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REVISIÓN

ERP and the Metamorphosis of Management Control: An Innovative Bibliometric Exploration

ERP y la metamorfosis del control de gestión: Una exploración bibliométrica innovadora

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ABSTRACT

Introduction: the aim of this article was to analyse the scientific production exploring the transformation of management control by ERP. This bibliometric review, based on Scopus data, used VOSviewer software for bibliometric analysis. By mapping the existing literature, it identified research trends, the main themes addressed, and potential gaps in the field.
Method: the methodology adopted included a bibliometric study of scientific publications on legitimacy and management control using Scopus and VOSviewer. A database was created by searching for specific keywords on Scopus, selecting the combination "management control" and "ERP".
Results: the results of this bibliometric study reveal the evolution of research into ERP and management control, highlighting the importance of technological integration for better organisational performance. They also provide valuable indications for researchers and practitioners wishing to deepen their knowledge and improve the implementation of ERP in various organisational contexts.
Conclusions: this synthesis of bibliometric results reveals the complex dynamics of ERP and management control research, highlighting an interconnected network of researchers and institutions with diverse and evolving themes. The results provide valuable insights, identifying influential work, emerging themes and opportunities for future collaboration, while helping to develop more effective research strategies and advance knowledge in the field.

Keywords: ERP; Metamorphosis of Management Control; Bibliometric.

RESUMEN

Introducción: el objetivo de este artículo fue analizar la producción científica que explora la transformación del control de gestión por el ERP. Esta revisión bibliométrica, basada en datos de Scopus, utilizó el software VOSviewer para el análisis bibliométrico. Mediante el mapeo de la literatura existente, se identificaron las tendencias de investigación, los principales temas abordados y las posibles lagunas en el campo.
Método: la metodología adoptada incluyó un estudio bibliométrico de las publicaciones científicas sobre legitimidad y control de la gestión utilizando Scopus y VOSviewer. Se construyó una base de datos mediante la búsqueda de palabras clave específicas en Scopus, seleccionando la combinación "control de gestión" y "ERP".
Resultados: los resultados de este estudio bibliométrico revelan la evolución de la investigación sobre ERP y control de gestión, destacando la importancia de la integración tecnológica para mejorar el rendimiento de las organizaciones. También proporcionan valiosas indicaciones para los investigadores y profesionales que deseen profundizar sus conocimientos y mejorar la implantación de la ERP en diversos contextos organizativos.
Conclusiones: esta síntesis de resultados bibliométricos revela la compleja dinámica de la investigación sobre ERP y control de gestión, poniendo de relieve una red interconectada de investigadores e instituciones

con temas diversos y en evolución. Los resultados aportan valiosas perspectivas, identificando trabajos influyentes, temas emergentes y oportunidades de colaboración futura, al tiempo que ayudan a desarrollar estrategias de investigación más eficaces y a avanzar en el conocimiento de este campo.

Palabras clave: ERP; Metamorfosis del Control de Gestión; Bibliometría.

INTRODUCTION

In recent decades, companies have undergone a profound transformation thanks to the adoption of new technologies and management practices, including Enterprise Resource Planning (ERP). ERP, integrated systems for managing all of an organization's processes, have revolutionized resource management, bringing greater efficiency and better coordination (Davenport, 1998). This technological evolution has led to a redefinition of the roles and responsibilities of management controllers, placing them at the heart of strategy and organizational performance (Granlund & Malmi, 2002).

However, ERP implementation is not without its challenges. Organizations must overcome significant obstacles, such as resistance to change, adapting existing processes, and managing organizational transformation (Markus & Tanis, 2000). What's more, ERP requires considerable investment in terms of time, resources and training, which can pose additional challenges for companies of all sizes (Esteves & Pastor, 2001).

Faced with these challenges, it is crucial to understand how ERPs influence management control practices, and how they can be effectively implemented to maximize organizational benefits. This article aims to analyze the scientific production exploring this interrelation. Drawing on a bibliometric review based on Scopus data, we use VOSviewer software to map existing literature, identify research trends, the main themes addressed, and potential gaps in the field.

We begin with a presentation of bibliometrics, its history and definition, to better understand the context and objective of our work. Next, we will outline the methodology adopted to carry out our bibliometric review, detailing the tools exploited, in particular Scopus and VOSviewer, as well as the general process of the study. Finally, we will present and interpret the results obtained, highlighting the collaborations and citations between the authors who contributed to this theme, as well as the key concepts they addressed. This analysis will provide valuable insights for researchers and practitioners wishing to deepen their knowledge and improve ERP implementation in various organizational contexts.

Definition of bibliometrics

Before defining bibliometrics, it is crucial to recall two fundamental principles implicit in any bibliometric analysis method.

First principle: scientific writing is the objective product of thought. In a scientific context, a publication represents the author's research activity. The author makes a considerable effort to persuade his peers of the relevance of his discoveries, methods and techniques. Consequently, written communication contains all the technical, conceptual, social and economic elements that the author wishes to put forward in his argument.

Second principle: scientific publication is a perpetual confrontation between the author's own thinking and the knowledge acquired by reading the work of other researchers. Publication thus becomes the reflection of a convergence of individual and collective thoughts. To consolidate their arguments, researchers often refer to the work of other researchers, who enjoy a certain consensus within the scientific community. There is therefore a relationship between all published scientific works, whether this relationship is direct or indirect, acknowledged or hidden, conscious or unconscious, in agreement or disagreement.

By accepting these two principles, the study of scientific publications aims to understand knowledge according to schools of thought and their evolution. These postulates, initially established for scientific research, have also been applied to technical or technological publications, notably patent applications.

