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Causes of Delay in Construction Projects: A Systematic Review

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***Abstract*:- The paper aimed at systematically reviewing extant journal on causes of delay in construction projects and adopted the Systematic Quantitative Assessment Techniques (SQAT) in identifying and examining 51 English peer-reviewed journal articles on causes of delay in construction projects collated from six high quality academic databases: Emerald, Elsevier, Springer, Wiley, Taylor & Francis and JSTOR. The study revealed that most of the papers focused on factors causing delays in construction projects and project delay analysis. Majority of the articles were studies from Asia and Africa, then Europe, while Australia, North America and South America having one article each.**

Keywords: Systematic Review, Causes of delay, Construction Project, Construction Industry

INTRODUCTION

Construction sector is one of the most important industries in every country that can spur economic growth and inspire development in other sectors (Aziz and Abdel-Hakam, 2016). Population growth, increasing urbanization and globalization have made it vital that the infrastructure is developed promptly for sustainable development (Prasad et al. 2019). Construction projects such as roads projects, water supply projects, hospital projects etc. play significant role as they are necessary requirement for employment generation, poverty alleviation and socio-economic development, especially in developing economies (Amoatey and Ankrah, 2017). However, for a project to be successful it has to be completed within the specified budget, cost, time and satisfying the projected standards. Failed projects lead to negative circumstances such as late completion, cost overruns and inferior work (Association of Construction Development, 2014).

Globally, the construction industry encounters delays that pause many projects, in some cases even cause total abandonment, along with it are time and cost overruns, which comes with other consequences such as project failure, reduction of profit margin, and the loss of public confidence, particularly on government funded projects (Doraisamy et al. 2015; Zailani et al. 2016).

Delays are classified into two categories. Excusable and non-excusable delay. Delays that resulted from factors that are beyond the control of the contractor or any other party and were unable to be detected earlier and did not occur due to their fault or negligence is regarded as excusable delay. However, delays that are instigated by the contractor or any other party such as sub-contractor and are within the control of the contractor is referred to non-excusable delays. concurrent delays occur when the contractor and the owner are responsible for the delay (Doraisamy et al. 2015; Anysz and Buczkowski, 2018).

A construction project could experience delay in handing over the site, or when there are unanticipated ground conditions, extra works, variations, suspensions of work, adverse weather conditions etc. Such delays can be recognized and considered based on their causes and effects (Keane and Calettka, 2008). They can also be characterized due to the party that is accountable for them, i.e., Excusable Delays, Non-Excusable Delays and Concurrent Delays (Ekanayeka and Perera, 2016).

Delay in project completion is generally experienced in the construction projects and has always being a problem in the construction industry and is being regularly reported in many countries (Oyegoke and Al Kiyumi, 2017; Budayan et al. 2018)

Considering the potential benefit of construction projects to the economic development of any nation and the challenge of projects delay is gradually becoming a global occurrence, it is therefore of great consequence that causes of delay in construction projects be explored in depth, as an in-depth analysis of the concept could be what is needed to mitigate the distress and anxiety to all the parties involved in construction projects and making sure that projects are completed within the specified budgeted time and cost. Also, understanding of the main factors causing the construction projects delays can aid in evaluating the gaps and inadequacies in project implementation and can pave ways of improvement of project performance. As such, this research work conducted a quantitative and systematic analysis of 51 peer-reviewed scholarly articles on causes of delay in construction projects in an attempt to highlight trends and gaps that will serve as points of reference for future research in the area.

The rest of this paper is organized as such: The next section is review of literature, followed by methodology of the study, findings and discussion of the results. Lastly, the conclusion, limitations and recommendation for future research prospects.

Literature Review

Delays in construction projects are acknowledged as one of the most conspicuous challenge facing the industry, Cost and time overruns are common in construction projects and infrastructure development (Mahmidi, 2011; Oyeguke and Kiyumi, 2017; Anysz and Buczkowski, 2018). In the construction industry, delay refers to the time exceeding beyond the specified project completion date or time agreed to complete the projects by both the parties (Yang et al. 2014; Oyegoke and Al Kiyumu, 2017).

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History had shown that worldwide the construction industry is full of projects that experienced delays and completed with significant time and cost overruns (Amehl et al. 2010). Many studies on construction related projects particularly, those in developing countries claim that in most of the cases the cost at the end of the project surpasses the original budgeted cost by almost 30 percent. by the time many projects are completed due to delay in the execution of the projects (Al-Momani, 1996; Mahmidi, 2011).

