



# Potential Risks Occurring in Fidic Contract Construction Projects: A Literature Review

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## ABSTRACT

Most major construction projects in the world are based on standard contract conditions for international projects issued by the *Fédération Internationale des Ingénieurs-Conseils (FIDIC, or International Federation of Consulting Engineers)*, which are based on concept law rooted in the common law system. Thus, the stakeholders involved in construction projects in the World need to understand the interpretation of FIDIC provisions against a background of civil law. This literature study will explore the identification of risks that occur in international projects using FIDIC contracts. A systematic review and detailed content analysis of 30 articles selected from respected academics and relevant journals published over the past three decades was carried out. The findings of risk identification are divided into 5 namely (1) Planning and Design, (2) Construction, (3) Operations & Maintenance, (4) Political Environment and (5) Social Economic. This study trying to identify, investigate, and classify the strongest factors that are considered to influence delays in construction projects. From the results of grouping identification, it is found that the greatest risk in FIDIC construction contracts is when the construction work is caused due to the complexity of the problems at the time of the construction, whether the dispute, payment or claims of work results. Recommendations from the authors would be good for the relevant stakeholders the project uses the FIDIC contract to further study the contents of the contract to help reduce or at least minimize the risk of project delays, especially during construction.

## Keywords:

Risk identification, Fidic contract.

