

The Evolution of ERP and Organisational Agility: A Bibliometric Analysis and Mapping of Research Trends

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Abstract

This article examines the evolution and structure of scientific research on ERP systems and organisational agility between 2013 and 2023. Drawing on a corpus of 550 scientific publications from Scopus, a bibliometric analysis carried out using the VOSviewer software enables an examination of publication trends, scientific collaborations and the main thematic and intellectual structures within the field. The results reveal an uneven growth in scientific output, characterised by a surge in publications towards the end of the period. The mapping highlights diverse international participation, but a dispersed distribution of authors with no visible connections within the network under study. The keyword analysis identifies three major research directions relating to ERP systems, decision-making processes and organisational agility in the context of digital transformation. Co-citation networks reveal an interconnected intellectual base, situated at the intersection of information systems and management sciences. This study contributes to a better understanding of the organisation of the scientific field and identifies several avenues for further analysis of its developments.

Keywords: ERP systems; Organisational agility; Bibliometric analysis; VOSviewer; Scientific mapping.

Introduction

The digital transformation of organisations has gradually strengthened the role of information systems in the integration of activities, the coordination of processes and the evolution of business operating models. Among these technologies, enterprise resource planning (ERP) systems occupy a prominent position due to their ability to centralise data, harmonise processes and ensure the interconnection of different organisational functions. Originally developed with a view to standardisation and information integration, these systems have undergone successive transformations in their architectures, functionalities and modes of use (Davenport, 1998; Shang and Seddon, 2002; Turner and Chung, 2005). The development of cloud-based ERP solutions and the gradual integration of new digital functionalities reflect this evolution, which is accompanied by a growing academic interest in the relationship between integrated systems and organisations' adaptive capacities. In this context, organisational agility is a particularly relevant concept, as it refers to the capacity of organisations to detect changes and respond to them rapidly in environments characterised by uncertainty and continuous transformation (Overby et al., 2006; Tallon and Pinsonneault, 2011).

The academic literature on ERP systems and organisational agility has developed around several perspectives, notably

informational integration, process standardisation, the evolution of digital architectures, and organisational transformations associated with integrated systems. The work of Newell et al. (2003) examines the relationships between ERP, efficiency and organisational innovation, whilst Seethamraju and Diatha (2013) focus more specifically on the links between these systems and the agility of business processes. Other studies focus on information technology and organisational agility from complementary conceptual and empirical perspectives (Sambamurthy et al., 2003; Lu and Ramamurthy, 2011). This diversity of research highlights the value of examining how scientific research has gradually organised itself around these two concepts. The aim is therefore not to determine the mechanisms through which ERP influences organisational agility, but to characterise the evolution of publications, the main intellectual contributions, the collaborative networks and the thematic orientations that make up this field of research. Such a perspective leads to a focus on the study of bibliographic structures and scientific dynamics rather than an explanatory synthesis of empirical results.

From this perspective, bibliometric analysis is an appropriate approach for examining the organisation and evolution of a scientific field based on publication metadata. Zupic and Čater (2015) highlight its value for identifying intellectual structures and scientific networks, whilst Aria and Cuccurullo (2017) and Donthu et al. (2021) highlight its contribution to knowledge mapping and the analysis of research trends. This article therefore seeks to address the following research question: how has scientific output on ERP systems and organisational agility evolved between 2013 and 2023, and what intellectual structures, scientific collaborations and thematic trends emerge from the bibliographic data? To address this question, the study employs bibliometric analysis and research trend mapping based on a corpus of 550 scientific publications from the Scopus database, covering the period 2013–2023. The aim is to examine the temporal dynamics of publication, identify influential contributions, characterise collaboration networks and highlight the main thematic clusters. The expected contribution lies in a structured analysis of the field's evolution, aimed at identifying dominant scientific trends, emerging themes and research areas that remain largely unexplored in the literature on ERP systems and organisational agility.

1. Conceptual framework for the evolution of ERP systems and organisational agility

1.1. Definition and evolution of ERP systems

Enterprise resource planning (ERP) systems are integrated information systems that coordinate key organisational functions through a shared information infrastructure. Their development was initially driven by a need to centralise data, standardise processes and interconnect activities, in response to the limitations of stand-alone functional applications. Davenport (1998) emphasises that these systems have profoundly transformed the organisation of information flows by bringing together different functions within an integrated architecture. This view is further developed by Klaus et al. (2000), who highlight the diversity of functionalities and configurations associated with ERP systems, whilst Shang and Seddon (2002) propose a classification of the benefits associated with their use, particularly at the operational, organisational, managerial, strategic and technological levels. These seminal contributions position ERP systems at the intersection of information systems and organisational functioning, emphasising their role in the evolution of practices relating to the coordination and management of activities.

The evolution of ERP systems has been accompanied by a gradual transformation of their architectures, functionalities and deployment methods. Initially geared towards the integration of internal processes, these systems have gradually opened up to complementary applications and information exchanges extending beyond the functional boundaries of the organisation. Turner and Chung (2005) emphasise the importance of integration, modularity and flexibility in this evolution, whilst Newell et al. (2003) situate ERP within a broader discussion of process transformations and the tensions between efficiency and innovation. The emergence of cloud-based ERP solutions represents a further step, characterised by new ways of accessing, maintaining and upgrading applications. Elmonem et al. (2016) identify several characteristics of these systems, notably their accessibility and scalability, whilst Salih et al. (2021) examine the main challenges associated with their adoption. More recently, Hansen et al. (2023) focus on the customisation possibilities of cloud-based ERP systems, illustrating the diversification of academic inquiry concerning new generations of integrated systems. This research reflects a gradual broadening of the research focus, moving from traditional issues of integration and standardisation towards themes associated with digital architectures, usage patterns and the evolution of ERP systems.

1.2. Organisational agility and its relationship with the evolution of ERP systems

Organisational agility refers to an organisation's ability to detect changes in its environment and respond rapidly by adjusting its activities, resources and processes. Overby et al. (2006) conceptualise this notion on the basis of two complementary dimensions: the detection of changes and the capacity to respond. From a similar perspective, Sambamurthy et al. (2003) situate organisational agility within the transformations associated with digital technologies, whilst Lu and Ramamurthy (2011) distinguish between several manifestations of organisational agility, particularly in relation to the market and operational activities. These contributions demonstrate that agility has gradually emerged as a significant area of research within the fields of information systems and management science. They also highlight the diversity of conceptual approaches employed to study organisations' capacities for adaptation and response, without reducing agility solely to process flexibility.