Shebob et al. (2012) undertook a comparative study of delay factors in Libyan and the UK construction industry. The results indicated the factors that causes delay are different in the two countries and construction projects suffered more delays in Libya than in the UK. Adopting case study approach and looking at the most critical delay factors, found that a building project might be delayed in Libya by 41 to 46 days and 34 to 38 days in the UK.

Amaotey et al. (2015) examined the delay causes and effects in Ghanaian state housing construction projects. the study indicated that the factors that causes delay construction projects were; delay in paying contractors, price fluctuation/inflation, increases of materials prices, insufficient finances from project sponsors, variation orders and absence of good financial or capital market. The major impacts of delays are cost and time overrun, litigation, continuity by client and adjudication.

Khoshgoftar et al. (2010) investigated causes of delays in Iranian construction projects. The findings identified that finance and payments of completed work, inadequate planning, improper site management, improper contract management, and communication gap between the parties involved in the are the main reasons that causes delay in the Iranian construction projects.

Several studies related to possible causes of delay in construction projects have been described in the literature. Table 1 displays some of the recent research works and their related references. From Table 1, it can be observed that sources of delay were grouped by researchers under different classes, depending on the responsible party (such as owners, client, contractor etc.) or the associated theme (such as managerial, technical etc.).

Table 1: List of 10 selected previous studies about causes of delay in construction projects (2010 – 2019)

References	Brief description of the study	Causes of delay
Kazaz et al. (2012)	Conducted a survey on 34 factors affecting project duration of 71 construction companies in Turkey	Outlined the most significant delay factor to include design and materials changes; payments delay; problem of cash flows; poor labor productivity and contractor's financial problems.
Yang et al. (2013)	Analysis of the contents of legal cases from Supreme Court verdicts in Taiwan on the main causes of schedule delays in construction projects.	The research work discovered that change orders, changed of scope, weather condition and construction site handover delays as the major reasons for schedule delays in construction related legal cases.
Akogbe et al. (2013)	Analysis of delay factors which affect the delay in completion of construction projects in Benin.	Delays in construction project emanated due to contractor's financial capability, owner's financial difficulties, poor performance of subcontractors, materials procurement of contractor, inadequate planning and scheduling, sluggish inspection of completed works by the consultants and unavailability of equipment.
Kim et al. (2016)	A survey of delay factor analysis for hospital projects in Vietnam.	The paper indicated that the top five causes of delay in hospital projects were: Owner's financial difficulties, change of design, incompetent contractor, inadequate experience of contractor and improper handling of responsibilities by supervisors
Aditya et al. (2017)	Review on the causes of delay and difficulties in execution of water supply project in India.	The causes of delay were due to delays in administration (Land acquisition, planning and coordination), difficulties in execution and non-performance of the contractors.
Amoatey & Ankrah (2017)	Conducted a survey of 48 roads projects to examines the causes of delay of roads projects in Ghana.	The delays were classified as client-related, contractor-related and donor-related. The client-related delays include delay in payment of completed work, changes of scope during the construction and delay to deliver the site to the contractor. The contractor-related delay centered on inadequate experience of contractor, while the donor-related delay was on inflexible funding allocation for project items.
Agyekum-Mensah & Knight (2017)	Exploring the practitioners' perspective on 32 delay causes in the UK construction industry in the post-recession era.	Inadequate project planning, poor commercial decisions, design problems, scope creep and unclear project requirements, financial problems, inexperience and incompetence, inappropriate risks transfer and mitigation, poor resource management.

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Zidane and Andersen (2018)	Analysis of the top 10 universal delay factors in construction projects and review of delay factors in major Norwegian construction projects.	The Norwegian construction industry experienced delays due to poor planning, scheduling problem, slow decision process, administrative challenges and bureaucratic inadequacies with the project organizations, resources inadequacies, lack of good communication and coordination between parties in the project. The paper highlighted 10 delay factors to comprised changes in design; delay in paying contractors; poor planning and scheduling; bad supervision and site management; inadequate or inappropriate design; contractor's inexperience and competence; shortage of finances; sponsor or owner's financial difficulties, shortage of resources; poor labor productivity and lack of adequate skills.
Rezaee et al. (2019)	Analyzing factors that causes delays in construction projects in Iran and their effect on project performance.	Incorrect estimation of job, insufficient equipment and correct project completion time, absence of good legal framework relating to job responsibilities and inadequate enforcement of sanctions
Viles et al. (2019)	Examined the assessable examination of factors causing delay in construction projects.	Changes during construction, Poor construction management, Construction errors, Economic/Financial, Conflict/Relationship and Lack of experience.

