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Araştırma Makalesi / Research Article

Social Network Theory in Project Management: A Bibliometric Analysis

Proje Yönetiminde Sosyal Ağdüzenekleri Kuramı: Bibliyometrik bir Analiz

Atıf Gösterimi:
Hafizoğlu, M. , Tuzlukaya, Ş. (2023). Social Network Theory in Project Management: A Bibliometric Analysis. Başkent Üniversitesi Ticari Bilimler Fakültesi Dergisi, (7)2, 63 –82.

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Özet

Amaç: *Bu çalışmanın temel amacı proje yönetiminde sosyal ağdüzenekleri kuramının kullanımının mevcut durumunu sunmak ve proje yönetiminde bu yeni alanın ortaya koyduğu eğilimleri keşfetmek; kuramın proje yönetimi literatürü ve uygulamalarına katkı sağlayabileceği alanları göstermektir.*

Yöntem: *Proje yönetiminde Sosyal Ağdüzenekleri Kuramı kullanımını araştırmak için Web of Science veri tabanında 2001-2022 yılları arasındaki ilgili makalelere odaklanılarak bibliyometrik analiz metodu kullanılmaktadır. Kümeleme analizi ile de benzerlik veya farklılıklara göre gruplandırılma yapılmaktadır.*

Bulgular: *Çalışma, proje yönetiminde sosyal ağdüzenekleri kuramının popülerlik kazanmasına rağmen, uygulamasının sınırlı kaldığını ortaya koymaktadır. Bu kapsamdaki literatürün inovasyon, Ar-Ge, bilişim teknolojileri, uzay ve tarım projeleri gibi birden çok paydaş ve ilişkiyi içeren projeleri ihmal ederken, öncelikle inşaat projeleri gibi belirli proje türlerine odaklandığı görülmektedir. Ayrıca bu çalışma,*

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Sosyal Ağdüzenekleri Kuramının ağırlıklı olarak risk yönetimi, paydaş yönetimi ve bilgi yönetimi olmak üzere üç bilgi alanında kullanıldığınnıı tespit etmiştir.

Sonuç ve Katkılar: *Proje yönetiminde Sosyal Ağdüzenekleri Kuramı yaklaşımını anlamanın, proje yöneticilerinin daha etkili ekipler oluşturmasına, paydaş katılımını geliştirmesine, iş birliğini ve yeniliği teşvik etmesine ve proje risklerini azaltmasına yardımcı olabileceği sonucuna varılmıştır.*

Sınırlılıklar: *Bu çalışma Web of Science veri tabanı ile sınırlıdır. Gelecekteki araştırmalar, daha fazla veritabanına girerek çabalarımızı genişletebilir.*

Anahtar Kelimeler: *Sosyal Ağdüzenekleri Kuramı*, proje yönetimi, bibliyometrik analiz, ilişki kalıpları, araştırma eğilimleri.

Jel Kodu: M1, L14, O22.

Abstract

Purpose: *This study employs a bibliometric analysis of project management literature from 2001 to 2022 to investigate the use of social network theory in project management. The main goal is not only to present the current state of the social network theory usage in project management but also to explore emerging trends of this new field in project management.*

Methodology: *Bibliometric analysis is used by focusing on related articles between the years 2001-2022 in the Web of Science database to investigate the state and evolution of social network theory in project management. Cluster analysis which is a powerful tool employed in SNA (Social Network Analysis) is utilized for the grouping of items based on similarities or distances between them.*

Findings: *The study revealed that although the Social Network Theory (SNT) approach in project management is gaining popularity, its implementation remains limited. The literature primarily focused on specific project types, such as construction projects, while neglecting others that involve multiple stakeholders and relationships, such as innovation, R&D, IT, space, and agricultural projects. Moreover, the study identified that SNT is predominantly used in three knowledge areas, namely, risk management, stakeholder management, and knowledge management.*

Implications: *Understanding the SNT approach in project management can help project managers create more effective teams, improve stakeholder engagement, foster collaboration and innovation, and mitigate project risks.*

Limitations: *This study is limited to Web of Science database. Future research may extend our efforts by digging into more databases.*

Keywords: Social network theory, project management, bibliometric analysis, relationship patterns, research trends

Jel Codes M1, L14, O22

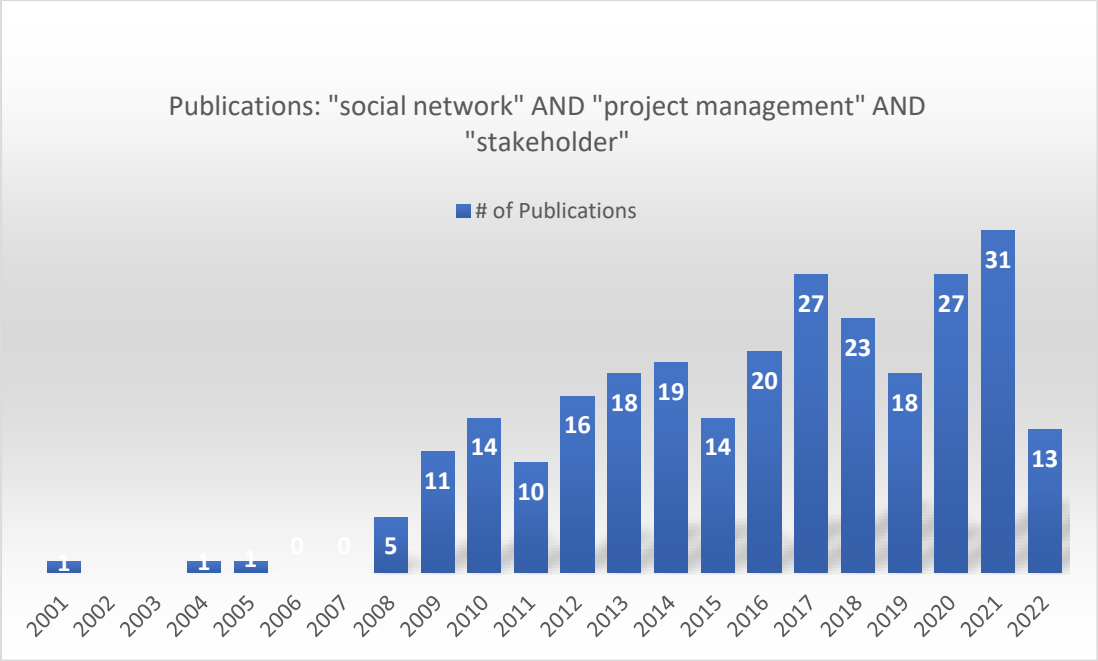
1. Introduction

Project management principles have evolved over time from Gantt charts to computerized logical network-based approaches and, finally to a focus on personal management control and overview, consensus, flexibility, and acceptance of uncertainty (Sankaran et al., 2021). The most recent change added project stakeholder management as a new knowledge area which is also included for the first time in the fifth version of Project Management Body of Knowledge Guide by Project Management Institute (PMI).

