

The root cause of claims and disputes in construction industry and solution analysis^{1, 2}

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ABSTRACT

Globalization has entered a new age in which the entire world is inextricably linked. Countless transnational trade is carried out every day, while numerous contracts are signed every day, and a EPC contracting is the main modality. However, trade frictions and trade disputes may cause various problems because of the differences between buyers and sellers and may eventually damage the interests of one or both parties. Hence, to settle the claims and disputes in international project management admits of no delay.

This paper focus on two research questions to address the above issues: the root causes of claims and disputes in construction; and to explore the best options by some analyzing techniques and methodologies. Such as to provide feasible alternatives (prevention, negotiation, standing neutral, non-binding solution, private binding solution, litigation) to deal with them. Then by evaluating through Fish bone Diagrams, Pair-wise comparison method, non-comparison model, non-dimensional data technique, rank table as well as Pareto Analysis to achieve the objective of choosing the best and eliminating the worst.

Therefore, throughout all the analysis we found that prevention is the best alternative solution and we eliminated negotiation and litigation.

Keywords: EPC contracting; contract; contractor; dispute; cause; project management; risk; solution; disagreement

INTRODUCTION

Throughout the world, dispute is inevitable in the construction domain. “In 2016, the average value of construction disputes stood at 42.8 million U.S. dollars. A dispute was defined as a

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situation where two parties differ in the assertion of a contractual right.”³ The causes are numerous mainly caused by what happened on site between the parties. All the project management team are challenged by the risk of dispute from the initiating to the closing stage of a project. It does not matter that how exhausting the planning is, uncertainty are always happen during the execution stage of a project. So many parties are involved, owners, contractors, subcontractors, “there are always different between the parties and it exist so many opportunities for a disagreement.”⁴

The EPC mode is a common project management model for engineering. Under normal circumstances, the owner strictly controls the contract price standard of the project, and the “project design, procurement and construction”⁵ are fully contracted to the contractor. The contractor is responsible for the contracting of the whole process of design, procurement and construction of the project. Under the EPC project management model, the contractor of the project needs to bear responsibility for all aspects of the project, such as project design, material procurement, construction progress, quality, safety control and so on. Using the EPC project contracting model, the engineering contractor can use its own advantages to coordinate and manage the project overall, “control project costs and schedules, so as to achieve maximum economic and social benefits with minimum investment, and achieve the goal of achieving maximum corporate value.”⁶ The EPC contracting mode is also an effective means for project owners to control engineering risks and ensure project benefits.

Indeed, as an “important element of any country’s infrastructure and industrial growth, construction industry has faced an intense period in many countries”⁷ such as China and India, particularly in to improve the performance and productivity. In addition to the most 3 important elements: time, cost, quality, other factors such as rework, variations, incorrect design and incomplete documentation, late authority approvals are must to be taken into consideration of the new project managers. The leading causes of claims and disputes mainly come from the following 4 aspects: “Construction technique related causes; Financial/Economical causes; management related causes; Contract related causes”⁸. As mentioned in the previous paragraph, the management of sub-contractor is a fatal element for the success of a project. To resolve all the sub issues may quite effective. Essentially, if the claims and disputes can be

³ Statista. (n.d). U.S. Construction Industry - Statistics & Fact. Retrieved from <https://www.statista.com/statistics/731826/global-construction-dispute-values/>

⁴ What are the most common causes of construction disputes? Retrieved from <https://www.wrightgreenhill.com/blog/2017/05/what-are-the-most-common-causes-of-construction-disputes.shtml>

⁵ Engineering, procurement, and construction Retrieved from https://en.wikipedia.org/wiki/Engineering,_procurement,_and_construction

⁶ The characteristic of EPC contracting Retrieved from <https://wenku.baidu.com/view/54f24efb0b4e767f5bcfcea8.html>

⁷ A REVIEW ON CAUSES OF DISPUTES IN CONSTRUCTION INDUSTRY Retrieved from http://ijaresm.net/Pepar/VOLUME_1/ISSUE_4/12.pdf

⁸ A REVIEW ON CAUSES OF DISPUTES IN CONSTRUCTION INDUSTRY Retrieved from http://ijaresm.net/Pepar/VOLUME_1/ISSUE_4/12.pdf

reduced by improving “workflow management”⁹, by perfecting the “documentation detail management”¹⁰, by perfecting system, by “changing behaviors”¹¹, the productivity can have a significantly increase.

