

Research Paper

Virtual Reality Research in Office Management: A Bibliometric Analysis

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Office digitization not only occurs in the aspect of using digital tools to facilitate the work of employees and office managers but also transfers all office activities to a virtual environment. This also invites the pros and cons. This study aims to provide an extensive bibliometric literature study on “virtual reality in office management”. The research articles were compiled from the Google Scholar database and the publishers Elsevier and Emerald. Of the 38 articles found in the database, from 2011 to 2021, 35 articles were analyzed in this study. The selected references were then managed using reference manager software, namely Zotero. After managing the database, the researcher performed classification and visualization using VOS viewer software. Overall, this literature study provides an appropriate reference point for further research on “virtual reality in office management.”

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1. INTRODUCTION

The body text starts with a standard first-level heading like INTRODUCTION or any other heading suitable to the content and context. First level headings are in all caps. Copy the content and replace it for other first-level headings in remaining text. Reference citations should be within square bracket [1]. Headings should always be followed by text.

Digitization has penetrated all lines of life, including various office jobs. Even as technology advances and the types of office work develop, the scientific field of office management is now starting to explore the discussion of moving office buildings in total to a virtual environment, commonly referred to as a virtual office. [1]. The occurrence of the covid-19 pandemic which requires the implementation of work from home and the trend of remote work increasingly supports the virtualization of office work [2].

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The phenomenon of virtualization of office work which was announced with the limitation of social relations between employees then inspired the concept of virtual reality in the office management environment [3]. Where this invites workers to be able to interact physically and socially. The concept of virtual reality in office management is also increasingly considered a solution to accommodate the characteristics of the current workforce, which is a digital native figure [4]. They are very close to technology and it is not an impossibility to invite them totally into the technology arena, whether for leisure, gaming, or entertainment purposes to work. [5].

Virtual reality has now been widely used in various fields of work, such as teaching in universities [6], teaching in K-12 [7], medical field [8], safety training [9], to manufacturing technology [10]. The implementation of virtual reality is also in the layout of the office environment [11], that workplace layout affects worker well-being and is related to productivity, physical fatigue, and production costs. However, so far, many office managers have not optimized it, so a device that can support office layout settings is needed using immersive technology, namely virtual reality.

Unfortunately, the discussion of virtual reality in office management has not been widely studied see the latest literature review, even though the presence of virtual reality in office management still invites pros and cons. [12]. So, this requires the attention of researchers in the field of office management. Findings related to the concept of virtual reality in office management are needed to be the basis for decision-making in preparing office management in an increasingly radical era of digitalization. [13].

This study aims to provide a broad overview of the topic of virtual reality in office management during the period 2011 – 2021 using bibliometric analysis techniques. The specific aim is to identify influential authors and keywords in the research topic area to analyze the thematic evolution of the virtual reality field in office management. The results of this study are important for academics, researchers, and professionals in the field of office management to make efforts to prepare office management in an increasingly radical era of digitalization. To achieve the research objectives, analysis using bibliometric analysis techniques with the help of VOS viewer software is used to present a visualization of the results of data analysis from the articles found in the process of studying this literature.

2. METHOD

This bibliometric literature study refers to the use of systematic and explicit methods [14], or mind mapping method that emphasizes the boundaries of knowledge [15].

The bibliometric literature study method used by the researcher adopted the five-step method found by Setyaningsih et al. and Tranfield et al. [15], [16]. The following is an overview of the five stages of this research method.

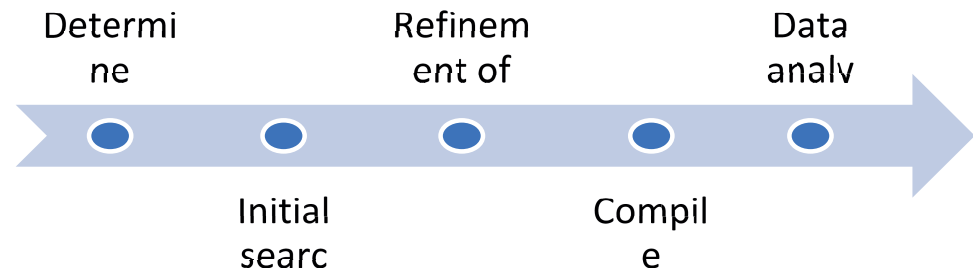


Figure 1: Five Stages of Bibliometric Literature Study Method.

