

THE RELATIONSHIP BETWEEN STRATEGIC MANAGEMENT AND TECHNOLOGY ADOPTION: A REVIEW AND BIBLIOMETRIC ANALYSIS

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ABSTRACT

This research has been conducted and is directed toward a systematic literature review and bibliometric visualization analysis of the relationship between the strategic management model and technology adoption. This research aims to document the intellectual structure, volume, and knowledge-development directions empirically. To achieve this objective, we will use Scopus to access the databases, VOS Viewer, and Excel to analyze data. From the analysis that has been conducted, we have identified that there is a difference in the volume of the articles that have been produced on strategic management and technology adoption published in the current ten years, which are from 2013 until 2022, by comparing to the entire period before 2013 which is from 2003 until 2012 with 346 documents articles that have been published in the last ten years. Furthermore, the bibliometric analysis that will be conducted in this research by using the platform that has been chosen will identify the most influential journals, authors, and papers in this study field that have been chosen which are strategic management and technology adoption.

Keywords: strategic management, technology adoption, bibliometric analysis

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INTRODUCTION

In this current situation, there are rapid changes in terms of technology. There are always improvements and innovations in the changes made in technology. Every change in the theories and models in the technology that have been widely employed in the evaluation stages of the current technology for each different of information and communication technology (ICT) goods and services is to achieve the goal of determining the technology applicability and improve the predictive validity (Granić, 2022). Since 2019, the terms of technology adoption have been widely known because most transactions and operations have been conducted online or by using technology. This is because of the COVID-19 pandemic that has attacked the world and required people to keep a distance from each other to prevent the spread of COVID-19. As an initial step in technology adoption, acceptance is an attitude toward technology that is impacted by various circumstances.

According to the Innovation Diffusion Theory (IDT) (Rogers, 1962, 1995), adoption can be defined as a choice to take full advantage of technological progress as the most effective course of action. As we can see, the changes that have been conducted in our technology right now have been through the strategic management stages to provide the technology that can give benefit the end users and also utilize each function that the technology has to make our lifestyle more accessible and systematic (Granić, 2022). Strategic management is the art and science of formulating, implementing and evaluating cross-functional decisions chosen through the decision-making process. It is to ensure we can achieve each objective we have set in the strategy formulation stage nowadays; as we mentioned earlier, the changes in technology are going constant along with the world situation. So it is vital to focus on and study the new technology that is available today to aim that we can make our life more accessible and more systematic. Along with this, people should also be aware of the technological changes we have right now, especially in the business sector, since most businesses nowadays will use technology as a competitive advantage for their firm.

Based on the article that has been produced by Emerald Insight that has been conducted by the University of the Itajai Valley (UNIVALI), Biguacu, Brazil, discusses digital transformation by enabling strategic capabilities in the context of “BRICS” (Andrade & Gonçalves, 2021). This research covers digital transformation and its association with IR 4.0 value creation system. It states that the limitation to conduct in this field which is about technology, is how the awareness about technology adoption nowadays the people, especially in the adoption of platform business models (Andrade & Gonçalves, 2021) that have been widely used in this world. Since we want to know how an individual is aware of the technology nowadays, we can evaluate the article’s data on technology adoption and strategic management. To make some changes to our current technology, we should conduct strategic management models to ensure that the alternatives or changes we have made are suitable and the best. All the economists, environmentalists, and industrialists should be one of our sampling of the new technology that will be produced since they are the technology user nowadays (Begum, et.al, 2022).

Research Purpose

This research aims to identify common and future interdisciplinary topics between strategic management and technology adoption. Since we want to cover all the limitations of research that have been conducted before 2013. We will use systematic literature review and bibliometrics methods that can make our results more accurate. It also allows us to empirically document the volume of the intellectual structure and also the knowledge-development directions that have been used in this field that has been chosen. By using the combination of systematic literature review and bibliometric also the visualization analyses, we have identified several research questions in this study which are:

1. What are the effects of the strategic management model on technology adoption?
2. What are the field's most influential journals, authors, and research papers?
3. What is the volume of published articles on the strategic management and technology adoption?
4. Which are the most addressed research topics in the domain?