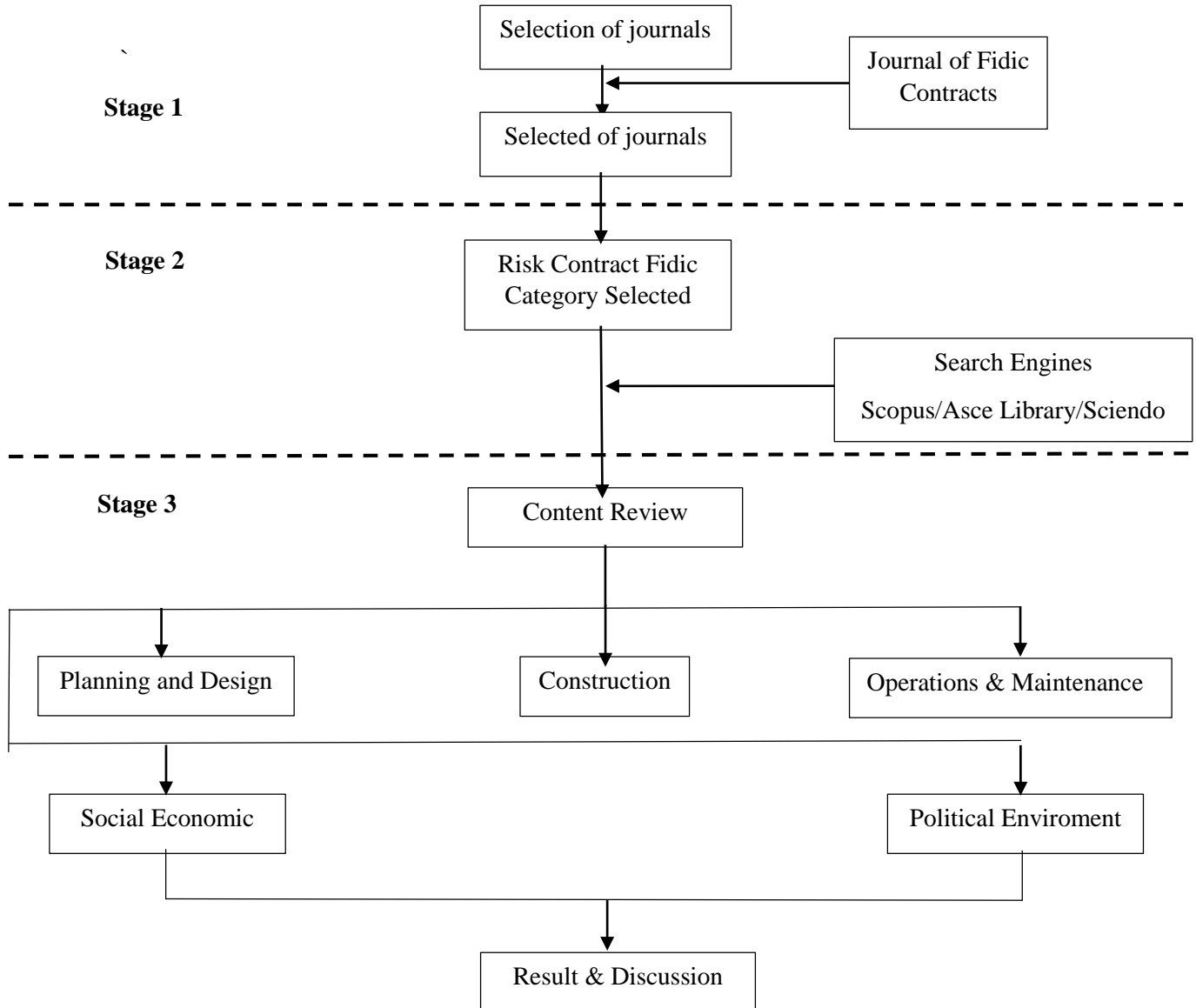


## **1. Introduction**

Construction projects are characterized by their varying degrees of uniqueness and complexity, the active involvement of multiple stakeholders, capital intensiveness, dynamic environments, long production durations, and exposure to external environment and weather conditions (Taroun 2014). Studies confirm that construction is a highly risk-prone industry because of certain distinctive characteristics of construction projects (El-Sayegh and Mansour 2015; Zeng et al. 2007). Risk classification (or categorization) is an integral part of risk identification. This helps the project team devise various and varied risks that can affect construction projects. Structured risk classifications contribute to the effectiveness and quality of the risk identification process and create a better understanding of the nature of risks and their sources (Bu-Qammaz et al. 2009). Siraj and Aminah (2019) in the study of Identification of Risks and General Risks in Construction simplified the risk categories to ten risks that commonly occur in construction, namely Management, Technical, Construction, related to resources, Site conditions, Contracts and law, Economics and financial, social, political and HSE (health and safety, environment). This paper uses the classification / category of risk to carry out risk testing in the sub-section of the contract by re-examining the risks that occur in the contract, especially in the use of international contracts FIDIC. The risk identification findings in this sub-contract section are divided into 5 covering: (1) Planning and Design; (2) Construction; (3) Operations & Maintenance; (4) Political Environment and (5) Social Economic.

## **2. Methodology**

This paper is based on a literature review from trusted sources which discusses the identification of risk and risk management in fidic contract construction projects then reviewed and synthesized to provide the latest information. A two-stage process (Fig. 1) was adopted in this paper to achieve the research objectives.



**Figure 1. Study Framework**

### 3. Result and discussion

The list of selected articles analyzed from the aspect of risk identification in the construction project is as shown in Table 1.



**Table 2. Mapping of Risk Identification in Stadium Project On Construction Phase.**

No	Articles Identity	Risk Identification					Result
		Internal			External		
		Planning And Design	Construction	Operational & Maintenance	Political Environment	Social Economic	
1.	(S. Fawzy & EL-Adaway, 2012)				√		The authors thus recommend that the Windows technique is the one to be used for delay analysis under the WB Contract and FIDIC
2.	(FIDIC and Integrity: A Status Report, 2009)				√	√	Combating corruption requires a concerted effort by everyone that is involved in projects—clients, contractors, government procurement groups, and funding agencies alike—in helping to prevent, and not just to punish.
3.	(S. A. Fawzy & El-adaway, 2012a)		√				The ConsensusDOCS 200 requires the contractor to provide written notice within 14 days. The EJCDC C700 gives a 30-day. The FIDIC 99 (and the World Bank Contract) give the contractor 28 days. The JCT requires a contractor to notify the architect/contract administrator with the causes and effects of the delay, followed by the detailed particulars of the delay. The JCT 2011 does not provide a timescale for the contractor in making his claim. Lastly, the NEC 3 requires notice to be given within 8 weeks of the delay.
4	(S. A. Fawzy, El-adaway, & Asce, 2014)		√				To avoid any misunderstanding regarding such important provisions, the authors recommend that later editions of the four contracts include an express provision that such time periods are mandatory and a condition precedent for the employer to maintain his entitlement for liquidated damages for delay.