Project Stakeholder Management has enabled the project management profession to more focus on people (and organizations) who affect or are affected by the project and their relations. Stakeholders have become an essential component of project success (Yang et al., 2011) not only with their power and interest but also their various types of relations. Managing stakeholder expectations and their relations has become increasingly important in the knowledge age, as information and knowledge are created and transferred at a rapid and massive scale and as complexity of the projects increase. Emerging technologies, such as AI (Artificial Intelligence), blockchain, and data science, as well as new trends gaining prominence such as sustainability, globalization, cultural shift shape how projects are defined and managed. As a result, new projects have been launched to achieve digital transformation, ensure responsible use of AI (Benjamins, 2020), and improve sustainability (Silva et al., 2018). Traditional project management which primarily focuses on actions of organizations and individuals but not on relationship patterns within the project cannot be successful. These traditional applications are limited because they do not consider the role of social networks (Chung & Crawford, 2016) and do not use the explanatory power of the networks and there is a need to further develop a systematic framework for stakeholder management (Yang et al., 2011). To deal with stakeholders and their relations, a social network perspective has been introduced (Rowley, 1997) which offers different insights into managing project stakeholders (Chung and Crawford, 2016).

Social network theory has been developing from a multi-disciplinary perspective. Project management is one of the unexplored areas at which social network theory may have various applications. Social Network theory is about structure and position. A new project organization is created with ongoing and new relations (structure) each time a new project is initiated. Project Management with its temporary relational structure and changing positionings based on project organizations can not only benefit from social network theory but also improve it. As an example, Chowdhury et al. (2011) applied social network theory to identify and classify potential stakeholders as well as to analyze the structural constraints and opportunities that a stakeholder faces in Public Private Partnership (PPP) affiliation. Figure-1 illustrates the growing attention to social network perspective in project management field.

Figure-1 Number of publications as a result of search query in all fields: ALL=("social network" AND "project management") in Web of Science.



The number of papers working on "social network" and "project management" has been increasing since the beginning of 2000s, although total number of papers focusing on social network in project management is only 269. Thus, the study aims to present the current state of the social network theory usage in project management and explore emerging trends of this new field by using bibliometric analysis. The main contribution of this study will be to uncover the main knowledge areas of project management which social network theory can contribute to. To the best of our knowledge, it is the first time such an exploratory research is conducted to uncover these knowledge areas.

Exploring specific application areas of social network theory on project management will contribute both to social network theory and project management literature by extending new application areas for social network theory which contributes to the development of the theory as well as by using more relational approach in project management field which has been ignored for a long time (Rowley, 1997).

As a result, this study has made a difference by decreasing the gap between social network theory and project management field and uncovered specific knowledge areas as well as the potential ones which social network theory can contribute.

2. Background

2.1 A review of social network theory and its distinctive features

Social network theory is concerned with the actors and connections between them within a network (Borgatti and Foster, 2003). Its scope spans across multiple disciplines and aims to explore how individuals interact and form relationships with

each other within a network (Jafari et al., 2020). In contrast to the traditional approach of solely examining individual organizations, social network theory acknowledges the importance of the interconnectedness and interdependence among organizations (Salancik, 1995). Furthermore, social network theory departs from the assumption that social behavior is solely the result of individual behavior, and instead focuses on relationship patterns within a social system (Emirbayer & Goodwin, 1994).

Social network analysis (SNA) is a research method used in social network theory, providing an analytical framework to explore relationships at different levels of analysis (Breiger, 2004). The primary goal of SNA is to model the relationships between actors and uncover the underlying structure of a group. By analyzing this structure, researchers can better understand the impact of relationships on group functioning and individuals within the group.

A key feature that distinguishes social network explanations from non-network explanations is the emphasis on operationalizing relationships among units in terms of networks of linkages (Wasserman & Faust, 1994). This is in contrast to traditional social science perspectives, which often ignore relational information. In essence, SNA provides a way to explore and measure the impact of relationships among social actors, highlighting their significance in shaping social dynamics.

Social network analysis is a structural approach that differs from other strategies by emphasizing the importance of relationships and their patterns and implications (Wasserman and Faust, 1994). While reductionism, which was prominent in twentieth century research, aimed to understand the whole by understanding its parts, social network analysis stresses the significance of relations and uses structural information to study and test theories (Barabasi, 2002). By focusing on relationships and their structures, researchers can gain insights into the social environment and understand the whole as a sum of its parts (Wasserman and Faust, 1994).

Social network theory emphasizes the importance of relationships among interacting units, with the unit of analysis being a collection of individuals and their linkages. In SNA, structures are operationalized in terms of networks of linkages among units, prioritizing relational ties over attributes of units. SNA differs from traditional data analytic frameworks in that it explicitly considers the interrelatedness of social units and uses structural variables to measure dependencies among them. However, collecting primary social network data presents challenges, such as recalling bias, and requires complete network data rather than samples.

Social network analysis (SNA) offers a range of analytical methods for examining structural properties and testing theories at multiple levels of analysis, from individual actors to groups and organizations (Breiger, 2004). Unlike standard theories, SNA emphasizes the importance of relationships and interactions among actors and provides a framework for understanding how these connections give rise to emergent structures and patterns (Granovetter, 1994). However, the quality of SNA-based generalizations is contingent on the quality of the underlying data, and much work is needed to develop reliable and valid procedures for collecting observational network data. Therefore, ongoing efforts to improve data collection techniques and enhance the validity of SNA-based findings are necessary for advancing our understanding of social structures and processes.