Based on these principles, bibliometrics involves analyzing scientific or technical activity through the quantitative study of publications. This approach uses statistical data to count publications or extract elements from them. Bibliometrics encompasses a range of statistical techniques aimed at quantifying written communication processes

Anglo-Saxon authors attribute the invention of the term "bibliometrics" to Pritchard (1969), while some French authors credit it to Otlet. In introducing the term, Pritchard aimed to replace the expression "statistical bibliography" in use since 1923, when Hulme presented his work (Hulme, 1923). Pritchard felt that the term "statistical bibliography" could be ambiguous, suggesting a bibliography of statistics. Moreover, adopting the term "bibliometrics" brought it into line with other well-established terms such as "biometrics" or "econometrics". In proposing this new term, Pritchard also provided his own definition of bibliometrics: "...the application of mathematical and statistical methods to books and other communication media".

However, Pritchard's definition did not explicitly specify the objectives and purposes of bibliometrics. At the

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time of its introduction, the application of bibliometrics was mainly linked to library management, as shown by Raising's 1962 definition. This approach, which used mathematical and statistical methods to analyze books and other media, was still called "statistical bibliography": "the assembly and interpretation of statistics relating to books and periodicals... to demonstrate historical movements, to determine the national and universal research use of books and newspapers, and to ascertain in many local situations the general use of books and newspapers".

Since then, the applications of bibliometrics have extended far beyond the boundaries of library science. More recently, Hawkins defined bibliometrics as "quantitative analyses of the bibliographic characteristics of a body of literature" (Hawkins, 1977). However, this definition is too restrictive, as it does not take into account one of the essential activities of bibliometrics: the study of the circulation of publications (Khouibiri.N,2024).

It was to distinguish these two types of application that the term "scientometrics" was coined. At a conference, Brookes clarified this distinction: "Whereas bibliometrics is concerned with the study of scientific books and journals, and with understanding information communication activities, scientometrics is concerned with the study of quantitative aspects of the creation, dissemination and use of scientific and technical information, and with understanding the mechanisms of research as a social activity" (Brookes, 1990). Thus, bibliometrics would encompass all the methods used to help manage libraries, while scientometrics would aim to study the laws governing science, hence its name "science of science" according to Price.

Bibliometrics is the application of statistical or mathematical methods to sets of bibliographic references (Rostaing, 1996). This definition is in line with that of White and McCain in their article on bibliometrics, making it possible to integrate all the treatments cited by the previous definitions (Rostaing, 1996). From this perspective, scientometrics embraces bibliometrics as one tool among others for evaluating a research system. Scientometric studies take into account factors broader than the simple act of publication, including resources and the way in which these resources are converted into knowledge and skills (Rostaing, 1996).

However, as Callon notes, "until recently, it was almost exclusively concerned with the analysis of documents written by researchers and technologists" (Callon et al., 1991). This means that scientometrics was limited primarily to the use of bibliometric techniques, neglecting other factors to be analyzed. This restriction explains the confusion that has persisted between these two terms throughout the history of "science of science".

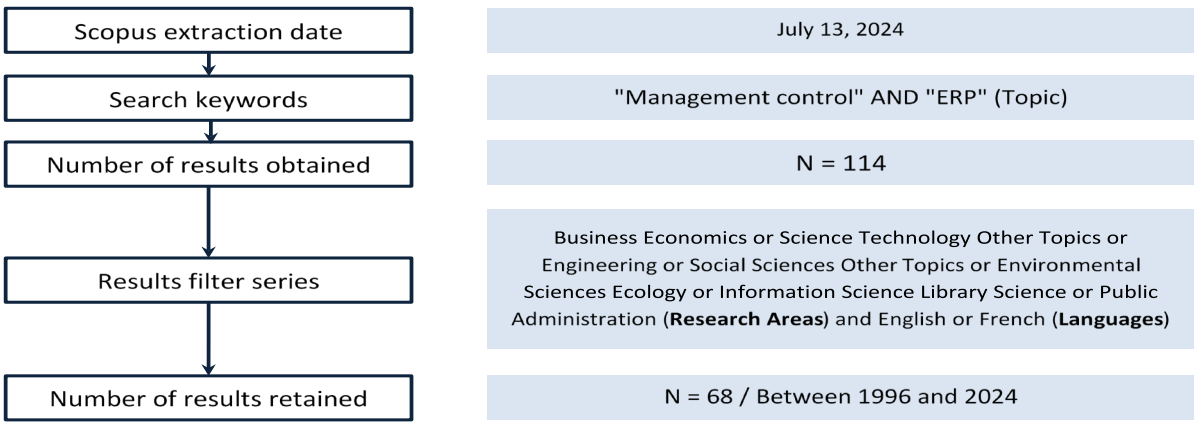
METHOD

As mentioned in the introduction, our aim is to carry out a bibliometric study of scientific publications relating to legitimacy and management control. This study will enable us to analyze bibliographic data on scientific writings in this field, using advanced bibliometric research and processing tools, in particular Scopus and VOSviewer.

The first step in this type of analysis is to set up a database containing all the scientific productions to be studied. To do this, we opted for a keyword search on Scopus, as this was the source that provided us with the greatest number of results. The choice of keywords was made according to our problematic, and after a series of trials, we chose the combination of keywords that gave us the maximum number of results without straying too far from our theme: "management control" AND "ERP".

The public sector context has not been taken into account in this research due to the very limited literature available in this field. It is therefore considered as one environment among others, in which the main phenomenon is the legitimization of management control)(Triantafyllou, 2024)(Saravanan, 2024)(Khetavath, 2024) (Reddy, 2024).

