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Investigation of Uneven Implementation of Price Adjustment Clauses for Public Building Construction Projects in Arsi Zone of Ethiopia

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Abstract: ***Public building construction projects have become a growing concern because they ensure the construction of hospitals, colleges, offices, universities, and other public buildings to overcome social issues. However, the Ethiopian building project's price adjustment provision was not properly implemented. The expected programs and uses of public building construction projects are hampered. Thus, this paper is aimed to establish a mitigation measures system to a prune problem at the grass route level to solve inappropriate price adjustment clause implementation. Focused group discussion, case study, and questioner survey are employed as data-gathering instruments in this study. In addition, the study was analyzed with the use of statistical package software and the Relative Importance Index, therefore, the results confirmed good decision making at the right time, a special contract condition must be drafted by experienced professionals, value engineering of alternate materials, paying the contractor in full advance, and regular cost monitoring is identified as mitigation steps for these issues. This research addresses how we can mitigate the issue of price adjustment clause misapplication in our country. More studies in more zones and regions are required to exert positive stresses so that the study's findings can be used to strengthen the national conditions of contract.***

Keywords: Construction Management, Project Management, Improper Implementation, Price Adjustment Clause, Public Building Project, Arsi Zone, Ethiopia

I. INTRODUCTION

The construction sector plays a vital role in short-term trends, annual and more frequent growth, not just for the construction industry but also for all economic activities. Construction activity adds significantly to the country's total activity, at least in terms of the need for materials and labor inputs. The changes in construction activity tend to exacerbate and drive the economy's broader movements. Ethiopia's construction industry is afflicted by a series of difficulties that threaten to impede efforts to expand the sector. These difficulties are generally related to material shortages and market price volatility for construction materials (Mossa, 2013). According to ADB, (2018) a price adjustment is a change to the overall price of a contract to account for acceptable changes in the contract's performance costs. These provisions are planned during the planning and bid preparation stages of the procurement cycle, and they are employed as needed during the contract execution stage. Price change provisions are intended to safeguard the contractor from price hikes. The cumulative consequences of price escalation might be significant in contracts with longer delivery and completion durations. Large contracts involving price-sensitive materials or goods may see significant price rises. Price adjustments may pass on savings to the borrower as a result of downward price changes (or grant recipient). Borrowers may be tempted to shift the risk of variable input costs to contractors, but this usually comes at a higher overall cost (Mulugeta, 2018).

(Abdulkadir & Mohammed et al, 2020) found that construction cost escalation is a common concern in the construction industry, with constant increases in project costs causing major problems with the efficacy of works contracts and their performance in construction projects. Many infrastructure projects are currently being late for various reasons, and as a result, cost inflation has an impact on the project's budgeted cost. Project costs are a major issue for both owners and contractors in any type of building project. Budgeting for cost escalation is critical during the planning stage of these projects (Muleyl & Purushottam Dange, 2018).

A construction contract, by definition, is a legally binding agreement between two parties to assign the issue, the duties, the responsibilities, and the liabilities involved with the contract's performance. Because it is such a complicated type of contract that usually necessitates a lengthy tendering and negotiation process, terminating it is never an easy decision; employers often hesitate to do so even when the contractor has broken the contract; the reason for this is that it is far too difficult to begin the process of tendering for a new contractor and going through the entire process again. Employers are always hesitant since it is such a difficult decision (Bakey, 2018).

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The goal of this research is to build a mitigation measures framework for Ethiopian construction to overcome erroneous price adjustment clause implementation. Furthermore, these clauses are not clear, effective, or have an easily accessible index to address this issue, preventing the project from being halted for months or years owing to a change in the master timetable.

II. OBJECTIVE

The study's main purpose is to build a mitigation measures framework for Ethiopian construction to overcome erroneous price adjustment clause implementation**.**

A. General Objective

The goal of this study is to establish price adjustment problem mitigation approaches to construct a framework for dealing with price adjustment.