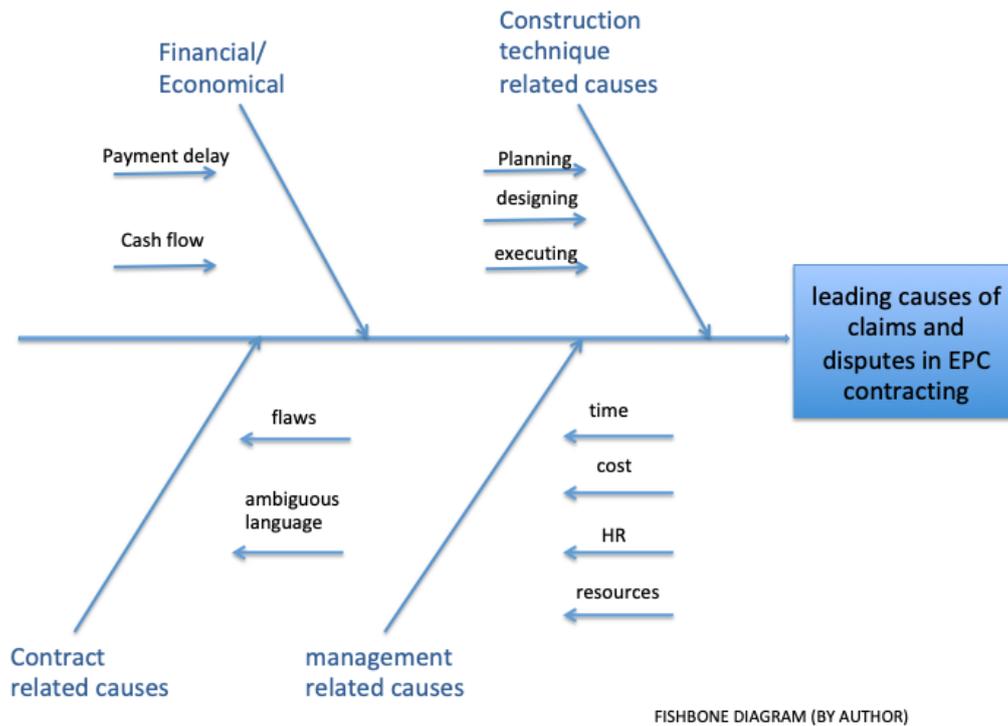


Figure 1: Fishbone Diagram Showing Leading Causes of Construction Claims¹²

Therefore, the purpose of the research and analysis in this paper is to develop and answer the following questions:

1. The root causes of claims and disputes in construction;
2. The best options to address those claims and disputes

METHODOLOGY

⁹ A REVIEW ON CAUSES OF DISPUTES IN CONSTRUCTION INDUSTRY Retrieved from http://ijaresm.net/Pepar/VOLUME_1/ISSUE_4/12.pdf

¹⁰ A REVIEW ON CAUSES OF DISPUTES IN CONSTRUCTION INDUSTRY Retrieved from http://ijaresm.net/Pepar/VOLUME_1/ISSUE_4/12.pdf

¹¹ A REVIEW ON CAUSES OF DISPUTES IN CONSTRUCTION INDUSTRY Retrieved from http://ijaresm.net/Pepar/VOLUME_1/ISSUE_4/12.pdf

¹² By Author

Step 1: Summarize

As the huge losses caused by the emerge of claims and disputes in EPC contracting, while the study of this article, the author practices Dominance method as the principal methodology to definite and evaluate the problems, in order to find the best way to avoid the emergence of such losses. "The dominance method is one of the Multi-Attribute Decision Making (MADM) methods can be used to address issues that involve a finite and discrete set of alternative policies, which was evaluated from conflicting objectives."¹³ This method indicates one or more alternatives which perform better than others to all criteria matched. It bases the eliminating solely on the criteria rates.

Step 2: Feasible Alternatives

All the stakeholders concerned need to make sure that all feasible alternatives are explored to avoid new issues, before any decision requiring the displacement of contract. In the international construction industry, the event of a party default or expected default, the aggrieved party shall take reasonable measures to avoid all kinds of loss. Considering the work background of EPC contracting, we will list and analysis some effective ways among the principal recommendations of actions as the alternative solutions for the risks of the occurrence of claims and disputes. Because of the claims and disputes, including the other causes to accomplish the project successfully, which can lead to the breach of contract and shall bear the corresponding liability for breach of contract which according to the provisions of agreement of the provisions of laws and administrative regulations.

