

# Bibliometric Analysis of the Concept of Using Enterprise Resource Planning in the Micro, Small and Medium Enterprises (MSME) Sector

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**Abstract** – This study presents a bibliometric analysis study presuming the concept of ERP (Enterprise Resource Planning) management in the Micro, Small, and Medium Enterprises (MSME) sector. This bibliometric analysis provides information about the trend of article publication topics, the production of the most relevant authors, references cited as well as institutions and countries. It also discusses the most common themes, joint citations and bibliographic networks. The bibliographic data was collected through the web of science database between 2000 and 2021. The analysed documents were 449 documents; the analytical tools used R Programming and VOSviewer. These tools generate graphical representations of bibliographic data based on co-occurrence and their coupling. These findings suggest that the journal is increasing its publication volume and reputation in the field, with 449 Scopus indexed research articles to date. Therefore, the study will comprehensively understand past research trends and forecasts future research directions.

**Keywords** – bibliometric, enterprise resource planning.

## 1. Introduction

During these difficult times during the COVID-19 pandemic, all businesses experienced obstacles, including those engaged in the small and medium-sized business sector (MSMEs). All MSME business fields were affected by the decline. MSMEs in the micro food and beverage business saw a decline of up to 27 percent. Meanwhile, the implication on small food and beverage enterprise is 1.77 percent, and medium businesses are 0.07 percent. The impact of the COVID-19 virus on wood and rattan craft units of micro-enterprises was at 17.03 percent. Small businesses in the wood and rattan craft sector have 1.77 percent and 0.01 percent within medium businesses. Meanwhile, the manage of home consumption will also be between 0.5 percent and 0.8 percent [1] To restore MSMEs to normal as before the pandemic, there are many things that must be addressed, such as ERP (Enterprise Resource Planning), which will espouse the development of MSMEs so that good MSME performance can be established, both from the financial side and the non-financial side.

Among MSMEs, the use of the ERP software will be able to provide excellent and profitable opportunities, especially for market growth [2]. This can be viewed from the many uses of the ERP adopted by MSMEs in meeting their business needs [3]. By implementing the use of the ERP, especially in the MSME business actors, they will be focused on their primary business. Therefore, they can be used as a reference in making relevant strategies for their business [4]. Therefore, implementing the ERP software is very important, especially for the MSME actors. Thus, it becomes the center of attention, especially for practitioners and researchers, to contribute ideas so that they will have an impact and

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good solution regarding the need for information systems market growth [5].

Bibliometric analysis is the technique selected and the judgments connected with every stage performed to influence the results obtained and conclusions drawn from the analysis [6]. The data that is the focus of this analysis tend to be massive and objective. However, interpretation often depends on these two objectives being established by means of informed procedures and techniques. In bibliometric analysis, pre-processing and cleaning data has the most substantial burden and assignment to be carried out in the early stages. Therefore, the software and data sources being compared contained various methods and algorithms before processing [7].

This bibliometric analysis study on implementing enterprise resource planning (ERP) is still not widely carried out by academics, especially the MSME business actors. Many researchers in an academic context have indeed studied references to previous research on the bibliometric analysis, as was done by [8], who used a database of 127 scientific publications to attest the completeness of the information systems literature and innovations that resulted in the finding that Brazil and the United States dominated magazines where Enterprise Resource Planning (ERP) tools have higher recurrence from the articles analysed comparison with MIS and TAM model. Research [9] uses the Web of Science database to define the scope of study in social entrepreneurship by country, language, the person responsible for the publication, and the most significant results. Research conducted by [7] in an academic review on the assessment and analysis of scientist output, collaboration among universities, the influence of state-owned science granting on national research and cultivation performance and education efficiency, which records numbers that can be exported is between 500 and 50,000 and the scope of different disciplines is not the same in each database by recommending the analytical tools Bibliometrix, VOSviewer, and SciMAT whose analysis outputs can be selected and adapted to their purpose. Research that focuses on the subject of the MSMEs has been studied by several researchers, including research conducted by (Lu et al., 2020) with survey data of 2018 MSMEs in China. This analysis was conducted to explore how the innovation capability and market response of MSMEs influence financing performance show that both can affect financing performance. Furthermore, the ability to innovate can also help an organization, including SMEs, to stay afloat in the business world. In addition, another study was conducted by [4]. This type of research is qualitative research with interview method using three determining factors, namely technology, management, and environment. The results of this study were that the use of the ERP software as an alternative for organizational success in improving the quality of the decision-making process.

