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Mapping the knowledge domain of stakeholder perspective studies in construction projects: A bibliometric approach

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ABSTRACT

Construction projects require the effective collaboration among the various types of stakeholders involved to succeed, thus leading to stakeholder perspective studies in construction projects. The study proposes an integrated bibliometric approach to detect the knowledge evolution, domain and frontier with a broader searching scope compared with manual review. A total of 752 peer-reviewed academic papers published until the end of 2017 are used. The knowledge evolution indicates seven milestones in history, namely, stakeholder concept, method, identification, assessment, management, influence and complexity. The identified knowledge domain consists of four major research areas which are society, sustainability, analytical tool and project management. The knowledge frontier is also revealed, including a dearth of detailed discussions on stakeholder engagement in sustainable urban projects, lack of generalisation of stakeholder studies in complex construction projects, limited application of dynamic and simulation stakeholder analysis in uncertain project environment and few instant and accurate approaches to integrate stakeholder information. The study provides a holistic knowledge map for the past, current and future of stakeholder perspective studies in construction projects.

1. Introduction

The stakeholder concept is important in strategic management and is considered an essence of project management (Freeman, 1984; Institute, 1987). With the fast development of the construction industry, a growing number of complex projects are underway all over the world, and they have far-reaching effects on national and regional economic development (Mok, Shen & Yang, 2015). A construction project is complex as it comprises various processes and participants (Yang, Shen & Ho, 2009b). It involves a wide range of stakeholders who have different cultural and occupational backgrounds (Mok et al., 2015). Given the temporary nature of stakeholder relationship in construction projects, dealing with complexities is challenging for project stakeholders owing to the of experience (Yang et al., 2009b). Construction projects are also full of uncertainties due to their long-term duration (De Meyer, Loch & Pich, 2002). Stakeholder collaboration is required to react instantly when uncertain events happen (Read, Madani, Mokhtari & Hanks, 2017; Shen, Brandon & Baldwin, 2009). Moreover, construction projects are on the way to achieve sustainability, which is critically driven by support from project stakeholders (Gan, Zuo, Ye, Skitmore & Xiong, 2015). According to previous studies, project stakeholders are the direct participants and affected people of the construction projects (Guide, 2001). Their interactions and relationships directly affect project completion (Liu et al., 2015). In recent years, safety accidents and community protests have occurred frequently during the implementation of construction projects, resulting in cost overruns and time delays (Zhao, Mccoy, Kleiner, Mills & Lingard, 2016; Zhou, Hou, Yang, Chong & Moon, 2019). The reason, apart from the technical issues within the project team, is highly related to the poor management of project stakeholders (Liu et al., 2015; Olander & Landin, 2005). Therefore, several stakeholder perspective studies in construction projects (SPCP) have been conducted with the aim to improve project performance. As a result, some theories, frameworks and models have been established in this multi-disciplinary field which have focused on different themes, such as infrastructure,

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sustainability, project decision making and construction technology (El-Gohary, Osman & El-Diraby, 2006; Li et al., 2016a; Yang, Wang & Jin, 2014).

Despite the recent increase in research, published studies that provide an overview map of this complex field are lacking. Previous review studies are based on the manual approach with the limitation on the sampling scope (Oppong, Chan & Dansoh, 2017). Existing studies either discuss the stakeholder management under the concept of the general construction industry without highlighting the specific characteristics of each sub-theme (Yang et al., 2009b) or only focus on one particular theme, lacking the overview of the whole knowledge domain (MOK et al., 2015). In addition, comprehensively analysing citation information which reveals the chronological patterns and clustered topics in the literature is difficult for the traditional manual review studies (Li, Wu, Shen, Wang & Teng, 2017c). To address the deficiencies, bibliometric techniques have been developed to find the bibliographic connections among relevant literature quantitatively and accurately. With the help of bibliometric tools, such as Citespace and Citnet, visualising the knowledge map of SPCP is possible, and connections among various studies are revealed easily and unbiasedly because interpretations are obtained less subjectively, especially compared with the manual review method (Chen, Hu, Liu & Tseng, 2012).

This study aims to understand the past, current and future trends of SPCP by drawing a full picture of existing research domains and highlighting the milestones in this field. This study undertakes a bibliometric analysis of SPCP-related publications from three perspectives: document co-citation, keyword co-occurrence and timespan citation analyses. Using these quantitative means, the study explores the knowledge domain (structured research area) and knowledge evolution (key literature milestones) in this field. The knowledge frontier with the current gaps based on the literature from 2015 to 2017 are then highlighted. Finally, a knowledge map about SPCP is proposed, including evolution, domain and frontier, to contribute to the future development of SPCP.

2. Background

2.1. Stakeholder analysis in construction projects

The Stanford Research Institute first took the concept of stakeholder into the management domain in 1963. Then the stakeholder was clearly regarded as a critical part of strategic management in a book written by Freeman. In that book, the stakeholder is defined as a group or an individual who can impact or be impacted by the achievement of the firm's objectives (Freeman, 1984). Initially, the concept of stakeholder was focused on the corporation management until the Project Management Institute extended this concept to the project management (Institute, 1987). Then, the later studies furtherly have identified the stakeholders of a construction project not only include the project members within the project (i.e. owner, consultant, contractor, suppliers), but also involve members from the project environs. (i.e. government, local community, public media). Based on stakeholders in construction projects, stakeholder studies initiated with the exploration of the stakeholder theories, management process, and analysis methods (Aaltonen, Jaakko & Tuomas, 2008; Yang et al., 2009b). According to the findings of these fundamental researches, a systematic management framework was established by Yang and Shen (2014). After that, stakeholder analysis has been conducted in different construction branches to help researchers to study on various construction related problems from perspectives of stakeholder influence, stakeholder concerns, stakeholder expectations, and public participation(Li, Ng & Skitmore, 2012a, 2013; Olander, 2007; Zhuang, Qian, Visscher & Elsinga, 2017).

2.2. Former review studies on SPCP

There are three important review papers in the field of SPCP research, all three of which were manual reviews and focused on stakeholder management theories: one was written by Yang et al. (2009b), which was the first review paper to overview the previous studies in the construction field; another was written by Mok et al. (2015), which focused on the stakeholder management in the megaprojects; and the third one was by Oppong et al. (2017), which was mainly on the issues of stakeholder management performance.

Yang et al. (2009b) systematically extended general stakeholder theories into the construction sector. The authors pointed out the importance of establishing a practical framework and conducting network analysis on stakeholder management in construction projects. As a pioneering review paper on SPCP research, the research objective was focused on general construction projects. As the construction has the fast development in the past ten years, SPCP research has been made to achieve better collaborations of stakeholders in many specific branches (i.e. urban development, megaproject, sustainability, construction technology). Thus, the previous review paper did not reflect the latest trend of SPCP research across the various sub-areas of the construction industry. According to the statistics of Web of Science, the SPCP publication after 2009 reaches 855 whereas there are only 143 related publications before 2009, which shows the dramatic increase in the SPCP research calling for the new holistic knowledge map. After that, Mok et al. (2015) reviewed stakeholder studies on megaprojects, since when it has become one of the highest cited articles in the Web of Science database. However, the review paper was in the scope of megaprojects which is lacking a full picture of the other construction types. Oppong et al. (2017) published a review paper on measuring stakeholder management performance. Since the stakeholder evaluation is one component of the framework of stakeholder management (Yang & Shen, 2014), more advanced analysis tools are still waiting for the review in other components, such as stakeholder identification and stakeholder assessment.

In summary, these three manual reviews have played important roles in the development of SPCP research, there are still improvements that can be made. First, all three papers focused on the review of stakeholder management theories. They have not covered the wide applications of stakeholder analysis in various specific construction projects, thus not showing the multi-disciplinary trend in this research field. Second, each of the three review papers did not cover a large dataset as the limitation of searching terms. The authors referred the construction projects with the terms, including "construction projects", "infrastructure projects", and "civil engineering projects". However, it is doubtful that the group of search terms is sufficient to describe the different kinds of construction work. Some literature is likely to be missed if only "construction", "infrastructure", and "civil engineering" are used as search terms to describe the type of projects in the field of construction. Therefore, the expansion of search terms is needed to provide a full picture of construction projects.

3. Research method

3.1. Bibliometric method for knowledge exploration

With the development of information technology, scientific index, and visualization techniques, the bibliometric method provides researchers with a way to understand the connections and trends in the literature. Bibliometric techniques explore the unheeded linkages based on the bibliographic records of the literature. For instance: co-citation analysis is helpful to cluster the scientific documents according to their citation links and semantic similarities (Chen, Ibekwe-sanjuan & Hou, 2010); co-occurrence keyword analysis is beneficial for the detection of the main research topics and methodologies in one research field (Su & Lee, 2010); and Timespan analysis is a useful way to find the dynamics of research themes in terms of timeline(Abu, 2016). Besides these techniques, there are some tools, such as Citespace, Citnet, Bibexcel, Sci2, and VantagePoint, which visualizes the knowledge map of literature and provides detailed statistical results of the bibliometric analysis

(Cobo, López-herrera, Herrera-viedma & Herrera, 2011). Among these tools, Citespace is a powerful software to do the co-citation analysis and co-occurrence keyword analysis (Chen et al., 2012), while Citnet is good for the detection of high frequent citation articles in a timeline (Van Eck & Waltman, 2014). In the field of construction management, a BIM knowledge map has been successfully completed through a bibliometric approach (LI et al., 2017c). Therefore, combined with bibliometric techniques and visualization tools, it would be feasible to make a systematic exploration of SPCP knowledge and establish a knowledge map to show an overview of the research field.

3.2. Data collection

3.2.1. The database

Web of Science (WoS) is the database that was used in this research to find the literature related to the research field. It contains the major scientific publications, including literatures collected by Science Citation Index (SCI) and Social Science Citation Index (SSCI), which was the database in many previous bibliometric studies as providing the comprehensive bibliographic records to conduct statistical analysis (Chen et al., 2012; Chen, Dubin & Kim, 2014). There are several kinds of documents collected by WoS, such as articles, proceedings papers, reviews, editorial material, and meeting abstracts. In this study, the peer-reviewed articles and reviews were chosen for analysis since they are considered to have better academic standing, which is in accordance with the recent review studies done by Mok et al. (2015) and Derakhshan, Turner and Mancini (2019).

3.2.2. The searching terms

The searching terms are formed by two parts. One is stakeholder-related words including “stakeholder”, “’project participant” and “project environment”, which are referred by the previous review studies (Mok et al., 2015; Yang et al., 2009b). Another is project-related words that are necessary to be expanded for better describing different types of construction as previously stated in 2.2.

In general, there are three types of construction projects: building, infrastructure, and industrial (Chitkara, 1998). Based on the classification standard of the Engineering News-Record (ENR), infrastructure could be further divided into 17 sub-groups, and industrial is formed by 6 types of projects (Enr, 2014; Halpin, 2010). Additionally, large construction projects are often referred to as “megaprojects” (Mok et al., 2015), construction projects conducted by government are usually termed “public works” (Jacobson & Ok Choi, 2008), and “civil engineering” is also regarded as one major expression of construction type in many cases (Oppong et al., 2017).

Consequently, a framework of searching terms as Table S1 in the appendix is built for the data collection. The wildcard character * is used to deal with relevant variations of one word, such as “construction project” and “construction projects”. The final searching string consists of stakeholder-related words and project-related words by Boolean operator *AND*/*OR* (Di Maddaloni & Davis, 2017), shown in Table S2 in appendix.