2.1. Determine Search Keywords

The keywords that the researcher uses in compiling the articles are: “virtual reality office model”; “virtual reality office collaboration”; and “virtual reality remote work”. A search was conducted in December 2021 on the Google Scholar database as well as the websites of publishers Elsevier and Emerald. The selection of this database source is based on the fact that Google Scholar is the largest article database source, while to strengthen the findings, Elsevier and Emerald publishers are considered as publishers who have credibility in the topic of management studies [17].

2.2. Initial Search Results

The search for articles that the researcher did specifically for “journal” and “proceedings”, only “title words” and “keywords”, and the years “2011-2021”. A total of 38 articles were found in the initial search. The results are compiled in a Research Information Systems (RIS) format to include all important article information such as paper title, author name and affiliation, abstract, keywords, and references.

2.3. Refinement of Search Result

Matched articles indexed in the Google Scholar database are filtered, this is to select articles only from “journals” and “proceedings”. Furthermore, to make appropriate corrections, each article’s metadata is imported into Zotero’s bibliography software and then compiled into a single collection for further storage in the form of a RIS file. This RIS file is used for further data analysis.

2.4. Compile Preliminary Data Statistics

The collected data is stored in the form of RIS. In the initial stage, the components of the journal articles and the complete proceedings (year of publication, volume, number, pages, etc.) are checked and the researcher adds the necessary information if incomplete data is found. Data analysis is carried out so that articles can be classified by year and source of publication and publisher.

2.5. Data Analysis

Analysis of bibliometric literature studies to analyze and visualize the bibliometric network in this study using VOS viewer software. VOS viewer is used for its ability to work efficiently with large data sets and provides a variety of interesting visuals, analyses, and investigations [18]. VOS viewers can also create publication maps, author maps, or journal maps based on network-shared citations or build keyword maps based on shared-network [19].

3. RESEARCH RESULTS

The purpose of this study is to analyze the literature on the topic of virtual reality in office management, by reviewing two aspects, namely 1) Authors and Co-Authorship Relations; and 2) Keywords. Through a literature study using bibliometric analysis with the help of VOS viewer software to classify and visualize the data that has been done, the following results are obtained. Where each presentation of the author's metadata and the researcher's keywords uses the minimum appearance limit is 1.

3.1. Authors and Co-Authorship Relation

The distribution of authors in a research field is important to analyze to find out who are product experts in conducting studies in related fields [20]. In today's modern era, new researchers can emerge, especially in the field of office management virtualization through virtual reality technology. Figure 2 below shows the distribution of researchers or writers of scientific articles in the field of virtual reality studies in office management.

Each researcher has a fairly close relationship with other researchers. This indicates that the articles they wrote are related to each other because this indicates an indication of the citation of articles by other articles [21]. The findings are connected to form a

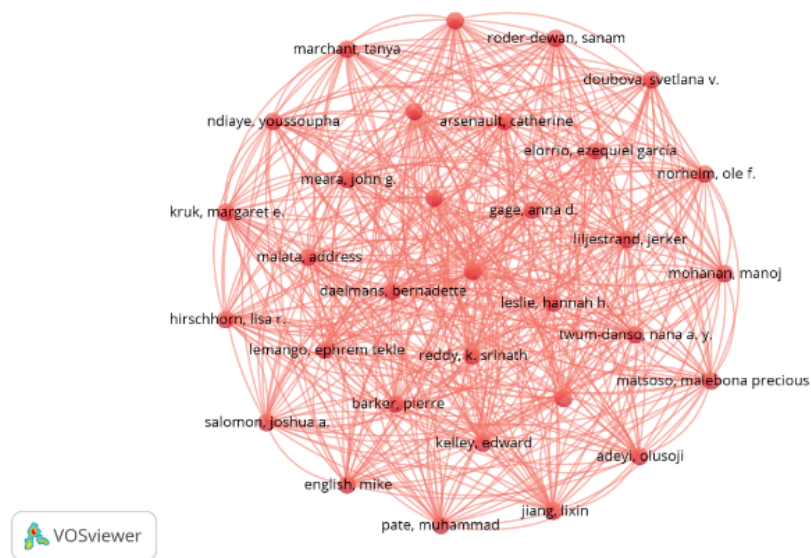


Figure 2: Distribution of Authors and Their Relationships.

virtual reality study in office management. So far, almost no researchers from Indonesia have discussed the topic of virtual reality in office management. This is quite surprising because in Indonesia there are many study programs in office administration and/or office management. However, so far, the HR in the study program has not conducted a study on the virtual reality phenomenon in office management which is increasingly urgent to discuss.

