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Bibliometric Analysis of COVID-19 Research in Information Systems: A Proposed Model

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Abstract—A new coronavirus, eventually identified as COVID-19, triggered an outbreak in Wuhan, China, at the end of 2019. It has since spread around the world. This has also resulted in an increase in the number of publications pertaining to COVID-19. However, not much research has examined COVID-19 in information systems using bibliometrics. The purpose of this work is to develop a model for visualising COVID-19 research in information systems using bibliometric data. We did a brief survey of the literature in this study, followed by an analysis of related work. We anticipate that our proposed model will aid future researchers who wish to undertake bibliometric visualisations utilising it.

Keywords—Bibliometrics, Bibliometric visualization, Data Visualization, Coronavirus disease 2019, Information systems

I. INTRODUCTION

Pneumonia cases were first reported in December 2019 in the Chinese city of Wuhan. It was later identified as a new coronavirus (COVID-19), sparking global concern. The illness has since spread to nearly every continent except Antarctica. COVID-19 is one of the most remarkable events of the early twenty-first century. As the virus outbreak is unlikely to be alleviated anytime soon, the world is adapting to the virus.

As a result, the pandemic has a profound effect on schools and higher education [1]. An increasing number of studies have focussed on COVID-19 [2]. This has resulted in an increase in the number of publications about coronaviruses [3],[4]. There is an urgent need to integrate COVID-19 knowledge with that of information systems. Additionally, it may aid in the handling of COVID-19 pandemic data. Additionally, the outbreak had implications for the creation, design, and implementation of information systems.

The aim of this paper is to propose a model for bibliometric analysis of information systems-related COVID-19 research articles. This paper is structured as follows. Section II does a literature review and discusses related work. The proposed framework is described in Section III. Section IV concludes with a discussion of future work.

II. LITERATURE REVIEW

A. The importance of data visualization

The process of data visualisation normally involves charts, graphs, and other visual tools. It aids in identifying the underlying trends in data as well as its trends. The visualization of data enables us to comprehend the content of a data set visually. It enables us to comprehend it in a more relevant and simple manner. Meanwhile, a large volume of data, particularly in real-time, is crucial. Author [5] emphasised the importance of data visualisation, stating that

when enormous amounts of data are analysed, the human brain is better able to discover visual patterns.

Apart from that, data analytics opens new avenues for visualising large amounts of data. The primary process of big data visualisation is the acquisition, preservation, processing, distribution, discovery, and presentation of large amounts of data. As a result, data visualisation has been integrated into a range of fields, including education and business [6]. Users can now visualise data in a more straightforward manner, thanks to advancements in data visualization techniques [7].

B. Bibliometric analysis

Bibliometric approaches have significant advantages over other methods for evaluating research. They can be used to create helpful interdisciplinary research measurements and quantitative indicators of collaboration.

Nowadays, academic journals are the primary vehicle for disseminating new research findings and expanding existing knowledge. Roy [14] illustrated how data visualisation may be utilised to solve Coronavirus-related problems using graphical representations of data. Reference [15] conducted a bibliometric analysis of the journal Information Systems Frontiers (ISF) article trends and identified its publication patterns. Additionally, [16] used a machine learning approach to undertake a bibliometric analysis of COVID-19 research tendencies. Scopus data were extracted. Author [17] conducted research on country rankings for computer science subfields during a 25-year period (1995–2019) based on the citation structure extracted from the Web of Science database.

Bibliometrics is a powerful method for evaluating research articles. Bibliometric analysis is defined as the process of examining the body of academic literature using statistical approaches. Using VOSviewer, [8] investigated science literacy researchers in physics and proposed a future study. The software enables the analysis and visualization of publication patterns via network mapping [9]. Additionally, it can generate publications mapping based on co-citation and co-occurrence of publication networks. Apart from that, VOSviewer can display a variety of visualisations, including overlay, network, and density visualisations. According to [10], bibliographic data analysis includes data collecting, analysis, visualisation, and interpretation of article's data. Thus, there is a need to properly visualize the data [11]. However, according to [12], bibliometric research, on the other hand, is time-consuming.

Additionally, bibliometric analysis assists scholars in discovering research publication patterns. They possess an instinctive capacity to appraise the progress of a field as well as useful for assessing the output of research on rising pandemic disease outbreaks [18]. They can deduce