2.2 The specific applications of social network theory to project management

Although the application of social network theory to project management is not new, only a few studies have suggested social networks as an alternative analytic stakeholder management approach (Chung and Crawford, 2016; Mok et al., 2017; South et al., 2018). In one of the early studies, Rowley (1997) suggests that multiple and interdependent interactions are more important than the dyadic ties used in traditional stakeholder management approaches. More recent ones may also incorporate social network theory into project management. Loosemore et al. (2020) investigate the construction project outcomes from relational perspective, for example. Project management's relational and social dimensions are also investigated (Pryke et al., 2018). Furthermore, social network theory is used to investigate the governance of construction projects (Pryke, 2005) as well as to investigate the determinants of knowledge transfer (Takahashi, 2018) and to analyze the institutional relations in projects (Wang et al., 2018). Zheng et al. (2016) examined 63 SNA articles published in journals between 1997 and 2015 in construction project management research and proposed a future direction for a new stakeholder management framework.

The application of the generic hypothesis of network theory (Borgatti et al., 2013) to project management reveals that a stakeholder's position in a network determines how the project is executed, and the success of the project depends on the structure of relations among the stakeholders. Networks focus the attention on the relationships among the stakeholders. Moreover, the possibility of disparate parts of a system affecting each other is a part of the power of network concept (Borgatti et al., 2013) which can be applied to project management.

Social network theory has found numerous other applications in project management. One such application is in understanding and analyzing the communication and collaboration patterns among project team members (Nunes and Abreu, 2020; Nunes et al., 2021; Xu and Lu, 2023). By mapping out the communication networks within a project team, project managers can identify the key players and their roles in the team, as well as potential bottlenecks or gaps in communication (Mead, 2001). This knowledge can be used to optimize team performance and improve communication flow. Another application is in identifying and managing project risks. By analyzing the network of dependencies among project tasks and stakeholders, project managers can identify critical paths and potential risks, as well as develop strategies to mitigate those risks (Yu et al., 2017; Wang et al., 2020). Social network theory can also be applied to resource allocation, stakeholder management, and change management in project management, making it a versatile and valuable tool for project managers.

3. Methodology

3.1 Research strategy and bibliometric analysis

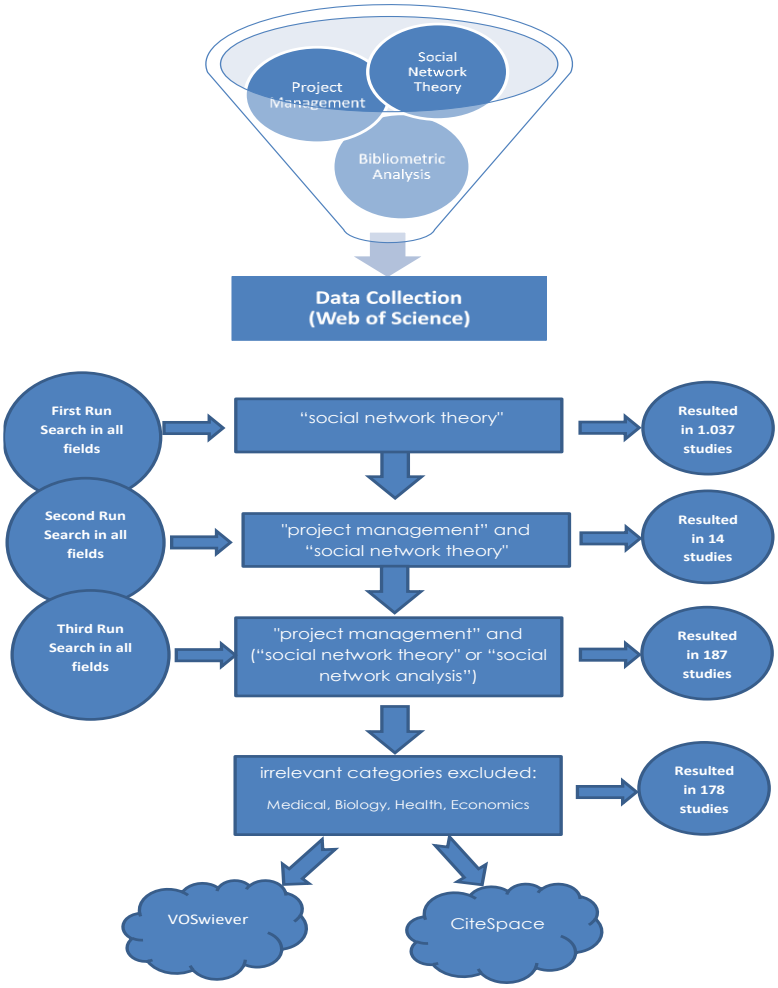
Bibliometric analysis is a valuable tool for researchers to comprehend and illustrate the current intellectual structure within a field of literature. It also enables the identification of emerging trends and patterns in research (Donthu et al.,2021, Xue et al., 2020). Bibliometric analysis is ideal for large datasets and broad reviews. Qiu and Chen (2022) applied this methodology to institutional theory in construction project

management, while we used it to investigate the state and evolution of social network theory in project management, focusing on related articles in the Web of Science database. Cluster analysis is a powerful tool that can be effectively employed in SNA. This set of techniques allows for the grouping of items based on similarities or distances between them (Borgatti et al., 2013). Johnson's hierarchical clustering is a method for grouping items based on similarities, and it can be useful for identifying different clusters in projects, which may range from function-based to role-based groups. This study will utilize clustering analysis.

3.2 Data collection

Data was collected from Web of Science (WoS), a commonly used database in bibliometric studies (Xue et al., 2020), using a three-part search term. The first term was "social network theory" but it was found to be too narrow. The second term, "social network analysis," was added with an "or" conjunction to capture related studies. The third term, "project management," was added with an "and" conjunction to limit the search to relevant literature. After excluding irrelevant categories as shown in Figure-2, 178 studies with full records were used in the analysis, including author names, title, abstract, keywords, volume number, and cited references.