3.2.3. Bibliographic records

In this study, according to the previous bibliometric study by Li et al. (2017c), bibliographic records from the web of science are used, which includes the name list of authors, the title, the abstract, the keywords, the volume number, the DOI reference, and all the references cited by the article.

3.3. Data analysis

3.3.1. Document co-citation analysis

Document co-citation analysis detects the distribution of frequent co-cited articles in the dataset. As each scientific paper has a list of references, if two articles are often co-cited in the reference list of different papers, it is likely that these two articles share a similar research domain (Chen et al., 2010). Based on this rule, the co-citation network is created in which the individual node representing each article in the dataset establishes a link between two co-cited articles. In the network, the individual nodes could be clustered into several groups by their interconnectivity, which helps to identify each of the knowledge domains in one research area (Li et al., 2017c).

Table 1
The dataset for bibliometric analysis.

Duration	After Step 1	After Step 2
Until 2017	998	752
2015–2017	526	408

3.3.2. Keyword co-occurrence analysis

Keyword co-occurrence analysis detects the frequency of the keywords that occur in different articles of the dataset. If one word or phrase is used as the keyword in many articles of the dataset, it is considered that this word or phrase might indicate one of the research focuses in this area (Chen et al., 2012). Hence, these co-occurrence keywords could be regarded as the knowledge base of the study’s research issues (Li et al., 2017c).

3.3.3. Time-span citation analysis

Time-span citation analysis detects high-impact articles in different periods during the development of the research issue. By counting the citations of the articles in the dataset, the most frequently cited articles could be found in a given time span (Van Eck & Waltman, 2014). From a timeline perspective, it is important that the most frequently cited articles in each period be tracked because the change of those articles in each stage shows the knowledge evolution in this research area.

3.4. Framework of research method

With the help of the three basic bibliometric techniques mentioned above, it is feasible to draw the framework of the research method as shown in Fig. 1.

Step 1: The data collection was conducted with the keywords formed by stakeholder-related and project-related words with WoS database. The bibliographical records were extracted for further analysis.

Step 2: The data retrieval was made manually based on the two-stage process adopted by previous literature studies (Mok et al., 2015; Yang, Shen, Ho, Drew & Xue, 2011) to filter out the irrelevant literature. In the first stage, publications not including the keywords in the title or the abstract were screened out. In the second stage, the less irrelevant literature was excluded through the fast scanning of the content of the title and abstract in each record. After that, the remaining records were for the later bibliometric analysis.

Step 3: The data analysis was processed by three bibliometric methods. First, time-span citation analysis traced the knowledge evolution of SPCP. Second, the document co-citation analysis was used to find the knowledge domain of SPCP. Third, keyword co-occurrence analysis explored the knowledge frontier of SPCP. The whole dataset was used in the first and second procedures to reflect the existing achievements in SPCP. While the dataset used in the third analysis covered publications from 2015 to 2017 for showing the latest research trend.

Step 4: The holistic knowledge map of SPCP was drawn according to the results of data analysis.

4. Results

4.1. Results of data collection

As Table 1 shows, after the step 1 described in Fig. 1, a total of 998 publications were found in the WoS database, including 526 (53%)

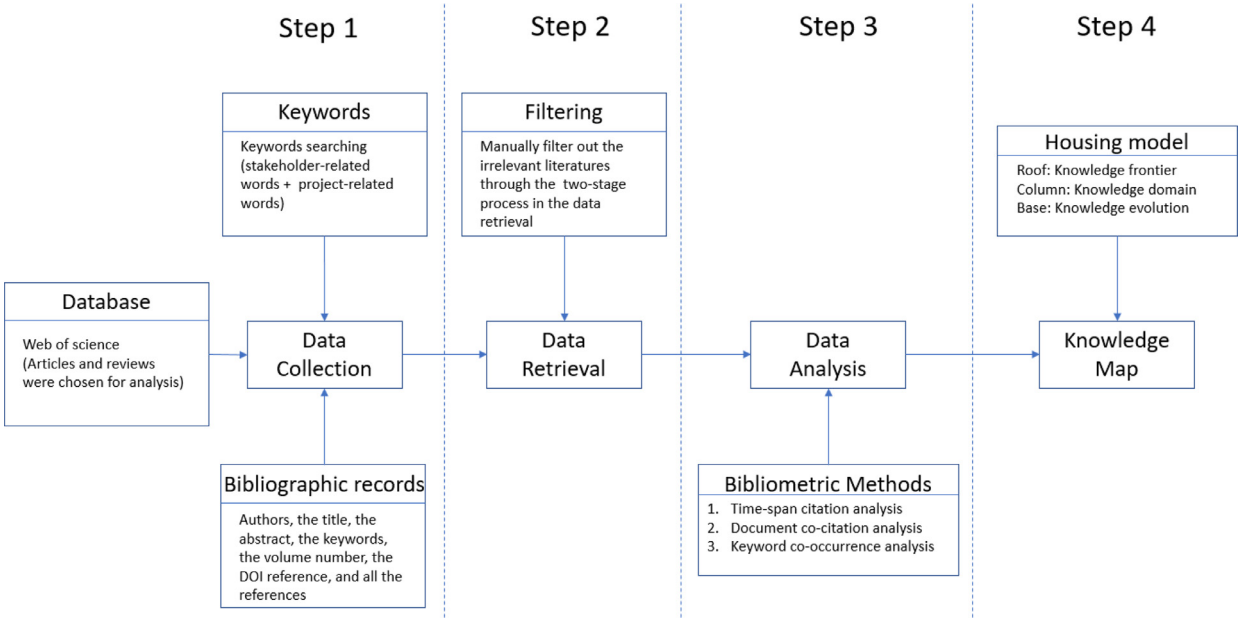

Fig. 1. Research framework of this study.

Table 2
Top-ranked clusters.

Cluster ID	Size	Silhouette-value	Cluster Name	Category
0	36	0.794	Social competencies	Society
1	31	0.784	Decision-making strategies	Tool
2	30	0.912	Risk path	Project
3	29	0.965	Building information modelling	Tool
4	26	0.932	Stakeholder management	Project
5	20	0.994	PPP project	Project
6	17	1	Sustainability deliverable	Sustainability
7	14	1	Wind turbine	Sustainability
8	13	1	Building assessment tool	Sustainability
9	11	1	Waste management	Sustainability
10	11	0.96	Systems integration	Tool
11	11	0.972	Green real estate development	Sustainability
12	11	0.965	Sustainability assessment	Sustainability
13	10	0.994	Project delay	Project

published in the last three years (Deadline of data collection was on 31/12/2017). It can be seen from the data that SPCP related research has developed the fastest in the past three years, which indicates the need for a new map to show the current knowledge domain in this field. After step 2 described in Fig. 1, 752 such publications, including 408 in the last three years, were chosen to form the dataset by two-stage process in the data retrieval. The dataset completed after Step 2 was used for further analysis.

4.2. Knowledge domain

The literature co-citation network can be clustered into groups by the interconnectivity of the nodes. Cluster labels are then derived by using a statistical method called LLR (log-likelihood ratio test). This method labels each cluster by calculating and ranking the significant value of words that frequently appear in the abstract of publications from the network (Chen et al., 2010).

Fig. 2 shows the result of the clustering analysis in the field of SPCP. There are 14 large clusters listed in Table 2 with each one having at least 10 group members. The Silhouette-value of each cluster is more than 0.75, which means the result is valid and can be used for further interpretation (Chen et al., 2010). The largest cluster is the social competencies (Cluster 0), which includes 36 publications. This cluster shows the society related issue is a major knowledge domain in SPCP. The building information modelling (Cluster 3) is another critical area. On one hand, many BIM studies focus on stakeholder participation in construction projects. One the other hand, the approaches of stakeholder analysis are under fast development with the support of the advanced construction technology. Interestingly, the theoretical studies in stakeholder management (Cluster 4) are not in the largest cluster, as it is ranked behind social issues and BIM studies. The result proves the necessity of bibliometric analysis in SPCP to explore the wider research areas besides the stakeholder theories which have been summarized by former reviews. Another significant knowledge domain is on the issue of sustainability. A group of top-ranked clusters is related to this topic, including sustainability deliverable (Cluster 6), wind turbine (Cluster 7), waste management (Cluster 9), green real estate development (Cluster 11), and sustainability assessment (Cluster 12).

4.3. Knowledge evolution

The result of the time-span analysis is shown in Fig. 3. As the graph shows, knowledge evolution can be divided into four stages in terms of the timeline. The first stage is the period before 1990s, which is the birth stage of SPCP. The second stage is the growth stage when stakeholder

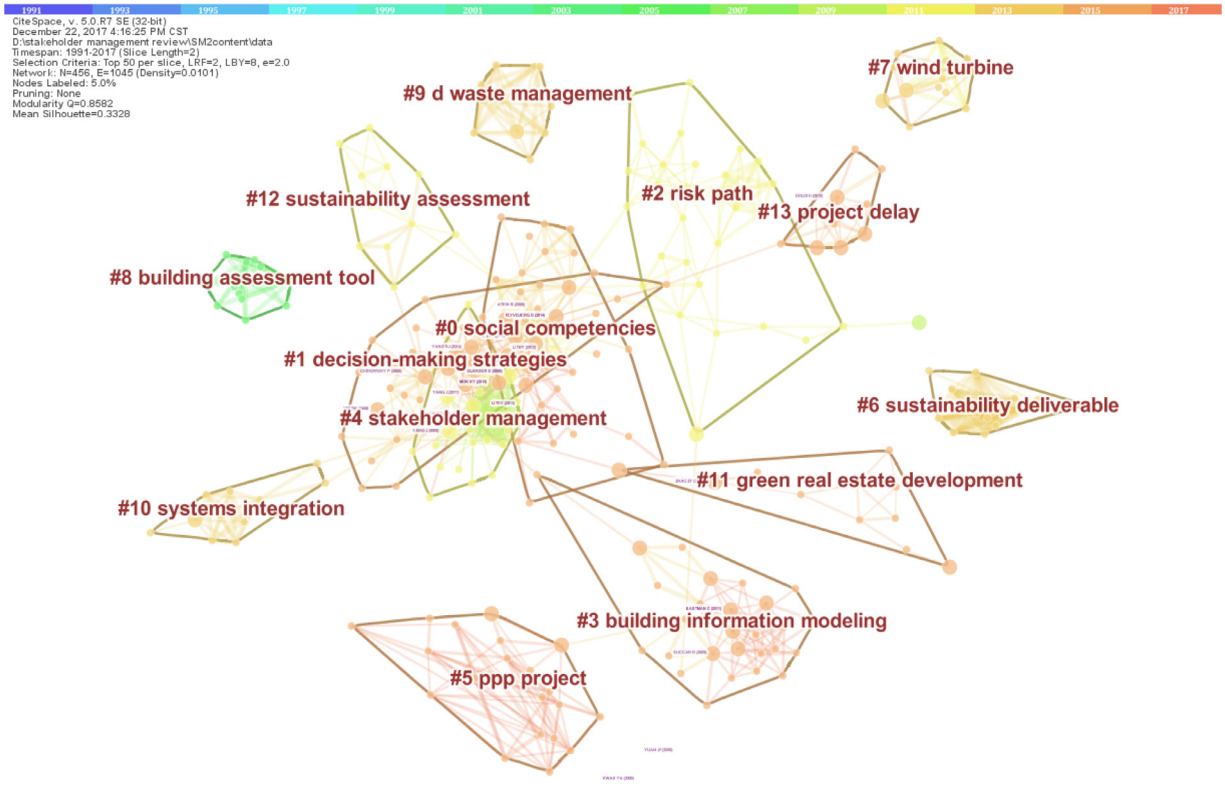

Fig. 2. Clusters of knowledge domains on SPCP research.