The feasible alternatives solutions which can be implement in EPC contracting projects are as below, as the most six common methods:

1) Prevention¹⁴

This stage is vital for claims and disputes. Imaging that if the project stakeholders can prevent before issues have been arised and this absolutely a perfect management technique for all kinds of business. Good risk allocation incentives are indispensable in project management. "Clear written contract, a commitment to act in good faith, cooperation to achieve the objectives, open communication, well **documented and** planned negotiation"¹⁵

2) Negotiation¹⁶

¹³ Dominance method, retrieved from http://www.ivm.vu.nl/en/Images/MCA7_tcm234-161533.pdf

¹⁴ Adapted from The Handbook of Conflict Resolution: Theory and Practice 3rd Edition, 2014, Coleman, Deutsch & Marcus Retrieved from <http://www.planningplanet.com/guild/gpccar/formal-disputes-resolution>

¹⁵ Joanne Staugas (January-2002) - Strategies for dispute prevention and management in commercial arrangements - Vol 4 no 9. Retrieved from: <https://epublications.bond.edu.au/cgi/viewcontent.cgi?article=1169&context=adr>

¹⁶ Adapted from The Handbook of Conflict Resolution: Theory and Practice 3rd Edition, 2014, Coleman, Deutsch & Marcus Retrieved from <http://www.planningplanet.com/guild/gpccar/formal-disputes-resolution>

“The project manager is the one who takes responsibility for negotiating time, cost, and quality”¹⁷. There are some basic points can be used as the principle approach to negotiate:

Negotiators should see the people who attacking the problems separately. It should focus more on interests but not on positions or other things. Your positions means what you want and why you want them. And the best options are those for mutual gain. The disputes came out from different interests, “there may be bargaining outcomes that will advance the interests of both”¹⁸.

3) **Standing neutral**¹⁹

It is widely applied when the case is composed of complicated scientific or technical issues, neutral third parties experts can filter out confusing information and provide a more reasonable case summary to the controversy.

4) **Non-binding solution**²⁰

This alternative’s point is mediation and mini trial. A trained mediator turned to be very helpful for the disputants when negotiations break down. “Unlike an arbitrator or a judge, the mediator cannot impose a settlement on the parties”²¹. A mediator is much more like a stimulator, who can discuss and compromise, supporting the parties to reach their own agreement. “A Mini-Trial is a voluntary, confidential and non-binding procedure.”²²

5) **Private binding solution**²³

Private means private judge, in construction industry, the issues of law must be decided and to reach resolution. “The concept is to retain the services of a retired judge who is experienced with construction litigation”.²⁴

¹⁷ Alternative Dispute resolution in the Construction Process: A course of study for construction managers Retrieved from <http://www.dtic.mil/dtic/tr/fulltext/u2/a204220.pdf>

¹⁸ Alternative Dispute resolution in the Construction Process: A course of study for construction managers Retrieved from <http://www.dtic.mil/dtic/tr/fulltext/u2/a204220.pdf>

¹⁹ Adapted from The Handbook of Conflict Resolution: Theory and Practice 3rd Edition, 2014, Coleman, Deutsch & Marcus Retrieved from <http://www.planningplanet.com/guild/gpccar/formal-disputes-resolution>

²⁰ Adapted from The Handbook of Conflict Resolution: Theory and Practice 3rd Edition, 2014, Coleman, Deutsch & Marcus Retrieved from <http://www.planningplanet.com/guild/gpccar/formal-disputes-resolution>

²¹ Alternative Dispute resolution in the Construction Process: A course of study for construction managers <http://www.dtic.mil/dtic/tr/fulltext/u2/a204220.pdf>

²² GUILD OF PROJECT CONTROLS COMPENDIUM and REFERENCE; Retrieved from <http://www.planningplanet.com/guild/gpccar/formal-disputes-resolution>

²³ Adapted from The Handbook of Conflict Resolution: Theory and Practice 3rd Edition, 2014, Coleman, Deutsch & Marcus Retrieved from <http://www.planningplanet.com/guild/gpccar/formal-disputes-resolution>

²⁴ GUILD OF PROJECT CONTROLS COMPENDIUM and REFERENCE Retrieved from <http://www.planningplanet.com/guild/gpccar/formal-disputes-resolution>

6) Litigation²⁵

The advantages of litigation are: normally the arbitrators are experts in the domain, hence, they do not need the complicated detailed explanations in terms of technical; “the decision of the arbitrator is final”²⁶.

In order to assess the above 6 alternatives, we need to set a list of attributes which can rank the options. Then we choose some of them which are the most important elements to measure the situation of an EPC project.

A. The impact on benefits.

Parties are likely to submit disputes to arbitration. Nowadays, owners and contractors are likely more and more to submit claims and disputes without international litigation.