Figure-2 The search strategy flow diagram

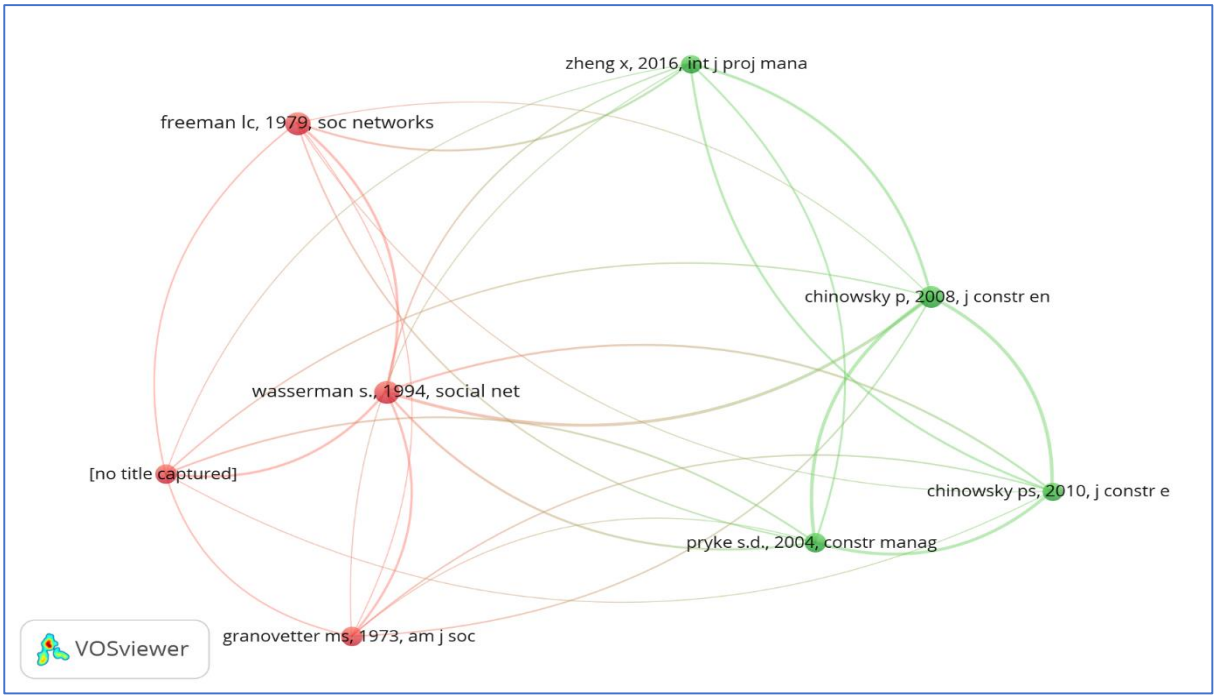


3.3 Data analysis

Bibliometric analysis has been revolutionized with the development of advanced information technology and visualization techniques, resulting in the creation of powerful tools such as Citnet, Citespace, Sci2, Vosviewer, and VantagePoint (Xue et al., 2020). Among these, Citespace stands out as a formidable bibliometric analysis software (Chen et al., 2012; Xue et al., 2020). Utilizing data retrieved from WoS, Citespace 6.1.R6 is used to analyze the author keywords with the selection criteria set as g-index and a scale factor of k=25. This results in the formation of a network with 9 clusters, providing insights into the frequency and thematic relationships between co-occurring author keywords (Xue et al., 2020; Chen et al., 2012; Donthu et al., 2021). However, the limitations of co-word analysis, such as the usage of words in multiple contexts or being too general, are mitigated through the use of Vosviewer version 1.6.19, which employs full counting and author keyword co-occurrence type of analysis for additional triangulation (Donthu et al., 2021).

Keyword co-citation analysis shows the most powerful studies as given in Figure-3. Among these, Wasserman and Faust (1994) is one of the mostly cited study in social network theory as well as Granovetter (1994)'s study on the power of weak ties in networks.

Figure-3 The most powerful studies based on keyword co-citation



The data also shows the universities which work on social network and project management as given in Figure- 4. Universities from Australia and China contribute to the majority of the related studies. These studies are mostly published in either project management related journals such as International Journal of Project Management or Engineering journals mostly specific to construction like Journal of Construction Engineering.

Figure-4 The universities contributing to social network and project management mostly