Table 3
Key milestones of SPCP research by timeline.

Birth (Before 1990s)	Growth (1991–2000)	Prosperity (2001–2010)	Orientation (2011–2017)
Concepts of stakeholders:	*Identification of stakeholders*:	*Management of stakeholders:*	*Complexity of stakeholders*:
Public participation:	Mitchell et al. (1997)	*Social related issues*	Stakeholder concerns:
Arnstein (1969)		Social acceptance:	H.Y.Li (2012)
Stakeholder:		Rolf Wüstenhagen et al. (2007)	
Freeman (1984)			
Morris, Pwg (1987)			
Methods of stakeholders:	*Assessment of stakeholders*:	*Sustainability related issues*	Megaprojects:
AHP:	Critical success factors:	Wind power projects:	Flyvbjerg, B (2014)
Saaty, Tl (1980)	Sanvido et al. (1992)	Patrick Devine Wright (2005)	Ka Yan Mok (2015)
Case study:	Network analysis:	*Project related issues*	
Eisenhardt, Km (1989)	Wasserman (1994)	PPP projects:	
	Timothy J. Rowley (1997)	Nora M. El-Gohary (2006)	
		Influence of stakeholders:	
		Stefan Olander (2005)	
		Derek H.T. Walker (2005)	
		Stefan Olander (2007)	

perspective studies first started to appear in the 1990s. The third stage is the prosperity stage from 2000 to 2010, during which time a lot of classical SPCP research was undertaken. The fourth stage is the new research orientation era since 2011, during which some new directions of SPCP have been presented. The knowledge evolution path is presented according to the key milestones of SPCP as shown in Table. 3. In the first stage there only a few frequently cited papers, although each one played a fundamental role in the field of SPCP by providing the basic concepts and methodologies. In the second stage, there were two major occurrences: methods on stakeholder identification and assessment. In the third stage, there are a lot of stakeholder perspective researches emerging in various sub-areas of SPCP. In the fourth stage, some very frequently cited articles indicated the new direction in the field of SPCP.

4.4. Knowledge frontier

The keywords co-occurrence network from 2015 to 2017 is shown in Fig. 4 which highlights the most frequent occurrence keywords by larger characters. Based on the most frequently used terms, the latest research frontier is presented by three aspects: research topics, targets, and methods. The popular terms under each aspect are shown in Fig. 5 which have interdependencies with each other. For instance, according to the linkage information of the network, the stakeholder analysis has been conducted on sustainability in megaprojects and ppp projects respectively. The stakeholder issues in megaprojects have been discussed by case study. The network analysis has been applied to analyse the stakeholder performance in the BIM management process.

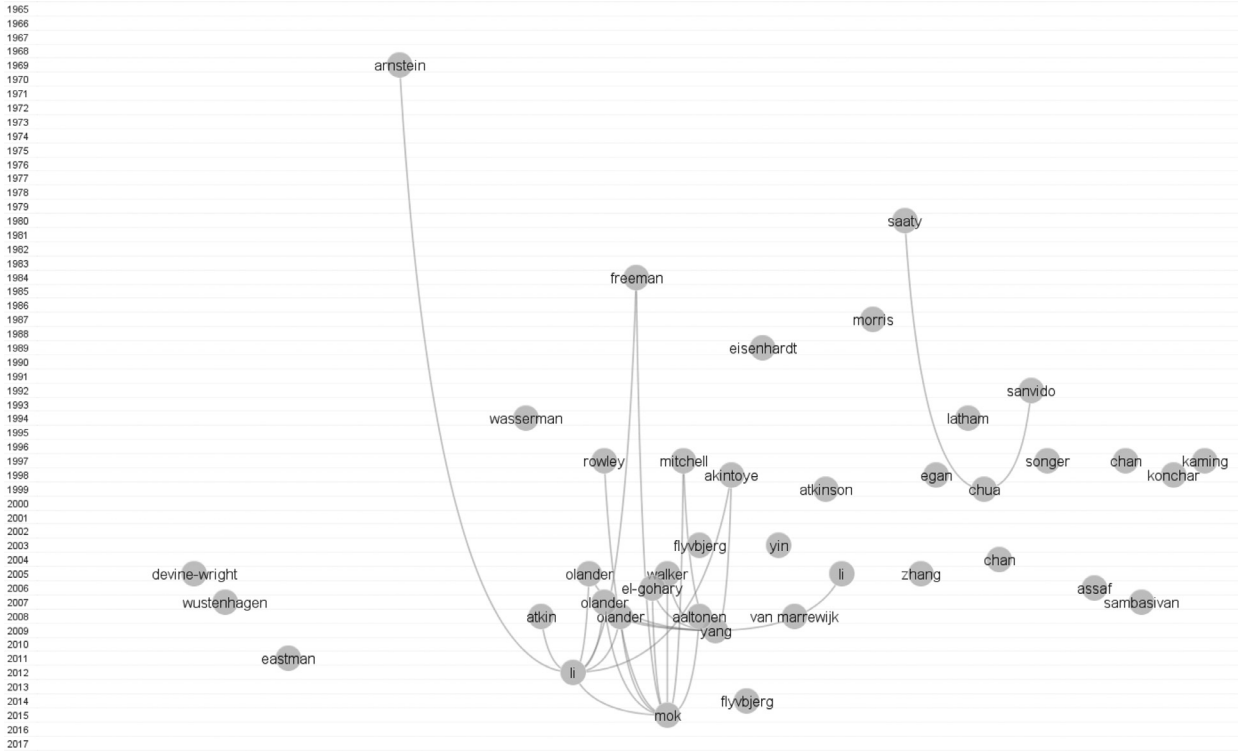

Fig. 3. Results of Time-span analysis.

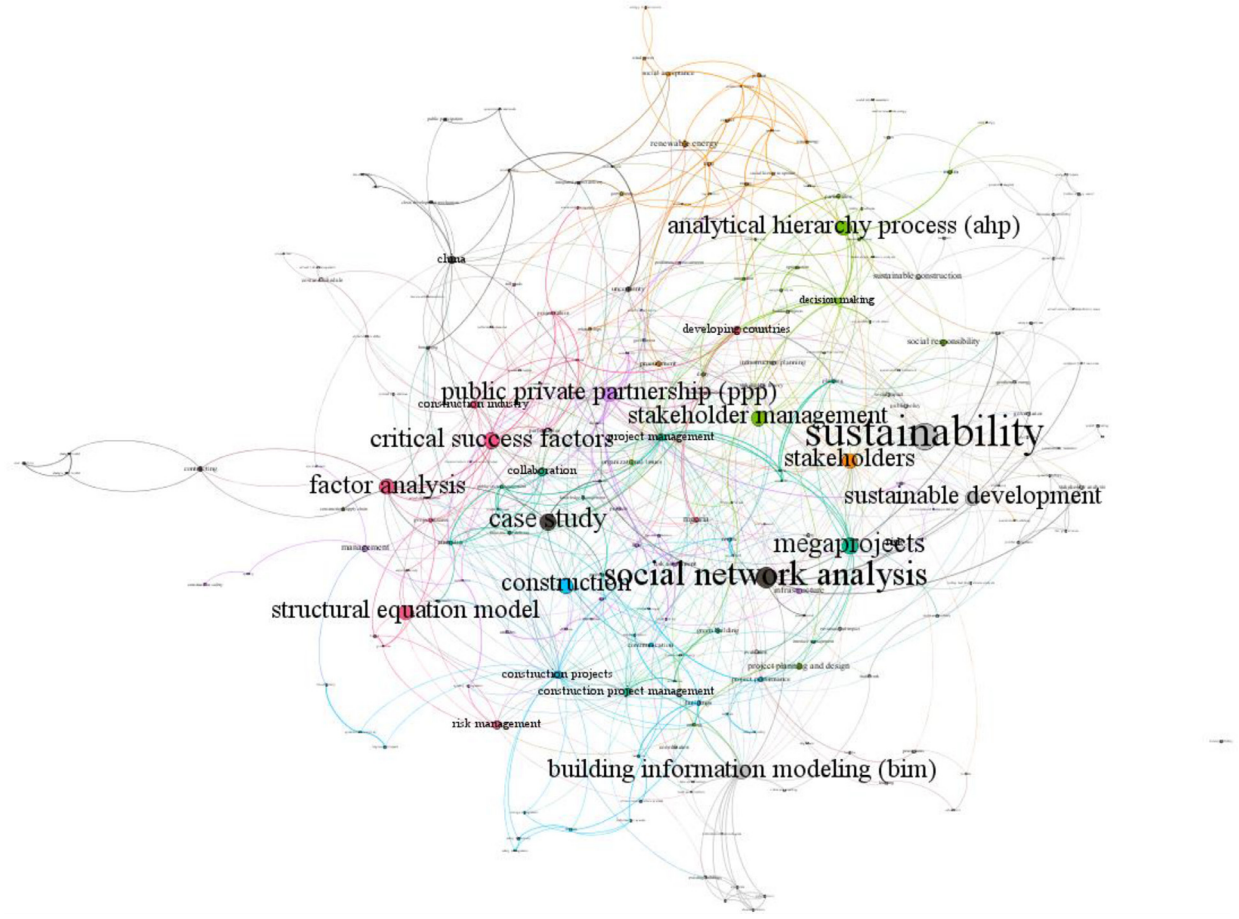

Fig. 4. Keywords co-occurrence network from 2015 to 2017.

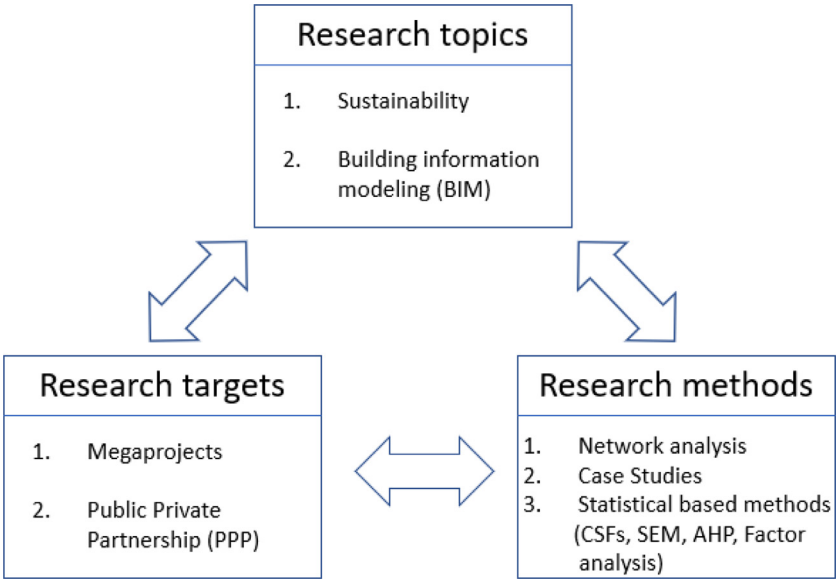

Fig. 5. Current hot terms in the latest SPCP research.