The link between ERP systems and organisational agility has given rise to various research directions, notably concerning information integration, process coordination, the evolution of digital architectures and organisations' responsiveness. Seethamraju and Diatha (2013) directly address the relationship between ERP and the agility of business processes, whilst Tallon and Pinsonneault (2011) examine more broadly the links between information technology and organisational agility. These perspectives form part of a field of research in which ERP systems are studied in terms of their characteristics, uses and successive transformations. In the context of this article, however, the focus is not on a detailed explanation of the mechanisms through which ERP systems influence organisational agility, but on how publications devoted to these two concepts have developed and been organised over time. The bibliometric analysis therefore aims to identify influential contributions, collaborative networks and thematic clusters that structure the scientific literature between 2013 and 2023. This scope directs the research towards a mapping of scientific trends, distinguishing between historically established themes and more recent trends emerging from the corpus under study.

2. Presentation of the analysis and research methodology

Bibliometric analysis is a methodological approach suited to exploring scientific fields characterised by a diversity of publications, concepts and research directions. Based on the quantitative analysis of bibliographic data, it aims to examine trends in scientific output, identify influential contributions

and highlight the intellectual relationships that structure a field of research. In the field of management sciences, Zupic and Čater (2015) highlight the value of this method for studying citation networks, scientific collaborations and thematic clusters, as a complement to traditional literature review approaches. Donthu et al. (2021) point out that bibliometric techniques contribute to a structured understanding of scientific output, particularly through the identification of its intellectual foundations, its developmental dynamics and its main directions. This approach is of particular interest for the study of ERP systems and organisational agility, the convergence of which has given rise to various research perspectives focusing on systems integration, process transformation and the evolution of digital environments.

In this article, bibliometric analysis is used to examine the structure and evolution of research on ERP systems and organisational agility. The study focuses on the successive transformations of integrated systems, from traditional approaches based on data centralisation and process standardisation to more recent generations characterised by open architectures, scalable functionalities and diversified deployment methods. These transformations form the scientific context within which publications relating to organisational agility — understood as the ability of organisations to detect changes and respond to them rapidly — are examined. The aim is not to explain the mechanisms by which ERP systems influence agility, but to characterise the publication dynamics, influential contributions, collaboration networks and key thematic trends that structure the literature. This scope places the research within a bibliometric framework specific to management sciences, where the unit of analysis consists of academic publications and their metadata rather than the causal relationships observed within organisations.

The research adopts a quantitative approach based on the analysis of bibliographic metadata, supplemented by an interpretation of the scientific networks and thematic clusters identified. The VOSviewer software was selected to map research trends and visualise the relationships between publications, authors and the concepts under study. Developed by van Eck and Waltman (2010), this tool facilitates the construction of bibliometric networks based on various techniques, notably keyword co-occurrence, co-citation, bibliographic coupling and the analysis of scientific collaborations. Its use addresses the need to identify intellectual affinities between research on ERP systems and organisational agility, whilst distinguishing the thematic clusters that characterise the structure of the field. The construction of these networks is based on precise methodological parameters, including, in particular, units of

analysis, counting methods, inclusion thresholds and normalisation methods. These elements must be documented for each representation in order to ensure the transparency of the processing and to facilitate the interpretation of the results.

The compilation of the bibliographic corpus represents a crucial stage in this process, as it determines the relevance and reliability of the analyses carried out. The Scopus database was selected as the source of documentation due to its multidisciplinary coverage and the diversity of publications it references in the fields of information systems, management sciences and organisational studies. Mongeon and Paul-Hus (2016) highlight the breadth of its scientific coverage, whilst emphasising the differences in representativeness that exist between the main international bibliographic databases. The choice of Scopus is also based on the availability of structured metadata, notably titles, abstracts, keywords, authors, institutional affiliations and cited references. This information provides the documentary basis required for examining scientific output and constructing bibliometric networks. The use of a single source promotes the homogeneity of the data analysed, even though this limitation entails certain restrictions relating to the coverage of publications and the indexing methods specific to the database.

The literature search strategy is based on a combination of terms relating to the two central dimensions of the study. The first concerns ERP systems and their evolution, using terms such as Enterprise Resource Planning, ERP systems, ERP evolution, ERP implementation, ERP integration, Cloud ERP, ERP adoption and intelligent ERP. The second focuses on organisational agility and related concepts, notably organisational agility, enterprise agility, business agility, business process agility, organisational responsiveness and organisational adaptability. The combination of these terms aims to identify publications addressing ERP systems and their relationship with the agility of organisations and organisational processes. The literature review covers the period 2013–2023, spanning eleven calendar years, in order to examine changes in scholarly output and shifts in research trends. The literature review was conducted in the Scopus database using a combination of terms relating to ERP systems and organisational agility, utilising Boolean operators and search fields associated with titles, abstracts and keywords. The search query actually used was as follows: (“enterprise resource planning” OR “ERP systems” OR “cloud ERP”) AND (“organisational agility” OR “enterprise agility” OR “business process agility”). Bibliographic data was collected in October 2023, selecting scientific publications published between January 2013 and October 2023. The resulting corpus comprises 550 publications from

Scopus, with the final year of the period under study being considered only up to the date of data extraction.

The selection of publications is based on criteria of thematic relevance designed to ensure that the selected documents align with the research objectives. The scientific scope covers work devoted to ERP systems, their evolution and their relationship with organisational agility, including in particular research on systems integration, process transformations, digital architectures and organisational responsiveness. Publications focused exclusively on programming, software development or algorithmic design, with no explicit link to organisational issues, fall outside the defined scope. The selection procedure also involves verifying bibliographic records to identify any duplicates, documents unrelated to the research topic and metadata insufficient for the intended processing. The inclusion and exclusion criteria, document types, languages selected and the number of documents involved in the various filtering operations must be specified on the basis of the collection data. This requirement is in line with the recommendations of Zupic and Čater (2015) and Donthu et al. (2021), who emphasise the importance of a clearly defined scope of the literature and a selection procedure that is sufficiently transparent to ensure the reproducibility of the analyses.