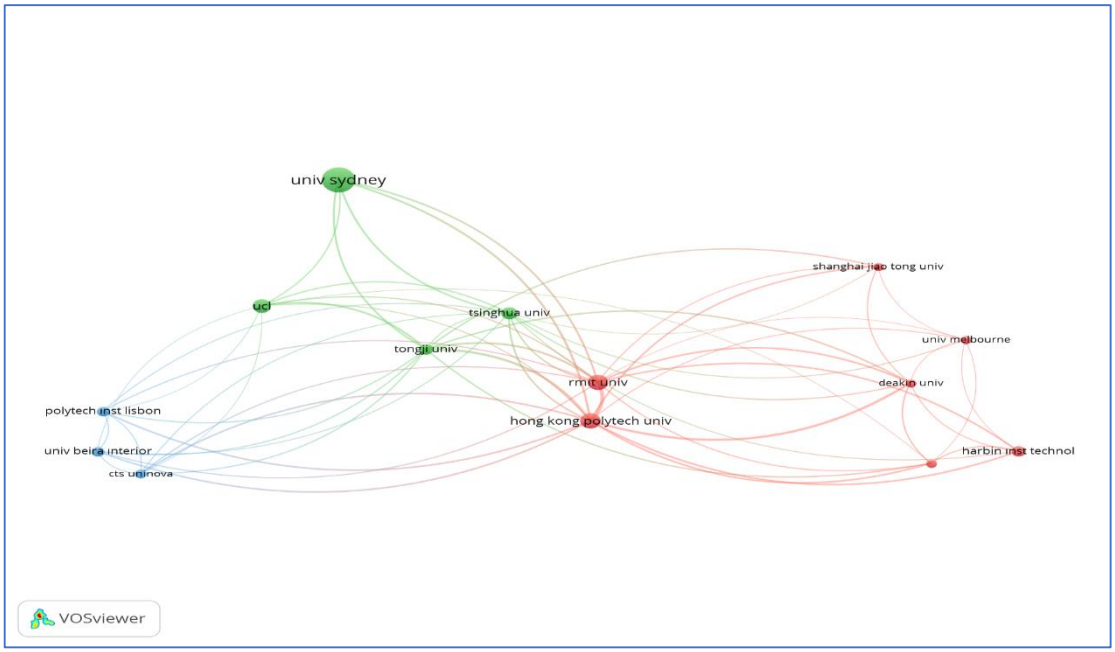
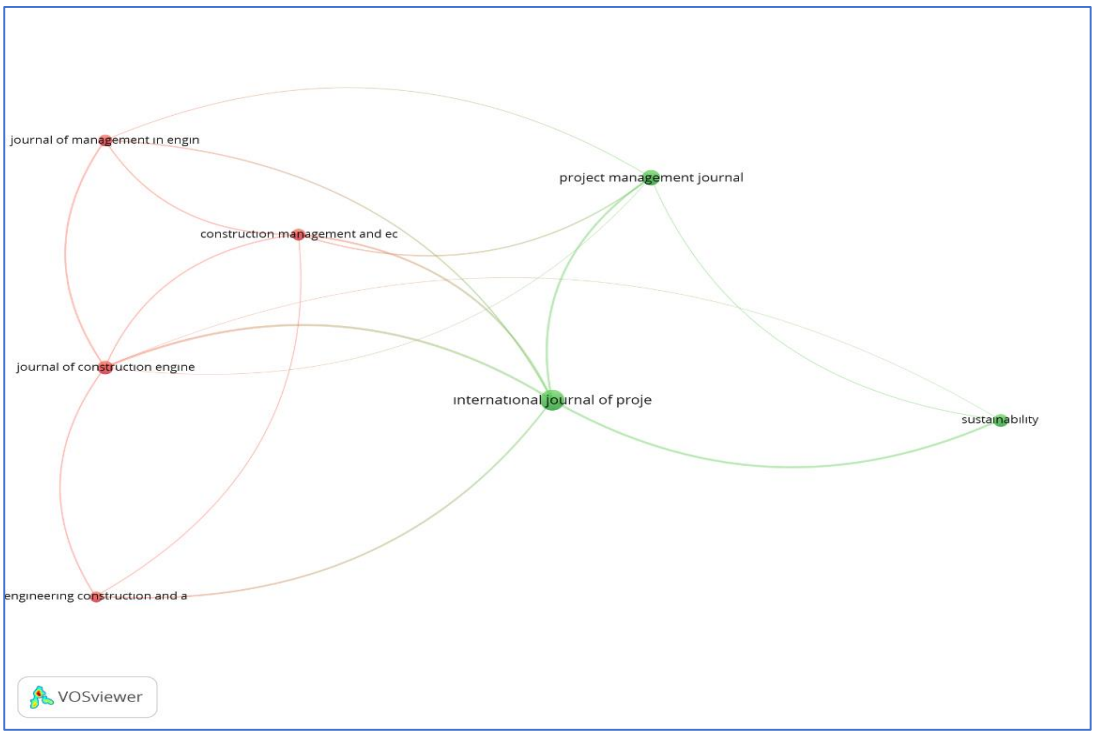


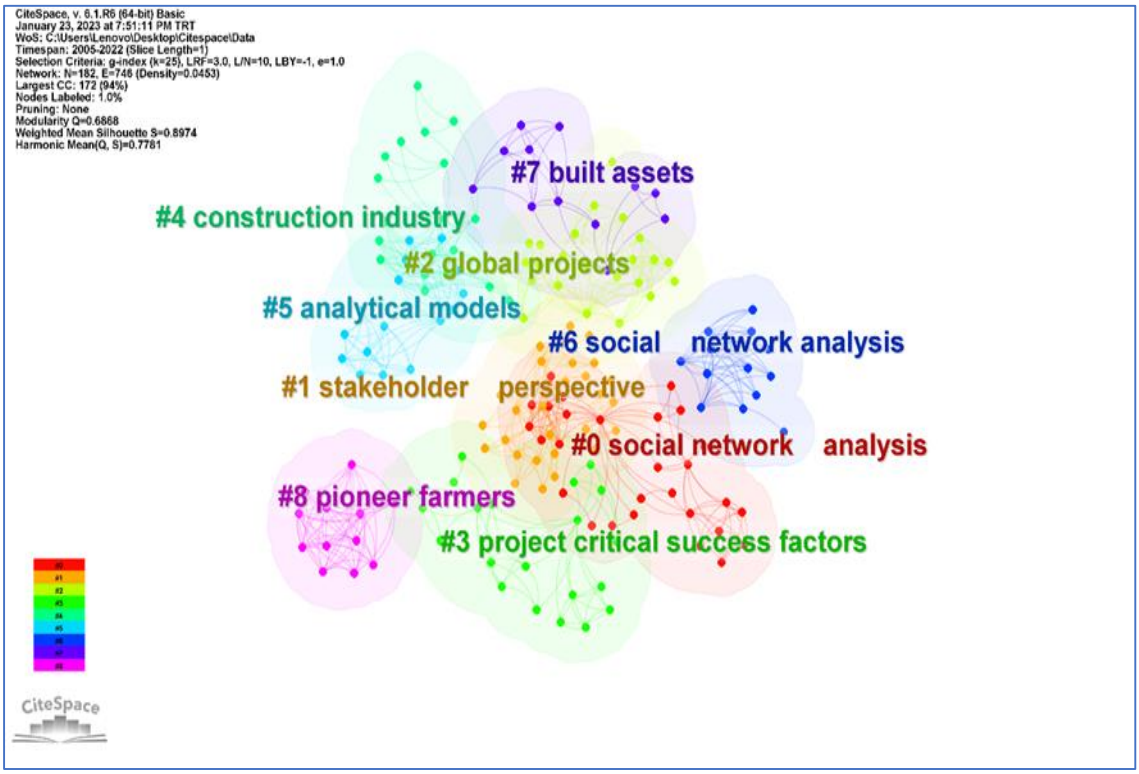
Figure-5 The most preferred journals on social network and project management



4. Results

The keywords co-occurrence network given in Fig. 6 shows that there are mainly 9 clusters listed in Table 2 with each one having at least 10 group members.