Many previous researchers have researched the concept of using the ERP. However, the literature review on the idea of using the ERP in the micro, small and medium business sector is still minimal, so it becomes an attraction to conduct further analysis of the concept of using the ERP, especially in the MSME sector from 2000 to 2021 by collecting 341 articles from reputable journals indexed by Scopus. This analysis discusses the trend of topics about the ERP that are developing both in the past and in the present. In addition, it also aimed to explore trends and developments that might appear in ERP concept research in the future. Three questions and answers are offered in this study:

RQ1: What is the trend of the ERP publications which includes the top-cited articles, top author rankings, keywords, publishing institutions, and countries

RQ2: How to classify the ERP articles

RQ3: What is the impact of the ERP for future research

## 2. Research Methodology

This study takes a descriptive type by a qualitative approach utilizing the bibliometric analysis method introduced by [10]. By analyzing the concept of using the ERP in the micro, small and medium enterprise sector, the data used are Scopus database traced on March 7, 2022. In addition, this study analyzes general research trends, publications, keywords, authors, universities, and citation structure. The analytical tool used is the VOSviewer application [11] and R Program [12]. The data analyzed were 314 documents.

## 3. Results and Discussion

Research on the ERP from 2000 to 2022 has published 449 documents with 948 authors. The results of the bibliometric analysis discussed are shown in Table 1. below:

Table 1. Page layout description

Authors	Articles	Articles Fractionalized
HADDARA M	9	4.67
RUIVO P	7	2.33
NA NA	6	6.00
AUTHORS F	5	4.50
BAUERNHANSL T	5	1.33
HUSTAD E	5	1.67
MAQSOOD AHMAD SANDHU ASPH	5	5.00
OLIVEIRA T	5	1.50
JOHANSSON B	4	1.50
KOH SCL	4	1.83
MOLINA A	4	1.45
ABADI AN	3	0.27
CERCHIONE R	3	0.95
FADHIL NA	3	0.27
HASHIM KF	3	0.27
KUMAR A	3	0.65
KURNIAWAN F	3	0.27
LIU R	3	0.27
MAHENDRAWATHI ER	3	1.08
MAJSTOROVIC V	3	0.62

From Table 1., it is noted that the articles from the fewest to the most are [13] This research focuses more on the challenges of adopting an Enterprise Resource Planning (ERP) cloud system for MSMEs. This ERP cloud system provides new opportunities for small businesses, especially MSMEs so that the process business processes are easier to access for small businesses [13], while in the business process integration between systems can affect the investment value including the ERP and the CRM software which will provide added value for system integration and business processes [14]. Another impact of using the ERP is organizational performance. The ERP is a way to increase the MSMEs [15]. The digital transformation of MSMEs is essential because this will be a necessary experience for the MSME actors themselves [16]. The focus of the ERP in the MSMEs is more on critical issues and MSME activities [17]. The ERP is also important for daily use. The purpose is to get practical benefits [18]. Another factor in the emergence of this digital transformation is to create new occasions and defiances in designing and arranging fast supply chains [19]. This technology will be able to open new market businesses to allow players to compete [20]. Besides, the information provided is more standardized, centralized, and cost-effective [21].

The topics that appear below are per the keywords in the ERP implementation research on SMEs. These are the most frequently used topics and keywords that are often used as shown in the following timeline:

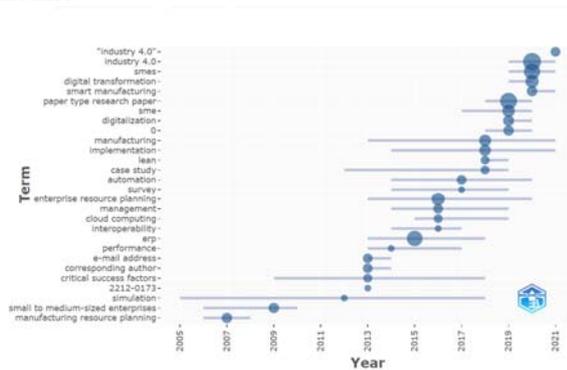


Figure 1. Research topic development

The topic from Figure 1. that experienced very rapid development in 2005 was the topic of simulation. However, from 2006 to 2010, the issue of small, micro, and medium enterprises has emerged and developed, while research on the ERP and the Cloud Computing has begun to create and attract the

public's interest. Researchers between 2013 and 2020, while research on the MSMEs, especially in terms of digitalization, digital transformation, and industry 4.0 transformation at the MSME level, continues to increase and is increasingly popular from 2018 to the current year.