5. Discussion and implications

5.1. Milestones in the development of SPCP

The literature milestones in each stage obtained from the timespan analysis (see Table 3) highlight the classical research findings in SPCP. Generally, the knowledge trend starts at the birth of basic stakeholder concepts and methods, followed by the formation of stakeholder theories and then the application stage in various sub-areas. This trend indicates the direction of SPCP from the explorations of fundamental theories to the practice in multi-disciplinary areas of the construction industry.

5.1.1. Birth stage: concept and method of stakeholders

The first stage is the birth of the basic concepts and methodologies in SPCP. In terms of stakeholder concepts, the noticeable definition of stakeholders came from the famous book *Strategic Management: A Stakeholder Approach* written by Freeman (1984). A clear definition of stakeholder was first suggested in this book: 'any group or individual who can affect or is affected by the achievement of the firm's objectives'. This definition set the foundation of stakeholder management and was further interpreted by Cleland and Kerzner (1986), who listed eighteen project stakeholders, bringing the stakeholder concept from corporation management into project management. Following, Morris and Hough (1987) first pointed out that multi-organisational management is a determinant of large complex projects' success, indicating the importance of stakeholder concept in the construction project management domain. Afterward, terms like 'group and individual' and 'affect and affected' developed by Freeman (1984) were finally incorporated and translated into the project stakeholder concept defined by Project Management Institute (PMI) (Institute, 1987) as 'those individuals and organisations actively involved in a project or whose interests may be affected as a result of project execution or completion'. Basing on the definitions of Freeman and PMI, the stakeholder concept was further described by various categories: external/internal (Atkin & Skitmore, 2008), direct/indirect (Lester, 2006), proponents/opponents (Bonke & Winch, 2002) and core/fringe (Hart & Sharma, 2004).

Another critical concept was public participation, which was an incentive to initiate stakeholder analysis in construction projects. Through the fast development of the economy, the demand for proper management strategies appeared as the frequent interactions between the public and traditional project stakeholders in urban renewal projects (Arnstein, 1969). In the citizen ladder proposed by Arnstein (1969), public participation was assessed by citizen power, which first highlighted the impact of external stakeholders (general public, NGO and government) engagement towards construction projects. Since then, a number of urban studies were at the stakeholder engagement level (Larson, Measham & Williams, 2010; Mahjabeen, Shrestha & Dee, 2003), and they provided various engagement methods for project stakeholders in practice, including interviews, forums, focus groups, surveys and workshops (Larson et al., 2010). The concept of public participation was then further introduced into the stakeholder management domain as the term 'stakeholder participation' (Li, Ng, Skitmore & Li, 2016b). Stakeholder participation was considered an essential engagement to improve the chance of project success by prioritising stakeholder concerns (Li et al., 2012a) and maximising stakeholder satisfaction (Li et al., 2013).

In the aspect of stakeholder methodologies, Saaty (1980) was the first to introduce the analytic hierarchy process (AHP) model, an essential tool to analyse the complex multi-criteria decisions among project stakeholders. Given the lack of participatory tools in stakeholder negotiations, the AHP method is useful for stakeholder involvement in the group decision judgement process (Ananda & Herath, 2003). The method was widely used to integrate stakeholder preferences in the decision-making process in transportation planning (Dalal, Mohapatra & Mitra, 2010; Wakchaure & Jha, 2012), quality management (Lam, Lam & Wang, 2008) and construction sustainability assessment (Alwaer & Clements-Croome, 2010; Mostafa & El-Gohary, 2014).

Case study was another critical method. Eisenhardt (1989) introduced this method as a suitable means for exploring a new research area with inadequate existing theories. Exploratory case study was popular in the stakeholder management domain for studying the problems and challenges of SPCP (Mok, Shen & Yang, 2017a). Based on another classical study by Yin (2003)), case study can be divided into two approaches: single-case research and multiple-cases study. Generally, most case studies in the stakeholder management domain are single-case studies (Mok, Shen & Yang, 2017b; Ogunlana, 2010) or two-comparative-cases studies (Olander & Landin, 2005, 2008; Yang et al., 2014). A limitation of the small number of cases is the generalisations of the research findings, which is a bottleneck in the development of SPCP (Mok, Shen, Yang & Li, 2017c). The information-oriented case sampling strategy was applied to minimise the restrictions of the small sample size (Flyvbjerg, 2006).

5.1.2. Growth stage: identification and assessment of stakeholders

In the early 1990s, SPCP reached the growth stage wherein methods to address the problems of stakeholder identification and assessment were proposed. The 'power, legitimacy, urgency' model proposed by Mitchell, Agle and Wood (1997) set the principles to insightfully identify the critical stakeholder by its influence level on organisational activities. The model is the influential work for identifying critical stakeholders by their attributes and is the basis of a series of critical stakeholder identification methods, including the 'power/interest matrix' (Scholes, Johnson & Whittington, 2002) and 'stakeholder circle methodology' (Bourne & Walker, 2005). However, the static attributes-based model cannot reflect the stakeholder dynamics as the levels of attributes often vary over time through the development of construction projects (Yang et al., 2009b).

In terms of stakeholder assessment, two significant methods emerged. One approach is the critical success factors (CFSs) that was first identified by Sanvido, Grobler, Parfitt, Guvenis and Coyle (1992) in the construction industry. Since then CSFs and the related survey-based method have become an essential part of SPCP. Sanvido et al. (1992) claimed that various stakeholders (owners, designers and contractors) had common and unique CSFs in construction projects and that exploring these factors was worthwhile for achieving project success. Cleland (1999) then emphasised the significance of CSFs in stakeholder management seeing that the project team must know whether the project stakeholders were managed successfully or not. The CSFs of stakeholder management in construction projects were discovered by Yang, Shen, Drew and Ho (2009a), and they were stakeholder identification, assessment, decision making, action and evaluation and continuous support. The identified CSFs of stakeholder management was further applied by Oppong et al. (2017) to guide the strategies for improving stakeholder management performance. As CSFs are significantly related to management performance, the assessment of the preferred CSFs of project stakeholders attracted a group of SPCP in a broad theme, such as green buildings and public–private partnership (PPP) projects (Liang, Shen & Guo, 2015; Osei-Kyei & Chan, 2017).

Another assessment tool was network analysis, which was comprehensively presented by a book written by Wasserman and Faust (1994). The book introduced social network analysis (SNA) as a relational measure to systematically assess the interactions among various organisations. Later, Rowley (1997) was the first to analyse stakeholder influence with SNA by combining the methodology of SNA with a stakeholder-related study. Afterward, Yang et al. (2009b) adopted the SNA technique to analyse the stakeholder relationship in construction projects because it was useful to visualise and examine various project stakeholders as a system rather than a group of independent focal organisations with the dyadic ties presented by Freeman (1984). The SNA approach was further recommended by Mok et al. (2015) for stakeholder analysis on the complexities in mega construction projects. Currently, two types of SNA approaches are employed for stakeholder assessment. One is to evaluate the relationship among project stakeholders (Mok et al., 2017a). Another is to assess the interactions of stakeholder-associated issues in the projects (Mok et al., 2017c). Both approaches provide researchers with a robust assessment tool to understand the stakeholder positions in construction projects.

5.1.3. Prosperity stage: management and influence of stakeholders

In the third stage, SPCP were prosperous as they gradually extended the knowledge domain from general stakeholder theories to specific sub-areas of the project issues, including stakeholder management on social acceptance, sustainability and PPP projects. Regarding social-related issues, social acceptance was conceptualised by three aspects: socio-political acceptance, community acceptance and market acceptance, which required the support of a wide range of stakeholders towards a specific project (Wüstenhagen, Wolsink & Bürer, 2007). The three aspects set a model on how to evaluate the social impact on stakeholder perspective. The stakeholder management of socio-political risks entails seeking of effective assessment tools, involvement processes and response strategies. The stakeholder network evaluation approach was developed by Boutilier and Zdziarski (2017) to assist project managers in maintaining a high level of social license for a project. In addition, Benn, Dunphy and Martin (2009) established the stakeholder involvement framework to address the socio-political risks by considering stakeholder interactions, narrative theory, leadership styles and reflexive management. Moreover, Aaltonen and Sivonen (2009) provided the response strategies for project stakeholder pressures on social-political issues, including adaptation strategy, compromising strategy, avoidance strategy, dismissal strategy and influence strategy. The management of community stakeholders was focused on identification, impact analysis and managerial implications. The identification of community stakeholders was categorised into four groups: communities of place, communities of interests, communities of practice and virtual advocacy groups (Dunham, Freeman & Liedtka, 2006). These stakeholders were considered to exert unseen power and influence on the success of project delivery (Bourne & Walker, 2005; Olander & Landin, 2008). The engagement of community stakeholders in decision making is essential to improve the stakeholder management of construction projects (Di Maddaloni & Davis, 2017). The stakeholder management of the construction marketing issues led to the research on stakeholder perspective measurement, which was beneficial for improving organisation business performance in the construction market (Love & Holt, 2000; Rodriguez-Melo & Mansouri, 2011).

In the aspect of sustainability, public perception was discussed in wind energy projects, which emphasized the essence of general public support and local community involvement on project success (Devine-Wright, 2005). The leading research by Devine-Wright (2005) indicates the criticalness of external stakeholder management in green projects. The external stakeholder management of green projects consists of understanding the stakeholder visions (Château, Chang, Chen & Ko, 2012), organising effective stakeholder consultation and involvement (Gray, Haggett & Bell, 2005; Martin & Rice, 2015) and encouraging stakeholder empowerment (Alvial-Palavicino, Garrido-Echeverría, Jiménez-Estévez, Reyes & Palma-Behnke, 2011). In terms of stakeholder visions, besides the traditional community meeting method (Hall & Lazarus, 2015), a group modelling approach was introduced to simulate the stakeholder visions on wind farm projects. This approach provided an innovative simulation perspective to understand the stakeholder perception with the proposed management strategy before implementation (Château et al., 2012). Moreover, integrated with the stakeholder studies in green projects, the conceptual framework of stakeholder participation was finally developed by Jami and Walsh (2014) to guide stakeholder consultation in wind energy projects through five steps: inform, consult, involve, collaborate and empower.

In the project domain, the stakeholder involvement model was established for managing stakeholders in PPP projects (El-Gohary et al., 2006). The model was built for better communication among project proponents and stakeholders by capturing and integrating stakeholder interests in the management process. The article opened the window for other SPCP on the management process in PPP projects. Focused on the stakeholder management process, Henjewele, Fewings and Rwelamila (2013) proposed a multi-stakeholder management framework for PPP projects by combining the management process with project phases, which assisted project managers in stakeholder management in the PPP project lifecycle. Ng, Wong and Wong (2013) enhanced the stakeholder management process of PPP projects by linking stakeholder engagement activities in each project phase. In response to the stakeholder dynamics in the management process, the dynamic dual stakeholder management tool and ex-ante stakeholder inclusion were introduced to mitigate stakeholder conflicts, and they further upgraded the stakeholder management process in PPP projects (De Schepper, Dooms & Haezendonck, 2014).