METHODOLOGY

This study espouses a systematic quantitative literature review method on Causes of Delay in Construction Projects adopting the ''Systematic Quantitative Assessment Technique'' (SQAT) developed by Pickering and Bryne (2014). SQAT is systematic in the way papers are assessed and determine their inclusion or exclusion in the review process, and it allows the researchers, to methodically analyze existing academic literature to produce an organized quantitative summary of the field (Pickering and Bryne 2014). The focus of this studies was on only peer reviewed original English journal publications on causes of delay in construction projects to uphold a high quality of papers. The systematic technique explores the geographical spread of the literature, the research methods adopted, the type of literature and their specific focus (Pickering and Bryne, 2014).

SQAT recommends five important dimensions in undertaking an effective systematic review. Each dimension and how it was implemented in this research work is described within this framework. A total of 51 peer-reviewed English articles on causes of delay in construction projects were compared across the dimensions outlined in Table 1.

Table 1: Description and Application of SQAT

S/No.	**Dimensions**	**Application in current study**
1.	Define topic	Causes of Delay in Construction Projects (CDCP)
2.	Formulate research questions	Six research questions: 1. What is the time distribution of CDCP research articles? 2. Where were these articles written? 3. What kind of CDCP articles were published? (Conceptual vs. Empirical) 4. Which journal publishers were adopted by the articles? 5. What research methods were employed in the research? 6. What were the specific themes explored in the articles?
3.	Identify key words	"Causes of Delay" and "Construction Projects"
4.	Identify the research databases	1. 6 databases utilized: Emerald; Elsevier; Springer; Wiley; Taylor and Francis; JSTOR. 2. "All in title" search using three search combinations: a. "delay" + "construction project" b. "delay" + "project" c. "delay" + "construction"
5.	Read and access publication	1. Abstracts of articles found were read and where necessary, the entire research works were read to ensure that they were dealing with "Causes of Delay in Construction Projects" and ensure that the research questions were answered. 2. Book chapters and conference proceedings were not included; only peer-reviewed conceptual and empirical papers were assessed.

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FINDINGS

Time Distribution of Causes of Delay in Construction projects (CDCP) Articles

This research work reviewed 51 papers which met the selection criteria of within ten (10) years (2010 – 2019); as ten years is considered enough time to include sufficient data required for the study. These were diagrammatically presented in the bar chart below (Figure i).

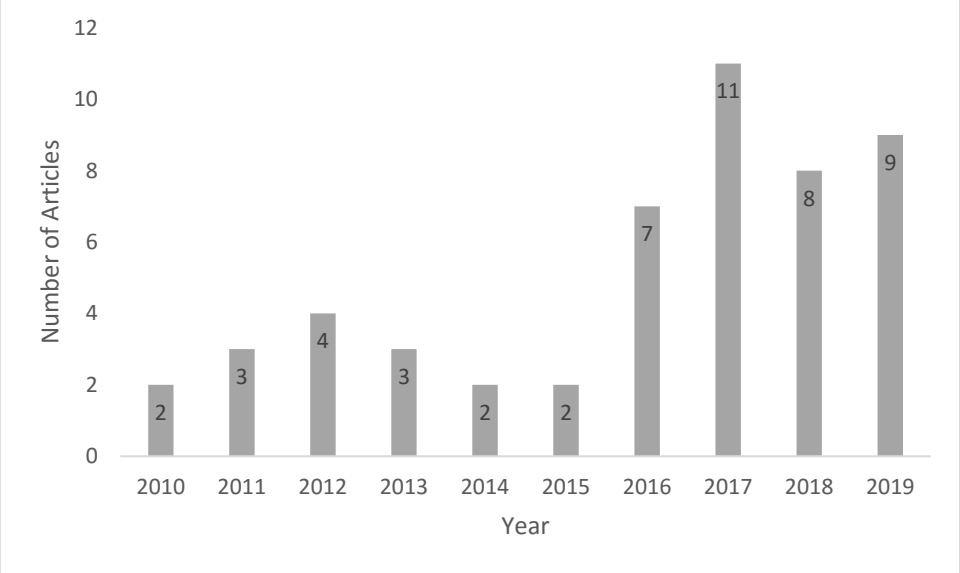

Figure 1: Time Distribution of CDCP Articles

Geographical Distribution of Causes of Delay in Construction Projects Articles

The geographical distribution of causes of delay in construction projects papers reviewed was presented in figure 2. Asia had the highest number (30); followed by Africa (10); Europe (8); while Australia, North America and South America had 1 each, respectively. These were presented in figure 2 below.