After taking into consideration the primary purpose of this research and there are two main research directions in this research which are strategic management and technology adoption, the first step in this research is to form the sample database from the articles that have been published in these two keywords in the articles. We have identified some essential articles from the Scopus database for this sample database. The data extraction that Scopus provided will be done using the Preferred Reporting Items for Systematic Review and the Meta-Analyses (PRISMA) method for the bibliometric review. Thus, we have established a sample of 372 peer-reviewed articles from Scopus. The research method we will use to answer all the research questions identified before is a bibliometric review of the literature. By referring to the literature, it states that bibliometric methods can give the ability to some researchers the to analyze the evolution of the scientific literature over time, and it also reveals the intellectual relationship of the knowledge that have in the field of study that has been chosen before.

Since the purpose of this paper is to choose the research methodology that can illustrate the entire diversity of the knowledge (James, 1997), the analysis of the literature in this research has been done from a descriptive point of view. With this method, we can offer much information to the new researcher about the well-known research topics, most frequently cited authors, and papers, and we also can identify the publisher that has published more articles. In addition, in this research, we perform the keyword co-occurrence analysis; we can obtain supplementary data that show the most popular and studied topics over the years. From this, the researcher can gain a suitable reference base and quickly identify the study's limitations that we will consider when we want to conduct further research in the future.

This paper will be structured first by the introduction that will consist of the main definitions of the concept or two topics that we have chosen: strategic management and technology adoption. This section also clarifies the research question identified in this research. The following section will explain in more detail the methodology used in this research to answer the research question. The next part will present the research result and the interpretation. Finally, we will close this research with the sections of discussion and plan for future research that will be conducted. Finally, it will highlight the summary of the research's results and the limitations we face while conducting this research.

METHODOLOGY

In this research, we need to extract the data and the text analysis of the citation from the previous study that has been conducted before. So systematic literature review and bibliometric review methods are suitable for this research to have more accurate and empirical results. The bibliometric review method can also provide a complete analysis of previous knowledge (Maier et al., 2020). By referring to the research that has been conducted by Corsini et al (Corsini et.al, 2018) states that many benefits we can have when we conduct research by using the bibliometric methods, which are from this method we can have an overview of the scientific literature and, in the case of conducting the formal review the output when we conduct bibliometric method is more subjective than the traditional one. Generally, we can see that this bibliometrics method can include the article he already chooses in the sample database, filtering and refining the bibliographic data we have. So, in this process, we should choose the best software and need to decide the best alternative on how we want to illustrate the information.

Data Collection

For the data collection, we will use the Scopus database for a search article that consists of the field we chose to create a sample database. In addition, we will use the PRISMA guidelines proposed by Moher, Liberati, Tetzla, and Altman (Moher et.al, 2009). According to the research those researchers have conducted, the PRISMA approach will have four steps to identify and extract the data to conduct the bibliometric review. (Figure 1).

The first step for the PRISMA approach is the identification of the article related to the keywords that we have chosen, which are strategic management and technology adoption. In this stage, we will consider the large volume of the published article we have from the search strategy we have chosen, which is the Scopus database. After we have chosen the keywords that we want in this research, there are two keywords: strategic management and technology adoption. Scopus will give the paper that has been published that has a relation with this keyword either based on their abstract, keyword, or title. We have identified 1,627 journal articles from this process on the specific search. So we will limit the papers, which we call inclusion and exclusion criteria (Table 1), we limit the paper only from 2013 until 2022, and only papers that categorize as article-type papers will be chosen. This has been conducted because we want to review articles that have better quality than other types of papers that Scopus have.

Not only that, but we also limited our search by focusing on the documents classified under business, economics, and social science areas. From this limitation, we successfully have 372 articles chosen based on the specific criteria we have set. Next, from the selected article, we removed the same article, which is by looking at their title, we have eliminated two articles from 370 articles that have been chosen. After that, all 370 articles will be reviewed by looking at their title and abstracts to determine whether the abstract can be relevant to the topic we chose; if not, we will directly eliminate the article. Makes there are only 310 articles that will be reviewed and have been chosen as the sample database.

Table 1 Search Criteria.