B. “Effectiveness”²⁷

“The success of international arbitration can be explained by several major advantages it offers in comparison with litigation, especially litigation in foreign courts.”²⁸

C. “Principal feature: party autonomy. Arbitration is, indeed, a creature of contract and can be fashioned by parties in many ways.”²⁹

D. “Freedom to Choose a Neutral and Competent Decision maker”³⁰

A very valuable features of international arbitration is the ability of the parties to choose their arbitral tribunal to ensure that their disputes are heard by courts they trust. They consider these disputes to be independent, impartial and competent in the relevant subject.

E. Duration

Time is money, this golden rule is suitable for almost all kinds of project particularly for construction projects. The time which were spent on the resolving issues is surely a key performance to be measured.

²⁵ Adapted from The Handbook of Conflict Resolution: Theory and Practice 3rd Edition, 2014, Coleman, Deutsch & Marcus Retrieved from <http://www.planningplanet.com/guild/gpcar/formal-disputes-resolution>

²⁶ Alternative Dispute resolution in the Construction Process: A course of study for construction managers Retrieved from <http://www.dtic.mil/dtic/tr/fulltext/u2/a204220.pdf>

²⁷ Proskauer on International Litigation and Arbitration: Managing, Resolving, and Avoiding Cross-Border Business or Regulatory Disputes Retrieved from <https://www.proskauerguide.com/arbitration/19/I>

²⁸ Proskauer on International Litigation and Arbitration: Managing, Resolving, and Avoiding Cross-Border Business or Regulatory Disputes Retrieved from <https://www.proskauerguide.com/arbitration/19/I>

²⁹ Proskauer on International Litigation and Arbitration: Managing, Resolving, and Avoiding Cross-Border Business or Regulatory Disputes Retrieved from <https://www.proskauerguide.com/arbitration/19/I>

³⁰ Proskauer on International Litigation and Arbitration: Managing, Resolving, and Avoiding Cross-Border Business or Regulatory Disputes Retrieved from <https://www.proskauerguide.com/arbitration/19/I>

F. “Cost”³¹

Contemporarily, International arbitration process became more and more complex consequently expensive. Logically, to well control the cost is almost as important as the duration for all the disputes.

G. Confidentiality³²

When claims and disputes emerge, the first reaction of the project management team is to keep it confidential against the public. They attempt to find a resolution before it produces impact on the project.

H. Ability to Select Place and Language of the Arbitration³³

Normally the parties need to take into account how arbitration-friendly the chosen location and preferable agree on one language.

I. Flexibility of Process³⁴

The litigation process normally under the rules of procedures, they may too detailed or intricate which may lead to time-consuming. Thus, the flexibility of process has advantage in solving problems.

J. Limited Discovery³⁵

This is very rare in practice, however, in this paper we will not take this attribute into our rank analysis.

K. Absence of Appeal

In the majority situation, arbitral awards in international environment is terminal, it is rarely with the possibility to appeal.

³¹ Proskauer on International Litigation and Arbitration: Managing, Resolving, and Avoiding Cross-Border Business or Regulatory Disputes Retrieved from <https://www.proskauerguide.com/arbitration/19/I>

³² Proskauer on International Litigation and Arbitration: Managing, Resolving, and Avoiding Cross-Border Business or Regulatory Disputes Retrieved from <https://www.proskauerguide.com/arbitration/19/I>

³³ Proskauer on International Litigation and Arbitration: Managing, Resolving, and Avoiding Cross-Border Business or Regulatory Disputes Retrieved from <https://www.proskauerguide.com/arbitration/19/I>

³⁴ Proskauer on International Litigation and Arbitration: Managing, Resolving, and Avoiding Cross-Border Business or Regulatory Disputes Retrieved from <https://www.proskauerguide.com/arbitration/19/I>

³⁵ Proskauer on International Litigation and Arbitration: Managing, Resolving, and Avoiding Cross-Border Business or Regulatory Disputes Retrieved from <https://www.proskauerguide.com/arbitration/19/I>

L. Enforceability

It will be seen as universal in this paper.

M. “Potential Need for Court Intervention”³⁶

The fact is that once the tribunal for each arbitral has been constituted, a party could have right to recourse, but impossible to choose.

N. “Arbitrators Inability to Consolidate Actions or Join Third Parties”³⁷

Due to the consensus of arbitration, arbitrators normally cannot have consolidated action without mutual consent.