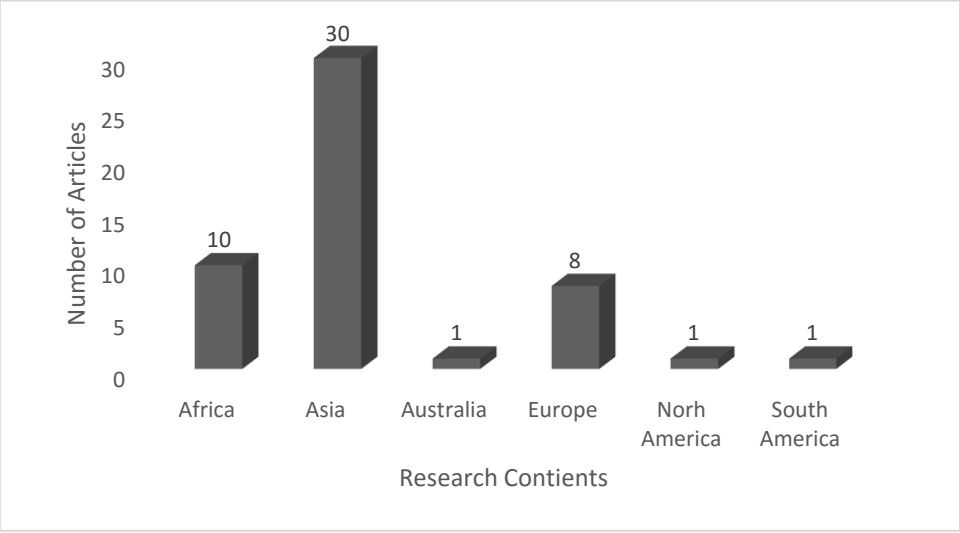

Figure 2: Geographical Distribution of CDCP Articles

Type of Articles on Causes of Delay in Construction Projects

The 51 articles reviewed were divided into two categories; conceptual and empirical. Conceptual articles here mean papers that focuses on the theory and concept of the causes of delay in construction projects, whilst empirical articles were those which includes both quantitative and qualitative studies "where conclusion are drawn from evidence verifiable by observations or experience rather than theory or logic" (Difference between Conceptual and Empirical Research, 2019). It can be observed from figure 3 that 82% (42 out of 51) articles reviewed were empirical in nature where researchers presented significant practical conclusions on issues that causes delay in construction projects (Khoshgaftar et al. 2010; Muhammad et al. 2015; Hossain et al. 2019). The remaining 18% were conceptual papers in which authors provides recommendations (Keller et al. 2010; Hamzah et al. 2011; Yang et al. 2014). The pie chart below in figure iii depicted the categorization of type of the articles.

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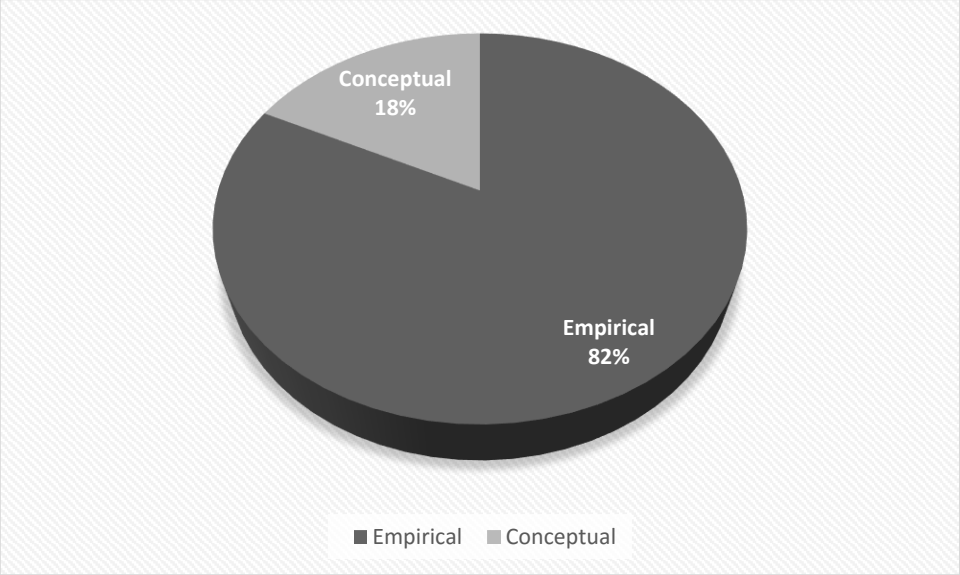

Figure 3: Type of CDCP Articles

Distribution of Top 5 Journal Publishers of CDCP Literatures
The table 3 below, shows the journal publishers with the most articles on causes of delay in construction projects (CDCP).