Furthermore, stakeholder influence analysis was particularly discussed, leading to the development of the measurement tools. The source of major measurement tools was the 'power, legitimacy, urgency' model (Mitchell et al., 1997). The reason is that power is considered the critical attribute to assess stakeholder influence. Three classical tools were developed in this period. Firstly, the power/interest matrix was first proposed by Scholes et al. (2002) in the corporate management. Olander and Landin (2005) then introduced this tool into project management by mapping the stakeholders and their influences in two construction projects. Secondly, the stakeholder circle was designed by Bourne and Walker (2005) to visualise the power and influence of stakeholders in a project. Thirdly, Olander (2007) developed the stakeholder impact index by integrating the stakeholder attribute model (Mitchell et al., 1997), stakeholder position theory (McElroy & Mills, 2000) and power/interest matrix (Scholes et al., 2002). The index tool was further enhanced by Nguyen, Skitmore and Wong (2009) by supplementing the perspective of stakeholder knowledge. However, the series of stakeholder influence analysis tools relied heavily on the cognitive information of project managers, and thus lacked efficiency when employed in complex construction projects (Yang et al., 2009b).

5.1.4. Orientation stage: complexity of stakeholders

In the fourth stage, SPCP turned to the complexity of stakeholders as construction projects became increasingly complicated, which indicated new orientations in this field. Firstly, SPCP concentrated on the complexity of stakeholder concerns because conflicting concerns among stakeholders intensified project complexity (Atkin & Skitmore, 2008). The research of stakeholder concerns was started by LI et al. (2012a), who emphasised the criticalness of exploring the conflicts and consensus from the multiple stakeholder concerns. The stakeholder concerns were further considered as an aspect of stakeholder complexity by Mok et al. (2017a), who recommended the network analysis approach to analyse the complex interactions of stakeholder concerns. The network-based approach was explicitly introduced to reduce stakeholder complexity by identifying the critical position of stakeholder concerns with theoretical network indicators (Mok et al., 2017c). With the prioritisation of stakeholder concerns by network analysis, a group of project risks and challenges were detected in a variety of projects, including infrastructure (Mok et al., 2017c), urban redevelopment (Yu et al., 2017) and prefabricated housing projects (Luo, Qiping Shen, Xu, Liu & Wang, 2019).

Secondly, megaprojects have played a significant role in SPCP in recent years. The megaproject review written by Flyvbjerg (2014) was widely cited in SPCP. Mok et al. (2015) followed this trend and wrote an influential review paper on stakeholder studies in mega construction projects. This paper provided a national culture analysis, a life-cycle analysis and a SNA and established a database which formed the four major directions for SPCP when facing the complexity in megaprojects (Mok et al., 2015). Subsequently, stakeholder investigations of megaprojects were undertaken under various national cultural contexts to understand the stakeholder management measures in different countries (Di Maddaloni & Davis, 2018; Park, Kim, Kim & Kim, 2017; Yang et al., 2018). Moreover, stakeholder management studies of long-term megaprojects were conducted to explore the stakeholder dynamics in complex project environment (Eskerod & Ang, 2017; Park et al., 2017). SNA was employed to visualise stakeholder complexity and manage stakeholder relationship in megaprojects (Mok et al., 2017b). However, a stakeholder database of megaprojects is lacking to provide adequate empirical data for generalising the stakeholder theories facing the complexity of megaprojects.

5.2. Major knowledge domains of SPCP

According to the clustering results of co-citation analysis, the knowledge domains of SPCP can be further interpreted as four major issues: society, sustainability, analytical tool and project management. Of them, society and sustainability are two interesting focal areas. The former has the largest cluster, whereas the latter contains the greatest number of clusters, representing the hotspots in SPCP.

Regarding the largest cluster, society-related issues (Cluster 0 in Table 2) represent a major knowledge domain in SPCP, which is echoed by the social impact research from Di Maddaloni and Davis (2017) and Boutilier and Zdziarski (2017). As public participation is a critical driving force to stimulate the demand for stakeholder studies stated in 5.1, many discussions in SPCP are on how to deal with the interactions between project stakeholders and the public (Jami & Walsh, 2014; Li, Thomas Ng & Skitmore, 2015; Xie, Yang, Hu & Chan, 2014). To achieve better performance in stakeholder interactions, a fuzzy approach was adopted to test stakeholder satisfaction during the public's participation in a construction project (LI et al., 2013). Corporate social responsibility in construction projects was also studied from the perspective of stakeholder power (Lin, Ho & Shen, 2018b). The hierarchy of stakeholder power on social responsibility in construction projects was discussed through stakeholder impact and stakeholder network analyses (Lin, Ho & Shen, 2017, 2018a). Moreover, most public works attract huge public attention because they use the public budget and have deep social impact, thus requiring clear identifications of stakeholder concerns to detect the key challenges and associated risks among stakeholders (Li et al., 2016b; Li, Ng & Skitmore, 2012b; Mok et al., 2017c).

Six clusters related to the knowledge domain of sustainability in SPCP, which indicates the wide application of stakeholder analysis in the field, also echoed by Hörisch, Freeman and Schaltegger (2014). Generally, the sustainability domain can be divided into three parts. The first part is to introduce stakeholder analysis to the approaches for sustainability assessment (Clusters 6, 8 and 12 in Table 2) in construction projects. For the evaluation of project sustainability, the environmental assessment method was developed from stakeholder perspective, and stakeholder-associated risks were assessed (Wong & Abe, 2014; Yang, Zou & Wang, 2016). To achieve better sustainable projects, the cost of sustainability-related components was analysed from the stakeholder perspective (Goh & Yang, 2014). The second part is stakeholder engagement in green energy projects. One hotspot is the wind energy projects (Cluster 7 in Table 2). It has not been mentioned in any review papers of SPCP but in fact consists of a group of studies on stakeholder engagement detected by clustering analysis. It includes stakeholder engagement in the aspects of community participation, value-sensitive design, land use planning and energy policy (Alvial-Palavicino et al., 2011; Gold, 2011; Hall & Lazarus, 2015; Martin & Rice, 2015; Oosterlaken, 2015; Veidemane & Nikodemus, 2015). SPCP on wind energy projects can set a valuable reference to guide subsequent studies of stakeholder engagement in other renewable energy projects. The third part concerns stakeholder involvement of environmental protection in construction projects. One application is in waste management (Cluster 9 in Table 2). The research advocates that the amelioration of stakeholders' awareness and behaviour is a useful measure for dealing with construction waste (Lu, Peng, Webster & Zuo, 2015; Saez, Del Río Merino, González & Porras-Amores, 2013; Yuan, 2013). Another application focuses on green real estate projects (Cluster 11 in Table 2). The key stakeholders were identified, and the transaction costs of these stakeholders were analysed to maximise the value of environment-friendly building projects (Li, Wu & Wu, 2017b; Qian, Chan & Khalid, 2015; Zhang, 2015).

The other two knowledge domains in SPCP are tool and project issues. Regarding tool-related issues, SPCP have developed a series of effective approaches to analyse problems in construction project management (Mok et al., 2015). Stakeholder assessment is a critical analytical component in the decision-making process (Cluster 1 in Table 2), which is useful in identifying stakeholder-associated risks in the early stage of projects (Williams, Ferdinand & Pasian, 2015; Yang et al., 2014). Moreover, the development of building information modelling (BIM) technology (Cluster 3 in Table 2) provides a new tool to integrate stakeholder

information for achieving better stakeholder collaboration (He et al., 2017b; Li et al., 2017a, 2016a). SPCP also explore approaches to address the conflicts arising from complex system integration (Cluster 10 in Table 2) (Davies & Mackenzie, 2014; Mok et al., 2017a). In terms of project-related issues, SPCP contributes to construction project management research (Oppong et al., 2017; Yang et al., 2009b). Firstly, general stakeholder theories in construction projects are included under this domain as the essence of stakeholder management (Cluster 4 in Table 2) on improving project performance (Atkin & Skitmore, 2008; Mok et al., 2015; Yang & Shen, 2014). Secondly, stakeholder evaluations are incorporated into other critical project management studies, including project risk and schedule management (Clusters 2 and 13 in Table 2), for enhancing the relevant management performance from stakeholder perspective (Benn et al., 2009; Braeckman & Guthrie, 2016; Valentin, Naderpajouh & Abraham, 2018; Zhao et al., 2016).

5.3. Trends in the frontier of SPCP

With the keywords co-occurrence network from 2015 to 2017 as basis, hotspots in the frontier of SPCP are explored (see Fig. 5). Generally, the future development of SPCP corresponds to the features of modern construction projects in search of efficient solutions to face the challenges in sustainability, complexity and uncertainty. The continuous advancement of information technology like BIM can support stakeholder studies in tackling the challenges by providing an accurate and instant approach for detecting stakeholder concerns and achieving better stakeholder collaboration.

5.3.1. Stakeholder engagement in sustainable urban projects

Sustainability is the hottest research topic in current SPCP. Stakeholder analysis has been conducted on energy projects (Read et al., 2017), sustainable infrastructure (Diaz, Adler & Patt, 2017) and green buildings (Yang et al., 2016). As urbanisation is a global trend, sustainability has become a critical topic with regard to urban issues (Tan, Xu & Zhang, 2016). Sustainable urbanisation calls for sustainable construction management in urban infrastructure and building projects (Gan et al., 2015). In SPCP, stakeholder perspective studies have been introduced into urban redevelopment projects because stakeholders are an essential part of sustainability management (Hörisch et al., 2014). For instance, a stakeholder-expectation-based analysis has been conducted for better sustainability performance of urban renewal projects (Zhuang et al., 2017). Network analysis has been carried out to detect social risks from the stakeholder perspective in an urban redevelopment project (Yu et al., 2017). However, current studies focus on the identification of stakeholder concerns to facilitate the decision-making process. More SPCP on stakeholder engagement in urban projects are expected, as recommended by Gan et al. (2015), to achieve sustainability in construction project management. Sustainable urbanisation seeks the engagement of all stakeholders in a city (Enserink & Koppenjan, 2007), so SPCP are expected to investigate stakeholder engagement by providing efficient engagement levels and methods in different types of sustainable urban projects. This call is also echoed by Tan et al. (2016) in an urbanisation review.

5.3.2. Generalisation of stakeholder studies in complex construction projects

The popular research targets are SPCP on project complexities. As Fig. 5 shows, megaprojects and PPP projects are complex as they involve a great number of stakeholders (De Schepper et al., 2014; Mok et al., 2015). The complicated working interfaces require a high level of stakeholder collaboration to face various risks in the long term (Davies, Macaulay, Debarro & Thurston, 2014). Hence, SPCP must tackle the challenges of project complexity from the stakeholder perspective (Mok et al., 2017a). As stated in 5.1, megaproject has been the rising research area in SPCP. Although much experience of stakeholder management in megaprojects has been summarised case by case, generalised rules and guides are waiting to be concluded at the geographical level (Mok et al., 2015). PPP projects present a similar situation is SPCP. The limitation of the generalisability of research findings is highlighted due to the sampling scope (Osei-Kyei & Chan, 2017) and inborn case deficiencies (Amadi, Carrillo & Tuuli, 2018; De Schepper et al., 2014). One possible solution is to establish a database to organise the collected data in various empirical stakeholder research, as suggested by Mok et al. (2015). The database will be beneficial for future researchers of SPCP to generalise their findings through comprehensive data and cases. Although the database-driven stakeholder research was adopted in the area of corporate strategic management (Odziemkowska & Henisz, 2016), an open-source database remains lacking in SPCP. In summary, as the complexity increases the difficulties for exploring the unified management standard, SPCP should start with a case study, and future studies should generalise existing findings.