The bibliometric analysis is organised around two complementary components: the analysis of scientific performance and the mapping of research networks. The first aims to characterise the annual trends in publications, identify the most widely represented scientific sources, and examine the contributions of authors, institutions and countries. Citation analysis provides further insight into the visibility of publications within the corpus, whilst taking into account differences in the age of the works. The second component is based on an examination of bibliographic relationships in order to characterise the intellectual, social and thematic organisation of the field. The co-occurrence of keywords helps to identify concepts frequently associated in publications, whilst co-citation aims to highlight references cited together in the literature. Bibliographic coupling provides insight into the connections between documents sharing common references, whilst co-author analysis enables the visualisation of scientific collaboration networks. These techniques offer complementary perspectives on the structure of the field, in line with the methodological approaches presented by van Eck and Waltman (2010) and Donthu et al. (2021).

The preparation of bibliographic data also pays particular attention to terminological consistency and the quality of the information used in the analyses. In the field under study,

several terms may refer to equivalent or closely related concepts, notably 'Enterprise Resource Planning', 'ERP' and 'ERP systems', or 'organizational agility' and 'organisational agility'. The bibliographic data contain several terminological variants relating to ERP systems and organisational agility. These terms were retained in their original form when constructing the co-occurrence networks, without applying a thesaurus file. This approach preserves the terms present in the metadata, but may result in occurrences being distributed across several nodes corresponding to identical or similar concepts. This particular feature is taken into account when interpreting the thematic clusters obtained.

The interpretation of the results is based on a cross-referenced analysis of bibliometric indicators and the patterns observed in scientific networks. The maps produced are not regarded as mere graphical representations, but as tools designed to examine the distribution of publications, the relationships between contributions and the formation of thematic clusters. The size of the nodes, the strength of the links, the colours of the clusters and the spatial proximity of the elements must be interpreted according to the parameters specific to each analysis. Particular attention is paid to distinguishing between frequencies of occurrence, citation counts and link strengths, which correspond to different indicators. The identification of dominant or emerging themes is therefore based on the structures actually observed in the corpus, without equating bibliometric proximities with causal relationships between ERP systems and organisational agility. This precaution helps to preserve the descriptive and relational scope of the bibliometric analysis, by distinguishing its results from explanatory interpretations based on an in-depth examination of empirical studies.

The corpus selected for this research comprises 550 scientific publications from the Scopus database, covering the period 2013–2023. These documents form the empirical basis for the bibliometric analysis focusing on the evolution of ERP systems and organisational agility. Data analysis using the VOSviewer software focused on publication dynamics, scientific collaborations between countries and between authors, keyword co-occurrence relationships, and co-citation networks of scientific sources. This approach aims to characterise the main intellectual and thematic structures of the field, whilst tracing the evolution of research trends over the period studied. The corresponding results are presented in the following section, which is devoted to the analysis of scientific output and the mapping of bibliometric networks.

3. Results of the bibliometric analysis

Bibliometric analysis forms a central part of this research, which is dedicated to examining the evolution and structure of scientific output relating to ERP systems and organisational agility. Using bibliographic data from Scopus, it aims to characterise publication trends, identify the most influential scientific contributions and examine the main trends shaping this field of research. The analysis of metadata using the VOSviewer software adds a further dimension to this approach, notably through the construction of networks showing collaboration, co-citation and keyword co-occurrence. The aim is not to explain the mechanisms by which ERP influences organisational agility, but to map out the intellectual and thematic organisation of scientific publications, paying particular attention to developments observed between 2013 and 2023.

The study of scientific output is based on an examination of several bibliometric indicators, notably the annual distribution of publications, scientific sources, authors' contributions, collaboration networks and the relationships between the main concepts employed. These analyses aim to identify periods of development within the field, characterise its main scientific structures and pinpoint dominant or emerging themes. From this perspective, bibliometric mapping serves as a tool for interpreting research trends, the results of which must be examined in light of the characteristics of the corpus and the processing parameters selected (van Eck and Waltman, 2010; Donthu et al., 2021). The various analyses are based on a common corpus of 550 scientific publications from Scopus, covering the period 2013–2023. The bibliometric visualisations were produced using the VOSviewer software, employing distinct units of analysis according to the objectives pursued. The networks focus respectively on countries, authors, keywords and cited scientific sources. The number of elements represented in each network diagram depends on the selection criteria and thresholds applied during data processing. Consequently, the differences observed in the size and composition of the networks do not reflect variations in the initial bibliographic corpus, but result from the specific characteristics of each analysis.

Table 1: General information on bibliometric data.

Indicator	Value
Database	Scopus
Period analysed	2013–2023
Number of publications	550
Mapping software	VOSviewer

Source: author

3.1. Analysis of trends in scientific publications (2013–2023)

Analysing annual trends in publications provides an initial indicator of the scientific dynamics of the field under study. It aims to assess variations in the volume of literature devoted to ERP systems and organisational agility, to identify periods of growth or decline, and to characterise the changes in pace observed over the period 2013–2023. This temporal analysis sheds light on the quantitative development of the scientific field, without prejudging the thematic content of the publications or the factors explaining their evolution.

An examination of the data presented in Figure 1 reveals an irregular trend in scientific output during the early years. Between 2013 and 2018, the number of publications fluctuated roughly between 37 and 50 papers per year. The year 2013 saw a relatively high level, followed by a decline in 2014 and a slight recovery in 2015. Output fell in 2016, before experiencing further fluctuations in 2017 and 2018. This initial period is therefore characterised by the absence of a continuous upward trend, despite the maintenance of regular scientific activity on the topics covered by the literature review.

The period 2019–2021 marks a more noticeable increase. The annual number of publications rose from around 46 documents in 2019 to 47 in 2020, before reaching 56 in 2021. This trend reflects a gradual increase in the volume of works indexed in Scopus, particularly from 2020 onwards. It suggests a strengthening of scientific output within the bibliographic scope under study, although it is not possible to attribute this growth to a specific thematic shift based solely on chronological data. Identifying the scientific trends

associated with this period will require further examination of keywords and bibliometric clusters.