The results obtained were eventually cleaned using Scopus search filters, to arrive at a total of 68 documents selected as relevant to our study. This selection can be summarized as follows:



Source: Own elaboration

Figure 1. Document search and selection process

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Once we had built up our database, we carried out a series of bibliometric processes using the functions available in VOSviewer.

RESULTS

Before moving on to the bibliometric analysis of the documents extracted from Scopus, it is appropriate to present a summary of the extracted database.

Containing 68 scientific papers, and according to the citation ratio generated by Scopus. Here we present the main journals and sources in our database, plus a list of the 20 most-cited articles (table 1).

Table 1. Analysis of Scopus results by SOURCE TITLE

Your query: (TITLE-ABS-KEY (“Management control” AND “ERP”))	
International Journal Of Accounting Information Systems	3
Journal Of Information Systems	3
Lecture Notes In Networks And Systems	3
Accounting Organizations And Society	2
Procedia Computer Science	2
Accounting Auditing And Accountability Journal	1
Annals Of Surgery	1
Applied Mechanics And Materials	1
Behaviour Research And Therapy	1
Business Strategy And The Environment	1
Business Systems Research	1
Accounting Controlling Audit	1
Computers In Industry	1
Contributions To Management Science	1
Corporate Ownership And Control	1
Critical Perspectives On Accounting	1
Data Base For Advances In Information Systems	1
Dongbei Daxue Xuebao Journal Of Northeastern University	1
Global Business And Organizational Excellence	1
Information And Management	1
International Journal Of Economics And Management	1
International Journal Of Services Economics And Management	1
Journal Of Accounting And Organizational Change	1
Journal Of Convergence Information Technology	1
Journal Of Management Control	1
Journal Of Modelling In Management	1
Lecture Notes In Business Information Processing	1
Lecture Notes In Information Systems And Organisation	1
Management Accounting Research	1
Management For Professionals	1
Problems And Perspectives In Management	1
Proceedings Of SPIE The International Society For Optical Engineering	1
Proceedings Of The World Congress On Intelligent Control And Automation WCICA	1
Qualitative Research In Accounting And Management	1
Review Of Managerial Science	1
Revista Lasallista De Investigacion	1
Supply Chain Management	1
Uncertain Supply Chain Management	1
Universidad Y Sociedad	1

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Publications by Research discipline

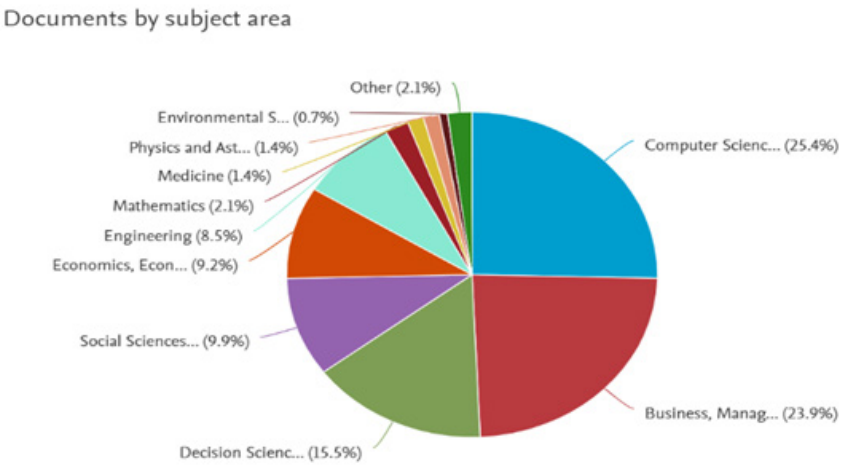

Figure 2. Number of publications by specialty area

The graph above illustrates the distribution of scientific publications by field of study resulting from a search on Scopus relating to enterprise resource planning (ERP) systems and management control, covering the period from 1996 to 2024. The results show a predominance of publications in the fields of information technology (25,4 %) and management, administration and accounting (23,9 %), followed by decision sciences (15,5 %) and social sciences (9,9 %).

The fields of IT and business, management and accounting largely dominate publications on ERP and controlling, which is not surprising given that ERP are technological systems designed to optimize the management of organizational resources. In computer science, research focuses mainly on the technical aspects of ERP, including its development, implementation and optimization, as well as on the underlying algorithms and technologies. This high concentration of publications in the IT field underlines the crucial importance of technology in ERP design and improvement. Similarly, management and accounting account for a significant proportion of publications, reflecting the direct impact of ERP on organizational efficiency, decision-making and management practices. Researchers in this field are studying how ERP can transform management and accounting processes, improve financial transparency, and foster better resource management (Adeniyi,2024) (Awotunde,2024).