No	Articles Identity	Risk Identification					Result
		Internal			External		
		Planning And Design	Construction	Operational & Maintenance	Political Environment	Social Economic	
5.	(El-adaway, Asce, Fawzy, Burrell, & Akroush, 2007)		√				The general contractor uses paid (or back-to-back) to subcontractors are very critical.
6.	(Barakat, Abdul-Malak, & Khoury, 2019)		√				This holistic mechanism represents an indispensable tool that directly aims at guiding contract administrators of owners in custom tailoring not only preferred claim and dispute tracking and resolution mechanisms, but also rationalized such mechanisms that can be better accepted by the concerned construction contracting organizations
7.	(Lina, 1997)		√				The dual role of the engineer should be abolished. (1) The current alternatives to the engineer are inefficient, although they look more fair. (2) My conception is to place the engineer in the neutral position from the beginning to the end of the work.
8.	(VeerasakLikhitrungsilp and Photios G. Ioannou, 2009)		√				By eliminating tunneling risk factors from contract documents can help the owner, designer and the contractor to prepare better contract documents and allocate tunneling risks fairly.
9.	(Iccrem 2016 386, 2016)	√	√	√	√	√	The purpose of the risk analysis is to strengthen control for general contractors of Chinese high-speed railway in order to reduce the losses of risks.
10.	(Asce et al., 2017)	√	√				This to recommended to be addressed within the conditions of new construction contracts around various areas in the world.



No	Articles Identity	Risk Identification					Result
		Internal			External		
		Planning And Design	Construction	Operational & Maintenance	Political Environment	Social Economic	
11.	(M.-A. Abdul-Malak & Khalife, 2017)	√	√				The importance of learning contracts
12.	(Construction Research Congress 2012 © ASCE 2012 71, 2020)		√				The recommendations serve as guidelines that mainly attend to the construction industry professionals, and specifically to those dealing with claims and their administration.
13.	(Seifert, 2005)	√	√				The Dispute Adjudication Board has succeeded where arbitration has failed, by providing expert and time saving dispute resolutions of construction disputes in a commercially efficient manner free from <i>ex post facto</i> determination.
14.	(Amarasekara, Perera, & Rodrigo, 2018)		√				It's important to consider the impact DSC and the most suitable strategy will overcome it impact on construction projects.
15.	(Construction Research Congress 2018 217, 2020)		√				DSC claims can be calculated in the contractor company's financial sheets.
16.	(Fu & Liu, 2018)		√				Two main characterizations, which relate to independence and impartiality, are concluded as overshadowing the implementation of one of these roles by the engineer concerned.
17.	(Fu & Liu, 2018)		√				By collecting problems in Big Data in a information extraction model based on a machine learning approach



No	Articles Identity	Risk Identification					Result
		Internal			External		
		Planning And Design	Construction	Operational & Maintenance	Political Environment	Social Economic	
18.	(Asce et al., 2017; S. A. Fawzy & El-adaway, 2012a)		√				The author is seeking to present further contract administration guidelines for dealing effectively and efficiently with problems claims and dispute resolution and how they are related unexpected physical conditions, employer risks, force majeure, and delay damage.
19.	(S. A. Fawzy et al., 2018b)		√		√		It is recommended to add three new sections article for ECL as well as changing the first two paragraphs Subparagraph 20.1 in FIDIC (CONS)
20.	(S. A. Fawzy et al., 2019)		√				Five recommendations were provided to amend Article 657 of ECL in relation to contract price, four suggestions were introduced as additions to delayed payment management under the Muqawala contract, and an amendment to Clause 16.2 of FIDIC (CONS) was introduced.
21.	(El-adaway, Fawzy, Allard, & Runnels, 2016)		√				All related parties contract to manage their respective rights and responsibility during handling changes / variations of orders using the most widely used national and international construction standards contract.