As in Figure 3, the following describes the level of the year the researcher wrote the article on the results of his research. This shows the author’s level of consistency and productivity in discussing virtual reality studies in office management [19]. The bluer the color of the element, the longer the research has been carried out, while the yellower the color of the element, the more recently this research has been carried out [22]. This means that based on the findings of the researcher, the year level of publication of scientific articles by the author is carried out around the middle period between 2011 and 2021. There has been no significant update on the research. Meanwhile, this phenomenon is increasingly in need of attention. Based on the findings of this researcher, the study in the field of virtual reality in office management becomes an attraction for more focused and further research.

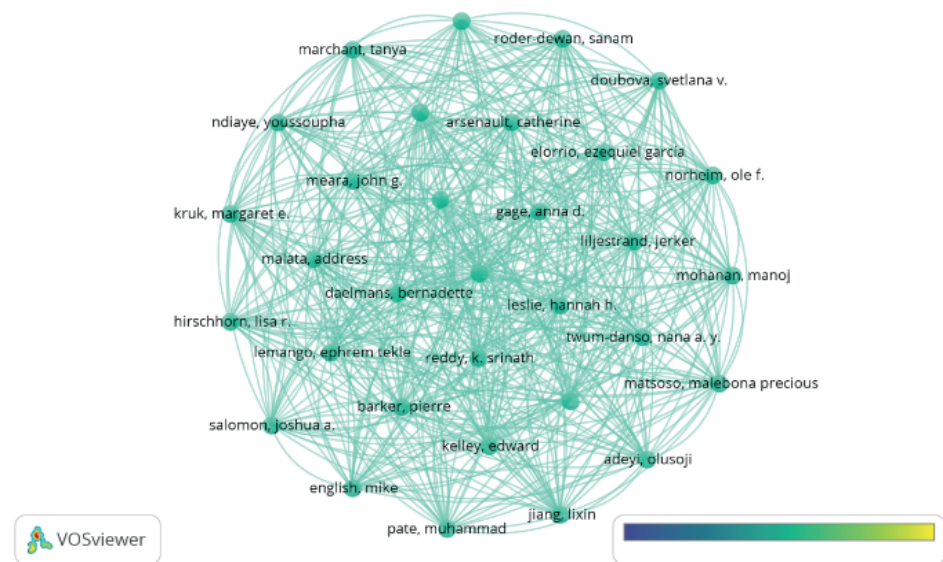


Figure 3: Years of Article Writing by Author.

3.2. Keywords

Keywords function to find out the main topic of the research article. Each keyword also has a relationship with other keywords to provide an overview of the relevance of what topics are discussed by the author of scientific articles [23]. Figure 4 below is the distribution of keywords that the researcher obtained from the collected metadata collection. Where based on Figure 4 it can be seen that there is no direct link (without any mediator variables) that connects virtual reality with office management. This is an attraction to conduct research on this topic without a mediator variable so that the relationship between virtual reality and office management can be discussed directly.

So far, the virtual reality keyword is still widely associated with teaching methods in universities, especially in the fields of medicine and nurses [6]. A surprising result was also found in the researchers' findings, that the relationship between virtual reality and training was quite far. Even though in the current digital era there is a lot of need for implementation of virtual reality in training in office management and other work environments, in the literature that is found not many have been found.

The following is the year level of each keyword found in scientific articles.

Based on Figure 5, the explanation of the color annotations is still the same as in Figure 3, namely the bluer the color of the element, meaning that the longer the keywords are found in scientific articles, while the yellower the color of the elements, the newer the keywords are found in scientific articles. Yellow keywords such as virtual reality, automation, employment, heutagogy, and business models can be adopted by