Step 3: Development of outcomes

According to the description of the attributes in step 2, we will choose the attributes which can represent typically the attributes’ nature, as below:

The listed 14 attributes can evaluate the will of both parties to resolve disputes in a certain way. To assess those 14 attributes and rank them from best to worst we are going to use a **non-compensatory model** based on a disjunctive reasoning. This method “take a look at all the attributes and conduct a Pair-Wise comparison to determine which attributes are the most important by asking “which is more important?” and give a score of 1 to the winning option and a score of 0 to the losing option”.³⁸

³⁶ Proskauer on International Litigation and Arbitration: Managing, Resolving, and Avoiding Cross-Border Business or Regulatory Disputes Retrieved from <https://www.proskauerguide.com/arbitration/19/I>

³⁷ Proskauer on International Litigation and Arbitration: Managing, Resolving, and Avoiding Cross-Border Business or Regulatory Disputes Retrieved from <https://www.proskauerguide.com/arbitration/19/I>

³⁸ Sullivan, Wickes & Kroelling (2014) [Engineering Economics](http://www.planningplanet.com/guild/gpccar/managing-change-the-owners-perspective) 15th Edition, Using the approach. Retrieved from: <http://www.planningplanet.com/guild/gpccar/managing-change-the-owners-perspective>

	Arbitrators' Inability to Consolidate Actions	Potential Need for Court Intervention	Enforceability	Absence of Appeal	Limited Discovery	Flexibility of Process	Ability to Select Place and Language of the Arbitration	Confidentiality	Cost	Duration	Freedom to choose a neutral and competent decision maker	Principal feature	Effectiveness	The impact on benefits of project	Ordinal ranking
The impact on benefits of project	0	0	0	1	0	1	0	1	0	0	0	1	1	5	
Effectiveness	0	0	0	0	1	1	0	1	1	1	0	0	1	6	
Principal feature	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
Freedom to choose a neutral and competent decision maker	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
Duration	0	1	1	0	0	1	0	0	1	1	0	1	1	7	
Cost	1	0	1	0	1	1	0	0	1	0	0	0	0	4	
Confidentiality	0	1	1	0	0	0	0	1	0	0	1	1	0	5	
Ability to Select Place and Language of the Arbitration	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
Flexibility of Process	0	1	0	0	0	1	0	0	0	1	0	1	0	3	
Limited Discovery	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
Absence of Appeal	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
Enforceability	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
Potential Need for Court Intervention	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
Arbitrators' Inability to Consolidate Actions or Join Third Parties	1	0	0	0	0	0	0	0	0	0	0	0	0	0	

Figure 2: Pair-wise comparison of attributes³⁹

Thus, we get the results as there are 6 attributes: **Duration/Cost/Effectiveness/The impact on benefits of project/Confidentiality/Flexibility of Process/** gained high score, in contrast, the other 8 attributes with 0 score will automatically eliminated from our following analysis steps.

The above assessment method illustrates that the best attributes is the duration among the alternative used, which is following by the Effectiveness. The lowest attribute is the flexibility of process.

Step 4. Selection Criteria

Thus, “we can see the multi-attribute decision making model based on a qualitative analysis to compare the attributes to the alternatives solution”⁴⁰ proposed in order to highlight the best option possible.

³⁹ By Author

⁴⁰ Sullivan, Wickes & Kroelling (2014) [Engineering Economics](#) 15th Edition, Then the second step is to calculate the relative weighting of each attribute. Retrieved from: <http://www.planningplanet.com/guild/gpccar/managing-change-the-owners-perspective>

We indicate 3 colors in this model:

Blue=good
 Purple=medium
 Red=weak/bad

	Prevention	Negotiation	Standing neutral	Non-binding solution	Private binding solution	Litigation
Cost	high	low	Medium	Medium	low	low
Duration	Long	weak	low	weak	weak	weak
Effectiveness	Medium	weak	Medium	high	Medium	high
The impact on benefits of project	Strong	Medium	low	weak	weak	weak
Confidentiality	high	weak	Medium	Medium	weak	Medium
Flexibility of process	Medium	high	high	weak	high	weak

Figure 3: Pair-wise comparison of attributes⁴¹

And we can weight each attribute by using the following table:

⁴¹ By Author

	Prevention	Negotiation	Standing neutral	Non-binding solution	Private binding solution	Litigation
Cost	1	0	0.6	0.6	1	0
Duration	1	0	1	1	0.5	0.5
Effectiveness	0.3	1	0.7	0	0.5	0.7
The impact on benefits of project	1	0.3	1	0.3	0.5	0
Confidentiality	1	1	0.6	0.4	0	0.8
Flexibility of process	1	0	0	1	1	0
Total	5.3	2.3	3.9	3.3	3.5	2

Figure 4: Matrix analysis, non-comparison method⁴²

It is clear that Litigation got the lowest score and Prevention got the best assessment, according to the assessment results. It significantly needs to consume more resources, to the contrary, it did not produce the best performance. With studying illustrates that the attributes which are less than 3.5 should be taken over from the best options and can be eliminated. Thus, standing neutral is a less better option because of the non-flexibility of this method, private bonding solution also considered as a less better solution as its low performance in terms of confidentiality.