Publications over time by author

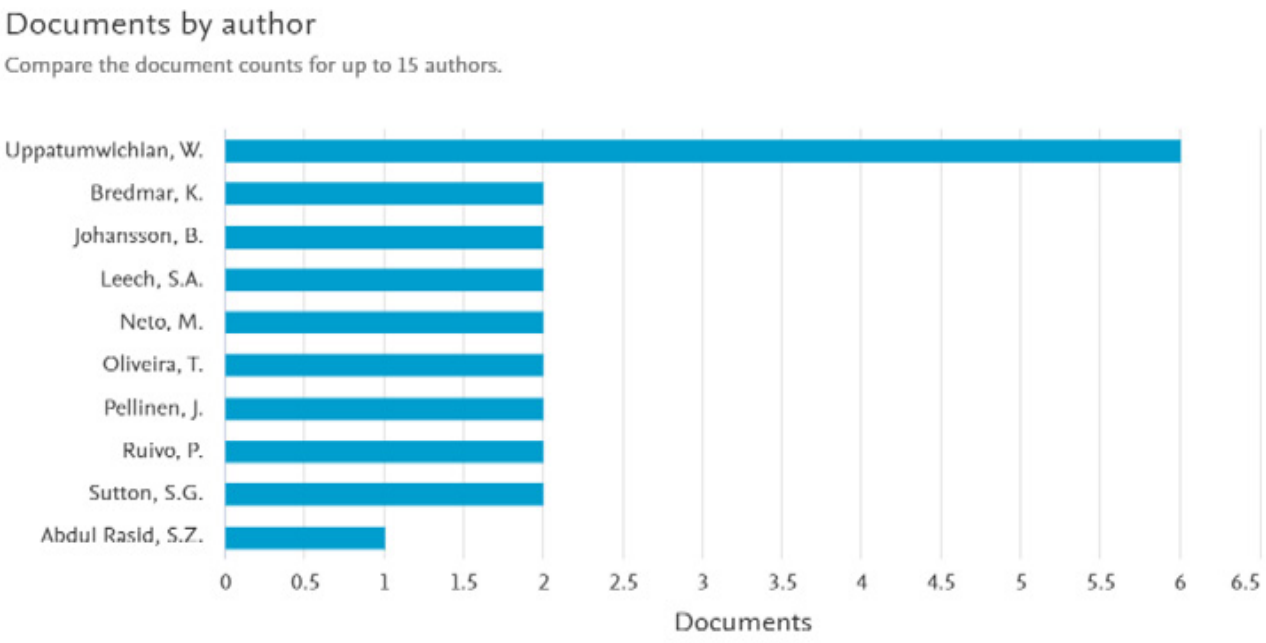

Figure 3. Number of ERP and Controlling publications by Author

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The results show that W. Uppatumwichian clearly stands out with a total of 6 publications, making him the most prolific author in the field of ERP and management control among the authors listed. This prominence suggests that Uppatumwichian is a key figure in the field, having probably made substantial and diverse contributions to ERP research. His ongoing expertise and commitment indicate that he is an influential opinion leader and an important source of knowledge for his peers and new research (Folorunso, S.O., 2024).

In contrast, authors Bredmar, K., Johansson, B., Leech, S.A., Neto, M., Oliveira, T., Pellinen, J., Ruivo, P., and Sutton, S.G. each published 2 papers. This contribution, although less voluminous than that of W. Uppatumwichian, indicates significant and ongoing research activity in the field. Their involvement suggests that they have probably explored specific or complementary aspects of ERP and management control, bringing varied and enriching perspectives to the existing literature. S.Z. Abdul Rasid, with a single publication, shows a more limited contribution. This may be due to more recent specialization in this field, or to a focus on very specific research aspects. Nevertheless, even a single publication can represent a valuable contribution, particularly if it brings innovative insights or significant results.

Publications by type of document

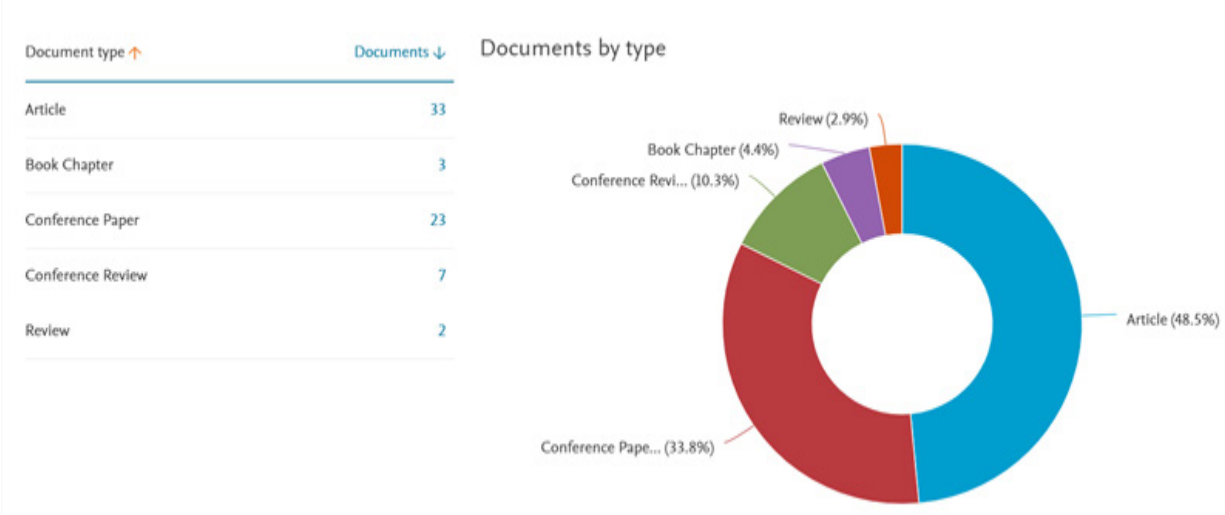

Figure 4. Number of ERP and Controlling publications by type of document

The distribution of document types in the field of ERP and management control shows a predominance of research articles and conference papers, underlining the importance of peer-reviewed academic contributions and active scientific exchange. Conference proceedings, book chapters and reviews complete this distribution, bringing diverse and enriching perspectives to the overall understanding of ERP and management control. These results reflect a dynamic and committed research community, making a significant contribution to the advancement of knowledge in this field.