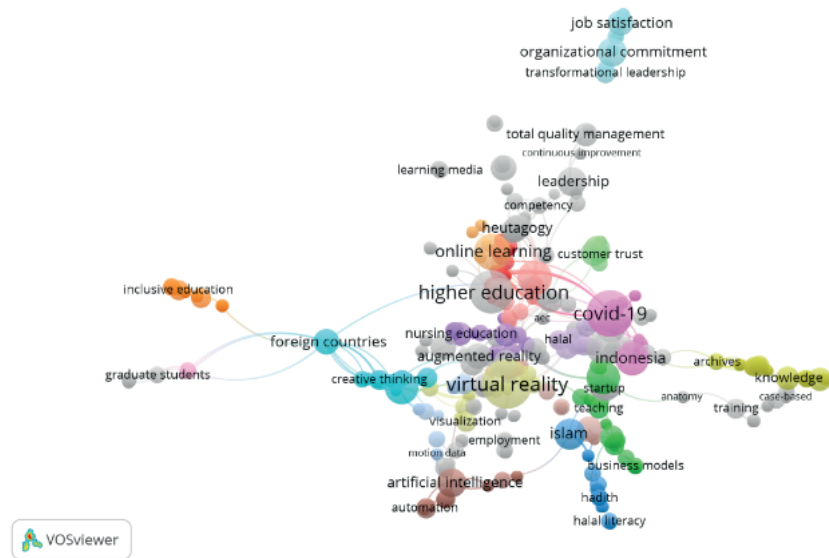


Figure 4: Distribution of Keywords.

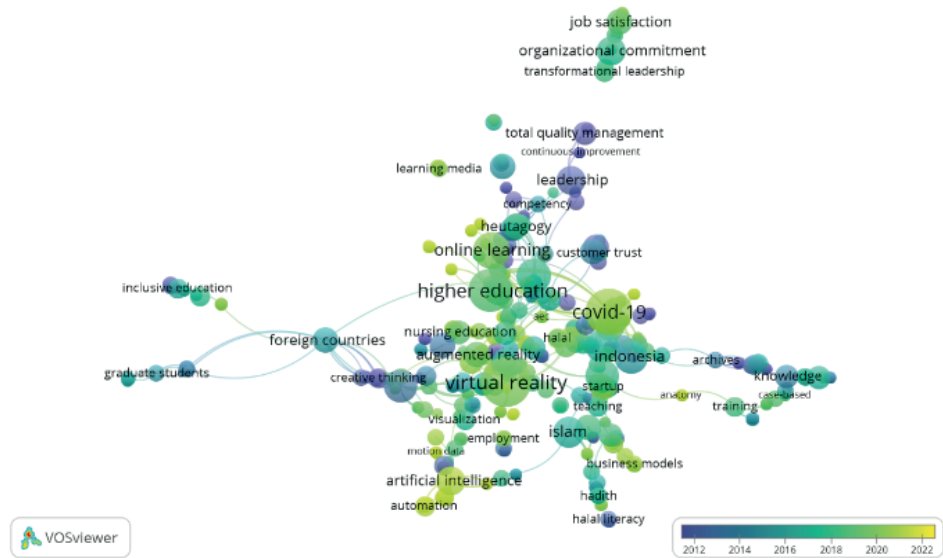


Figure 5: Years of Each Keywords.

researchers as material for determining future research variables. The relationship in the study of virtual reality in office management can be specified in the automation keyword, namely, virtual reality can automate office work. This includes collaborative work in a virtual environment through virtual reality facilities.

In Figure 6 below, the level of density of studies on each keyword in the literature sources that the researcher collects is shown. This explanation related to density strengthens the analysis in the previous Figure 5.