The year 2022 stands out for a significant increase in the number of publications, reaching approximately 79 documents – the highest level in the period studied. In 2023, the number of publications recorded stood at around 67 documents as at the date of data extraction, which took place in October. However, this difference cannot be interpreted as a definitive decline in scientific output, as publications from the final months of 2023 have not been taken into account. Any comparison with previous years must therefore take into account the ly incomplete nature of the data available for that final year.

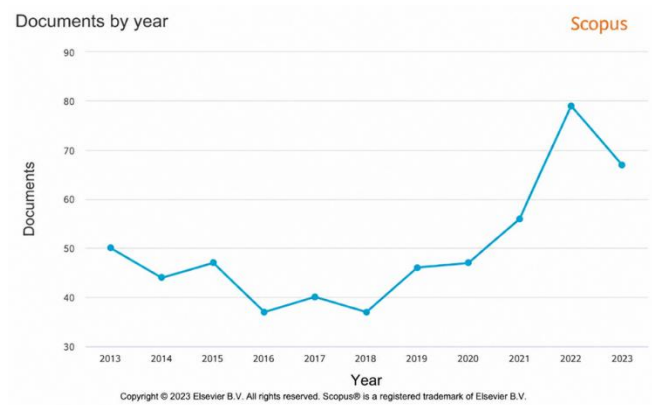


Figure 1: Trend in the number of scientific publications (2013–2023).

Note: Data for 2023 cover only the period from January to October 2023.

Source: Bibliographic data from Scopus, 2013–2023.

Overall, the trend is characterised by three distinct periods: fluctuations between 2013 and 2018, a gradual increase between 2019 and 2021, and then a marked rise in 2022 followed by a decline in 2023. The observed trend reflects an increase in annual output towards the end of the period, although it does not follow a strictly linear trajectory. These results provide an initial descriptive analysis of developments in the field and justify an examination of other bibliometric dimensions, notably influential contributions, collaboration networks and thematic clusters, in order to characterise more precisely the transformations in research on ERP systems and organisational agility.

3.2. Analysis of publications by country

An analysis of the geographical distribution of publications provides an insight into the international structure of research devoted to the evolution of ERP systems and organisational agility. The figure below, generated using the VOSviewer software, depicts a co-publication network by country based on the corpus studied. Each node corresponds to a country; its size reflects its relative weight within the network, whilst the links indicate the existence of academic collaborations. The visualisation also follows a temporal logic: the colour of the nodes indicates the average time period of the contributions, ranging from relatively older works, shown in blue, to more recent contributions, shown in yellow.

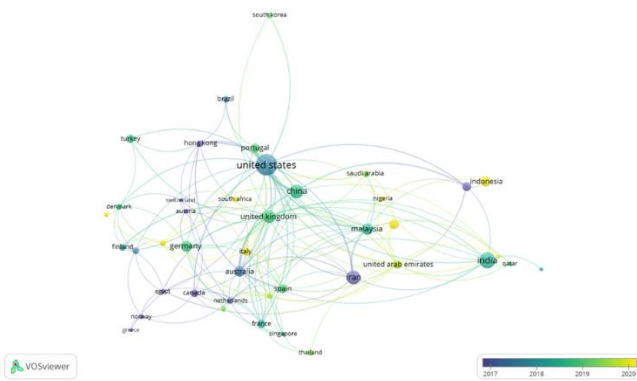


Figure 2: Co-publication network by country (2013–2023).

Source: Results of the VOSviewer analysis based on the Scopus corpus relating to ERP systems and organisational agility.

The map clearly highlights the central position of the United States within the international publication network. Its node is one of the largest and appears to be strongly connected to a large number of countries, reflecting both a significant volume of scientific output and strong integration into international collaborations. This centrality suggests that US institutions play a structuring role in the development of the literature on ERP systems and organisational agility. They appear to act as a hub linking several research areas, connecting European, Asian and Middle Eastern countries within a single scientific network.

Around this central core, several other countries also occupy an important position. China, the United Kingdom and India emerge as major players in the field. China and the United Kingdom stand out for their intermediate position and the density of their connections, which reflects their active participation in the circulation of scientific work. India is also characterised by a large node and numerous links with various

partners, which attests to a significant contribution to recent literature. This configuration confirms that the field is not solely dominated by North America, but is underpinned by a broader scientific dynamic, in which Asia and Europe are playing an increasingly prominent role.

The network also highlights the presence of several countries acting as interfaces between different geographical clusters. This is particularly the case for Germany, Spain, Australia, France, the Netherlands, Malaysia, Iran and the United Arab Emirates. Although they are smaller than the most dominant hubs, their position within the graph shows that they participate in international scientific exchanges and help to link different sub-networks. Malaysia, for example, appears connected to several Asian and Western countries, whilst Iran and the United Arab Emirates occupy an interesting position at the intersection of research conducted in Asia, the Middle East and the Anglo-Saxon countries. This configuration reflects a gradual spread of research on ERP and organisational agility into more diverse scientific spheres.

A temporal analysis of the map provides further insight into the chronological distribution of scientific contributions. The blue or blue-green shades, observed in particular for the United States, Finland, Brazil and Canada, correspond to relatively older average publication years amongst the documents associated with these countries. Conversely, shades closer to green and yellow, present notably for Indonesia, Italy and Nigeria, indicate more recent average publication years. This distribution reveals differences in the timing of national contributions, without necessarily implying that certain countries have only recently begun to participate in the field during the years under study. Rather, it highlights a diversity of temporal trajectories within the international network, the interpretation of which must take into account the number of publications associated with each country and the visualisation parameters selected in VOSviewer. Another important insight from the map concerns the diversity of transnational collaborations. The network is not limited to a single axis between Anglo-Saxon countries, but reveals multiple interactions between Europe, Asia, the Middle East and, to a lesser extent, Africa. Portugal, Turkey, South Africa, Saudi Arabia, Qatar, Thailand and South Korea illustrate this expansion of the network, even though their relative weight remains more modest. This diversity shows that research into ERP systems and organisational agility is gradually taking shape within an international framework, characterised by cross-collaborations between developed and emerging economies.