Bibliometric Analysis And Discussion Of Results

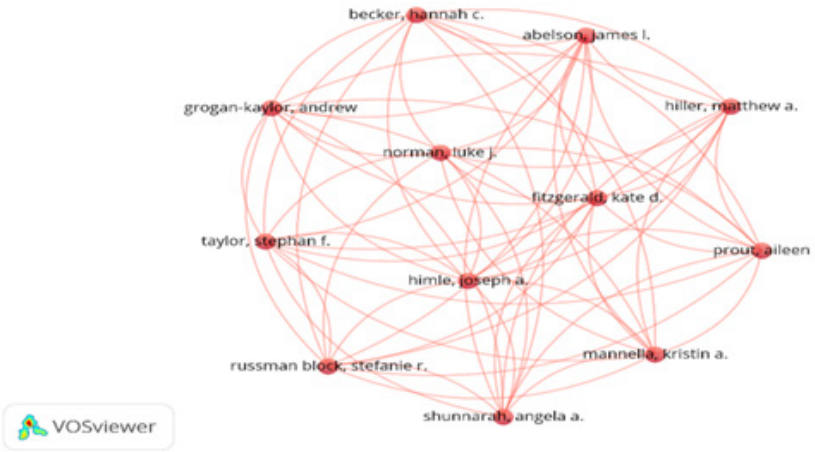

Figure 5. Co-authorship -unit of analyse: authors

The figure 5 shows a co-author visualization carried out using VOSviewer software, relating to the ERP and controlling research theme. This analysis focuses on co-publication relationships between different authors. It reveals crucial information about the structure and dynamics of research networks within this theme. The visualization highlights a dense and complex network of collaborations between researchers, where nodes represent authors and links between them indicate co-publications. The size of the nodes and the thickness of the links provide indications of the intensity and frequency of collaborations.

Norman, Luke J. appears as a central node in this network, suggesting that he plays a crucial role in the coordination and dissemination of ERP and controlling research. His central position and numerous connections indicate that he is a key collaborator, working with various other authors and probably facilitating exchanges of ideas and methodologies within the network. Such a strategic position reinforces the importance of his contributions and his influence in the field.

Another central player is **Fitzgerald, Kate D.**, whose position in the network also indicates intense collaborative activity. Like Norman, Fitzgerald is connected to many other researchers, underscoring her important role in the development and propagation of ERP knowledge. This centrality may reflect significant academic recognition and expertise, making Fitzgerald a pillar in this field of research.

The visualization also reveals smaller collaborative subgroups, such as the one formed by **Becker, Hannah C.** and **Abelson, James L.**. These subgroups suggest close, specialized collaborations, where authors work together on specific projects or well-defined research themes. Such collaborations can enable more in-depth exploration of particular topics, enriching the diversity and depth of research in the field of ERP and management control.

Authors such as **Taylor, Stephan F.**, **Russman Block, Stefanie R.**, and **Shunnarrah, Angela A.** show connections with several other authors, indicating participation in various research projects. These multiple and diverse collaborations suggest a flexibility and ability to address different aspects of ERPs, reinforcing the robustness and coherence of the overall research network.

The intensity of links between certain nodes, such as those between **Hiller, Matthew A.** and **Mannella, Kristin A.**, suggests frequent and close collaborations. These strong connections may indicate recurring and effective research partnerships, where authors develop a synergy and shared understanding that fosters high-quality, innovative contributions.

Co-publication by organization

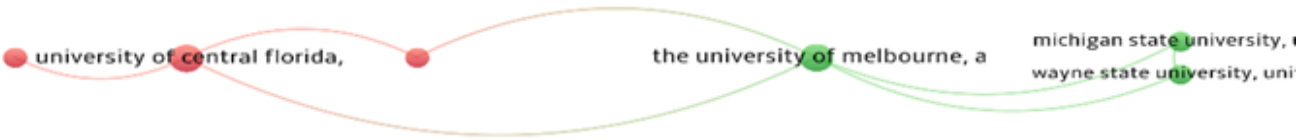

Figure 6. Co-authorship -unit of analyse: organizations

Figure 6 shows a visualization of co-authors made using VOSviewer software, focusing on collaborations between different organizations in the field of ERP and controlling. This visualization highlights institutional interactions and partnerships, providing a perspective on how institutions collaborate to produce research.

The visualization shows several key organizations and the collaborative relationships between them. Nodes represent institutions, while links between them indicate co-publications between researchers affiliated to these institutions. The thickness of the links reflects the intensity of the collaborations.

University of Central Florida: located at the far left of the graph, the University of Central Florida is represented as a central node in the red group. This indicates that this institution has significant collaborations with other organizations, underlining its active role in ERP and controlling research.

The University of Melbourne: at the center of the visualization and belonging to the green group, The University of Melbourne occupies a strategic position, connected to several other institutions. This centrality suggests that the university plays a pivotal role in the collaborative network, facilitating knowledge exchange and research partnerships.

Michigan State University and Wayne State University: these two institutions, also in the green group, show connections with The University of Melbourne. Their inclusion in this collaborative network indicates significant partnerships and an active contribution to collective research in this field.