Figure-6. Clusters resulted from keywords co-occurrence network



The Silhouette-value of each cluster is more than 0.75, meaning that the result is valid and can be used for further analysis (Chen et al., 2010; Xue et al., 2020). These clusters also highlight the most frequent occurrence keywords having a thematic relationship with one another based on Latent Semantic Indexing (LSI) which is a widely used information retrieval model for concept-based searching used to categorize information with the help of pre-existing semantic structures (Guo et al., 2003).

Table 1 features various project types and knowledge areas, with the top terms serving as key indicators. By categorizing these terms according to project types and knowledge areas, this study identified the most commonly studied types and areas, as shown in table 2. Through this table, the current trends of social network theory usage in project management literature are also revealed.

Table 1. Clusters with Top Terms

CLUSTER ID	CLUSTER NAME	SIZE	SILHOUETTE	TOP TERMS-LSI
0	Social Network Analysis	28	0.883	project management; risk management; organizational competencies; collaborative networks; project lifecycle; cooperative networks; informal networks; project success; risk management; project management
1	Stakeholder Perspective	28	0.883	social network analysis; housing demolition; social risk; urban redevelopment project; social risks; social risks; urban cultural heritage; construction projects; housing demolition; mixed research
2	Global Projects	23	0.786	project management; social networks analysis; software development; social networks; systematic literature review; global projects; supply chain; network analysis; social networks analysis; project management
3	Project Critical Success Factors	21	0.95	social network analysis; contract administration; contract provisions; building information modeling; legal aspects; critical success factors; risk management; project management; corporate behavior; sustainable cooperative partnerships
4	Construction Industry	19	0.875	construction industry; social-network theory; relationship marketing; medium-sized enterprises; social-network analysis | mediating role; success; management; leadership; trust
5	Analytical Models	16	0.955	product development; design structure matrix; clustering algorithms; social networking; analytical models | developing country; green project management; project delivery; green projects; clustering algorithm
6	Social Network Analysis	13	0.97	social network analysis; social sustainability; project-based organizations; project management office; knowledge governance; knowledge governance; mixed-method approach; project management office; social sustainability; social network analysis
7	Built Assets	12	0.921	social network analysis; green building project; green building project; social network analysis
8	Pioneer Farmers	12	0.944	extension planners; pioneer farmers; social power and influence; sustainable agriculture

Table 2. Categorization of Top Terms (LSI) based on Project Types and Knowledge Areas

PROJECT TYPES				KNOWLEDGE AREAS		
Global Projects	Construction projects	Social, Urban, and Tourism Projects	Green projects	Risk Management	Stakeholder Management	Knowledge Management

Social network theory has been mostly used in global projects, construction projects, social, urban, tourism projects and green projects according to keyword co-occurrence network. Although it is very surprising that social network theory hasn't gained enough importance and usage in mega projects, innovation projects and complex projects which have more and various stakeholders and connections, the challenges of applying social network theory to projects which are complex, large, and having more uncertainty may explain the lack of use of social network theory in these specific projects. Applying social network theory is challenging since it is distinct within the social and behavioral sciences with its assumption of the importance of relationships among interacting units. The unit of analysis in this theory is not the individual, but an entity consisting of a collection of individuals and the linkages among them and it is difficult to collect and analyze data for complex and large projects (Wasserman & Faust, 1994), Network analysis operationalizes structures in terms of networks of linkages among units. Regularities or patterns give rise to structures whereas standard social science perspectives usually ignore the relational information. In SNA the observed attributes of social actors are understood in terms of patterns of structures of ties among the units. Relational ties among actors are primary and attribute of actors are secondary. On the other hand, higher frequency of keywords used in this literature given in Table 3 contains innovation which implies that an increase in innovation project studies may be expected.

Table 3. Frequency of Top Terms

Freq (over 4)	Label	Cluster ID
16	social network analysis	3
10	project management	0
9	management	1
7	knowledge	2
5	construction project	1
5	impact	2
5	performance	3
4	communication	2
4	model	5
4	innovation	6
4	social network analysis	0
4	framework	5
4	risk management	0

The data shows that social network theory is mainly used in three knowledge areas in project management literature: risk management, stakeholder management, and knowledge management.

Another software called VOSviewer is used for the triangulation as discussed above. Although both CiteSpace and VOSviewer share a large number of bibliometric functionalities, they use different algorithms for normalization, mapping and clustering (Markscheffel & Schröter, 2021). VOSviewer uses the VOS (Visualization of Similarities) mapping technique by Van Eck and Waltman (2007) and it has the best viewing capabilities and clarity especially compared to all other well-known multidimensional scaling approaches (Van Eck, et al., 2010, Van Eck & Waltman, 2009). On the other hand, CiteSpace CiteSpace, developed by Chaomei Chen at Drexel University, USA (Chen 2017), is a java application for visualizing and analyzing trends and patterns and offers advantages in the evaluative analysis of network visualizations (Markscheffel & Schröter, 2021). VOSviewer uses a distance-based approach in which the distance between two items indicates the strength of the relation between the items, which makes it easy to identify clusters of related items and interpret better than graph-based ones, on the other hand this sometimes makes it difficult to label all the items in a map without having labels that overlap each other (Van Eck & Waltman, 2009). CiteSpace uses different algorithms not only to arrange the visualization of network but also normalization and mapping which enables a better understanding of the subareas of the network with the help of cluster labeling (Van Eck & Waltman, 2009).