The map also reveals an uneven representation of countries within the scientific network under study. Whilst several

geographical regions occupy relatively central positions, others appear less visible, particularly on the African continent, which is represented by a limited number of countries such as South Africa and Nigeria. Morocco does not feature amongst the countries shown in this visualisation. However, this absence does not necessarily mean that no Moroccan publications contribute to the field, as it may also result from the selection thresholds and parameters applied when constructing the network. This observation highlights the need to distinguish between countries' visibility on the map and their actual contribution to scientific output. It also underscores the value of exploring, in future research, the role of African and Maghreb contexts in studies on ERP systems and organisational agility, in order to better assess their representation in the international literature.

3.3. Analysis of collaborations between authors

The analysis of collaboration networks between authors sheds light on the organisation of scholarly exchanges concerning ERP systems and organisational agility. It aims to identify researchers active in the field, examine co-authorship relationships and assess how collaborations are structured within the literature. The network map, created using the VOSviewer software, represents authors as nodes, the size of which varies according to their weight in the analysis. The links between these nodes, where they exist, correspond to jointly authored publications. This visualisation provides a useful tool for examining the collaborative dimension of research and identifying potential clusters of researchers (van Eck and Waltman, 2010; Donthu et al., 2021).

The network diagram was generated from bibliographic data drawn from a corpus of 550 scientific publications, using the 'Co-authorship' option in the VOSviewer software, with authors as the unit of analysis ('Authors'). The network construction parameters include a minimum threshold of 3 publications per author, a minimum threshold of 10 citations and the 'Fractional counting' mode. The authors depicted correspond to those selected according to these criteria. In this configuration, no co-publication links appear between the displayed nodes; this is a characteristic of the resulting network and not an indication of a general lack of collaborations in the field.

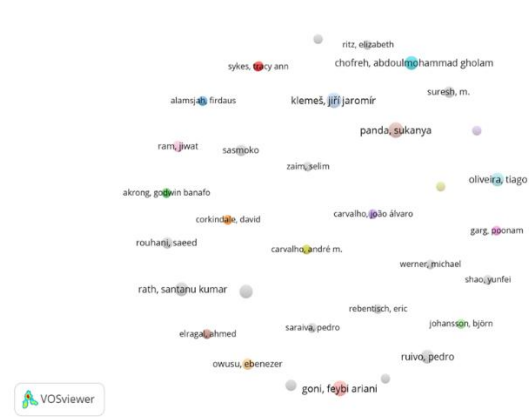


Figure 3: Scientific collaboration network between authors (2013–2023).

Source: Results of the VOSviewer analysis based on bibliographic data from Scopus.

A look at the figure reveals a relatively scattered distribution of authors, with no apparent connections between the various nodes. Several researchers stand out for their visibility within the network, notably Chofreh, Abdoulmohammad Gholam, Panda, Sukanya, Klemeš, Jiri Jaromir, Oliveira, Tiago and Sykes, Tracy Ann. Other authors, such as Rath, Santanu Kumar, Akrong, Godwin Banafo, Alamsjah, Firdaus and Rouhani, Saeed, also appear in the network diagram. This configuration suggests that scientific organisation is not highly concentrated around clearly identifiable collaborative groups. However, the absence of visible links is not sufficient to conclude that there is no cooperation between researchers, as the representation depends on the selection criteria and parameters used when constructing the network.

The differences observed in the size of the nodes also reflect an uneven representation of authors within the map. Some occupy a visually more prominent position, whilst others appear more discreetly. This distinction provides information on their relative weight according to the indicator used in VOSviewer, without necessarily reflecting greater scientific influence. Indeed, an author's productivity, the visibility of their publications and their level of collaboration correspond to different dimensions that require specific indicators. The interpretation of the map must therefore be supplemented, where data is available, by examining the number of publications, the citations received and the strength of the links between authors.

The dispersion of the nodes is one of the key features of this visualisation. It suggests that, in this configuration, the authors depicted do not form a highly interconnected collaborative network. This situation may be linked to the diversity of

researchers working in the field, but also to the selection thresholds applied during the bibliometric analysis. It is therefore important to distinguish between the structure actually visible in the figure and the general characteristics of scientific collaboration, which cannot be established without examining the underlying data. The map primarily provides a representation of the authors included in the analysis, rather than an exhaustive measure of their professional or scientific relationships. The results highlight a fragmented distribution of authors within the network, with no clearly observable collaborative clusters. This pattern contrasts with the keyword map, which reveals several interconnected thematic clusters. It shows that the conceptual structure of a field is not necessarily accompanied by a collaborative organisation that is equally visible in bibliometric representations. The interpretation of these results is, however, influenced by the parameters used to construct the map. A complementary analysis of co-publication relationships would therefore be useful to assess more precisely the dynamics of collaboration between researchers working on the evolution of ERP systems and organisational agility.

3.4. Keyword co-occurrence networks

The analysis of keyword co-occurrence is an important step in bibliometric mapping, as it aims to identify the main thematic trends and conceptual relationships that structure the scientific output devoted to ERP systems and organisational agility. Carried out using the VOSviewer software, this analysis is based on the identification of terms appearing together in the publications within the corpus under study. The size of the nodes reflects the relative frequency of occurrences, whilst the links represent the associations between keywords. The colours distinguish the thematic groupings, or clusters, formed on the basis of the structure of bibliometric relationships. This approach helps to characterise the conceptual organisation of the field without attributing a causal meaning to the observed associations (van Eck and Waltman, 2010; Donthu et al., 2021).

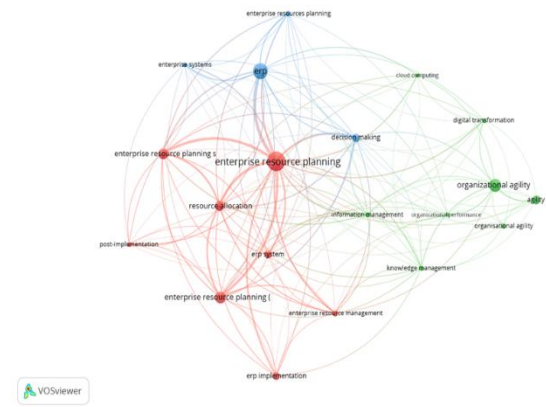


Figure 4: Co-occurrence network of keywords relating to ERP systems and organisational agility (2013–2023).

Source: Results of the VOSviewer analysis based on Scopus bibliographic data.