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Co-publication by country

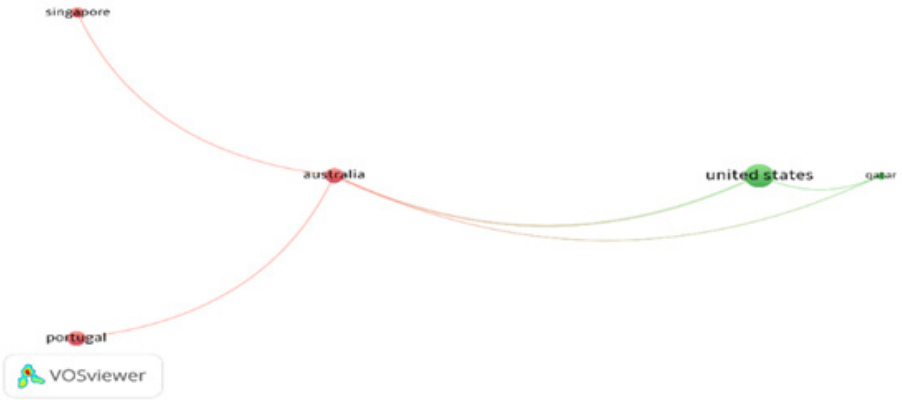

Figure 7. Co-authorship -unit of analyse: countries

Figure 7 reveals a dynamic network of international collaborations in the field of ERP and management control. Australia and the USA stand out as nerve centers in this network, playing crucial roles in facilitating collaborations and producing significant research. Connections with countries such as Singapore, Portugal and Qatar demonstrate the importance of international partnerships for the advancement of knowledge and innovation in this field.

This analysis underlines the importance of international cooperation in enhancing the quality and impact of research. Collaborative networks make it possible not only to share resources and expertise, but also to create synergies that accelerate scientific discoveries and practical applications. The results can serve as a basis for identifying key countries and encouraging new collaborations in the field of ERP and management control.

Keyword co-occurrence

Figure 8. Co-occurrence -unit of analyse all keywords- counting method: full counting

The visualization reveals several keyword clusters, indicating main search themes and their interconnections. The nodes represent keywords, while the links between them show co-occurrences, i.e. the times the terms appear together in publications. The size of the nodes reflects the frequency of the keywords, and the thickness of the links indicates the intensity of co-occurrence.

Main research topics:

- **Enterprise Resource Planning (ERP)** and **Management Control**: these two terms dominate the visualization, indicating that they are the central concepts in the publications studied. Their large node size and central position show that they are often co-mentioned with various other terms, underlining their importance in ERP and management control research.
- **Integration** and **Automation**: these terms are strongly connected to ERP, suggesting that integration and automation are key aspects of ERP implementation and use.

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Thematic clusters:

- **Resource Allocation and Competition**: this cluster shows a strong connection with ERP, indicating that resource management and competition are major concerns in ERP studies. This could reflect research into how ERP can improve resource efficiency and give a competitive edge.
- **Accounting Information Systems and Finance Function**: these terms form a distinct cluster, indicating specific research into the impact of ERP on accounting information systems and finance functions. The connections between these terms and ERP underline the importance of ERP in transforming accounting and finance practices.

Complementary concepts:

- **Business Intelligence and Competitive Advantage**: these terms appear in the periphery but show significant connections with ERP and controlling, suggesting research into how ERP can be used to gain strategic information and competitive advantage.
- **Activity-Based Management and Conceptual Frameworks**: these terms, although somewhat isolated, show clear connections with the core concepts, indicating studies of specific management approaches and conceptual frameworks used to understand and apply ERP.

Co-citation by documents and authors:

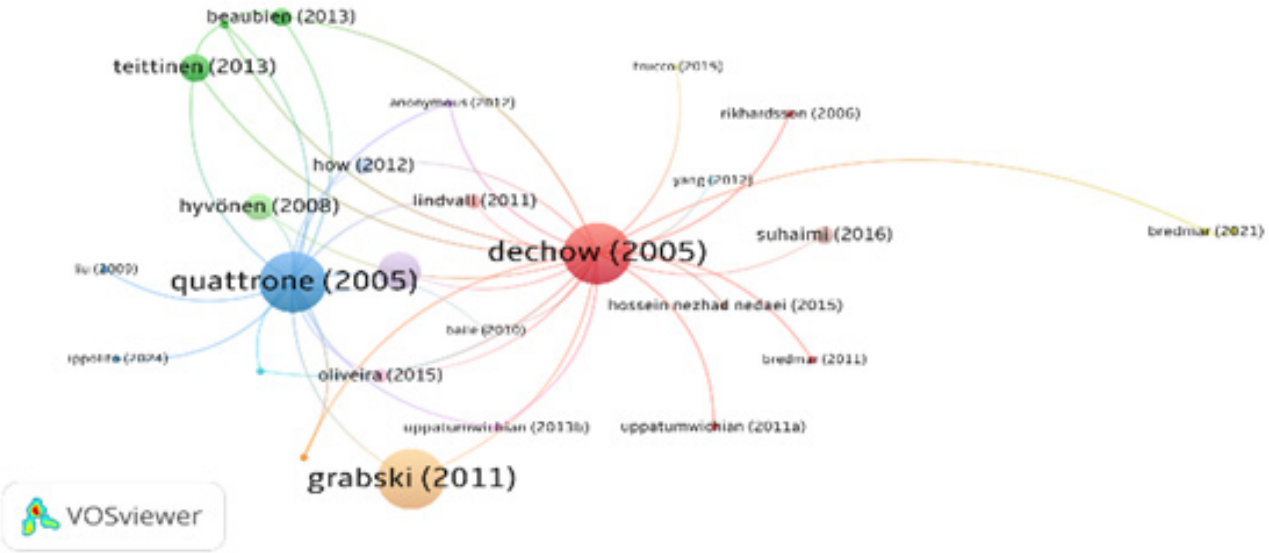

Figure 9. Citation -unit of analyse documents

Figure 9 shows a visualization of citations by document using VOSviewer software, focusing on citation relationships between publications in the field of ERP and controlling. Each node represents a document, and links between nodes indicate citations between these documents. This visualization reveals complex citation networks in ERP and controlling research. Central papers, such as those by Dechow (2005) and Quattrone (2005), play key roles in the evolution of knowledge and influence much subsequent work. Citation clusters show interconnected research themes and underline the importance of certain academic contributions.