Topic	“strategic management”
Document Type	article
Research Years	2013 -2022
Web of Science Category	Business, economics and social science
Language	English
Topic	“technology adoption”
Document Type	article
Research Years	2013 - 2022
Web of Science Category	Business, economics and social science
Language	English

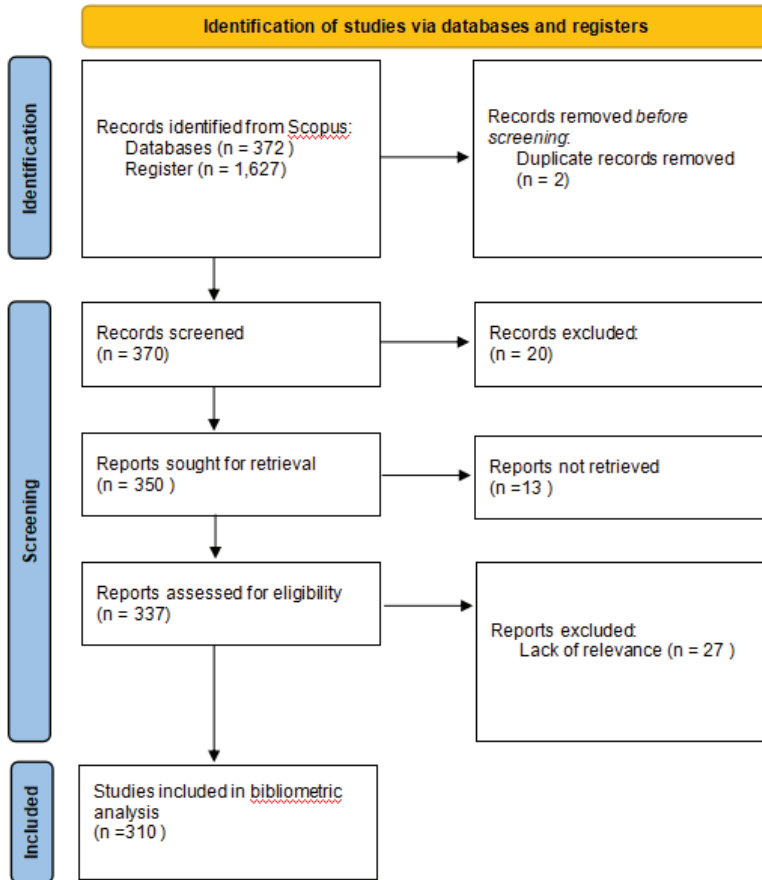


Figure 1 The PRISMA flow diagram used to identify, screen and include the papers from Scopus for bibliometric review.

Data Extraction

The final database will consist of 310 journal articles, so in this research, we have chosen Excel and VOSviewer software for the data analysis needed to answer each research question. VOSviewer is a free tool available for bibliometric research; it is not like other computer programs for bibliometric mapping; it will focus on the graphical display of the bibliometric maps. We have chosen excel since excel are very familiar to individual nowadays. Still, since Excel has limitations, we choose the VOSviewer since its features are very beneficial for showing big bibliometric maps in an easy-to-understand format. The extraction data from the sample database will consist of information like the article title, author names, the keywords used, and the citation information.

Data Analysis

The first phase is already conducted for the descriptive analysis. As mentioned early in this research, we also use Excel for the data analysis; we can generate any graph to identify any information related to the evolution of the published papers regarding the systematic management and technology adoption concept. Next phase, we will use VOSviewer since Excel also has its limitation that we cannot answer some of the research questions while we only use Excel. Hence, we choose to conduct a bibliometric analysis. From this methodology, we can gain information and look at the type of illustration for the most valuable papers, researchers, or journals in a particular domain by referring to the citation analysis. Furthermore, when we conduct citation analysis in bibliometrics, we can identify how many times the other article has cited that paper. We can also conduct a co-citation analysis to measure and analyze the similarity between the papers, journals, and authors.