Table 3: Journal Distribution of CDCP Papers

JOURNAL PUBLISHERS	NUMBER OF PAPERS	RANKING
International Journal of Construction Management (Taylor & Francis)	6	1st
Procedia Engineering (Elsevier)	6	1st
KSCE Journal of Civil Engineering (Springer)	5	2nd
Engineering Construction and Architectural Management (Emerald)	4	3rd
Alexandria Engineering (Elsevier)	3	4th

The evidence from table 3 above, shows that International Journal of Construction Management and Procedia Engineering are the most preferred publishers of Causes of Delay in Construction Projects literatures with 6 papers each. Closely followed by KSCE Journal of Civil Engineering with 5 articles, while Engineering Construction & Architectural Management and Alexandria Engineering have 4 and 3 papers, respectively. Other journal site or publishers with publication ranging from one to two were not included in the analysis for ease of interpretations.

Research Method of CDCP Articles
Figure 4 below shows the research method used in each of the 51 CDCP articles reviewed in this research work.

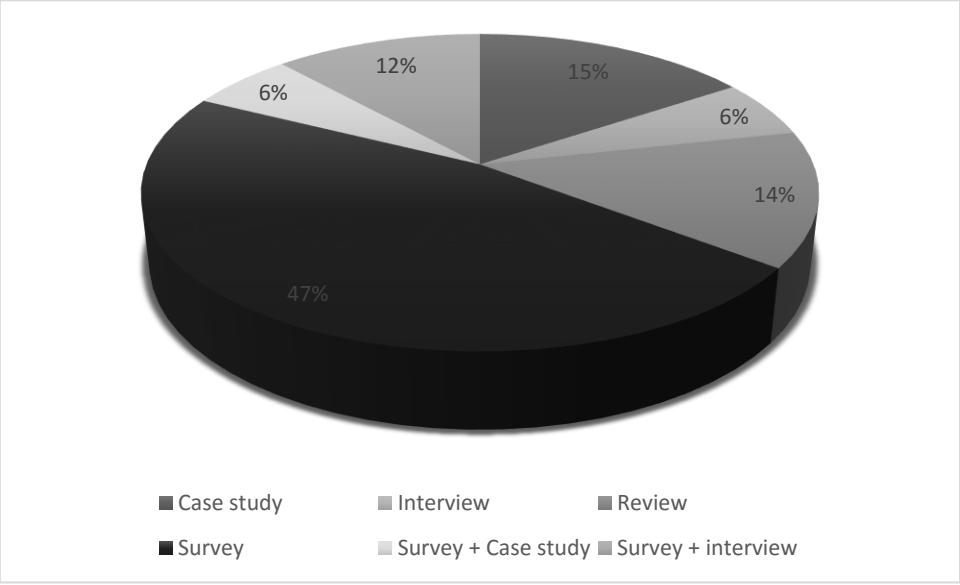

Figure 4: Research Methods

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Based on the findings in figure 4, the research method mostly adopted in the articles reviewed was survey (47%). This involved the distribution of questionnaires to projects' stakeholders (clients, consultants, professionals, owners and users of projects etc.) which would then be collated for analysis and interpretations (Mahmidi, 2011; Marzouk and El-Rasas, 2014; Tahir et al. 2017; Wang and Lin, 2018; Maqsoom et al. 2019). This followed by articles involving case studies (15%) which focuses on organizations or countries' issues and impact of causes of delays in construction projects (Yang et al. 2013; Iyer and Kumar, 2016; Koiraila et al. 2017; Guida and Sacco, 2019). The papers that adopted review analysis (14%) which includes theoretical, literature and systematic reviews on delay analysis in construction projects (Yang and Kao, 2012; Doraisamy et al. 2015; Mbala et al. 2018). 12% of the articles adopted combination survey and interviews, which comprised used of both questionnaires and collection of data directly from persons involved in constructions projects (Doloi et al. 2012; Shahsavand and Parchmijalal, 2018; Rachid et al. 2019). Another 6% of the papers reviewed adopted only interviews in collecting data for analysis and interpretation on CDCP (Agyekum-Mensah and Knight, 2017; Durdyev et al. 2017). Lastly, the papers that embraced the methodology of both survey and case studies were 6% (Shebob et al. 2012; Alsuliman, 2019), thus completing the six research methods identified in review of CDCP studies.