B. Specific Objectives

1) To investigate the causing factors that lead to price escalation in public construction projects.
2) To look in-depth at the challenges in price adjustment practice in public construction projects.
3) To investigate the Impacts of improper implementation of price adjustment clauses in public construction projects.
4) To evaluate the mitigation measures for improper price adjustment clause implementation by developing a mitigation measure framework for public building projects

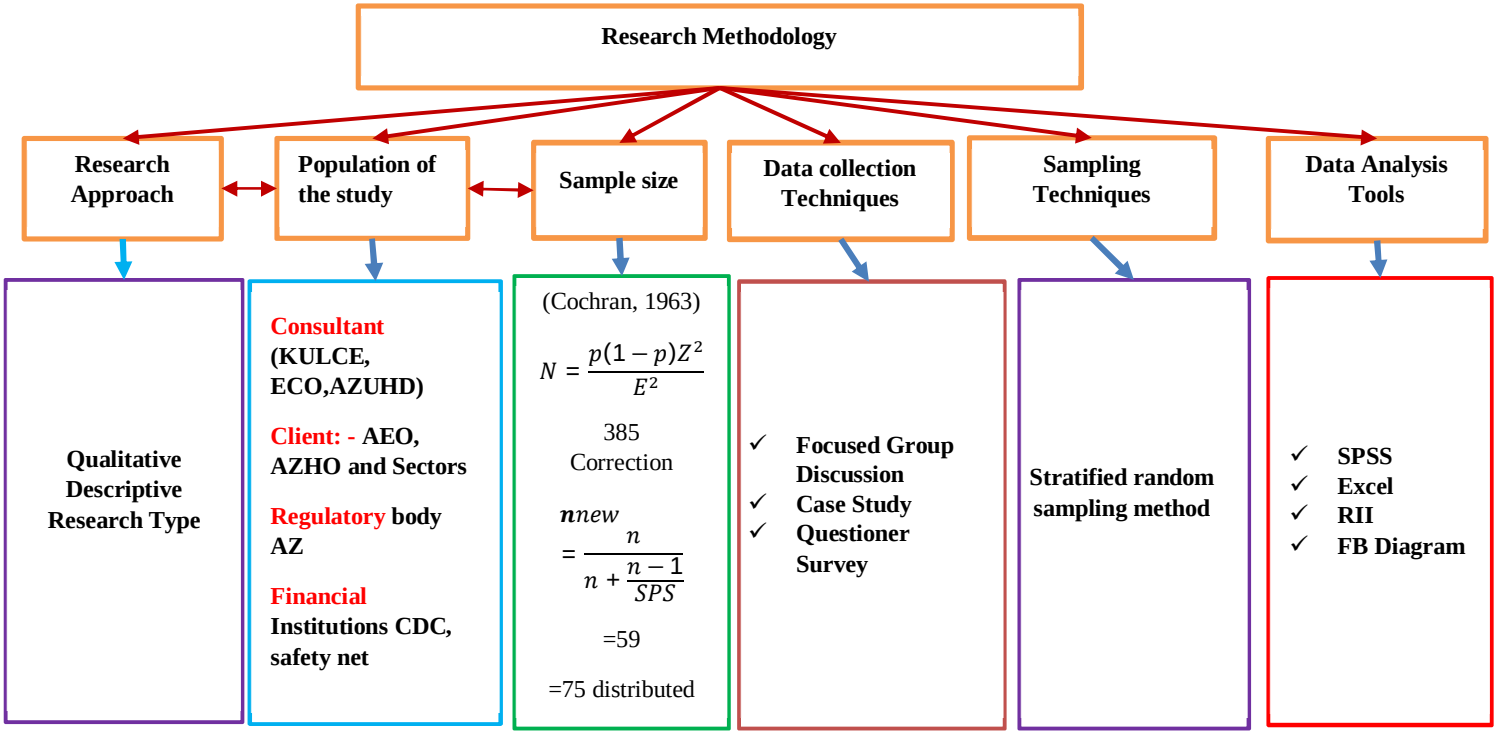
C. Scope and Limitation of the Study

This study focuses on IIPAC in the public building construction projects particularly in Arsi Zone

D. Limitations of the Study

1) *Target Population:* Contractor's grade 1-5 in Arsi Zone responds nearly the same way makes discussion part somewhat difficult
2) *Research Area:* Studying only in Arsi Zone lucks comparison.
3) *Research Tools:* SPSS version 25 is used it is good to use latest version to gate better result

III. RESEARCH METHODOLOGY



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A. Sampling Technique Used

Stratified random sampling methods were used to select the research population from the three major stakeholders (client, consultant, and contractor), the regulatory body and financial institutions from Arsi Zone

This sampling method is used Because of:

1) To select small sample size (59) from large popn (385)
2) To save time and money
3) To obtain best representative (from popn, COT, COSLT, ClT-)
4) To grasp the shared attributes among groups

B. Data Collection Techniques

All methods have short comings (Mulugeta,2018)

1) *Focused Group Discussion:* FGD can also be used to clarify, extend, qualify, or question data gathered through other methods, as well as to generate a comprehensive understanding of participants' feelings (Pearl. R, 1997).
2) *Questionnaire Survey:* The questionnaire provides firsthand information since it depend on topics (Eleyan , 2018).
3) *Case Study:* To dig out specific problems or situations in-depth and you can find case reaches in information (Eisenhardt , 2014)

IV. METHOD OF DATA ANALYSIS

A. Factor Analysis

Factor analysis in SPSS (using principal component analysis) software was used to extract factors to reduce its no from 40 factors to minimum.