RESULTS AND INTERPRETATIONS

Descriptive Analysis (Excel)

Research article distribution by year

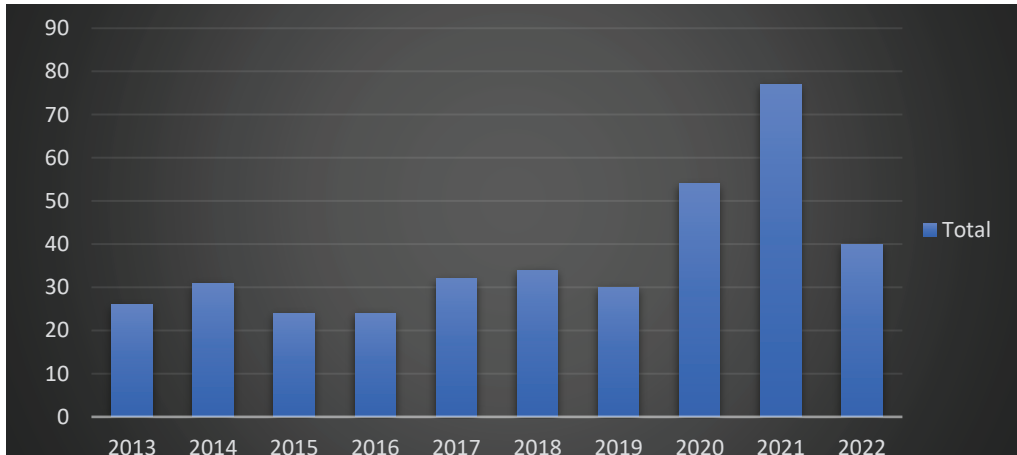


Figure 2 Research article distribution

Figure 2 shows the data of research article distribution for the two concepts, strategic management and technology adoption, generated by Excel. As we can see above, it shows the research article distribution from 2013 until 2022. It shows the fluctuating record of the research article distribution from 2013 until 2022. In 2021 it showed the highest record of research article distribution which is 77 articles, and the lowest records are in 2015 and 2016, with only 24 research articles produced, which means that in 2021 the articles about strategic management and technology adoption are viral and familiar.

Journal Analysis of Strategic Management and Technology Adoption articles

Table 2 Top 15 journals with the most published articles on strategic management and technology adoption.

No	Journal Name	Art. No.
1	Sustainability (Switzerland)	17
2	Technological Forecasting and Social Change	6
3	Technology in Society	5
4	Sustainable Cities and Society	3
5	Water (Switzerland)	2
6	Transportation Research Part E: Logistics and Transportation Review	2
7	Resources, Conservation and Recycling	2
8	Land Use Policy	2

No	Journal Name	Art. No.
9	Journal of Management in Engineering	2
10	International Journal of Innovation and Technology Management	2
11	IEEE Transactions on Engineering Management	2
12	Energy Research and Social Science	2
13	Cogent Business and Management	2
14	Weather and Climate Extremes	1
15	Tourism Management Perspectives	1

As shown in Table 2 reveals all the top 15 journals with the highest record of published articles. As we can see, the journal of Sustainability (Switzerland) is first ranking in the top 15 journals published on strategic management and technology adoption, of 17 articles. The second journal with the highest ranking after sustainability is Technological Forecasting and Social Change, with a total of the article published is 6. Lastly, the third-ranking journal listed in this data is Technology in Society journal, with a total of the published journal being 5.