The map reveals three main thematic clusters, represented in red, blue and green respectively. The first, located mainly in the lower left-hand part of the network, centres on the term ‘enterprise resource planning’, which occupies a central position and has a significant number of connections. This cluster also includes terms such as ‘ERP system’, ‘ERP implementation’, ‘resource allocation’, ‘post-implementation’ and ‘enterprise resource management’. The proximity of these terms reflects a concentration of publications centred on ERP systems, their deployment and their use within organisations. The presence of several terminological variants associated with ERP also highlights the diversity of expressions used in the literature to refer to these systems and their various dimensions. The mapping also reveals several terminological variants denoting similar concepts, notably ‘ERP’, ‘ERP system’ and ‘enterprise resource planning’, as well as ‘organisational agility’ and ‘organisational agility’. These terms have been retained as they appear in the bibliographic data, without prior grouping using a terminological correspondence file (*thesaurus*). This lack of harmonisation may lead to occurrences being scattered across several nodes and influence the formation of thematic clusters. The results are therefore interpreted with this particularity in mind, without regarding the differences in the positioning of these terms as a systematic expression of conceptual distinctions.

The second cluster, shown in blue in the upper part of the network, is characterised by the presence of the terms ‘ERP’, ‘enterprise systems’, ‘enterprise resource planning’ and ‘decision making’. The relationships observed between these keywords highlight a scientific focus linking integrated information systems to issues of management and decision-making. This cluster is situated relatively close to the central

core and has several connections with the other thematic clusters. This configuration indicates that research on ERP systems is not limited to implementation issues, but also forms part of a broader body of literature on enterprise systems and decision-making processes. The links with the other clusters demonstrate the existence of bibliometric affinities between these research orientations, without prejudging the relationships actually examined in the publications.

The third cluster, shown in green on the right-hand side of the network, is characterised by the presence of the terms ‘organisational agility’, ‘agility’, ‘organisational agility’, ‘digital transformation’, ‘cloud computing’, ‘knowledge management’, ‘information management’ and ‘organisational performance’. This cluster is of particular interest in relation to the article’s focus, as it brings together concepts relating to organisational agility and several themes associated with digital transformation in organisations. The position of ‘organisational agility’ and its connections with the other terms suggest that agility constitutes an identifiable focus within the scientific network under study. The presence of ‘cloud computing’ and ‘digital transformation’ also attests to the bibliographic association of these concepts with research on agility. However, this proximity is not sufficient to establish that the technologies in question actually enhance organisational capabilities.

An examination of the relationships between the three clusters reveals an interconnected thematic structure. Terms associated with ERP systems occupy a prominent place in the network, whilst concepts linked to organisational agility are mainly grouped within a distinct cluster, though one that is connected to the other scientific clusters. This configuration highlights several research strands that coexist within the corpus, notably those devoted to integrated systems and their implementation, to information systems and organisational decision-making, and to agility and digital transformation. The links between these clusters indicate that the publications share certain concepts, whilst retaining distinct areas of focus. The mapping therefore provides an initial insight into the thematic structure of the field and the observable connections between research on ERP and that on organisational agility.

An analysis of keyword co-occurrence reveals a scientific field organised around three main areas: ERP systems and their implementation, integrated systems and decision-making processes, and organisational agility and digital transformation. The presence of connections between these clusters reflects a thematic link between the various components of the literature. These results provide a basis for further exploring the evolution of scientific research areas and identifying the themes that occupy a central or peripheral

position within the field under study. Their interpretation must, however, take into account frequencies of occurrence, the strength of links and the parameters used to construct the network, in order to distinguish the observed bibliometric associations from theoretical explanations that require an in-depth analysis of the publications.

3.5. Co-citation network analysis of scientific sources

The analysis of co-citation networks of scientific sources sheds light on the intellectual structure of research devoted to ERP systems and organisational agility. It is based on the identification of journals and other sources that are cited together in the bibliographic references of the publications under study. Unlike the analysis of scientific output, which examines the documents published in each journal, co-citation focuses on the relationships between the sources cited by researchers. Carried out using the VOSviewer software, this approach helps to identify the main intellectual hubs within the field and to examine the bibliographic proximities between different scientific orientations. The size of the nodes reflects the relative weight of the sources in the analysis, whilst the links indicate their co-citation frequency. The colours correspond to the clusters identified on the basis of the network structure (van Eck and Waltman, 2010; Donthu et al., 2021).

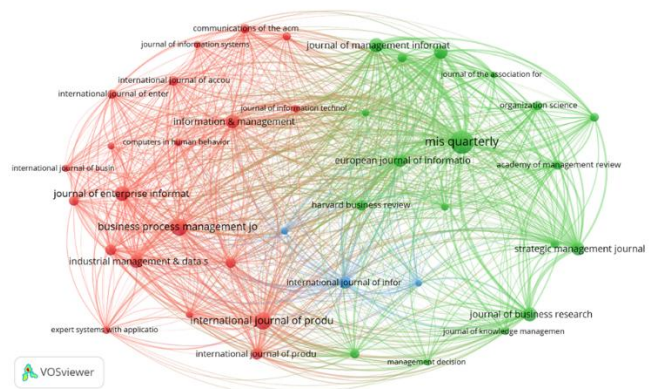


Figure 5: Co-citation network of scientific sources relating to ERP systems and organisational agility (2013–2023).

Source: Results of the VOSviewer analysis based on bibliographic references from the Scopus corpus.

An examination of the map reveals an intellectual structure organised around several highly interconnected clusters. Two main clusters stand out due to their size and the density of their connections, whilst a third, smaller cluster occupies an intermediate position. This configuration shows that the literature under study draws on a variety of scientific sources, the references to which are frequently cited together. The

numerous connections between journals reflect a bibliographic proximity between different fields of research, notably information systems, process management and organisational sciences. However, the presence of these relationships does not imply that the journals share identical theoretical positions; rather, it indicates that they contribute to shared sets of references within the publications analysed.

The first cluster, shown in red on the left-hand side of the network, mainly comprises journals associated with applied information systems, technology integration and organisational process management. Among the most prominent sources are **Information & Management**, **Business Process Management Journal**, **Journal of Enterprise Information Management**, **Journal of Information Systems** and **Communications of the ACM**. The proximity of these journals suggests the existence of a set of references frequently cited together in research on integrated systems and business processes. The density of links within this cluster also shows that these sources play a significant role in the references cited by the publications in the corpus. Their presence highlights the importance of research on information systems and organisational processes in forming the intellectual foundation of the field under study.