No	Articles Identity	Risk Identification					Result
		Internal			External		
		Planning And Design	Construction	Operational & Maintenance	Political Environment	Social Economic	
22.	(Jaworski, 2018)		√			√	FIDIC conditions of contract are particular contractual patterns originating from the <i>common law</i> system and which seem to apply in Poland despite the fact that they cannot be treated as a law, and certainly not as a domestic source of law; but only to the extent that is not in conflict with generally applicable national standards
23.	(Abotaleb & El-adaway, 2017)	√	√				Studies have shown that proper contract administration is the most effective action for avoiding disputes.
24.	(M. A. U. Abdul-Malak, Hanano, & Turman, 2019)		√				The presented findings serve to raise awareness on the part of contractors as to the critical need for conducting thorough and systematic reviews of owner-drafted contract conditions during the tendering stage.
25.	(S. A. Fawzy et al., 2018a)		√			√	Fidic Contract help minimize, as much as possible, disputes associated with and/or resulting from such provision.
26.	(Shafik, Qodsi, Serag, Ph, & Helmi, n.d.)		√				The authors recommend that the contradicting provisions presented in this paper should be clearly drafted if there exists a chance to modify the particular conditions, taking the highlighted points into consideration





No	Articles Identity	Risk Identification					Result
		Internal			External		
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27.	(S. A. Fawzy et al., 2014)		√				The authors studied the possibility of time becoming 'at large' in construction projects using the JCT DB 2011, the WB Contract, FIDIC 99, and A201
28.	(Marzouk, El-dokhmasey, & El-said, 2008)	√	√				The sources of engineering-related delays were reviewed and analyzed, describing their main categories including design development; work shop drawing preparation and/or approval; and project parties' changes.
29.	(Ndekugri, Chapman, Smith, & Hughes, 2014)	√	√				The cost of the DAB is a deterrent against its wider adoption, particularly to project owners with constrained project budgets, as would be the case for projects in most developing countries.
30.	(El-adaway et al., 2016)		√				All seven of the contracts studied by this paper maintain that the contractor is to immediately carry out the work and any changes to it as properly issued. Only JCT allows the contractor to disagree with the application of the procedure to provide quotations



#### 4. Conclusion

Contracts are part of the main consideration in the entire project management life cycle and can be considered as one of the most important parameters of a project and the driving force for the success of a project. In international scale contract construction which is often used is FIDIC. This is because the FIDIC contract, which is based on a legal concept rooted in the common law system, is the form of construction contract most widely used in the international construction market. Therefore, it is a must for the relevant stakeholders the project uses FIDIC contracts to study the impact of contract interpretations.

Delay often occurs and almost occurs in every construction work both at the design level or pre plan or at the time of construction. According to Siraj and Aminah (2019) contracts are included in the Top ten risks in each identified category. Some minimal efforts have been made and made to limit these delays, in this study trying to identify, investigate, and classify the strongest factors that are considered to influence delays in construction projects. From the results of grouping identification, it is found that the greatest risk in FIDIC construction contracts is when the construction work is caused due to the complexity of the problems at the time of the construction, whether the dispute, payment or claims of work results. Recommendations from the authors would be good for the relevant stakeholders the project uses the FIDIC contract to further study the contents of the contract to help reduce or at least minimize the risk of project delays, especially during construction.

#### 5. References

- [1]- Abdul-Malak, M. A. and Khalife, S., 2017, **Models for the Administration of Structured Construction Contract Notices**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 9(3), 04517017. [https://doi.org/10.1061/\(asce\)la.1943-4170.0000228](https://doi.org/10.1061/(asce)la.1943-4170.0000228)
- [2]- Abdul-Malak, M. A. U., Hanano, H. F., and Turman, H. M., 2019, **Administration Impairments Resulting from Imbalanced Contract Conditions: Owner Payment Default**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 11(4), 1–14. [https://doi.org/10.1061/\(ASCE\)LA.1943-4170.0000321](https://doi.org/10.1061/(ASCE)LA.1943-4170.0000321)
- [3]- Abotaleb, I. S., and El-adaway, I. H., 2017, **Administering Employers' Payment Obligations under National and International Design-Build Standard Forms of Contract**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 9(2), 04517003. [https://doi.org/10.1061/\(asce\)la.1943-4170.0000213](https://doi.org/10.1061/(asce)la.1943-4170.0000213)
- [4]-Amarasekara, W. D. L., Perera, B. A. K. S., and Rodrigo, M. N. N., 2018, **Impact of Differing Site Conditions on Construction Projects**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 10(3), 1–10. [https://doi.org/10.1061/\(ASCE\)LA.1943-4170.0000257](https://doi.org/10.1061/(ASCE)LA.1943-4170.0000257)
- [5]- Hosny, A. M., and Waly, A. F., 2017, **Particular Conditions to Cover Potential Risks of Construction Projects**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 9(3), [https://doi.org/10.1061/\(ASCE\)LA.1943-4170.0000223](https://doi.org/10.1061/(ASCE)LA.1943-4170.0000223).
- [6]-Barakat, M., Abdul-Malak, M. A., and Khoury, H., 2019, **Sequencing and Operational Variations of Standard Claim and Dispute Resolution Mechanisms**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 11(3), 1–15. [https://doi.org/10.1061/\(ASCE\)LA.1943-4170.0000304](https://doi.org/10.1061/(ASCE)LA.1943-4170.0000304)



