

# Bibliometric Analysis of ERP and Performance: Current situation

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**Abstract.** This paper presents a bibliometric analysis of international research on ERP and Performance from January 2013 to December 2022 using the Scopus Database. We found 256 references, with 71% being articles and the majority focusing on computer science and management science recorded more than 70% of the total studies. Our analysis illustrates a shortfall in ERP and performance studies at the national level.

**Index Terms**— Bibliometric analysis, ERP, Performance, Scopus, Database, indicator, International research.

## 1 Introduction

The emergence of the ERP research field in the mid-1990s has had a significant impact and now holds a crucial position in the academic landscape of information Systems [1]. This prominence is attributed to the opportunities it creates within the organizational sphere. When a ERP is implemented as the core application of the information system, it becomes a powerful tool for steering and managing a company's operations.

The primary objective of this article is to assess and evaluate the scientific research that examines the relationship between ERP and performance. To achieve this, we employ bibliometric analysis, a research method that aids in the accumulation of scientific knowledge [2].

This article is based on a bibliometric analysis of international studies published on ERP and Performance over the past decade, from January 2013 to December 2022.

Bibliometric analysis involves various mathematical and statistical methods used for quantitative analysis of sciences, along with measuring sociological dimensions associated with the dissemination of research through publications [3]. Bibliometric plays a crucial role in guiding research efforts. It helps understand and track the scientific output of departments, units, or thematic areas, identify specialists in specific fields, explore potential collaborations, discover new funding sources, identify emerging topic and competitors, and select appropriate journals for article submission.

Bibliometric analysis can be applied at three different levels: "micro level" (Individuals), "meso level" (Scientific population of institutions and research groups) and "macro level" (measuring national production by country, province, or city) [4].

To conduct this analysis, various bibliometric indicators such as the number of documents, number of citations, H-index, Impact Factor, citation rate ...are calculated based on bibliographic databases.

Each database has its limitations and disadvantages. Therefore, the selection of the appropriate database depends on the specific objectives of the analysis. Currently, two major generalist databases - Web of Science (WoS) and Scopus - accessible though subscriptions and covering around 90% of journals and papers, are commonly used. It is

essential to note that indicator values may differ between databases due to variations in database coverage. As a result, we always specify the database and filters used for the analysis.

## 2 Research methodology

The subjects under consideration are primarily focused on research in management sciences and computer science. Therefore, our bibliometric study has centred on documentary research, involving the compilation of scientific articles, books, conference papers, journals, and book chapters indexed in the Scopus database for the period 2013-2022.

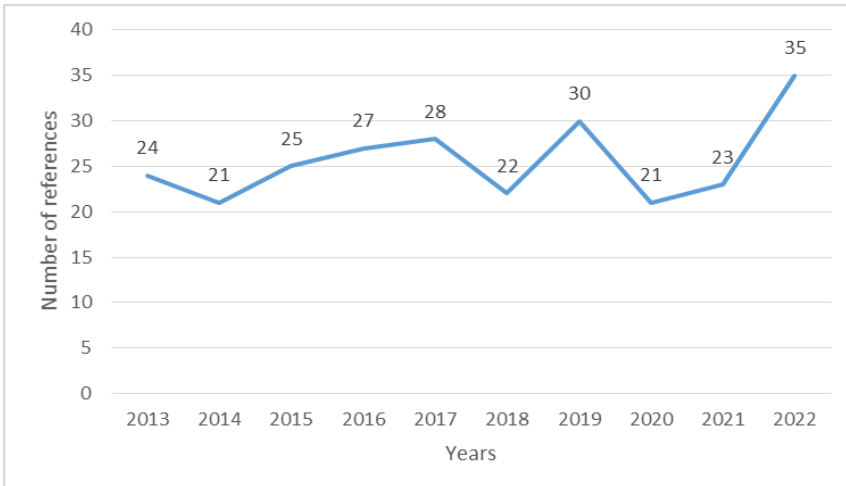
The research documents were identified through statistical analysis, combining two English keywords to ensure international coverage: ERP and Performance. Subsequently, a thematic structure was created by combining the two keywords, followed by geographical segmentation based on the continent and the affiliation country of the first author.

## 3 Results

We have identified 256 references in the Scopus database (based on the aggregation of keywords) for the period 2013-2022.

### 3.1 Evolution of the number of references

Based on the figure, we observe that the threshold of 25 articles per year ( $256/10$ ) was surpassed in 2016, 2017, 2019 and 2022. As a result, there has been a significant increase in publications recorded in 2022, potentially attributed to the emergence of interlignnet writing systems.