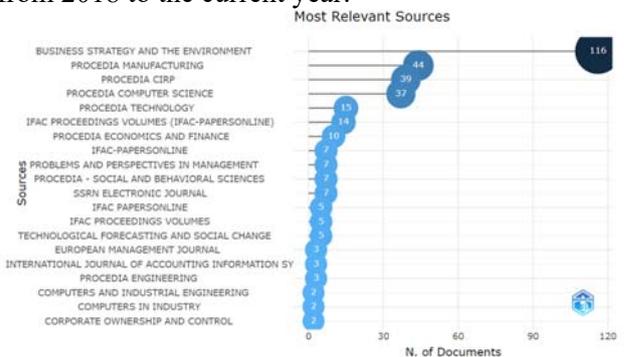


Figure 2. Most relevance source

Figure 2. above describes the most relevant sources published by each journal following its relevance, namely implementing the ERP in Micro, Small, and Medium Enterprises. The picture above also represents the number of journals and documents published at the top ranging from 0 to 116.

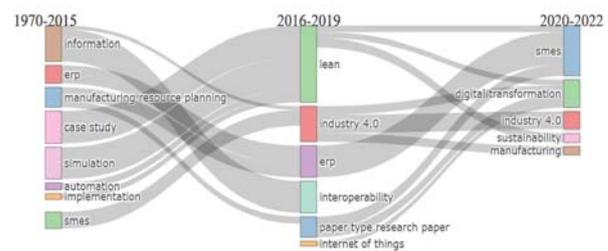


Figure 3. Thematic evolution

The research development based on themes and keywords spanning from 1970 to 2022 (Figure 3.). From 1970 to 2015, the piece of information systems research began to develop, followed by Enterprise Resource Planning, and then has penetrated the manufacturing sector. With the concept of resource planning, then the theme of simulation and implementation of automation in small-medium enterprises has also begun to be studied a lot. In the period between 2016-2019 research developments has already started to penetrate industry 4.0. The concept of its implementation is still entrepreneurial Resource planning. In the period between 2020-2022, the theme of digital transformation in small-medium enterprises has begun to be studied a lot with the assumption that this digital transformation can support industry 4.0 and sustainable production.



Enterprise Resource Planning, lean, information management while in 2020 research that grew quite rapidly was on the piece of industry 4.0, smart manufacturing, digitalization, transformation digital, sustainability and intelligent manufacturing.

This article analyzes the collaboration of authors published in the form of research on the application of Enterprise Resource Planning in the MSMEs; there are 940 authors in all. This analysis is based on the maximum collaboration between 28 authors.

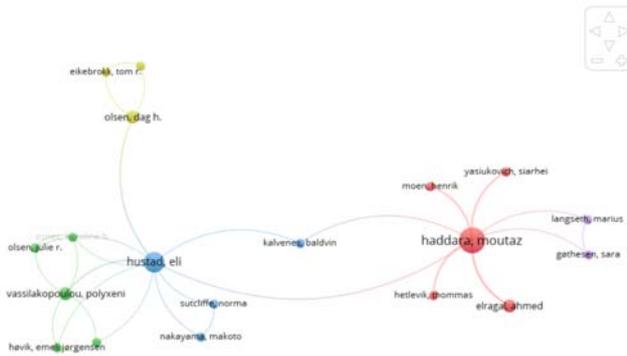


Figure 8. Research Author Area Visualization using Vosviewer Writer Network Visualization

From Figure 8., the first cluster is the largest cluster with the red color with ten authors represented by [13], the second cluster in green with nine authors represented by [22], the third cluster in blue with eight authors represented by [17], the fourth cluster is yellow with four authors [17]. In comparison, the fifth cluster is purple with four authors represented, [13].

#### 4. Conclusion

This analysis can provide a comprehensive review related to the ERP theme, allowing researchers to access research trends, keywords, and research years. This research only accesses bibliometric data, not complete data. The research topics carried out are still limited to the ERP. It is expected to facilitate researchers to conduct research, so that this research will be an excellent opportunity for future research.

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