By using the same data keywords co-occurrence network is calculated as given in Figure-7. When compared to the Citespace results which has 9 clusters and 4 project types and 3 knowledge areas, VOSviewer has 5 clusters showing only 1 project type (construction) and 1 knowledge area (risk management). On the other hand, when the "keywords plus" option is added to the VOSviewer as the unit of analysis, the keywords co-occurrence network in Figure-8 is found with again 5 clusters but 3 knowledge areas this time. The data in KeyWords Plus is unique to databases used in Web of Science platform and aims to enhance the power of cited-reference searching by searching across disciplines for all the articles that have cited references in common based upon a special algorithm. This enhancement is done by detecting words or phrases that frequently appear in the titles of an article's references, which do not appear in the title of the article itself. Project types found in Citespace analysis are not even observed in VOSviewer analysis except construction with this extension of "keywords plus" option. On the other hand, knowledge management and stakeholders are observed besides risk management in this "keywords plus" option.

Figure 7. Keywords co-occurrence network

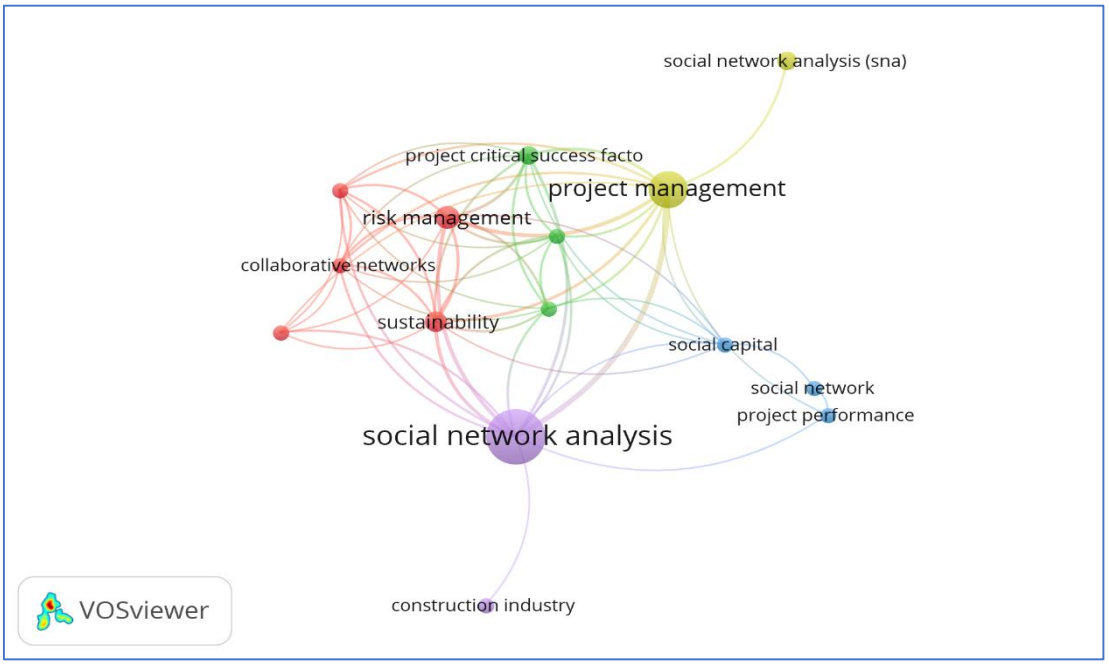
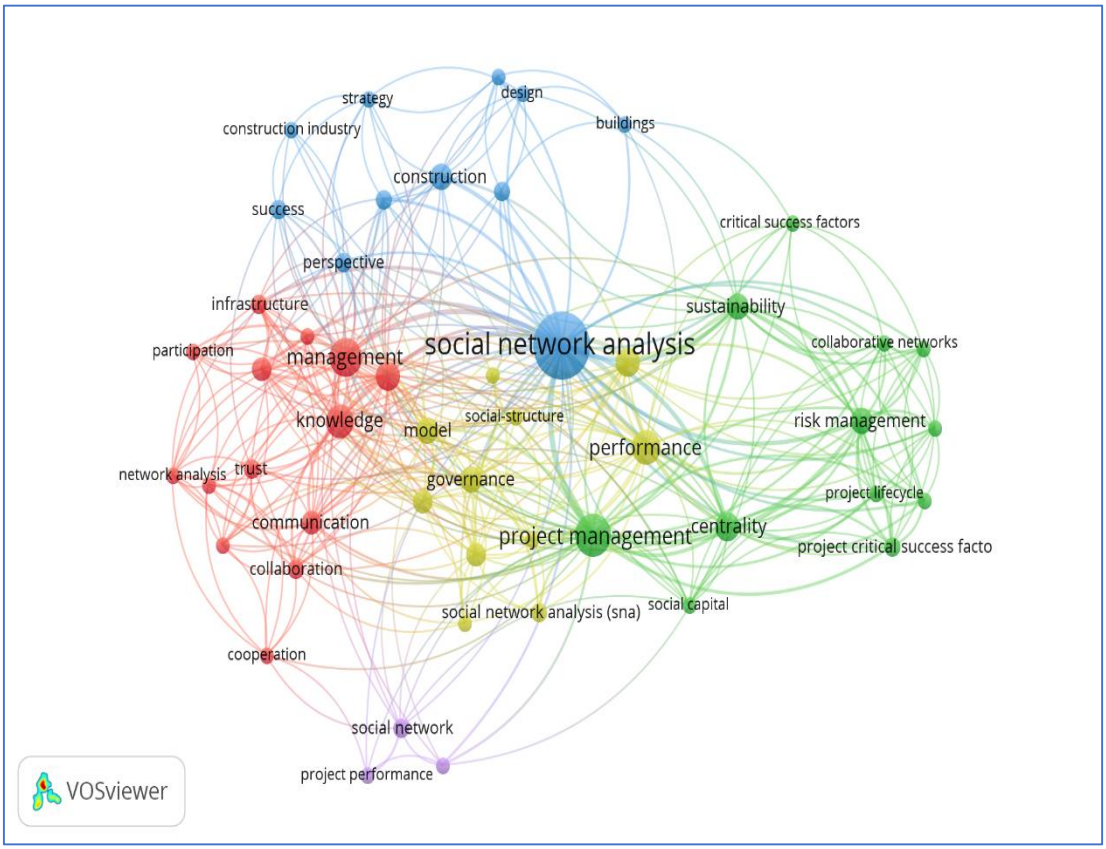


Figure 8. Keywords and Keywords plus co-occurrence network



5. Discussions and implications

While social network theory has been applied in various fields, studies on its applications in business and management are limited (Anugerah et al., 2022). However, recent research shows that "project management" is one of the most popular topics in these limited studies and there is an increasing trend in the use of social network theory in project management. Our bibliometric analysis further identified specific project types and knowledge areas that have been studied using social network theory in project management literature.