**Fig. 1.** Evolution of the number of references on ERP and Performance between “2013-2022”

To assess the evolution of the number of publication during the study period, we relied on the Compound Annual Growth Rate (CAGR). This parameter enabled us to calculate the average annual change in publications over the course of the ten-year study. The CAGR is expressed as a percentage and is calculated using the following formula:

$$CAGR = \left( \sqrt[n]{\frac{\text{Valeur finale}}{\text{Valeur Initiale}}} - 1 \right) \times 100$$

The CAGR for research on ERP and Performance is 6%. Additionally, the scientific consideration of the link between these two concepts, ERP and Performance, is not yet substantial enough.

### 3.2 Typology of References

The 256 references encompass various forms, such as articles, conference papers, book chapters and journals. The primary mode dissemination is scientific articles, accounting for 182 publications or 71%, followed by conference papers with 64 publications, representing 25%. Together, these two modes dissemination account for 86% of the references, whereas books represent only 0.8%.

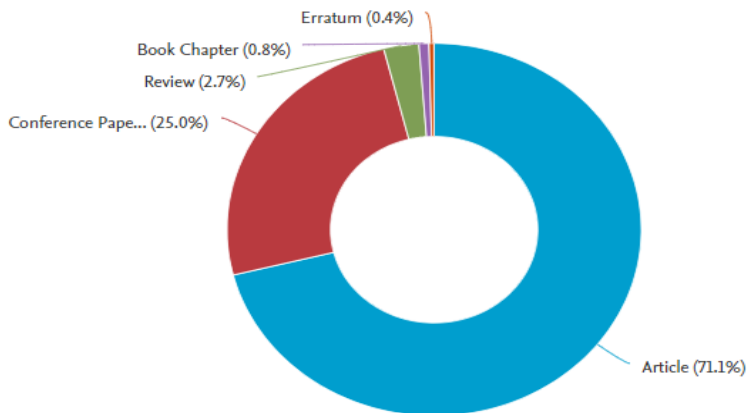
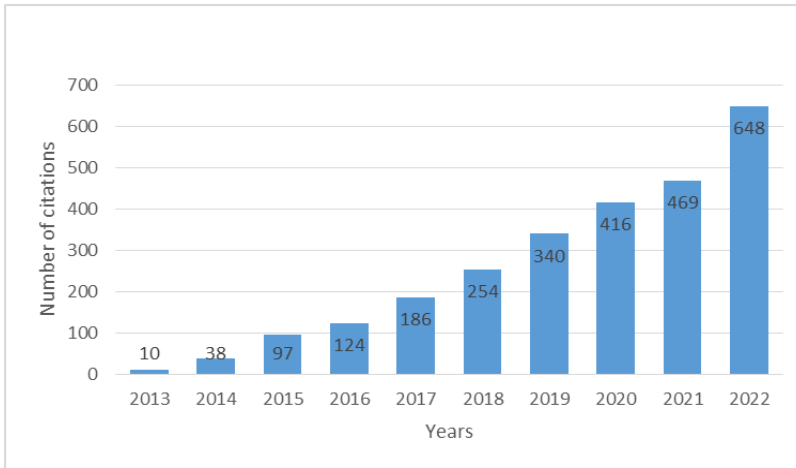


Fig. 2. Distribution of references based on the type of reference

### 3.3 Number of Citations

The 256 publications have received a total of 2582 citations from other articles during the period “2013-2022”, averaging nearly 10 citations per reference.

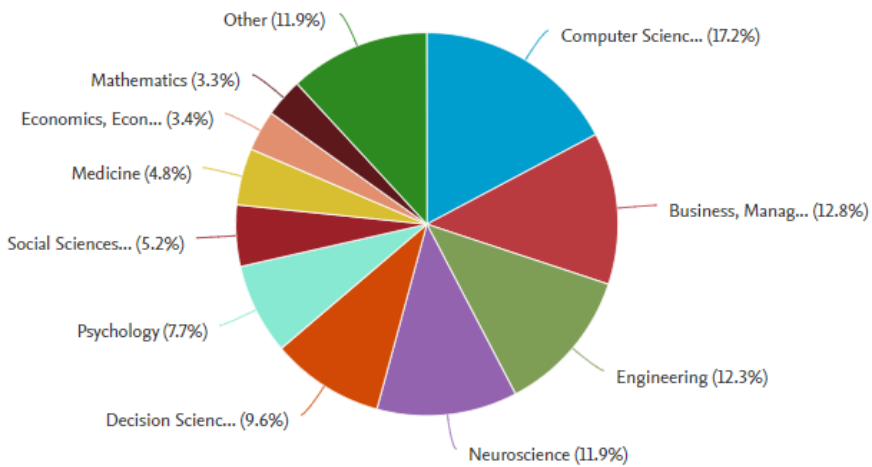


**Fig. 3.** Number of citations for the entire set of references on ERP and Performance.

The CAGR of citations for the entire set of references on ERP and Performance is 25%, reflecting the dynamism of this theme over the 10-year study period and indicating an increasing interest among researchers worldwide.

### 3.4 Disciplinary Fields

All these references are categorized by authors into one more disciplines.