Subject area of strategic management and technology adoption concept

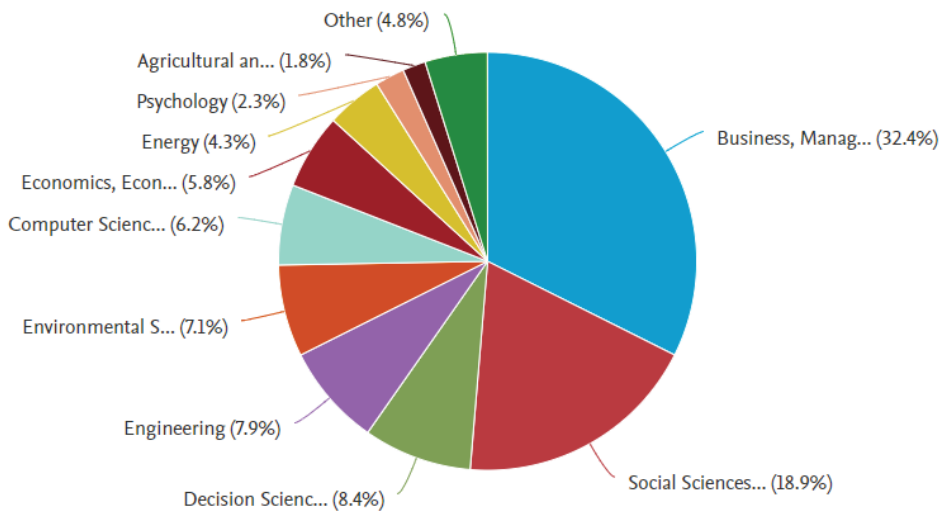


Figure 3 Subject Area Analysis

Figure 3 shows the search area of this research’s two main concepts; it shows that business, management, and accounting are the majority area of the search area with a value of 32.4%, followed by social science at 18.9%. These subject areas, business, management, accounting, and social science have been chosen as the search criteria in this research since both of the areas shows the top 3 subject area meaning that these two concepts that have been used in this research are strategic management and technology adoption can be classified that this two concept more focused under these two subject area. We have also chosen Economics as one of the criteria that have been limited when conducting the search strategy. This pie chart shows that the Economics part shows 5.8% focus on this research topic, strategic management, and technology adoption. It can be considered a moderate amount compared to all the subject areas stated in Figure 3.

Co-citation network analysis of journal

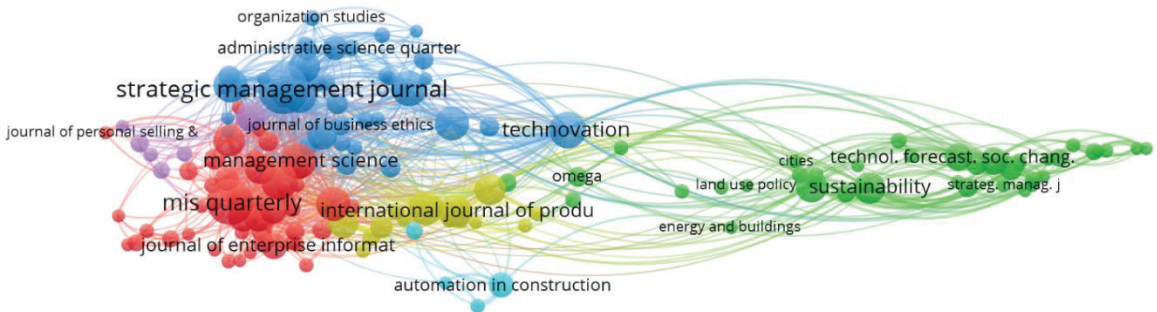


Figure 4 The co-citation network analysis of journals.

The journal co-citation analysis will consist of a series of colors of bubbles or notes that will indicate the relative numbers of the co-citations for each journal. Based on the sample of the article that has been used, which is 310 articles, a total of 10,330 sources have been identified. Still, we have set the minimum number of citations of sources to 20, and the results in 155 articles have been displayed in Figure 4. The node size above indicates the number of citations received, the more significant the node, the higher the number of citations for that journal. In this figure, we can take a look that there are 7 clusters of journals. As we can see, the most significant cluster is the green cluster. The most prominent node for this cluster is sustainability, with direct citations of 115 and total link strength of 2102.

The second cluster is the red color with 31 items. For this cluster, the most visible journal is mis quarterly having 256 direct citations with 10,328 total link strength. Finally, the third cluster is the blue one, with 31 items. After analyzing the node, the most significant number of direct citations is the strategic management journal, with 298 citations, with a total link strength of 13,222. It has been followed by technovation with 156 citations and 5,951 total link strength.

Influential Authors and Articles in the Strategic management and technology adoption field

We performed a citation analysis to identify the most prominent research or article from our sample database.