5.3.3. Dynamic and simulation stakeholder analysis in the uncertain project environment

Faced with the uncertainty in the lifecycle of construction projects, stakeholder studies require effective approaches to analyse the dynamics of stakeholder interactions (De Schepper et al., 2014) and propose strategies to improve the resilience against unpredictable events among stakeholders (De Meyer et al., 2002). The current research methods showed in Fig. 5 are still the classical ones initially developed before the early 1990s, including network analysis and traditional quantitative and qualitative methods. The classical approaches require an upgrade to improve adaptability in tackling uncertainties. Regarding the dynamic stakeholder analysis, the emerging advocacy for further studies is on how to upgrade the static network model to be a dynamic one to reflect the change of stakeholder relationships when uncertainties occur in construction projects (Mok et al., 2017c). The combination of SNA and longitudinal data to conduct dynamic analysis is beneficial to understand the development of internal and external stakeholder networks in an uncertain project environment (Zheng, Le, Chan, Hu & Li, 2016). As an effective tool to test the uncertainties in various scenarios in advance (Alzraiee, Zayed & Moselhi, 2015), another expectation is on the simulation model for predicting the changeable stakeholder performance during project duration. Currently, the evaluation models based on traditional statistical methods (i.e. AHP, SEM and factor analysis) have been employed to review the stakeholder perception after project completion (Babatunde, Perera, Zhou & Udeaja, 2016; Mojtahedi & Oo, 2017; Moslem, Ghorbanzadeh, Blaschke & Duleba, 2019). However, in the initial stage, according to the result in 4.4, few simulation models have been established in the field of SPCP to predict stakeholder performance and its robustness to face uncertainties under changeable environment in construction projects.

5.3.4. Advanced integrated tool for stakeholder information collection

In the history of the development of SPCP, one major obstacle is the lack of useful solutions to collect accurate information from project stakeholders. Without such solutions, implementing high-quality empirical studies to validate new theories and management strategies becomes difficult (Mok et al., 2017c; Osei-Kyei & Chan, 2017). Given that the number of stakeholders involved in modern construction projects is growing, the integration of various stakeholder information is essential for stakeholder analysis in SPCP (Mok et al., 2017a) As an information communication and sharing platform among various stakeholders(He et al., 2017a), BIM provides a new prospect to collect stakeholder information accurately and instantly. One potential application is the combination with Internet of Things (IoT) technology (Li et al., 2017a). In the prefabricated housing projects, the BIM model has been combined with RFID labels to share stakeholder information for improving schedule performance (Li et al., 2016a). In the future, more advanced integrated information tool is expected to support SPCP in dealing with

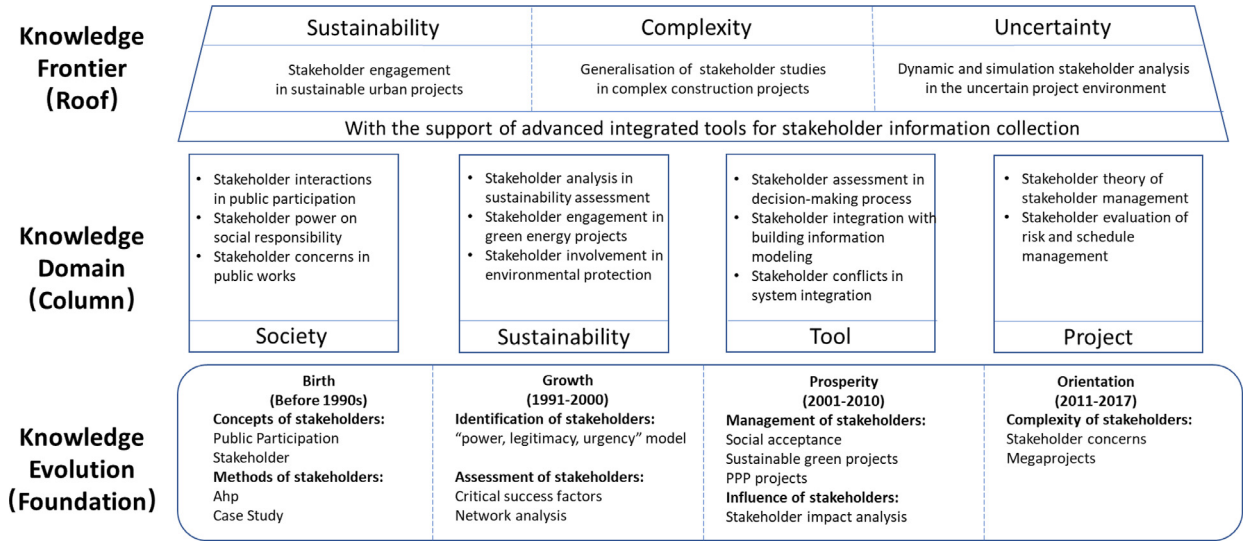

Fig. 6. "Housing model" The SPCP knowledge map.

sustainability, complexity and uncertainty problems in construction projects.

5.4. The knowledge map of SPCP

As Fig. 6 shows, the knowledge map of SPCP can be formed with three components, namely, knowledge evolution, domain and frontier. The holistic map is like a housing model. Knowledge evolution shows the history of SPCP, which is the foundation of the housing map. Above the foundation lies four major issues with eleven clusters of stakeholder perspective studies that form the knowledge domain. They represent the columns to support the whole house. At the top of the map is the roof, illustrating the trend of knowledge frontier in three aspects, namely, sustainability, complexity and uncertainty, with the support of stakeholder information collection tools.

The knowledge map contributes to SPCP from three aspects. Firstly, it brings new insights into the development path of knowledge evolution in SPCP by comprehensively highlighting seven milestones in history. Each detected milestone has a profound influence on SPCP, which is useful for scholars to learn the classical theories in the field. Secondly, it provides a new perception of current multi-disciplinary knowledge domains of SPCP with four identified research areas and eleven associated stakeholder perspective studies. This contribution benefits the scholar to understand the existing research scopes of SPCP. Thirdly, the knowledge-frontier roof indicates the new vision of SPCP by four future directions synchronised with the characteristics of the construction project management (sustainability, complexity and uncertainty) and the development of the construction information technology (BIM and its related IoT technology). The proposed future research directions bridge knowledge domains between stakeholder studies, construction project management and information technology. In summary, the knowledge map shows a holistic picture presenting the past, current and future of SPCP.

6. Conclusions

This study refers to 752 stakeholder-related articles. The knowledge evolution, domain, and frontier for SPCP are obtained systematically through the analysis of bibliographic records. The knowledge evolution reveals four critical development phases with seven research milestones in SPCP, namely, stakeholder concepts, methods, identification, assessment, management, influence and complexity. The knowledge domain indicates four major research areas of stakeholder perspective studies concerning the issues of society, sustainability, tool and project. The society issues include the stakeholder interactions in public participation, stakeholder power on social responsibility and stakeholder concerns in public works. The sustainability issues cover the stakeholder analysis in sustainability assessment, stakeholder engagement in green energy projects and stakeholder involvement in environmental protection. The tool issues consist of the stakeholder assessment in the decision-making process, stakeholder integration with building information modelling and stakeholder conflicts in system integration. The project issues are made up of the theory of stakeholder management and stakeholder evaluation of risk and schedule management. Standing on the knowledge frontier, future SPCP are encouraged to focus on the challenges of construction project management in the aspects of sustainability, complexity and uncertainty. Further studies regarding stakeholder engagement in the sustainable urban projects, generalised studies tackling the complexity in complex construction projects and the dynamic and simulation methods addressing the interactions between stakeholders and project uncertainties are awaited. Moreover, the rising demands on instant and accurate approach to integrating stakeholder information call for in-depth research on advanced integrated information tools, such as BIM and its related IoT technology.

The contribution of this article lies in two aspects. Theoretically, the proposed knowledge map SPCP presents the knowledge evolution, domain and frontier of SPCP. The traced knowledge evolution highlights seven research milestones and relevant profound influence on the knowledge body of SPCP in history. The detected knowledge domain clearly reveals four critical research areas for the latest knowledge scope, presenting how the applications of stakeholder perspective studies extend to multi-disciplinary areas in construction projects. The explored knowledge frontier indicates future directions for the knowledge development of SPCP by integrating the knowledge between stakeholder studies, construction project management and information technology. Therefore, the proposed knowledge map comprehensively depicts the past, current and future of SPCP. Methodologically, an effective method to map discipline knowledge is provided with the integration of bibliometric approaches, including timespan citation, document co-citation and keyword co-occurrence analyses. Unlike traditional literature reviews, the integrated bibliometric approach successfully explores the past, current and future of a target knowledge domain by

reducing the impact of a researcher's subjective opinions on the research results, thus ensuring that the results are more objective and accurate.

Two limitations of the research are noted. Firstly, although WoS database provides the high-standard literature that formed the dataset, other literature databases are welcome to be included in developing the bibliometric tool. Currently, other databases cannot provide sufficient bibliographic records owing to software compatibility. Secondly, the knowledge map for SPCP should be updated periodically with the development of stakeholder management practices in the construction industry.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Supplementary materials