CDCP THEMES

It can be observed from figure 5 that the 51articles reviewed on CDCP focuses on 3 themes. Causes of project delay (63%); project delay analysis (23%); and effects of project delay. For the papers with theme on causes of delay, the researchers acknowledged that delays are a common phenomenon in construction projects and it's among the challenges must projects faced and investigated the factors that caused cost overrun and scheduled time of projects (Aziz, 2013; Elawi et al. 2016; Al-Hazim et al. 2017; Chen et al. 2019). On the project delay analysis themes, the attention of the researchers was tilted towards method of analyzing causal relationship between delay factors in construction projects (Ekanayeka and Perera, 2016; Chiu and Lai, 2017; Bilgin et al. 2018). While researcher's emphasis on the theme on effects of project delay were on analyzing delay factors in construction projects and determining their impacts, mitigations and made recommendations based on the findings of the studies (Senouci and Eldin, 2016; Zailani et al. 2016; Abd El-Karim et al. 2017). Analysis of delay factors, its causes and their impact should be at the forefront of construction project research because of the frequent lengthy delay that occurs which significantly affects most of the projects objective, performance, benefits and costs and in some cases many projects are stalled or abandoned.

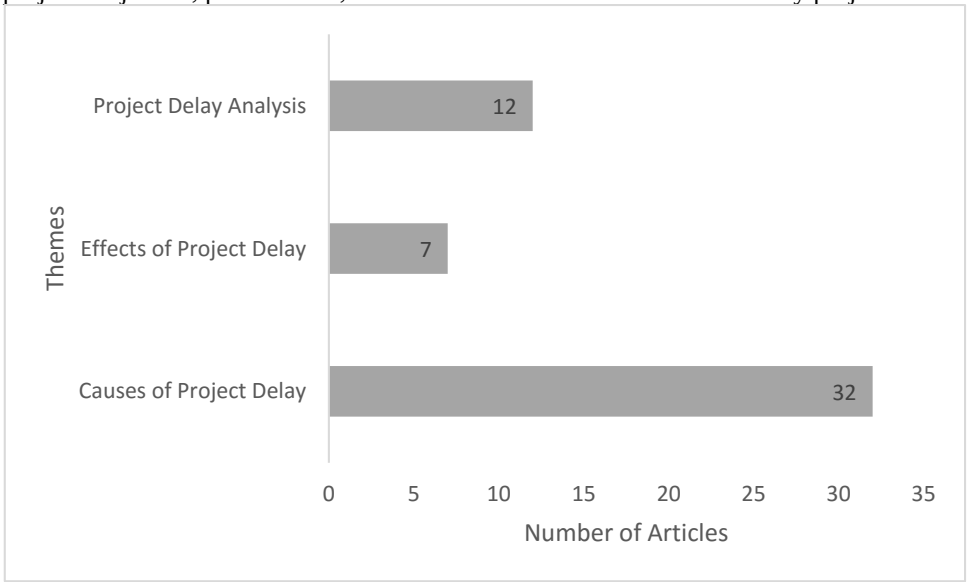

Figure 5: CDCP Themes

DISCUSSION OF RESULTS

As seen in figure 1, there is continuous, though uneven growth trend in research observed between 2010 and 2015. However, from 2016 there appeared to be an increase in interest of scholars on the topic, though still fluctuating. Therefore, it is likely that more researchers will take interest in issues of delay in construction projects.

It is observed from figure 2, Asian counties are seen to have dominated the attention of researchers with 30 out 51 reviewed articles, followed by Africa and Europe with 10 and 8 papers, respectively, and 1 each for Australia, North America and South America. This is not surprising, as most of the research papers on this study are from Asian countries of China, India, Malaysia, Iran and Saudi Arabia which are among fast growing economies where there is remarkable demand for infrastructural developments (Wang and Lin, 2018; Prasad et al. 2019 Rezaee et al. 2019). Meanwhile, in Africa construction industry holds enormous potential in generating employment and stimulating growth, resulting for rapid expansion of infrastructure by government and private sector initiatives that prompted more construction activities (Aziz and Abdel-Hakim, 2016; Amoatey and Ankrah, 2017; Gebrehiweta and Luo, 2017), hence the interest of researchers in delay analysis of construction projects in the continent.