Our analysis revealed that construction projects are the most studied project type with social network theory, as evidenced by 78 studies found when adding "construction" to the search field containing "social network theory" or "social network analysis" and "project management". This result may be expected since the construction industry is constantly evolving and getting increasingly complex with the need to ensure that each project is completed in sync with all the different teams. However, there are some other industries which are also evolving and complex like telecommunication but the project management academic programs are mostly developed under construction and civil engineering departments worldwide. For example, there are 4 Ph.D. programs worldwide accredited by Project Management Institute, two of which are under the department of construction and civil engineering.

Based on our analysis while not as frequent as construction projects, green building projects have also been studied with social network theory in five studies. Innovation projects are also emerging as a new trend in social network theory applications in project management, with two recent studies focused on analyzing the dynamically evolving social context of innovation projects.

In terms of knowledge areas, risk management is the most studied with social network theory, with 14 studies found when adding "risk management" to the search field containing "social network theory" or "social network analysis" and "project management". These studies have utilized social network analysis to analyze risks in complex projects, including green projects and infrastructure PPP projects. Stakeholder management is also a well-studied area, with eight studies found on effective stakeholder management frameworks and stakeholder influence on social performance in infrastructure projects using social network analysis. Lastly, our analysis found eight studies that indirectly use social network theory in knowledge management, such as examining structural patterns of intra team knowledge exchange networks and the relationship between trust, communication, and knowledge transfer.

In conclusion, our bibliometric analysis provides insights into the specific project types and knowledge areas that have been studied using social network theory in project management literature. The reason why there is such a relationship between these studies is the need for improvement caused by the limitations of traditional applications which do not consider the role of social networks. Since traditional applications do not use the explanatory power of the networks, there is a need to further develop a systematic framework for stakeholder management as well as risk and knowledge management in which relationship matters mostly. Moreover, as the projects having more interacting parts and complexity in nature like construction,

global, and green need to be analyzed from a relational perspective, use of social network theory in project management field is increasing.

It is clear that social network theory is a valuable guide for understanding and managing complex projects and stakeholders. Future research can further explore these areas and identify new opportunities for applying social network theory in project management.

6. Conclusion

Understanding the Social Network Theory (SNT) approach in project management is crucial for several reasons. At first, it is possible to reach better project outcomes. The SNT approach can help project managers understand the social structures within their teams and organizations. By mapping out the connections and interactions between individuals and groups, project managers can identify potential bottlenecks, communication breakdowns, and other issues that may hinder project success. With this knowledge, project managers can take steps to optimize team dynamics and improve project outcomes. Secondly, improved stakeholder engagement can be achieved. The SNT approach can also help project managers understand the relationships and power dynamics between stakeholders. By identifying key influencers and decision-makers, project managers can tailor their communication and engagement strategies to better meet the needs and expectations of different stakeholders. Furthermore, that is also possible to manage risk, more efficiently. Integration of SNT approach with project management field, project managers and team member can identify and mitigate project risks. From more behavioral perspective, managers can identify social structures of the project groups by using SNT. Thus, managers can identify potential sources of conflict or resistance, and develop strategies to address these issues before they escalate.

The study revealed that although the Social Network Theory (SNT) approach in project management is gaining popularity, its implementation remains limited. The research primarily focuses on specific project types, such as construction projects, while neglecting others that involve multiple stakeholders and relationships, such as innovation, R&D, IT, space, and agricultural projects. Consequently, using the SNT approach to identify critical success factors specific to these projects remains an untapped potential.

Furthermore, the study identified that SNT is predominantly used in three knowledge areas, namely, risk management, stakeholder management, and knowledge management. This finding is also supported by recent studies. For example, Social network theory is used to investigate the determinants of knowledge transfer at the fuzzy front end of innovation (Takahashi, 2018) and also as an alternative analytic stakeholder management approach (Chung & Crawford, 2016; Mok et al., 2017; South et al., 2018) to capture and analyze the institutional interplay between formal and informal institutions in projects (Wang, 2018). Moreover, Liu at al. (2023) constructed a relational network model of a mega-project governance mechanism based on risk prevention and control by using the social network analysis method. This intensive use of social network theory in project management is mainly due to the networks focusing the attention on the relationships among the stakeholders who affect the project or are being affected by the project. The power of network concept which comes from

the possibility of disparate parts of a system affecting each other (Borgatti et al., 2013) increases the applicability of social network theory to project management in these three knowledge areas. However, more relationship-based research is needed in other knowledge areas such as time, cost, scope management as well as integration and communication management to investigate the impact of relationships on project success in terms of time, cost, scope, and benefits.

Overall, understanding the SNT approach in project management can help project managers create more effective teams, improve stakeholder engagement, foster collaboration and innovation, and mitigate project risks. The bibliometric analysis of the trend as well as the performance of SNT in project management from 2001 to 2022 provides insights into the current state of research in this area, and can help project managers stay up-to-date with the latest developments and best practices.

This study is limited with the use of databases accessed by web of science platform only. This research may be extended by involving more platforms with other databases like Scopus.

Research and Publication Ethics Statement

The authors declare that ethical rules are followed in all preparation processes of this study. In case of detection of a contrary situation, Journal of Commercial Sciences has no responsibility and all responsibility belongs to the authors of the study. This study does not require ethics committee approval.

Author Contributions

Mustafa HAFİZOĞLU contributed to the study in Introduction, Conclusion, Theoretical Framework, and Data Collection / Analysis sections. Şule TUZLUKAYA contributed to the study in Introduction, Conclusion, Theoretical Framework and Empirical Literature sections. 1st author's contribution rate: 60%, 2nd author's contribution rate: 40%.

Conflict of Interest

There is no conflict of interest between the authors.

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