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References

Aaltonen, K., Jaakko, K., & Tuomas, O. (2008). Stakeholder salience in global projects. *International Journal of Project Management, 26*, 509–516.
Aaltonen, K., & Sivonen, R. (2009). Response strategies to stakeholder pressures in global projects. *International Journal of Project Management, 27*, 131–141.
Abu, K. (2016). Visualizing the citation patterns of parasitology research in India: A study using CiteNet explorer. *International Journal of Innovative Knowledge Concepts, 2*.
Alvial-Palavicino, C., garrido-echeverría, N., jiménez-estévez, G., Reyes, L., & Palma-Behnke, R. (2011). A methodology for community engagement in the introduction of renewable based smart microgrid. *Energy for Sustainable Development, 15*, 314–323.
Alwaer, H., & Clements-Croome, D. (2010). Key performance indicators (KPIs) and priority setting in using the multi-attribute approach for assessing sustainable intelligent buildings. *Building and Environment, 45*, 799–807.
Alzraiee, H., Zayed, T., & Moselhi, O. (2015). Dynamic planning of construction activities using hybrid simulation. *Automation in Construction, 49*, 176–192.
Amadi, C., Carrillo, P., & Tuuli, M. (2018). Stakeholder management in PPP projects: External stakeholders' perspective. *Built Environment Project and Asset Management, 8*, 403–414.
Ananda, J., & Herath, G. (2003). The use of Analytic Hierarchy Process to incorporate stakeholder preferences into regional forest planning. *Forest Policy and Economics, 5*, 13–26.
Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of planners, 35*, 216–224.
Atkin, B., & Skitmore, M. (2008). Stakeholder management in construction. *Construction Management and Economics, 26*, 549–552.
Babatunde, S. O., Perera, S., Zhou, L., & Udeaja, C. (2016). Stakeholder perceptions on critical success factors for public-private partnership projects in Nigeria. *Built Environment Project and Asset Management, 6*, 74–91.
Benn, S., Dunphy, D., & Martin, A. (2009). Governance of environmental risk: New approaches to managing stakeholder involvement. *Journal of Environmental Management, 90*, 1567–1575.
Bonke, S., & Winch, G. (2002). Project stakeholder mapping: Analyzing the interests of project stakeholders. *The Frontiers of Project Management Research* Project Management Institute, PMI.
Bourne, L., & Walker, D. H. (2005). Visualising and mapping stakeholder influence. *Management Decision, 43*, 649–660.
Boutilier, R. G., & Zdziarski, M. (2017). Managing stakeholder networks for a social license to build. *Construction Management and Economics, 35*, 498–513.
Braeckman, J. P., & Guthrie, P. (2016). Loss of value: Effects of delay on hydropower stakeholders. *Proceedings of the Institution of Civil Engineers-Engineering Sustainability, 169*, 253–264.
Château, P.-. A., Chang, Y.-. C., Chen, H., & Ko, T.-. T. (2012). Building a stakeholder's vision of an offshore wind-farm project: A group modeling approach. *Science of the Total Environment, 420*, 43–53.
Chen, C., Dubin, R., & Kim, M. C. (2014). Orphan drugs and rare diseases: A scientometric review (2000–2014). *Expert Opinion on Orphan Drugs, 2*, 709–724.
Chen, C., Hu, Z., Liu, S., & Tseng, H. (2012). Emerging trends in regenerative medicine: A scientometric analysis in CiteSpace. *Expert Opinion on Biological Therapy, 12*, 593–608.
Chen, C., Ibekwe-Sanjuan, F., & Hou, J. (2010). The structure and dynamics of cocitation clusters: A multiple-perspective cocitation analysis. *Journal of the Association for Information Science and Technology, 61*, 1386–1409.
Chitkara, K. (1998). *Construction project management.* Tata McGraw-Hill Education.
Cleland, D. I. (1999). *Project management: Strategic design and implementation*. McGraw-Hill.
Cleland, D. I., & Kerzner, H. (1986). *Engineering team management.* Krieger Publishing Company.
Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2011). Science mapping software tools: Review, analysis, and cooperative study among tools. *Journal of the Association for Information Science and Technology, 62*, 1382–1402.
Dalal, J., Mohapatra, P. K., & Mitra, G. C. (2010). Prioritization of rural roads: AHP in group decision. *Engineering, Construction and Architectural Management.*
Davies, A., Macaulay, S., Debarro, T., & Thurston, M. (2014). Making innovation happen in a megaproject: London's crossrail suburban railway system. *Project Management Journal, 45*, 25–37.
Davies, A., & Mackenzie, I. (2014). Project complexity and systems integration: Constructing the London 2012 Olympics and Paralympics games. *International Journal of Project Management, 32*, 773–790.
De Meyer, A., Loch, C. H., & Pich, M. T. (2002). Managing project uncertainty: From variation to chaos; Project managers can't predict the future, but accurately gauging the degree of uncertainty inherent in their projects can help them quickly adapt to it. *MIT Sloan Management Review, 43*, 60–68.
De Schepper, S., Dooms, M., & Haezendonck, E. (2014). Stakeholder dynamics and responsibilities in public-private partnerships: A mixed experience. *International Journal of Project Management, 32*, 1210–1222.
Derakhshan, R., Turner, R., & Mancini, M. (2019). Project governance and stakeholders: A literature review. *International Journal of Project Management, 37*, 98–116.
Devine-Wright, P. (2005). Beyond NIMBYism: Towards an integrated framework for understanding public perceptions of wind energy. *Wind Energy, 8*, 125–139.
Di Maddaloni, F., & Davis, K. (2017). The influence of local community stakeholders in megaprojects: Rethinking their inclusiveness to improve project performance. *International Journal of Project Management, 35*, 1537–1556.
Di Maddaloni, F., & Davis, K. (2018). Project manager's perception of the local communities' stakeholder in megaprojects. An empirical investigation in the UK. *International Journal of Project Management, 36*, 542–565.
Diaz, P., Adler, C., & Patt, A. (2017). Do stakeholders' perspectives on renewable energy infrastructure pose a risk to energy policy implementation? A case of a hydropower plant in Switzerland. *Energy Policy, 108*, 21–28.
Dunham, L., Freeman, R. E., & Liedtka, J. (2006). Enhancing stakeholder practice: A particularized exploration of community. *Business Ethics Quarterly, 16*, 23–42.
Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review, 14*, 532–550.
El-Gohary, N. M., Osman, H., & El-Diraby, T. E. (2006). Stakeholder management for public private partnerships. *International Journal of Project Management, 24*, 595–604.
ENR (2014). The Top 250. Engineering news-record.
Enserink, B., & Koppenjan, J. (2007). Public participation in China: Sustainable urbanization and governance. *Management of Environmental Quality: An International Journal, 18*, 459–474.
Eskerod, P., & Ang, K. (2017). Stakeholder value constructs in megaprojects: A long-term assessment case study. *Project Management Journal, 48*, 60–75.
Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry, 12*, 219–245.
Flyvbjerg, B. (2014). What you should know about megaprojects and why: An overview. *Project Management Journal, 45*, 6–19.
Freeman, R. (1984). Edward: Strategic management. A stakeholder approach, *New York*.
Gan, X., Zuo, J., Ye, K., Skitmore, M., & Xiong, B. (2015). Why sustainable construction? Why not? An owner's perspective. *Habitat International, 47*, 61–68.
Goh, K. C., & Yang, J. (2014). Importance of sustainability-related cost components in highway infrastructure: perspective of stakeholders in Australia. *Journal of Infrastructure Systems, 20*, 9.
Gold, S. (2011). Bio-energy supply chains and stakeholders. *Mitigation and Adaptation Strategies for Global Change, 16*, 439–462.
Gray, T., Haggett, C., & Bell, D. (2005). Offshore wind farms and commercial fisheries in the UK: A study in stakeholder consultation. *Ethics Place and Environment, 8*, 127–140.
Guide, A. (2001). *Project management body of knowledge (PMBOK® GUIDE)*. Project Management Institute.
Hall, D. M., & Lazarus, E. D. (2015). Deep waters: Lessons from community meetings about offshore wind resource development in the US. *Marine Policy, 57*, 9–17.
Halpin, D. W. (2010). *Construction management.* John Wiley & Sons.
Hart, S. L., & Sharma, S. (2004). Engaging fringe stakeholders for competitive imagination. *Academy of Management Perspectives, 18*, 7–18.
He, Q. H., Wang, G., Luo, L., Shi, Q., Xie, J. X., & Meng, X. H. (2017b). Mapping the managerial areas of building information modeling (BIM) using scientometric analysis. *International Journal of Project Management, 35*, 670–685.
He, Q., Wang, G., Luo, L., Shi, Q., Xie, J., & Meng, X. (2017a). Mapping the managerial areas of building information modeling (BIM) using scientometric analysis. *International Journal of Project Management, 35*, 670–685.
Henjewele, C., Fewings, P., & Rwelamila, P. D. (2013). De-marginalising the public in PPP projects through multi-stakeholders management. *Journal of Financial Management of Property and Construction.*