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CONCLUSION

This studies considered 51 peer–reviewed journal articles on causes of delays in constructions project which were examined based on six key classifications: the time distribution of the articles, where the articles were written, article type, which journal publishers were adopted by the articles research methods employed and the themes explored in the articles. The findings showed that the continent with highest articles on causes of delay in construction projects is Asia. Majority of the articles reviewed were empirical studies and survey method was mostly adopted with less of interview. The findings of the studies were limited by the fact that only peer-reviewed journal articles were included in the research work, book chapters and conference proceedings were excluded. Another limitation is the methodology used of a title search in six databases rather than search using a key word.

However, notwithstanding of these limitations, this study is vital as it identify a clear path on the current situation of issues arising on causes of delay in construction projects and provides clear direction on the areas that future research needs to address in order to mitigate risk associated with delays in construction projects.

Therefore, the following recommendations for future research work on this study were as follows:

Reviewers/Scholars should include, book chapters and conference proceedings in their studies, this is to further improve the understanding of the causes of delay in construction projects.

Future research should also focus on critical analysis and conceptual work and support their research work with considerable theoretical framework method in order to have all round review on causes of delay in construction projects.

Future study emphasis should be tilted towards investigating the impact and risk management strategies of delays in construction projects.

Potential researchers should look at comparative studies between countries on this area as since delays in construction projects has become a global phenomenon, and many projects continue to experience delay despite the adoption of modern project management techniques and application of advanced technology.

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APPENDIX 1
Literature Map of the 51 Articles Reviewed

Reference	Country	database	Journal	Type of Article	Method adopted	Specific theme
Keller et al. (2010)	USA	JSTOR	Public Contract Law Journal	Conceptual	Theoretical review	Effects of project delay
Khoshgoftar et al. (2010)	Iran	Taylor & Francis	International Journal of Construction Management	Empirical	Survey	Causes of project delay
Mahmidi I. (2011)	Palestine	Emerald	Engineering, Construction and Architectural Management	Empirical	Survey	Causes of project delay
Hamzah et al. (2011)	Malaysia	Elsevier	Procedia Engineering	Conceptual	Theoretical review	Causes of project delay
Orangi et al. (2011)	Australia	Elsevier	Procedia Engineering	Empirical	Interview	Causes of project delay