- [7]-Construction Research Congress 2012 © ASCE 2012 11. (2012). (3), 11–20.
- [8]-Construction Research Congress 2012 © ASCE 2012 71. (2020). 71–79.
- [9]-Construction Research Congress 2018 217. (2020). (2), 217–226.
- [10]-El-adaway, I., M., Fawzy, S., Burrell, H., and Akroush, N., 2007, **Studying Payment Provisions under National and International Standard Forms of Contracts.**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 4, 1–10. [https://doi.org/10.1061/\(ASCE\)LA.1943-4170.0000200](https://doi.org/10.1061/(ASCE)LA.1943-4170.0000200).
- [11]-El-adaway, I., Fawzy, S., Allard, T., and Runnels, A., 2016, **Change Order Provisions under National and International Standard Forms of Contract**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 8(3), 03716001. [https://doi.org/10.1061/\(asce\)la.1943-4170.0000187](https://doi.org/10.1061/(asce)la.1943-4170.0000187)
- [12]-El-adaway, I., Fawzy, S., M., Ahmed, M., and White, R.2016, **Administering Extension of Time under National and International Standard Forms of Contracts: A Contractor's Perspective**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction 1–14. [https://doi.org/10.1061/\(ASCE\)LA.1943-4170.0000182](https://doi.org/10.1061/(ASCE)LA.1943-4170.0000182).
- [13]-Fawzy, S. A., and El-adaway, I. H., 2012a, **Contract Administration Guidelines for Managing Conflicts, Claims, and Disputes under World Bank–Funded Projects**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction. [https://doi.org/10.1061/\(asce\)la.1943-4170.0000091](https://doi.org/10.1061/(asce)la.1943-4170.0000091)
- [14]-Fawzy, S. A., and El-adaway, I. H., 2012b, **Contract Administration Guidelines for U . S . Contractors Working under World Bank–Funded Projects. 1987(May)**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 40–50. [https://doi.org/10.1061/\(ASCE\)LA.1943-4170.0000088](https://doi.org/10.1061/(ASCE)LA.1943-4170.0000088).
- [15]-Fawzy, S. A., and El-adaway, I. H., 2013, **Contract Administration Guidelines for Effectively and Efficiently Applying Different Delay Analysis Techniques under World Bank–Funded Projects**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 5(1), 35–44. [https://doi.org/10.1061/\(asce\)la.1943-4170.0000104](https://doi.org/10.1061/(asce)la.1943-4170.0000104)
- [16]-Fawzy, S. A., El-adaway, I. H., Perreau-saussine, L., Wahab, M. S. A., and Hamed, T. H., 2018a, **Analyzing Termination for Convenience Provisions under Common Law FIDIC Using a Civil Law Perspective**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 10(4), 2–7. [https://doi.org/10.1061/\(ASCE\)LA.1943-4170.0000279](https://doi.org/10.1061/(ASCE)LA.1943-4170.0000279).
- [17]-Fawzy, S. A., El-adaway, I. H., Perreau-saussine, L., Wahab, M. S. A., and Hamed, T. H., 2018b, **Claims for Extension of Time and Additional Payment under Common Law FIDIC : Civil Law Analysis**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 10(4), 1–13. [https://doi.org/10.1061/\(ASCE\)LA.1943-4170.0000276](https://doi.org/10.1061/(ASCE)LA.1943-4170.0000276).
- [18]-Fawzy, S. A., El-adaway, I. H., Perreau-saussine, L., Wahab, M. S. A., and Hamed, T. H., 2019, **Civil Law Context for Understanding Employer ' s Payment Obligations under Common Law FIDIC**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction 11(1), 1–15. [https://doi.org/10.1061/\(ASCE\)LA.1943-4170.0000285](https://doi.org/10.1061/(ASCE)LA.1943-4170.0000285).
- [19]-Fawzy, S. A., El-adaway, I. H., M., 2014, **Time At Large within the Common Law Legal System : Application to Standard Forms of Contract**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 1–8. [https://doi.org/10.1061/\(ASCE\)LA.1943-4170](https://doi.org/10.1061/(ASCE)LA.1943-4170)