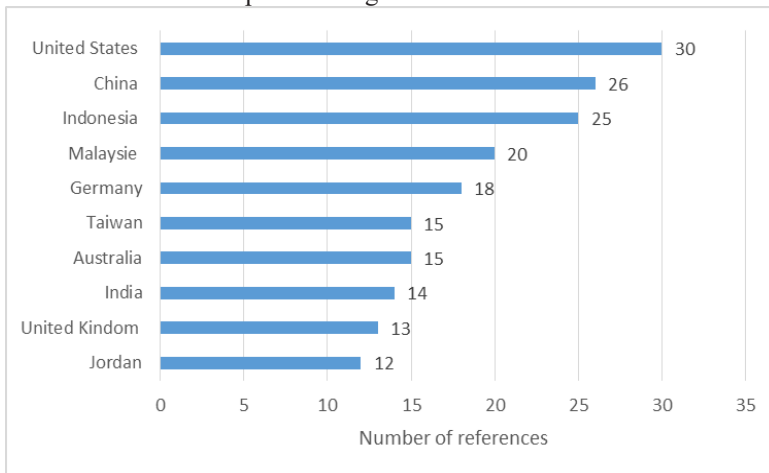
**Fig. 4.** Distribution of references across disciplinary fields.

Authors choose multiple disciplines, with a majority belonging to the fields of computer science and management science. This affiliation can be explained by the role of ERP as an IT tool in business management.

### 3.5 Geographical Balance

The positioning of different countries in the global research landscape of ERP and Performance is influenced, on one hand, by their production volume and, on the other hand,

by the relative impact of their articles, which indicates the visibility of their production on the global stage. The United States has contributed 30 references, followed by China with 26 references. We notice the low contribution of Morocco (3 references). This scarcity could be attributed to the conditions of scientific research in Morocco and the limited number of Moroccan companies using ERP.



**Fig. 5.** Number of references for the top 10 countries.

## 4 Discussion

The integration of an ERP is often a response to a company’s desire to improve its information system and enhance its operational performance. The question of the ERP’s contribution to performance is a recurring topic in Information Systems (IS) research. Since Solow’s paradox in 1987, various studies have been conducted to establish the relationship between ERP investments and performance [5].

Attempting to assess these research efforts faces challenges due to the diversity of chosen analytical levels (target population, process, industry ...) or the adopted performance concepts (financial, non-financial, organizational ...), leading to elusive and even contradictory empirical results.

Quantitative analysis of scientific publications dates back to the late 19<sup>th</sup> century [6]. Bibliometrics remains a subject of debate within the scientific community at both national and international levels. Many countries use this type of study to evaluate the performance of universities and research organizations.

The bibliometric study presented in this article was conducted using data extracted from Scopus. Its objective was to gain insights into scientific publications that focused on ERP and performance. We consider publication in scientific journals as a good indicator of the emergence and development of scientific ideas. Analyzing the evolution of publications over a ten-year period, we observed a modest research dynamic on this theme, with a CAGR of 6%. Additionally, the scientific consideration of the link between ERP and Performance is not yet substantial enough.

Research quality is a key concept in bibliometric analysis, derived from the number of citations, as "the more a document is cited, the better its quality is judged" [4]. In our study, the CAGR of citations for the entire set of references is 25%, reflecting the dynamism of this theme over the ten-year study and indicating an increasing interest among researchers worldwide.

The main mode of disseminating research finding is through scientific articles, which account for 182 references. This trend of publishing more articles and fewer books can be attributed to the following factors [7, 8, 9, 10, 11]:

- The pressure of globalizing higher education, international rankings, and the new management of universities, which encourage researchers to produce more scientific articles.
- Scientific productivity is evaluated through indicators used for recruitment and promotion of researchers.

We noted that there are many authors (over 180 authors), and articles are generally written collaboratively. The journals covering ERP and performance encompass a wide range of disciplinary fields, particularly in computer science and management sciences. It is also evident that the authors come from diverse nationalities. However, Asian authors make up the majority, accounting for 56% of the publications.

The United States appears as the most active country in research on this theme, contributing 30 articles, while Morocco is absent from the top 10 countries of author affiliation, indicating a lack of studies on ERP and performance at the national level. This absence can be justified by two main reasons:

- Unfavorable conditions for scientific research in Morocco: Studies conducted by the Department of Scientific Research within the Ministry of Higher Education for the preparation of the five-year plan (2000-2004) have identified certain shortcomings, such as inadequate management and administration of research, insufficient funding for scientific research (0.30% to 0.40% of GDP), lack of mechanisms and structures for research valorization, and the absence of policies to integrate researchers into the productive system and support research activities [12].
- Limited number of Moroccan companies with ERP systems.

## 5 Discussion

In summary, our bibliometric study provides information on the authors and the main national and international institutions publishing on ERP and performance that may be useful for future researchers to improve research on this topic. Thus, it shows that there is a lack of research on ERP and performance at the national level.

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