The second cluster, shown in green on the right-hand side of the map, is characterised by the presence of recognised journals in the fields of information systems, strategy and management sciences. MIS Quarterly occupies a particularly prominent position, with a large node and numerous connections. Notable journals appearing around this one include the European Journal of Information Systems, the Journal of Management Information Systems, Organization Science, the Academy of Management Review, the Strategic Management Journal and the Journal of Business Research. This configuration highlights a set of sources that play a significant role in the scientific references within the corpus. The connections observed suggest that the publications under study draw on work from several research traditions, extending beyond the sole domain of ERP to incorporate more general contributions from the fields of information systems and organisational sciences.

A third cluster, shown in blue and situated mainly in the lower central part of the network, appears less developed than the two previous clusters. It notably includes sources such as the **International Journal of Information Management**, whilst other smaller nodes are situated close to the red and green clusters. Its intermediate position suggests bibliographic links with several sets of sources. However, the limited size of this cluster and the difficulty in reading some of the titles mean that one should avoid an overly precise thematic

interpretation. Identifying its scientific focus would require a further examination of the sources comprising it and the references actually cited.

One of the key insights from this mapping lies in the density of connections between the different clusters. Several journals situated in distinct clusters share numerous co-citation relationships, reflecting the existence of a partially shared reference base amongst the publications. This configuration suggests that research on ERP systems and organisational agility forms part of a scientific field situated at the intersection of information systems and management sciences. Journals devoted to organisational technologies appear to be strongly connected to those dealing with business strategy and operations. This observation provides insight into the intellectual organisation of the corpus without, on its own, establishing the nature of the theoretical relationships developed in the publications in question.

Overall, the co-citation analysis reveals a relatively dense intellectual structure, organised primarily around two closely linked sets of sources. The first comprises journals devoted to applied information systems and organisational processes, whilst the second brings together leading publications in information systems and management sciences. The presence of **MIS Quarterly**, **Information & Management** and **Business Process Management Journal** amongst the visually prominent sources confirms their significant place within the reference network of the corpus under study, without, however, constituting in itself a ranking of their scientific influence. These results complement previous analyses by providing an insight into the intellectual foundation of research relating to the evolution of ERP systems and organisational agility. They also serve as a basis for discussing the main scientific trends identified in the literature.

4. General discussion of the results

A bibliometric analysis of 550 scientific publications from Scopus, covering the period 2013–2023, provides an insight into the evolution of research on ERP systems and organisational agility. The visualisations created using VOSviewer highlight distinct dynamics in terms of scientific output, collaborations, thematic clusters and references cited. Beyond the individual presentation of these results, comparing them provides a better understanding of the organisation of the field, its main characteristics and the issues that require further investigation. This discussion therefore aims to identify the cross-cutting lessons from the study, whilst maintaining a distinction between the bibliometric associations observed

and the organisational relationships that cannot be established by this method.

4.1. Convergences and divergences in the results

Trends in publications reveal a gradual growth in scientific interest in the topics studied, despite annual fluctuations and a particularly marked increase in 2022. This trend contrasts with the configuration of the co-author network, which is characterised by a dispersion of the selected researchers and the absence of visible connections between their nodes. The quantitative growth of the literature does not therefore appear, in this representation, to be accompanied by an equivalent concentration of individual collaboration. This observation must, however, be considered in the context of how the network was constructed, particularly the thresholds for publications and citations that were applied. As Zupic and Čater (2015) point out, productivity indicators and collaboration networks describe distinct dimensions of scientific activity.

This difference also becomes apparent when comparing collaborations between countries and between authors. The geographical map shows several international connections centred on the United States, China, the United Kingdom and India, whilst the individual network reveals no interconnected groups of co-authors amongst the researchers shown. These two findings are not incompatible, as they are based on different units of analysis and selection criteria. Rather, they highlight the need to distinguish between the intensity of international exchanges and the stability of relationships between researchers. The geographical distribution also reveals varying levels of visibility across countries, which suggests that the internationalisation of the field should be considered without assuming equivalent participation from all regions.

Thematically, the co-occurrence of keywords reveals three clusters associated with ERP implementation, integrated systems and decision-making processes, and organisational agility and digital transformation. Whilst these areas remain distinct, their connections indicate shared conceptual references within the publications. This connection aligns with the research interests of Seethamraju and Diatha (2013), who focus on ERP and business process agility, and those of Lu and Ramamurthy (2011), who address agility from the perspective of technological capabilities. However, the presence of common concepts does not mean that the relevant studies reach the same conclusions. Furthermore, the lack of harmonised terminology calls for a degree of caution when assessing the relative importance of the concepts.

Co-citation mapping complements this picture by revealing close links between sources specialising in information systems, process management and management sciences. The clusters observed around journals such as **Information & Management**, **Business Process Management Journal** and **MIS Quarterly** indicate that researchers draw on references from several academic fields. This pattern aligns with the conceptual diversity identified in the keyword network, without implying a direct correspondence between the two mappings. The convergence of the results lies primarily in the common ground occupied by technological and organisational issues, whilst their divergence concerns the specific structural forms of each network. This complementarity confirms the value of a cross-referenced analysis of bibliometric indicators, as advocated by Donthu et al. (2021).

4.2. Contributions to the field

The main contribution of this study lies in providing an overview of the literature on ERP systems and organisational agility. Whilst existing research primarily addresses the characteristics of integrated systems or their relationship with business operations, the present analysis examines how scientific knowledge is distributed and organised. It complements the work of Seethamraju and Diatha (2013) by shifting the focus from organisational outcomes to the structure of academic output. This perspective helps to situate the main research directions within the field without seeking to confirm the effects attributed to ERP systems in empirical studies.

Another contribution lies in highlighting the intellectual diversity of the research. The networks analysed show that work on integrated systems and agility forms part of a scientific environment that draws on information technology as well as issues of coordination, decision-making and organisational transformation. The distinction between thematic clusters and co-cited sources helps to understand how different research topics coexist within a shared bibliographic corpus. This analysis complements the perspectives of Sambamurthy et al. (2003) and Lu and Ramamurthy (2011), by demonstrating the place of concerns relating to agility within a broader field of research on information systems.