- [20]- Fawzy, S., and El-Adaway, I., 2014, **Application of the time “at large” principle to standard forms of contract. Construction Research Congress 2014: Construction in a Global Network**, Proceedings of the 2014 Construction Research Congress, 1418–1427. <https://doi.org/10.1061/9780784413517.0145>
- [21]-Fawzy, S., and EL-Adaway, I., 2012, **Applying delay analysis techniques to the World Bank funded projects. Construction Research Congress 2012: Construction Challenges in a Flat World**, Proceedings of the 2012 Construction Research Congress. <https://doi.org/10.1061/9780784412329.002>
- [22]- FIDIC and Integrity, 2009, **A Status Report**, 125–128.
- [23]-Fu, M., and Liu, R., 2018, **Construction Research Congress 2018**, Proceeding of Construction Research Congress 2018, 429–438. <https://doi.org/10.1213/01.ANE.0000149897.87025.A8>
- [24]-Iccrem, 2016, 86–397.
- [25]-Jaworski, B., 2018, **Applying the 20.1 Sub-Clause of the Fidic Conditions of Contract under Standards of Polish Civil Law**, Wroclaw Review of Law, Administration & Economics, 7(2), 14–23. <https://doi.org/10.1515/wrlae-2018-0014>
- [26]-Lee, J., Yi, J. S., and Son, J., 2019, **Development of Automatic-Extraction Model of Poisonous Clauses in International Construction Contracts Using Rule-Based NLP**, Journal of Computing in Civil Engineering, 33(3), 1–13. [https://doi.org/10.1061/\(ASCE\)CP.1943-5487.0000807](https://doi.org/10.1061/(ASCE)CP.1943-5487.0000807)
- [27]-Lina, B. C., 1997, **Role of engineering under Fidic Form Contract.**, 48–50.
- [28]-Marzouk, M., El-dokhmasey, A., and El-said, M., 2008, **Assessing Construction Engineering-Related Delays**, 315–326.
- [29]-Ndekugri, I., Chapman, P., Smith, N., and Hughes, W., 2014, **Best Practice in the Training , Appointment , and Remuneration of Members of Dispute Boards for Large Infrastructure Projects**. Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 185–193. [https://doi.org/10.1061/\(ASCE\)ME.1943-5479.0000195](https://doi.org/10.1061/(ASCE)ME.1943-5479.0000195).
- [30]- Construction Research Congress Copyright, 2009, **Risk Allocation in Standard Forms of Copyright**, ASCE 2009 Construction Research Congress, 1250–1259.
- [31]-Seifert, B. M., 2005, **International Construction Dispute Adjudication under International Federation of Consulting Engineers Conditions of Contract and the Dispute Adjudication Board**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 131(2), 149–157.
- [32]-Shafik, N., Qodsi, S., Serag, E., and Helmi, M., 2006, **Application of FIDIC Contracts under the Egyptian Civil Code**, Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 1–9. [https://doi.org/10.1061/\(ASCE\)LA.1943-4170.0000193](https://doi.org/10.1061/(ASCE)LA.1943-4170.0000193).
- [33]-Technology, N., 2014, **The Evaluation Index System for the Experience That “Experienced Contractors, Should Have**, 61–67.