Table 3 Top 10 most cited papers

Article Title	Authors	Year	Total citation
Turning sustainability into action: Explaining firms' sustainability efforts and their impact on firm performance	Schrettle S., Hinz A., Scherrer-Rathje M., Friedli T.	2014	215
Managing Value Co-Creation In The Tourism Industry	Cabiddu F., Lui T.-W., Piccoli G.	2013	183
Big data technologies: An empirical investigation on their adoption, benefits and risks for companies	Raguseo E.	2018	164
The information artifact in IT governance: Toward a theory of information governance	Tallon P.P., Ramirez R.V., Short J.E.	2013	151
Exploring the role of TQM and supply chain practices for firm supply performance in the presence of information technology capabilities and supply chain technology adoption: A case of textile firms in Pakistan	Basheer M.F., Siam M.R.A., Awn A.M., Hassan S.G.	2016	135
Opportunities for Use of Blockchain Technology in Medicine Total	Radanović I., Likić R.	2018	107
Strategic principles for smart city development: A multiple case study analysis of European best practices	Mora L., Deakin M., Reid A.	2019	102
Production Risks and Food Security under Alternative Technology Choices in Malawi: Application of a Multinomial Endogenous Switching Regression	Kassie M., Teklewold H., Marenya P., Jaleta M., Erenstein O.	2015	94
Electronic HRM: four decades of research on adoption and consequences	Bondarouk T., Parry E., Furtmueller E.	2017	92
Networks for the commercialization of innovations: A review of how divergent network actors contribute	Aarikka-Stenroos L., Sandberg B., Lehtimäki T.	2014	88

Data that have been shown in Table 3 consist of the top 10 most cited papers about systematic management and technology adoption. As we can see, the article "Turning sustainability into action: Explaining firms' sustainability efforts and their impact on firm performance" that have been written by Schoettle S., Hinz A., Scherrer-Rathje M., Friedli T. (Schoettle, S et. Al, 2014) known as the highest raking in top 10 most cited papers. This paper was published in 2014 in the International Journal of Production Economics; it has 215 citations in the Scopus database. This journal's objective is to look at how manufacturing firms adjust their strategy based on sustainability challenges. Also, the researchers aim to explain how the decisions of sustainability moves can motivate firms (Schoettle S et. Al, 2014).

The second most cited article has been written by Cabiddu F., Lui T.-W., Piccoli G. the title of the article is “Managing Value Co-Creation In The Tourism Industry”. It was published in 2013 with a total of citations in the Scopus database is 183 citations (Cabiddu, F et.al, 2013). This article aims to examine how information technology (IT) can create value in tourism, so the findings of this article show that operators have achieved the best performance to achieve value because of the strategies that have been the plan before fit with the objectives of the value creation initiative, synergy with other people and IT readiness to appple the business electronically suitable with the technology changes nowadays.

Author co-citation analysis

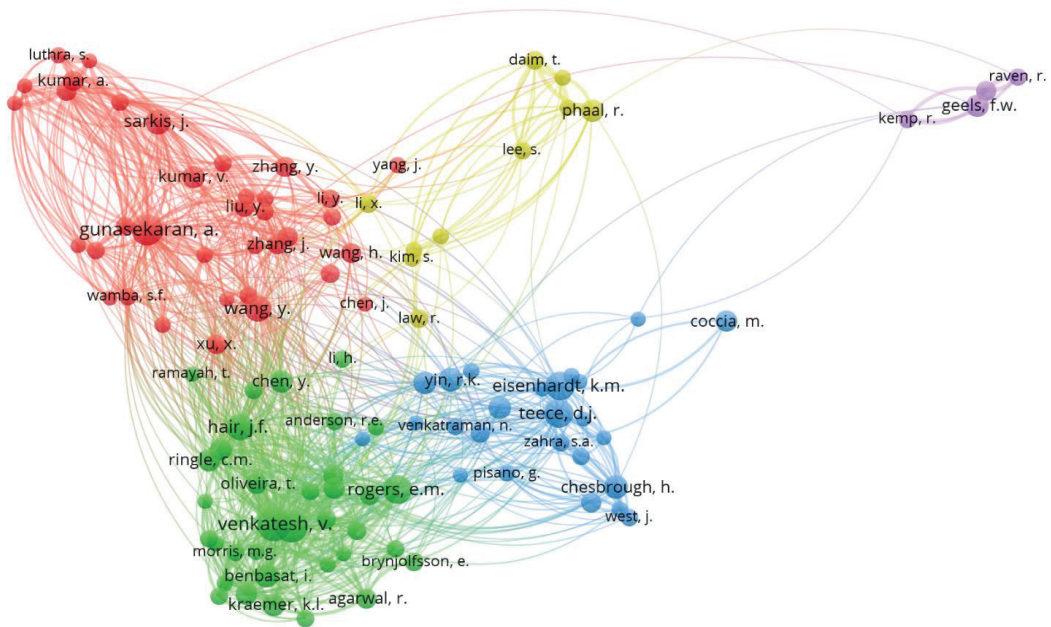


Figure 6 Author Co-citation network map

For the author’s co-citation map, 5 clusters have been identified. The red one is the most significant cluster with 36 authors; based on what we can see, one author that stands out is the researcher Gunasekaran, who has a total link strength of 2009 and 82 direct citations. Another outstanding author is Wang. y with 58 direct citations and 1171 total link strength.