This analysis enables us to identify influential works and understand the citation dynamics shaping the field of ERP and management control. It also provides a basis for researchers wishing to explore the relationships between different documents and develop new studies based on recognized fundamental works.

Central documents:

- **Dechow (2005)**: this paper appears as a central and well-connected node, indicating that it is widely cited by many other works. This suggests that Dechow (2005) is an influential and fundamental document in ERP and controlling research. Its influence is visible through its many connections with other papers, making it a major reference point in the field.
- **Quattrone (2005)**: another central paper, also widely cited, indicating its importance and significant impact on subsequent research. The strong connection with other works, such as those by **Hyvönen (2008)** and **Teittinen (2013)**, underlines its crucial role in the development of ERP knowledge.

Quote Clusters:

- **Green cluster**: includes papers such as **Teittinen (2013)**, **Hyvönen (2008)**, and **Beaubien (2013)**. This cluster shows strong citation relationships between these works, suggesting that they address similar or complementary aspects of ERP and management control.

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- **Blue Cluster**: brings together works such as **Quattrone (2005)** and **Hyvönen (2008)**, indicating interconnected and influential research in this field. Links with more recent work such as **Oliveira (2015)** show the continuity and evolution of the ideas initially presented by Quattrone.

Documents Connect:

- **Suhailmi (2016)** and **Hossein Nezhad Nedaei (2015):** these papers show connections with Dechow (2005), indicating that they build on concepts and ideas presented by Dechow. This reflects Dechow's continuing impact on recent research.
- **Grabski (2011)**: connected to several other papers, this work is also significant and shows significant citation relationships, underlining its relevance in the ERP literature.

Co-citation through Bibliographic Coupling - Document Analysis Unit

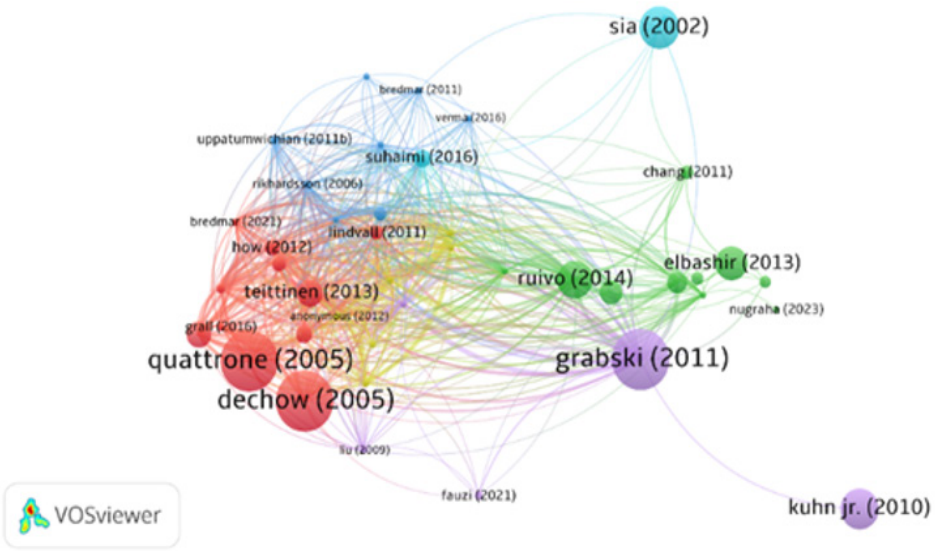

Figure 10. Bibliographic coupling -unit of analyse documents -full counting

Figure 10 shows a visualization of bibliographic coupling by document performed using VOSviewer software, focusing on shared citation relationships between publications in the ERP and controlling fields. Bibliographic coupling is a method that measures the similarity between documents based on the references they share. The visualization shows several interconnected document clusters, revealing knowledge networks and academic influences based on shared references.

Main clusters:

- **Red cluster**: includes influential papers such as **Quattrone (2005)** and **Dechow (2005)**, surrounded by works such as **Teittinen (2013)** and **How (2012)**. This cluster indicates that these papers share many common references, suggesting closely related research themes and strong reciprocal influence.
- **Green cluster**: includes papers such as **Ruivo (2014)**, **Elbashir (2013)**, and **Grabski (2011)**. This cluster shows a dense network of shared citations, indicating work that probably focuses on specific aspects of ERPs, such as their implementation and management impact.

Isolated but Connected:

- **Sia (2002)** and **Kuhn Jr. (2010)**: although geographically isolated in the visualization, these documents show significant connections with other clusters, indicating that they share key references with several documents in different clusters. This suggests their importance and relevance in various sub-domains of ERP research.

Inter-cluster interactions:

- The visualization reveals links between clusters, showing that certain documents act as bridges between different research themes. For example, **Suhailmi (2016)** and **Bredmar (2011)** appear to act as connectors between the red and green clusters, indicating their influence in several areas of ERP research.

Theme evolution:

- More recent documents, such as **Nugraha (2023)** and **Ippolito (2024)**, appear in relation to earlier work, suggesting continuity and evolution in research themes. These documents show how current research builds on established foundations while exploring new directions.