Hörisch, J., Freeman, R. E., & Schaltegger, S. (2014). Applying stakeholder theory in sustainability management: Links, similarities, dissimilarities, and a conceptual framework. *Organization & Environment, 27*, 328–346.
Institute, P. M. (1987). *Project management body of knowledge (PMBOK)*. Project Management Institute.
Jacobson, C., & Ok Choi, S. (2008). Success factors: Public works and public-private partnerships. *International Journal of Public Sector Management, 21*, 637–657.
Jami, A. A., & Walsh, P. R. (2014). The role of public participation in identifying stakeholder synergies in wind power project development: The case study of Ontario, Canada. *Renewable Energy, 68*, 194–202.
Lam, K. C., Lam, M. C. K., & Wang, D. (2008). MBNQA-oriented self-assessment quality management system for contractors: Fuzzy AHP approach. *Construction Management and Economics, 26*, 447–461.
Larson, S., Measham, T. G., & Williams, L. J. (2010). Remotely engaged? Towards a framework for monitoring the success of stakeholder engagement in remote regions. *Journal of Environmental Planning and Management, 53*, 827–845.
Lester, A. (2006). *Project management, planning and control: Managing engineering, construction and manufacturing projects to PMI, APM and BSI standards*. Elsevier.
Li, C. Z., Hong, J., Xue, F., Shen, G. Q., Xu, X., & Mok, M. K. (2016a). Schedule risks in prefabrication housing production in Hong Kong: A social network analysis. *Journal of Cleaner Production, 134*, 482–494.
Li, C. Z., Zhong, R. Y., Xue, F., Xu, G., Chen, K., & Huang, G. G. (2017a). Integrating RFID and BIM technologies for mitigating risks and improving schedule performance of prefabricated house construction. *Journal of Cleaner Production, 165*, 1048–1062.
Li, M., Wu, W., & Wu, G. (2017b). Promotion mechanism of the green building based on the stakeholder theory from the perspective of game theory. *Journal of Civil Engineering and Management, 34*, 20–26.
Li, T. H. Y., Ng, S. T. T., Skitmore, M., & Li, N. (2016b). Investigating stakeholder concerns during public participation. *Proceedings of the Institution of Civil Engineers-Municipal Engineer, 169*, 199–219.
Li, T. H. Y., Ng, S. T., & Skitmore, M. (2013). Evaluating stakeholder satisfaction during public participation in major infrastructure and construction projects: A fuzzy approach. *Automation in Construction, 29*, 123–135.
Li, T. H., Ng, S. T., & Skitmore, M. (2012a). Conflict or consensus: An investigation of stakeholder concerns during the participation process of major infrastructure and construction projects in Hong Kong. *Habitat International, 36*, 333–342.
Li, T. H., Ng, S. T., & Skitmore, M. (2012b). Public participation in infrastructure and construction projects in China: From an EIA-based to a whole-cycle process. *Habitat International, 36*, 47–56.
Li, T. H., Thomas Ng, S., & Skitmore, M. (2015). Modeling multi-stakeholder multi-objective decisions during public participation in major infrastructure and construction projects: A decision rule approach. *Journal of Construction Engineering and Management, 142*, Article 04015087.
Li, X., Wu, P., Shen, G. Q., Wang, X., & Teng, Y. (2017c). Mapping the knowledge domains of Building Information Modeling (BIM): A bibliometric approach. *Automation in Construction, 84*, 195–206.
Liang, X., Shen, G., & Guo, L. (2015). Improving management of green retrofits from a stakeholder perspective: A case study in China. *International Journal of Environmental Research and Public Health, 12*, 13823–13842.
Lin, X., Ho, C. M. F., & Shen, G. Q. P. (2017). Who should take the responsibility? Stakeholders' power over social responsibility issues in construction projects. *Journal of Cleaner Production, 154*, 318–329.
Lin, X., Ho, C. M., & Shen, G. Q. (2018b). Research on corporate social responsibility in the construction context: A critical review and future directions. *International Journal of Construction Management, 18*, 394–404.
Lin, X., Ho, C. M.-F., & Shen, G. Q. (2018a). For the balance of stakeholders' power and responsibility. *Management Decision*.
Liu, B., Huo, T., Meng, J., Gong, J., Shen, Q., & Sun, T. (2015). Identification of key contractor characteristic factors that affect project success under different project delivery systems: Empirical analysis based on a group of data from China. *Journal of Management in Engineering, 32*, Article 05015003.
Love, P. E., & Holt, G. D. (2000). Construction business performance measurement: The SPM alternative. *Business Process Management Journal*.
Lu, W., Peng, Y., Webster, C., & Zuo, J. (2015). Stakeholders' willingness to pay for enhanced construction waste management: A Hong Kong study. *Renewable and Sustainable Energy Reviews, 47*, 233–240.
Luo, L., Qiping Shen, G., Xu, G., Liu, Y., & Wang, Y. (2019). Stakeholder-associated supply chain risks and their interactions in a prefabricated building project in Hong Kong. *Journal of Management in Engineering, 35*, Article 05018015.
Mahjabeen, Z., Shrestha, K. K., & Dee, J. A. (2003). Rethinking community participation in urban planning: The role of disadvantaged groups in Sydney metropolitan strategy. *Australasian Journal of Regional Studies, 9*, 45.
Martin, N., & Rice, J. (2015). Improving Australia's renewable energy project policy and planning: A multiple stakeholder analysis. *Energy Policy, 84*, 128–141.
Mcelroy, B., & Mills, C. (2000). Managing stakeholders. *Gower handbook of project management*, 757–775.
Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Academy of Management Review, 22*, 853–886.
Mojtahedi, M., & Oo, B. L. (2017). The impact of stakeholder attributes on performance of disaster recovery projects: The case of transport infrastructure. *International Journal of Project Management, 35*, 841–852.
Mok, K. Y., Shen, G. Q., & Yang, J. (2015). Stakeholder management studies in mega construction projects: A review and future directions. *International Journal of Project Management, 33*, 446–457.
Mok, K. Y., Shen, G. Q., & Yang, R. J. (2017a). Addressing stakeholder complexity and major pitfalls in large cultural building projects. *International Journal of Project Management, 35*, 463–478.
Mok, K. Y., Shen, G. Q., & Yang, R. J. (2017b). A network theory-based analysis of stakeholder issues and their interrelationships in large construction projects: A case study. *International Journal of Construction Management, 17*, 210–227.
Mok, K. Y., Shen, G. Q., Yang, R. J., & Li, C. Z. (2017c). Investigating key challenges in major public engineering projects by a network-theory based analysis of stakeholder concerns: A case study. *International Journal of Project Management, 35*, 78–94.
Morris, P.W., & Hough, G.H. (1987). The anatomy of major projects: A study of the reality of project management.
Moslem, S., Ghorbanzadeh, O., Blaschke, T., & Duleba, S. (2019). Analysing Stakeholder consensus for a sustainable transport development decision by the fuzzy AHP and interval AHP. *Sustainability, 11*, 3271.
Mostafa, M. A., & El-Gohary, N. M. (2014). Stakeholder-sensitive social welfare–oriented benefit analysis for sustainable infrastructure project development. *Journal of Construction Engineering and Management, 140*, Article 04014038.
Ng, S. T., Wong, J. M., & Wong, K. K. (2013). A public private people partnerships (P4) process framework for infrastructure development in Hong Kong. *Cities (London, England), 31*, 370–381.
Nguyen, N. H., Skitmore, M., & Wong, J. K. W. (2009). Stakeholder impact analysis of infrastructure project management in developing countries: A study of perception of project managers in state-owned engineering firms in Vietnam. *Construction Management and Economics, 27*, 1129–1140.
Odziemkowska, K., & Henisz, W. J. (2016). In *Webs of influence: National stakeholder networks and corporate social performance. Academy of management proceedings: 10510* (p. 13867). Manor, NY: Academy of Management Briarcliff.
Ogunlana, S. O. (2010). Beyond the 'iron triangle': Stakeholder perception of key performance indicators (KPIs) for large-scale public sector development projects. *International Journal of Project Management, 28*, 228–236.
Olander, S. (2007). Stakeholder impact analysis in construction project management. *Construction Management and Economics, 25*, 277–287.
Olander, S., & Landin, A. (2005). Evaluation of stakeholder influence in the implementation of construction projects. *International Journal of Project Management, 23*, 321–328.
Olander, S., & Landin, A. (2008). A comparative study of factors affecting the external stakeholder management process. *Construction Management and Economics, 26*, 553–561.
Oosterlaken, I. (2015). Applying value sensitive design (VSD) to wind turbines and wind parks: An exploration. *Science and Engineering Ethics, 21*, 359–379.
Oppong, G. D., Chan, A. P. C., & Dansoh, A. (2017). A review of stakeholder management performance attributes in construction projects. *International Journal of Project Management, 35*, 1037–1051.
Osei-Kyei, R., & Chan, A. P. C. (2017). Perceptions of stakeholders on the critical success factors for operational management of public-private partnership projects. *Facilities, 35*, 21–38.
Park, H., Kim, K., Kim, Y. W., & Kim, H. (2017). Stakeholder management in long-term complex megaconstruction projects: The Saemangeum project. *Journal of Management in Engineering, 33*, 11.
Qian, Q. K., Chan, E. H., & Khalid, A. G. (2015). Challenges in delivering green building projects: Unearthing the transaction costs (TCs). *Sustainability, 7*, 3615–3636.
Read, L., Madani, K., Mokhtari, S., & Hanks, C. (2017). Stakeholder-driven multi-attribute analysis for energy project selection under uncertainty. *Energy, 119*, 744–753.
Rodriguez-Melo, A., & Mansouri, S. A. (2011). Stakeholder engagement: Defining strategic advantage for sustainable construction. *Business Strategy and the Environment, 20*, 539–552.
Rowley, T. J. (1997). Moving beyond dyadic ties: A network theory of stakeholder influences. *Academy of Management Review, 22*, 887–910.
Saaty, T. L. (1980). *The analytical hierarchical process*. New York: J Wiley.
Saez, P. V., del río merino, M., GONZÁLEZ, A. S.-A., & Porras-Amores, C. (2013). Best practice measures assessment for construction and demolition waste management in building constructions. *Resources, Conservation and Recycling, 75*, 52–62.
Sanvido, V., Grobler, F., Parfitt, K., Guvenis, M., & Coyle, M. (1992). Critical success factors for construction projects. *Journal of Construction Engineering and Management, 118*, 94–111.
Scholes, K., Johnson, G., & Whittington, R. (2002). *Exploring corporate strategy*. Financial Times Prentice Hall.
Shen, G., Brandon, P., & Baldwin, A. (2009). *Collaborative construction information management*. Routledge.
Su, H.-. N., & Lee, P.-. C. (2010). Mapping knowledge structure by keyword co-occurrence: A first look at journal papers in technology foresight. *Scientometrics, 85*, 65–79.
Tan, Y., Xu, H., & Zhang, X. (2016). Sustainable urbanization in China: A comprehensive literature review. *Cities (London, England), 55*, 82–93.
Valentin, V., Naderpajouh, N., & Abraham, D. M. (2018). Integrating the Input of Stakeholders in Infrastructure Risk Assessment. *Journal of Management in Engineering, 34*.
Van Eck, N. J., & Waltman, L. (2014). CitNetExplorer: A new software tool for analyzing and visualizing citation networks. *Journal of Informetrics, 8*, 802–823.
Veidemane, K., & Nikodemus, O. (2015). Coherence between marine and land use planning: Public attitudes to landscapes in the context of siting a wind park along the Latvian coast of the Baltic Sea. *Journal of Environmental Planning and Management, 58*, 949–975.
Wakchaure, S. S., & Jha, K. N. (2012). Determination of bridge health index using analytical hierarchy process. *Construction Management and Economics, 30*, 133–149.
Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications*. Cambridge University Press.

Williams, N. L., Ferdinand, N., & Pasian, B. (2015). Online stakeholder interactions in the early stage of a megaproject. *Project Management Journal, 46*, 92–110.
Wong, S. C., & Abe, N. (2014). Stakeholders' perspectives of a building environmental assessment method: The case of CASBEE. *Building and Environment, 82*, 502–516.
Wüstenhagen, R., Wolsink, M., & BÜRER, M. J. (2007). Social acceptance of renewable energy innovation: An introduction to the concept. *Energy Policy, 35*, 2683–2691.
Xie, L.-. L., Yang, Y., Hu, Y., & Chan, A. P. (2014). Understanding project stakeholders' perceptions of public participation in China's infrastructure and construction projects. *Engineering, Construction and Architectural Management*.
Yang, J., Shen, G. Q., Drew, D. S., & Ho, M. (2009a). Critical success factors for stakeholder management: Construction practitioners' perspectives. *Journal of Construction Engineering and Management, 136*, 778–786.
Yang, J., Shen, G. Q., Ho, M., Drew, D. S., & Xue, X. (2011). Stakeholder management in construction: An empirical study to address research gaps in previous studies. *International Journal of Project Management, 29*, 900–910.
Yang, J., Shen, Q., & Ho, M. (2009b). An overview of previous studies in stakeholder management and its implications for the construction industry. *Journal of Facilities Management, 7*, 159–175.
Yang, R. J., Jayasuriya, S., Gunarathna, C., Arashpour, M., Xue, X., & Zhang, G. (2018). The evolution of stakeholder management practices in Australian mega construction projects. *Engineering, Construction and Architectural Management*.
Yang, R. J., & Shen, G. Q. (2014). Framework for stakeholder management in construction projects. *Journal of Management in Engineering, 31*, Article 04014064.
Yang, R. J., Wang, Y., & Jin, X. H. (2014). Stakeholders' attributes, behaviors, and decision-making strategies in construction projects: importance and correlations in practice. *Project Management Journal, 45*, 74–90.
Yang, R. J., Zou, P. X. W., & Wang, J. Y. (2016). Modelling stakeholder-associated risk networks in green building projects. *International Journal of Project Management, 34*, 66–81.
Yin, R. K. (2003). Case study research design and methods third edition. *Applied Social Research Methods Series, 5*.
Yu, T., Shen, G. Q. P., Shi, Q., Lai, X. D., Li, C. Z. D., & Xu, K. X. (2017). Managing social risks at the housing demolition stage of urban redevelopment projects: A stakeholder-oriented study using social network analysis. *International Journal of Project Management, 35*, 925–941.
Yuan, H. (2013). Critical management measures contributing to construction waste management: Evidence from construction projects in China. *Project Management Journal, 44*, 101–112.
Zhang, X. (2015). Green real estate development in China: State of art and prospect agenda—A review. *Renewable and Sustainable Energy Reviews, 47*, 1–13.
Zhao, D., Mccoy, A. P., Kleiner, B. M., Mills, T. H., & Lingard, H. (2016). Stakeholder perceptions of risk in construction. *Safety Science, 82*, 111–119.
Zheng, X., Le, Y., Chan, A. P., Hu, Y., & Li, Y. (2016). Review of the application of social network analysis (SNA) in construction project management research. *International Journal of Project Management, 34*, 1214–1225.
Zhou, Y., Hou, L., Yang, Y., Chong, H.-. Y., & Moon, S. (2019). A comparative review and framework development on public participation for decision-making in Chinese public projects. *Environmental Impact Assessment Review, 75*, 79–87.
Zhuang, T. Z., Qian, Q. K., Visscher, H. J., & Elsinga, M. G. (2017). Stakeholders' expectations in urban renewal projects in China: A key step towards sustainability. *Sustainability, 9*, 21.