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Doloi et al. (2012)	India	Elsevier	International Journal of Project Management	Empirical	Survey and Interview	Causes of project delay
Kazaz et al. (2012)	Turkey	Taylor & Francis	Journal of Civil Engineering and Management	Empirical	Survey	Causes of project delay
Shebob et al. (2012)	UK	Emerald	Engineering, Construction and Architectural Management	Empirical	Survey and Case study	Effects of project delay
Yang & Kao (2012)	Taiwan	Elsevier	International Journal of Project Management	Conceptual	Systematic review	Project delay analysis.
Akogbe et al. (2013)	Benin	Springer	KSCE Journal of Civil Engineering	Empirical	Survey	Project delay analysis.
Aziz R.F. (2013)	Egypt	Elsevier	Alexandria Engineering Journal	Empirical	Survey	Causes of project delay
Yang et al. (2013)	Taiwan	Wiley	Project Management Journal	Empirical	Case study	Causes of project delay
Marzouk & El-Rasas (2014)	Egypt	Elsevier	Journal of Advanced Research	Empirical	Survey	Causes of project delay
Yang et al. (2014)	Taiwan	Springer	KSCE Journal of Civil Engineering	Conceptual	Case study	Causes of project delay
Muhammad et al. (2015)	Malaysia	Springer	CIEC	Empirical	Survey	Project delay analysis
Doraisamy et al. (2015)	Malaysia	Springer	CIEC	Conceptual	Literature review	Project delay analysis.
Aziz and Abdel-Hakim (2016)	Egypt	Elsevier	Alexandria Engineering Journal	Empirical	Survey and Case study	Causes of project delay
Ekanayeka & Perera (2016)	Sri Lanka	Emerald	Built Environment Project and Asset Management	Empirical	Survey and Interview	Project delay analysis
Elawi et al. (2016)	Saudi Arabia	Elsevier	Procedia Engineering	Empirical	Case study	Causes of project delay
Kim et al. (2016)	Vietnam	Springer	KSCE Journal of Civil Engineering	Empirical	Survey and Interview	Causes of project delay
Iyer & Kumar (2016)	India	Elsevier	Procedia Engineering	Empirical	Case study	Project delay analysis
Senouci & Eldin (2016)	Qatar	Elsevier	Creative Construction Conference	Empirical	Survey	Effects of project delay
Zailani et al. (2016)	Malaysia	Emerald	Journal of Science and Technology Policy Management	Empirical	Survey	Effects of project delay
Abd El-Karim et al. (2017)	Egypt	Elsevier	HBRC journal	Empirical	Survey	Effects of project delay
Aditya et al. (2017)	India	Springer	J. Inst. Eng. India Ser. A	Conceptual	Theoretical Review	Causes of project delay
Agyekum-Mensah & Knight (2017)	UK	Emerald	Engineering, Construction and Architectural Management	Empirical	Interview	Causes of project delay
Al-Hazim et al. (2017)	Jordan	Elsevier	Procedia Engineering	Empirical	Survey	Causes of project delay
Amoatey & Ankrah (2017)	Ghana	Emerald	Journal of Facilities Management	Empirical	Survey	Causes of project delay
Chiu & Lai (2017)	Hong Kong	Taylor & Francis	Journal of Civil Engineering and Management	Empirical	Survey	Project delay analysis
Durdyev et al. (2017)	Cambodia	Taylor & Francis	Civil & Environmental Engineering	Empirical	Interview	Causes of project delay
Gebrehiweta & Luo (2017)	Ethiopia	Elsevier	Procedia Engineering	Empirical	Survey	Impact of project delay
Koirala et al. (2017)	Nepal	Taylor & Francis	Impact Assessment and Project Appraisal	Empirical	Case study	Impact of project delay
Oyegoke & Al Kiyumi (2017)	Oman	Emerald	Journal of Financial Management of Property and Construction	Empirical	Survey	Causes of project delay
Tahir et al. (2017)	Malaysia	Springer	Global Civil Engineering Conference	Empirical	Survey	Causes of project delay
Anysz & Buczkowski (2018)	Poland	Springer	International Journal of Environmental	Empirical	Survey	Project delay analysis

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			Science and Technology			
Bajjou & Chafi (2018)	Morocco	Taylor & Francis	International Journal of Construction Management	Empirical	Survey	Causes of project delay
Bilgin et al. (2018)	Turkey	Springer	KSCE Journal of Civil Engineering	Literature review	Case study	Project delay analysis
Budayan et al. (2018)	Turkey	Springer	KSCE Journal of Civil Engineering	Empirical	Survey	Project delay analysis
Mbala et al. (2018)	South Africa	Springer	International Conference on Applied Human Factors and Ergonomics	Conceptual	Literature review	Causes of project delay
Shahsavand & Parchamijalal (2018)	Iran	Emerald	Engineering, Construction and Architectural Management	Empirical	Survey and Interview	Causes of project delay
Wang & Lin (2018)	China	Taylor & Francis	Journal of Discrete Mathematical Sciences and Cryptography	Empirical	Survey	Causes of project delay
Zidane and Andersen (2018)	Norway	Emerald	International Journal of Managing Projects in Business	Empirical	Survey	Causes of project delay
Alsuliman J.A. (2019)	Saudi Arabia	Elsevier	Alexandria Engineering Journal	Empirical	Survey and Case study	Causes of project delay
Chen et al. (2019)	China	Taylor & Francis	International Journal of Construction Management	Empirical	Survey	Causes of project delay
Guida & Sacco (2019)	Italy	Elsevier	Computers & Industrial Engineering	Empirical	Case study	Project delay analysis
Hossain et al. (2019)	Kazakhstan	Taylor & Francis	International Journal of Construction Management	Empirical	Survey and Interview	Causes of project delay
Maqsoom et al. (2019)	Pakistan	Taylor & Francis	International Journal of Construction Management	Empirical	Survey	Causes of project delay
Prasad et al. (2019)	India	Emerald	Journal of Financial Management of Property and Construction	Empirical	Survey	Causes of project delay
Rachid et al. (2019)	Algeria	Taylor & Francis	International Journal of Construction Management	Empirical	Survey and Interview	Causes of project delay
Rezaee et al. (2019)	Iran	Emerald	International Journal of Managing Projects in Business	Empirical	Case study	Project delay analysis
Viles et al. (2019)	Uruguay	Emerald	Engineering, Construction and Architectural Management	Conceptual	Literature review	Causes of project delay