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Co-citation - document analysis unit - authors cited - full count

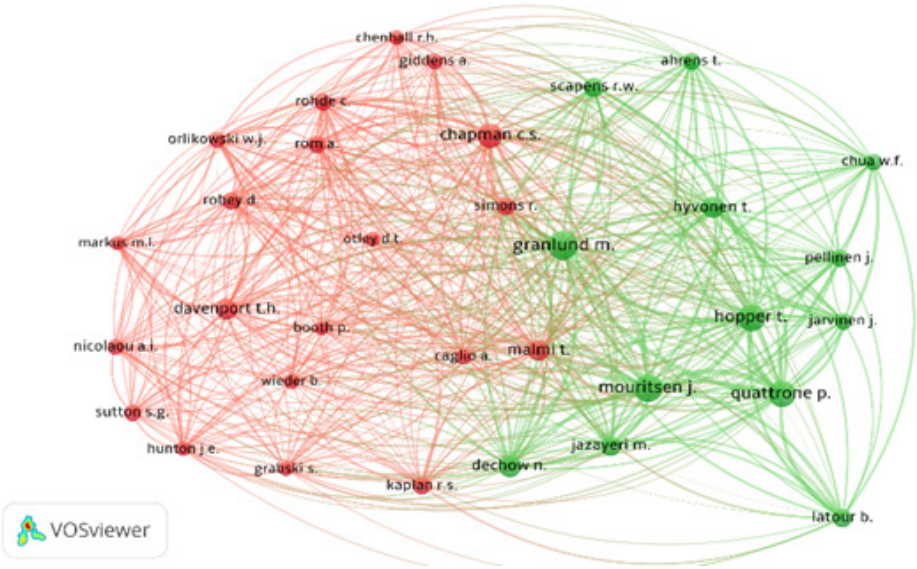

Figure 11. Co-citation -unit of analyse documents -cited authors -full counting

Figure 11 presents a visualization of co-citation by cited authors carried out using VOSviewer software. This analysis focuses on authors frequently cited together in ERP and management control publications, revealing academic reference networks and intellectual influences. figure 11 reveals complex co-citation networks in ERP and controlling research. The clusters identified show well-defined research communities and shared intellectual influences. The links between clusters underline the interconnectedness of research themes and the importance of certain authors as intellectual connectors.

The visualization shows several co-citation clusters, indicating shared research communities and academic influences. The nodes represent the authors cited, while the links between them show the times these authors are cited together in publications. The size of the nodes reflects the frequency of citations, and the thickness of the links indicates the intensity of co-citation.

Main clusters:

- **Red cluster**: this group includes influential authors such as **Davenport, T.H.**, **Markus, M.L.**, **Orlikowski, W.J.**, and **Nicolaou, A.I.**. This cluster indicates a strong interconnection between these authors, suggesting that they share similar research themes and are frequently cited together. These authors are known for their contributions to information systems and IT management research, reflecting their importance in the ERP field.
- **Green Cluster**: includes authors such as **Granlund, M.**, **Quattrone, P.**, **Hopper, T.**, and **Mouritsen, J.**. These authors are strongly interconnected, showing frequent citations together. Their work often focuses on management control practices and the impact of ERP on these practices. The presence of **Dechow, N.** and **Hyvönen, T.** in this cluster underlines the importance of their contributions to ERP integration and management control.

Interactions between clusters:

- The visualization reveals links between the red and green clusters, showing that certain authors act as bridges between different fields of research. For example, **Chapman, C.S.** and **Simons, R.** are connected to both the red and green clusters, indicating their role as intellectual connectors between the themes of information technology and management control.

Bibliometric analysis of publications on ERP and controlling has revealed significant trends, collaborative networks, and academic influences shaping this field of research. The results were obtained through various visualizations and analyses performed with VOSviewer, each offering a unique insight into research dynamics.

Publications by field

The breakdown of papers by field of study shows that IT and management are the main contributors to the literature on ERP and controlling. This predominance underlines the importance of ERP as a crucial technological tool for optimizing management processes. The other fields, although less represented, indicate the diversity of ERP applications and impacts in different sectors, such as economics, engineering and the social sciences.

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Document types

Research articles and conference papers make up the majority of publications. The articles, subject to a rigorous peer-review process, indicate high quality contributions. Conference papers reflect dynamic activity and active scientific exchange. Book chapters and reviews complete the picture, offering in-depth discussion and critical analysis.

Collaboration Networks

Analyses of co-authorship and institutional collaborations show interconnected networks of researchers and institutions. Authors such as **W. Uppatumwichian** and institutions such as the **University of Central Florida** and **The University of Melbourne** stand out for their central role and influence. These collaborative networks are essential for the dissemination of knowledge and the development of new ideas.

Keyword Co-Occurrences

Keyword co-occurrence visualizations reveal the main search themes and their interconnections. The terms **ERP** and **Management Control** dominate the scene, indicating their central importance. Thematic clusters show key areas such as integration, automation, budgeting, and accounting information systems. These results reflect the complexity and diversity of research in this field.

Quotations and bibliographic links

Citation and bibliographic linkage analyses highlight influential works and academic reference networks. Papers such as **Dechow (2005)** and **Quattrone (2005)** are major reference points, often cited together and influencing many subsequent works. Co-citation clusters show well-defined research communities, with authors such as **Granlund, M.** and **Hopper, T.** playing central roles.

CONCLUSIONS

This synthesis of bibliometric results highlights the complex dynamics of ERP and controlling research. Major contributions come from an interconnected set of researchers and institutions, with diverse and evolving research themes. Collaborative networks and academic influences reveal the importance of interdisciplinary and international interactions.

The results provide valuable insights for researchers and practitioners alike. They help identify influential works, emerging themes, and opportunities for future collaboration. By understanding the dynamics of citation and collaboration, it is possible to develop more effective research strategies and make a significant contribution to the advancement of knowledge in ERP and controlling.

For future research, it would be beneficial to continue exploring the interactions between the different themes and to strengthen international collaborations. By building on established foundations and integrating new methodological approaches, researchers can continue to innovate and respond to the complex challenges posed by ERP and controlling in modern organizational environments.

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