The second cluster is green, with 35 authors in this cluster. The most visible authors known as Venkatesh,v. It has 94 direct citations and 1973 total link strengths. They were followed by the hair,j.f with 55 direct citations and 1471 total link strength. The third cluster is the blue one, with 25 authors inside this cluster. The most central node is Eisenhad,t,k.m; with the direct citation of 69 and 942 total link strength. Next is Teece, d.j, which has 67 direct citations and 114 total link strengths.

DISCUSSION AND CONCLUSION

As mentioned earlier, the primary purpose of this research is to identify the common points and future interdisciplinary topics between strategic management and technology adoption by documenting the intellectual structure, the volume of the article and the knowledge-development directions y using a practical manner. So to fulfil this purpose, we have chosen to conduct this research using a systematic literature review and bibliometric analysis. We have been analyzing 350 articles published on the Scopus database. So for this section, we will summarize the result obtained, discuss the limitation, and identify the future research directions when we need to conduct the research in future.

Interpretation of the research results

The first research question in this study is what are the effects of the strategic management model on technology adoption? So based on the observation that we have conducted, strategic management and technology adoption are related to each other since there is a recorded research article distribution that shows in 2021, the article regarding these two main topics is very highest, and it shows the increasing value from 2013 until 2021. Therefore, to have more accurate data regarding this article distribution, we have limited the criteria of this research to only the current ten years article, which is from 2013 until 2022.

Secondly, we have answered research question 2: What are the most influential journals, authors, and research papers in the field? For this research question, we have used Excel for descriptive analysis by analyzing the top 15 journals that have produced many articles regarding strategic management and technology adoption. Also, we have used VOSviewer for the bibliometric analysis to analyze the author co-citation to identify which researchers have the highest direct citation on this topic. We have conducted these two analyses using the same data from Scopus databases. We have focused on 350 articles after removing the duplicate, non-relevance, and uneligible articles for this research. So, as we can see in the results sections, we can see the top 15 most published articles on strategic management and technology adoption topics, the top 10 of the most cited papers, and co-citation authors to identify the most influential author and journals for strategic management and technology adoption topics. The last research question that we have focused on is identifying the most addressed research topics in the domain. For this research question, we conducted the keyword co-occurrence analysis using the bibliometric method to have more accurate and detailed data about the topics and keywords most addressed. The analysis shows that technology adoption has a higher number of occurrences which is 390 total link strengths. Technology adoption is a topic that has been a focus of this research.

Generally, systematic management and technology adoption relate to each other, and both topics have similarities. As we can see in keyword co-occurrence analysis, it shows both strategic planning, which is one of the elements under strategic management and technology adoption. Also, we have faced changes in our environment, especially after the COVID-19 pandemic, since almost all transactions are online and using the current technology. Since the technology should be improved from time to time to fulfil all the user needs, the strategic management model should be conducted before we make some changes to ensure that the alternative or changes, we have been conducting are the best decisions. So, technology adoption nowadays should comply with strategic management to produce more quality technology.

Limitations of the research

In the process of conducting this research, we have faced many limitations in types of acquiring detailed information and analyzing the data. One of the limitations that have been faced while researching the relationship between strategic management and technology adoption is we only focus on one type of database, which is Scopus; it gives effect to the number of identified articles which is the number of the article will be less than we refer to other databases like the Google Scholar and ISI WoS database. When we decide to use more databases, it can increase the number of articles we can identify and record in our PRISMA framework. Not only that, but it also can make our research review analysis more accurate since we have been review from a significant amount of the article.

Finally, this research only focuses on two keywords which are strategic management and technology adoption; it makes the limited number of the article have been reviewed since we did not review the article that has a keyword that is related to strategic management and technology adoption like information management and innovation. Adding these two keywords to our future research can increase the number of articles we can review since information management and innovation are also included in most keywords in this field. We cover many areas regarding this topic.

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