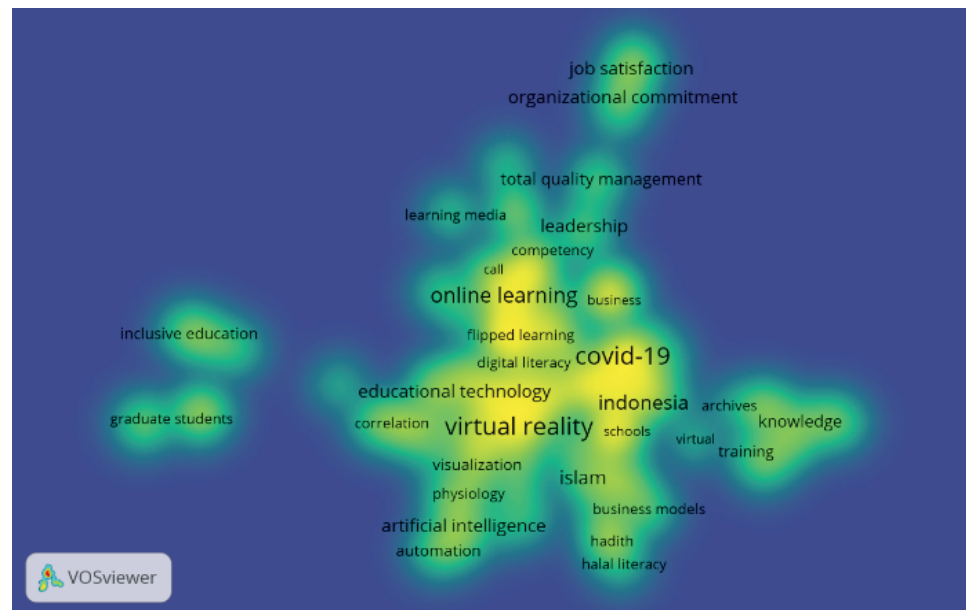


Figure 6: Research Article Keyword Density.

4. DISCUSSION

Based on the findings obtained in this study, the topic of virtual reality is still dominantly used for educational purposes. Its use in the field of work, especially office management, is still little used, especially those studied in research by academics. Virtual reality is very possible to help human work, including various activities in the office environment [24]. The phenomenon of working from home, working in a hybrid way to the trend of nomadic workers increasingly agrees with the use of virtual reality in the office management environment [25].

Based on the findings of the articles that the researchers obtained, several articles have specifically discussed the use of virtual reality in office management. For example, research by Juan et al. (2019) develops a virtual reality-based and user-oriented decision support system for interior design and decoration in an office building environment. Research by Szczepańska et al. (2021) The success of developing virtual reality applications to accommodate public consultations during the COVID-19 pandemic is also a form of using virtual reality in the office management environment, especially in the consulting field. Usually, the consultation is done by having a direct dialogue with the client in the office environment. But now it can be done immersively in a virtual environment.

Research by Fereydooni & Walker [3] also describes the challenges and opportunities of using virtual reality in the office environment, especially to improve the collaborative working of employees. In his findings, it is stated that the use of virtual reality during

work from home supports employees in overcoming obstacles while working remotely. This finding is also in line with research result conduct by Saetta et al. [28].

The use of virtual reality to support a variety of office work can open up opportunities for collaboration with the best human resources from around the world. Geographical boundaries are not a significant problem in today's digital era, especially since virtual reality can facilitate in-touch relationships in virtual scenes so it will improve social relations between workers. Even though they had never met face to face in real life. If the office manager implements the concept of virtual reality, it will also indirectly support the concept of going green or paperless so that it can help the earth to deal with the massive climate change that is currently happening [29].

Based on the findings in this study, the study of virtual reality in office management is still very little discussed by Indonesian researchers. Whereas in Indonesia, many start-up trends have emerged, where they have adopted the work-from-home trend. It is possible in the future they will adopt virtual reality in doing various office work. Therefore, researchers from Indonesia must examine the topic of virtual reality in office management.

5. CONCLUSIONS AND RECOMMENDATIONS

Studies on the topic of virtual reality in office management are still quite bit discussed in the last few years. Even though its implementation is now very urgent to do. It is necessary to conduct research by academics on virtual reality studies in office management to support the decision-making process of office managers. Especially now that the transition of life from the real world to the virtual world is increasingly massive.

In terms of the study of virtual reality in office management, the concept of holographic collaboration where this technology can facilitate employees who are doing remote work to stay connected with colleagues and their managers can be discussed further. Through the concept of holographic collaboration in the virtual reality environment, it can then develop more broadly into relevant discussions, such as the ergonomics efficiency of the virtual office work environment and its impact on human social relations in the real world.

Referring to the findings in the research using this bibliometric analysis, future researchers can also take the keywords virtual reality, automation, employment, heutagogy, and business models as their research variables. If global collaboration

is possible, future researchers can do so with the authors who have been highlighted in these findings (refer to Figures 2 and 3).

This research has a limitation where the databases are compiled manually, and imported one by one into Zotero software so that it is very possible to have metadata confusion. As a result, many metadata are empty or incomplete, so it can be seen that researchers are only able to analyze the distribution of authors and keywords from scientific articles that are compiled. This is due to the difficulty of searching databases from Scopus or the Web of Science, where researchers do not have access to these databases. Even though these two database sources are the two most complete and credible databases for now.

Suggestions for further research are to use a larger number of published scientific articles by expanding the keywords used and databases that are more accessible. Researchers can also use the comparison of the results of different and commonly recommended bibliometric analyses (such as BibExcel and HistCite). Another suggestion is that further related research can provide a more detailed explanation because there is still limited research that discusses the topic of virtual reality in office management.

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