Based on all the terms what discussed and the analysis, there are several suggestions are discussed in the above paragraph and the following parts will analysis all of these.

FINDINGS

Step 5: Analysis and Comparison of the Alternatives

In this step, we will use the “additive weighting technique”⁴³ which can rank the alternatives by

⁴² By Author

⁴³ Sullivan, Wickes & Kroelling (2014) *Engineering Economics* 15th. Adaptation from planning planet. Retrieved from: <http://www.planningplanet.com/guild/gpccar/managing-change-the-owners-perspective>

comparing the weight of the attributes with the weight of the alternative. Following the decision making process of our study, two alternatives between the 6 were supposed to be eliminated: litigation and negotiation. We can concentrate on the four remaining alternatives.

	Step 1	Step 2	Prevention		Negotiation		Standing neutral		Non-binding solution		Private binding solution		Litigation	
	Relative ranking	Normalized weight(A)	(B)	(A)*(B)	(C)	(A)*(C)	(D)	(A)*(D)	(E)	(A)*(E)	(F)	(A)*(F)	(G)	(A)*(G)
Cost	0	0.1	1	0.1	0	0	0.6	0.06	0.6	0.06	1	0.1	0	0
Duration	1	0.2	1	0.2	0	0	1	0.2	1	0.2	0.5	0.1	0.5	0.1
Effectiveness	4	0.4	0.3	0.12	1	0.4	0.7	0.28	0	0	0.5	0.2	0.7	0.28
The impact on benefits of project	2	0.2	1	0.2	0.3	0.06	1	0.2	0.3	0.06	0.5	0.1	0	0
Confidentiality	2	0.2	1	0.2	1	0.2	0.6	0.12	0.4	0.08	0	0	0.8	0.16
Flexibility of process	3	0.3	1	0.3	0	0	0	0	1	0.3	1	0.3	0	0
Total	12	1.2	1.12		0.66		0.86		0.7		0.8		0.54	

Figure 5: Additive weighting technique⁴⁴

Thus, the above table illustrates that Prevention remains as the best alternative to resolve the disputes in EPC contracting management, which is followed by standing neutral and private binding solution. Nevertheless, litigation always show the lowest impact on this study in comparing with the other alternatives.

Step 6: Selection of the Preferred Alternative

Now we are going to rank the best alternatives to the worst:

⁴⁴ By Author

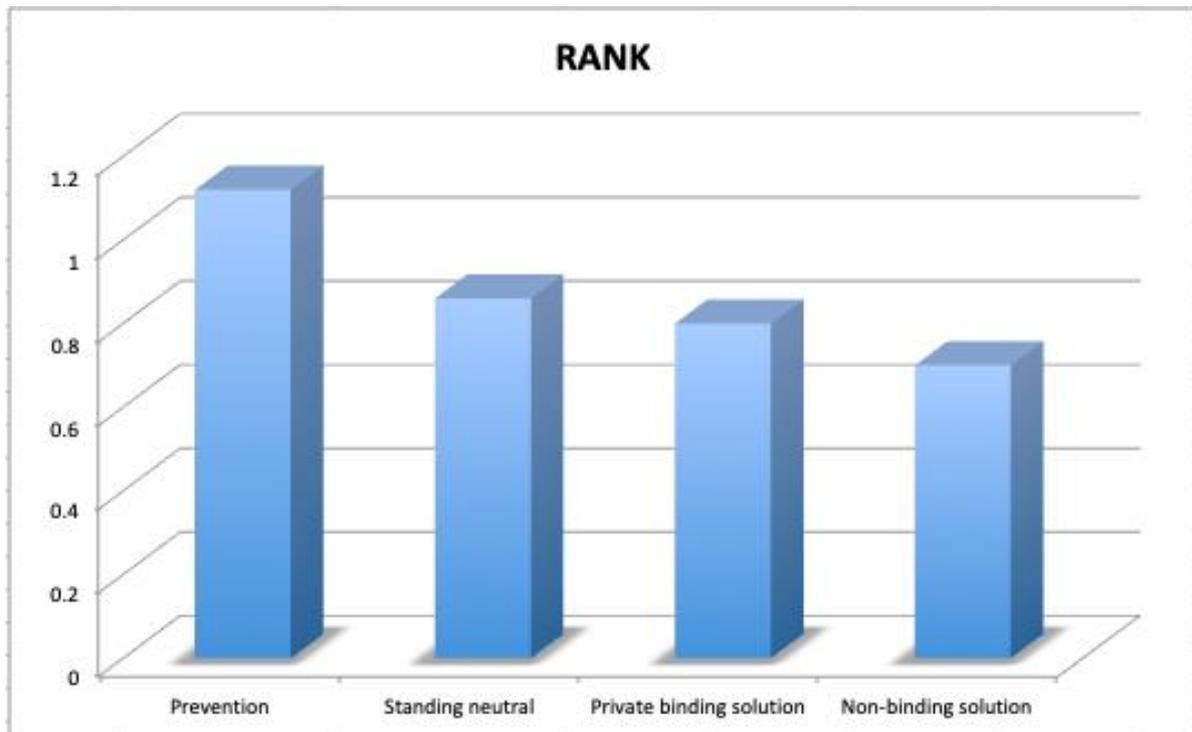


Figure 6: Rank table ⁴⁵

Based on our previous analysis and study in step 5, the negotiation alternative has been taken over, even if it was effective at the “dispute control stage” ⁴⁶. As summarized, we can know that prevention is the most feasible and effective alternative for both parties of contract to reduce claims and disputes.” The Construction Industry Institute (CII) conducted a survey of over 200 construction industry professionals on their attitudes about contract disputes and litigation. The **key causes of contract** disputes involve **imprecise contracts or inadequate communication** between the contracting parties.”⁴⁷ As we know the key cause, then we can know that the best resolution should be to prevent the issues before it occurs.

Thereby, the best alternative option is prevention, which is followed by standing neutral, private binding solution, non-binding solution. It is not necessary to verified those 4 alternatives, they are cost and saving to resolve the claims and disputes.

Old proverb said: an ounce of prevention is better than a pound of cure. It is really true when it comes to contracting management. “Unnecessary problems should be prevented at the source, and many can be.”⁴⁸ Once the project process has begun, if the work has been interrupted or

⁴⁵ By Author

⁴⁶ GUILD OF PROJECT CONTROLS COMPENDIUM and REFERENCE. Retrieved from <http://www.planningplanet.com/guild/gpccar/formal-disputes-resolution>

⁴⁷ Construction industry attitudes toward disputes and prevention/resolution techniques Retrieved from : <https://www.pmi.org/learning/library/construction-industry-attitudes-disputes-prevention-2032>

⁴⁸ An ounce of prevention--contracting for project success and problem prevention, retrieved from: <https://www.pmi.org/learning/library/contracting-project-success-problem-prevention-7258>

delayed, without doubt it comes along with serious cost consequences. In the construction business especially, “time is money.” Prevention is a solution which can prevent many problems at the first time, it can develop different opinions into controversy, and can control disagreements. Especially in EPC contracting projects, with so many suppliers and subcontractors, the well management of the interfaces among them is essential.

Step 7: Performance Monitoring and Post-evaluation of Results

So far, we are going to conduct a Pareto analysis which can justify the effect of prevention impacts resulting from a dispute. Pareto diagrams, also known as permutations, are sorted by the frequency of events, showing the number of defects or inconsistent sequence due to various reasons, and is the main way to find out the main factors affecting the quality of a project's products or services. That is, 20% of the causes cause 80% of the problems. By using Pareto analysis, we can see the impact on disputes with and without our best alternative respectively.

