, C. A., Coronado, F., & Urbano, D. (2016). Academic research in innovation: a country analysis. *Scientometrics*, *108*(2). https://doi.org/10.1007/s11192-016-1984-4

Merigo, J. M., Mas-Tur, A., Roig-Tierno, N., & Ribeiro-Soriano, D. (2015). A bibliometric overview of the Journal of Business Research between 1973 and 2014. *Journal of Business Research*, *68*(12). https://doi.org/10.1016/j.jbusres.2015.04.006

Nasir, M. D. S., Sabri, N. D. A., Shafii, N. H., & Abu Hasan, S. (2022). Shift Scheduling with the Goal Programming Approach in Fast-Food Restaurant: McDonald's in Kelantan. *Journal of Computing Research and Innovation*, *7*(1). https://doi.org/10.24191/jcrinn.v7i1.279

Nandiyanto, A. B. D., Ragadhita, R., al Husaeni, D. N., & Nugraha, W. C. (2023). Research trend on the use of mercury in gold mining: Literature review and bibliometric analysis. *Moroccan Journal of Chemistry*, *11*(1). https://doi.org/10.48317/IMIST.PRSM/morjchem-v%vi%i.36576

Osareh, F. (1996). Bibliometrics, citation analysis and co-citation analysis: A review of literature I.

Sudrajat, U., Ardianto, D., & Permana, I. (2022). Engineering design process: A review and bibliometric analysis. *International Journal of STEM Education for Sustainability*, *2*(2), 180-192.

Van Den Bergh, J., Belien, J., de Bruecker, P., Demeulemeester, E., & de Boeck, L. (2013). Personnel scheduling: A literature review. *European Journal of Operational Research*, *226*(3). https://doi.org/10.1016/j.ejor.2012.11.029

Van Eck, N. J., & Waltman, L. (2023). Retrieved Mac 07, 2023, from VOSviewer: https://www.vosviewer.com/documentation/Manual_VOSviewer_1.6.19.pdf

White, J. V., & Borgholthaus, C. J. (2022). Who's in charge here? A bibliometric analysis of upper echelons research. *Journal of Business Research*, *139*. https://doi.org/10.1016/j.jbusres.2021.10.028

Yang, Y., Reniers, G., Chen, G., & Goerlandt, F. (2019). A bibliometric review of laboratory safety in universities. *Safety Science, 120,* 14-24.

Zeleznik, D., Vosner, B. H., & Kokol, P. (2017). A bibliometric analysis of the Journal of Advanced Nursing, 1976–2015. *Journal of Advanced Nursing*, *73*(10). https://doi.org/10.1111/jan.13296

Zhou, T. (2023). Bibliometric analysis and visualization of online education in sports. *Cogent Social Sciences*, *9*(1). https://doi.org/10.1080/23311886.2023.2167625