The study also helps to differentiate between levels of structuring within the scientific community. The international connections observed between countries, when compared with the dispersion of the network of authors included in the analysis, illustrate the value of examining the geographical and individual dimensions of collaborations separately. This distinction provides significant clarity in the interpretation of

bibliometric networks, the configuration of which depends as much on the unit of analysis as on the available data. The originality of this research therefore lies less in each of the maps considered in isolation than in their comparison, which provides a complementary representation of the temporal, social, thematic and intellectual dimensions of the field.

4.3. Gaps identified

The results highlight several aspects that remain insufficiently documented. The first concerns the geographical representation of contributions. Despite the existence of international collaborations, African and Maghreb countries occupy a limited place in the resulting map. This low visibility does not indicate a lack of research, but underlines the need to examine their presence in the indexed literature and scientific networks more closely. A more detailed exploration of institutional affiliations and national outputs could help to clarify this distribution.

The configuration of the authors' network also raises questions about how collaborations are organised over time. The absence of visible links between the selected researchers does not directly provide information on the frequency of partnerships, their continuity or their evolution. These aspects therefore remain open to further investigation, which could, in particular, distinguish one-off collaborations from recurring research teams.

Another limitation concerns the scope of the thematic clusters. The maps identify frequently associated concepts, but do not specify how the publications define organisational agility, nor to what extent they distinguish it from business process agility or organisational flexibility. The coexistence of non-standardised terminological variants may also affect the distribution of occurrences and the composition of clusters. These factors limit the possibility of drawing definitive conclusions about the conceptual boundaries of the field based solely on bibliometric representations.

Finally, the scope of the literature imposes certain restrictions. The exclusive use of Scopus does not guarantee exhaustive coverage of available publications, as bibliographic databases differ in terms of indexing and representativeness (Mongeon and Paul-Hus, 2016). The 2013–2023 period also confines the observations to a defined timeframe. Added to these limitations is the very nature of the techniques used: co-occurrence, co-citation and collaboration networks describe relationships between metadata without providing an in-depth assessment of the content or methodological quality of the studies. These restrictions must be taken into account when interpreting the results.

4.4. Outlook for future research

Further research building on this study could, first and foremost, adopt a longitudinal approach to scientific trends. Comparing several sub-periods would help to examine changes in keywords, shifts in areas of interest and the role gradually assumed by new generations of ERP systems. Research focusing on Cloud ERP, digital transformation and scalable architectures is, in this regard, relevant for assessing changes in the thematic composition of the literature. This approach would offer a more precise understanding of temporal trends than that derived from a general mapping exercise.

A second avenue of inquiry involves a more in-depth analysis of scientific networks. Analyses focusing on institutional collaborations, groups of co-authors and their chronological evolution could complement current representations. Extending the data collection to Web of Science would also be a viable approach for comparing the coverage of bibliographic databases and examining the visibility of contributions from less-represented geographical contexts. Such a comparison should be based on harmonised documentary criteria and a clearly defined deduplication procedure.

From an intellectual perspective, future studies could utilise the co-citation of individual references and the bibliographic linking of documents to clarify the connections between publications and identify the most visible contributions. The application of a *thesaurus* file in VOSviewer would also help to reduce the dispersion of equivalent keywords, whilst preserving relevant conceptual distinctions. These approaches would build on the multidimensional approach proposed by Zupic and Čater (2015) and Donthu et al. (2021).

Finally, a complementary qualitative analysis of the literature could examine the definitions, conceptual frameworks and organisational contexts drawn upon in research on ERP and agility. This would constitute a distinct approach from the present mapping exercise, focused on the study of scientific content rather than bibliographic relationships alone. Combining these perspectives would help to deepen our understanding of developments in the field, whilst preserving the methodological specificity of each approach.

General conclusion

The aim of this research was to examine the evolution and structure of scientific output on ERP systems and organisational agility between 2013 and 2023. Using a corpus of 550 scientific publications from Scopus, the bibliometric

analysis carried out using the VOSviewer software made it possible to characterise publication dynamics, the geographical distribution of contributions, collaboration networks between authors, and the main thematic and intellectual structures within the field. This approach focused on analysing bibliographic relationships in order to better understand the organisation of scientific knowledge produced in the fields of integrated systems and organisational agility.

The results reveal an uneven trend in scientific output, marked by a more noticeable increase during the final years of the period studied, particularly in 2022. The geographical mapping highlights a diverse international participation, structured around several countries occupying key positions within the collaborative networks. This dynamic contrasts with the dispersion observed in the network of selected authors, where no co-publication links appear between the nodes represented. From a thematic perspective, the analysis of keywords identifies three main areas of focus relating to ERP systems and their implementation, information systems and decision-making processes, and organisational agility and digital transformation. The study of co-citations complements these observations by revealing an interconnected intellectual framework situated at the intersection of information systems, process management and management sciences.

The main contribution of this research lies in bringing together these different bibliometric dimensions, which provides a structured representation of the literature and its main scientific strands. The results show that research on ERP systems and organisational agility forms part of a diverse scientific landscape, where technological, informational and organisational issues coexist. However, the connections observed between concepts and scientific sources do not constitute proof of causal relationships between ERP systems and organisations' agility capabilities. The study's contribution therefore remains descriptive and relational, in line with the objectives of bibliometric mapping.

Certain limitations must nevertheless be taken into account. The exclusive use of Scopus and the time frame restricted to the period 2013–2023 limit the documentary coverage of the analysis. The parameters used to construct the VOSviewer networks also influence the visibility of the authors, countries and sources represented. Furthermore, the presence of non-standardised terminological variations may affect the distribution of keywords and the composition of thematic clusters. These limitations open up avenues for further research based on expanding the range of bibliographic sources, conducting a longitudinal analysis of themes, undertaking a more detailed study of scientific collaborations, and utilising complementary techniques of intellectual

mapping. With this in mind, the present study provides a foundation for further exploration of the evolution of scientific knowledge on ERP systems and organisational agility, whilst highlighting the value of rigorous bibliometric analysis in identifying transformations and future directions within this field of research.

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