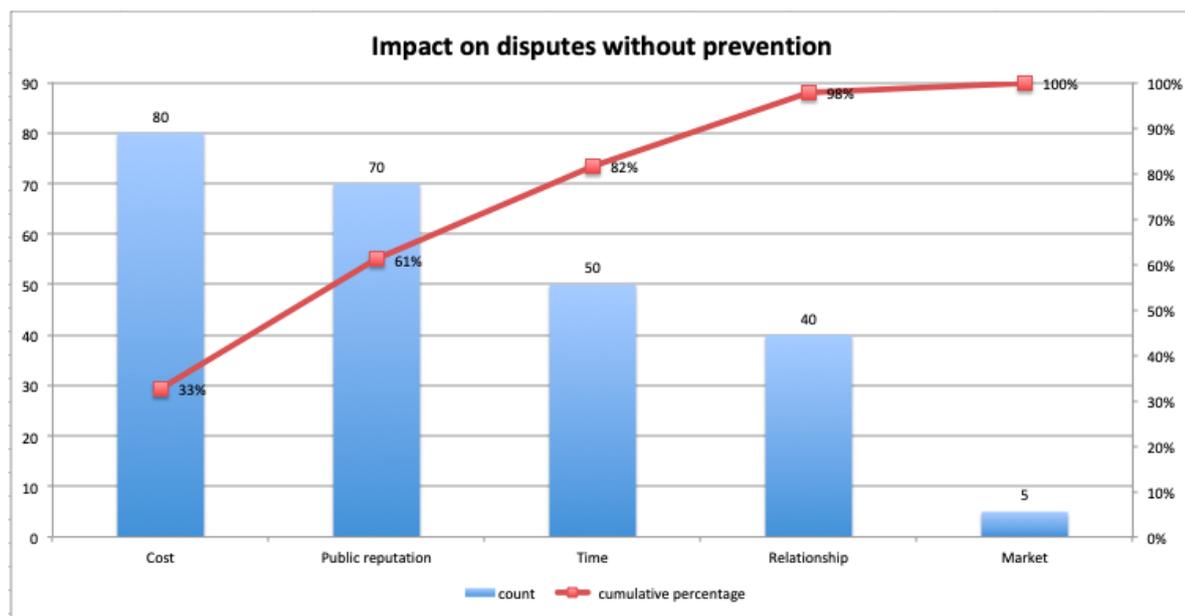


Figure 7: Pareto Analysis 1⁴⁹

Following our analysis of impact on disputes without prevention, we can see the above table demonstrates that without prevention, disputes are going to highly impact the cost, public reputation as well as the duration of the project.

Next step, we will see the impact on disputes when we use prevention.

⁴⁹ By Author

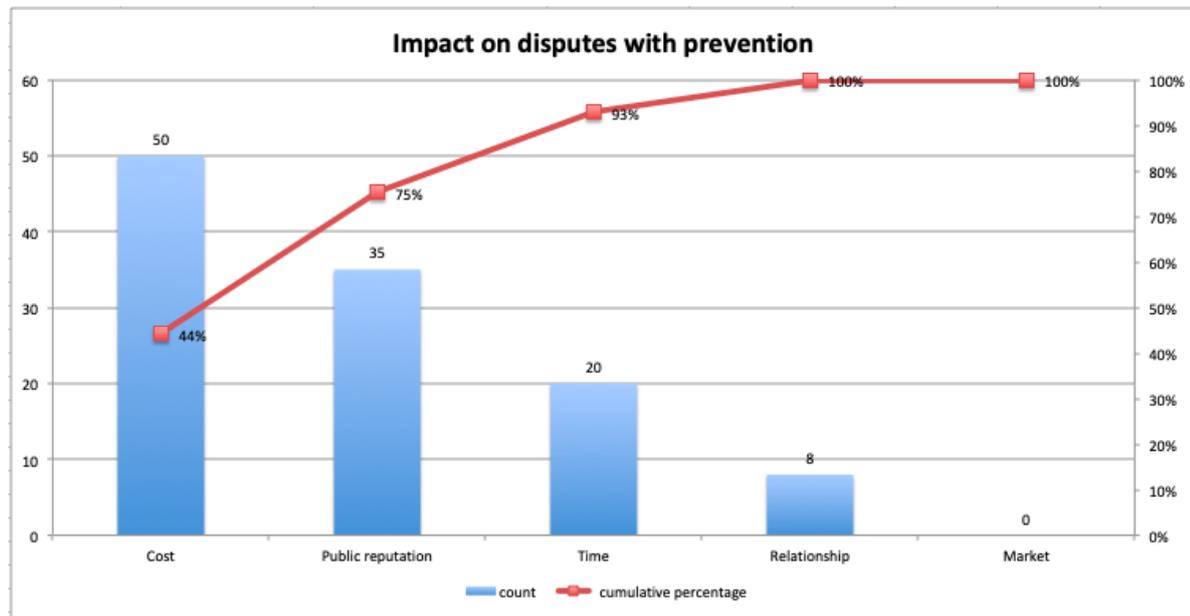


Figure 7: Pareto Analysis 2 ⁵⁰

In contrast, when prevention was being used, the impact on disputes in terms of cost, public reputation and time of project became lower.

CONCLUSION

To sum up, this paper explained and analyze mainly two questions: the root causes of claims and disputes in EPC contracting; and the best options to address those claims and disputes.

We have identified the most 6 common feasible alternatives solutions which and be implemented in EPC contracting project management, Prevention, negotiation, standing neutral, non-binding solution, private binding solution and arbitration. And we have took out two of them which are negotiation and arbitration, mainly because of the high cost and duration of these two alternatives. Then we analyze by using pareto method to prove why the best option is so important and crucial regarding the claims and disputes resolution. However, in some cases, standing neutral and private binding solution are considered as the second choice because they involve less negative impact on claims and disputes.

Thus, it is easier to lay a solid foundation to increase the project success.

⁵⁰ By Author

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