B. Fishbone Route Cause Analysis

Used to determining whether the causing variable retained from factor analysis is

1) Agreed upon,
2) Brainstorming the major categories of causes of the problem,
3) Categorizing the causes as branches from the main arrow

C. Method of Data Presentation

The Data Analysis result should be presented in the form of diagrams, tables and graphs, therefore:

1) Factor Analysis & Root cause Analysis-is presented by Fishbone Diagram
2) The RII Analysis are Presented by:
a) Frequency Tables and Graphs
b) Table, Different types of bar charts

D. Reliability

This research is thought to be trustworthy. Cronbach's alpha, the internal consistency of the between-item scale, is used to assess its reliability.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.807	0.808	18

- The value of cronbach's Alpha for this study is 0.808 >0.7 for items greater than 10 Hence it Reliable

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Figure : The response rate of the questionnaire survey

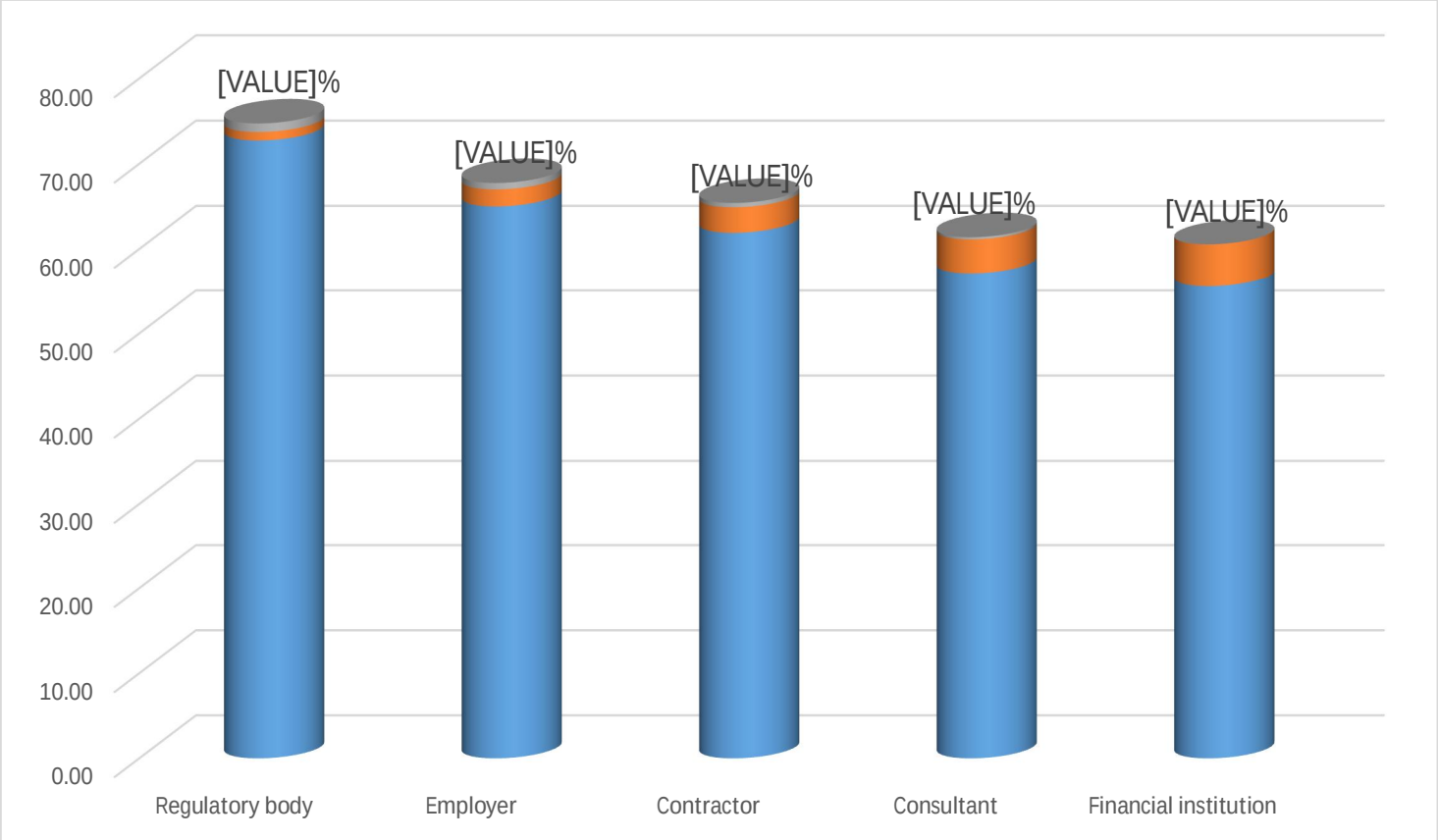


Figure : The Respondent Profile in Taking part in Contract Administration

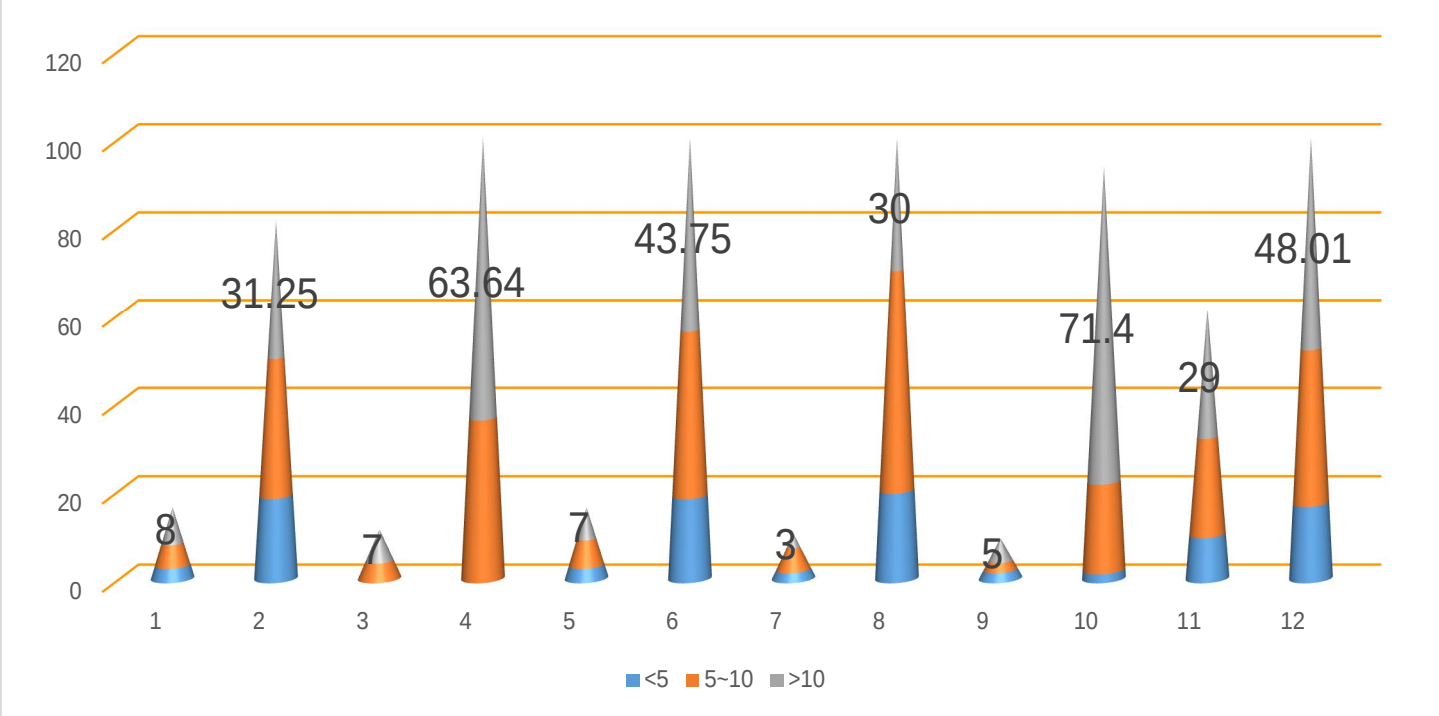
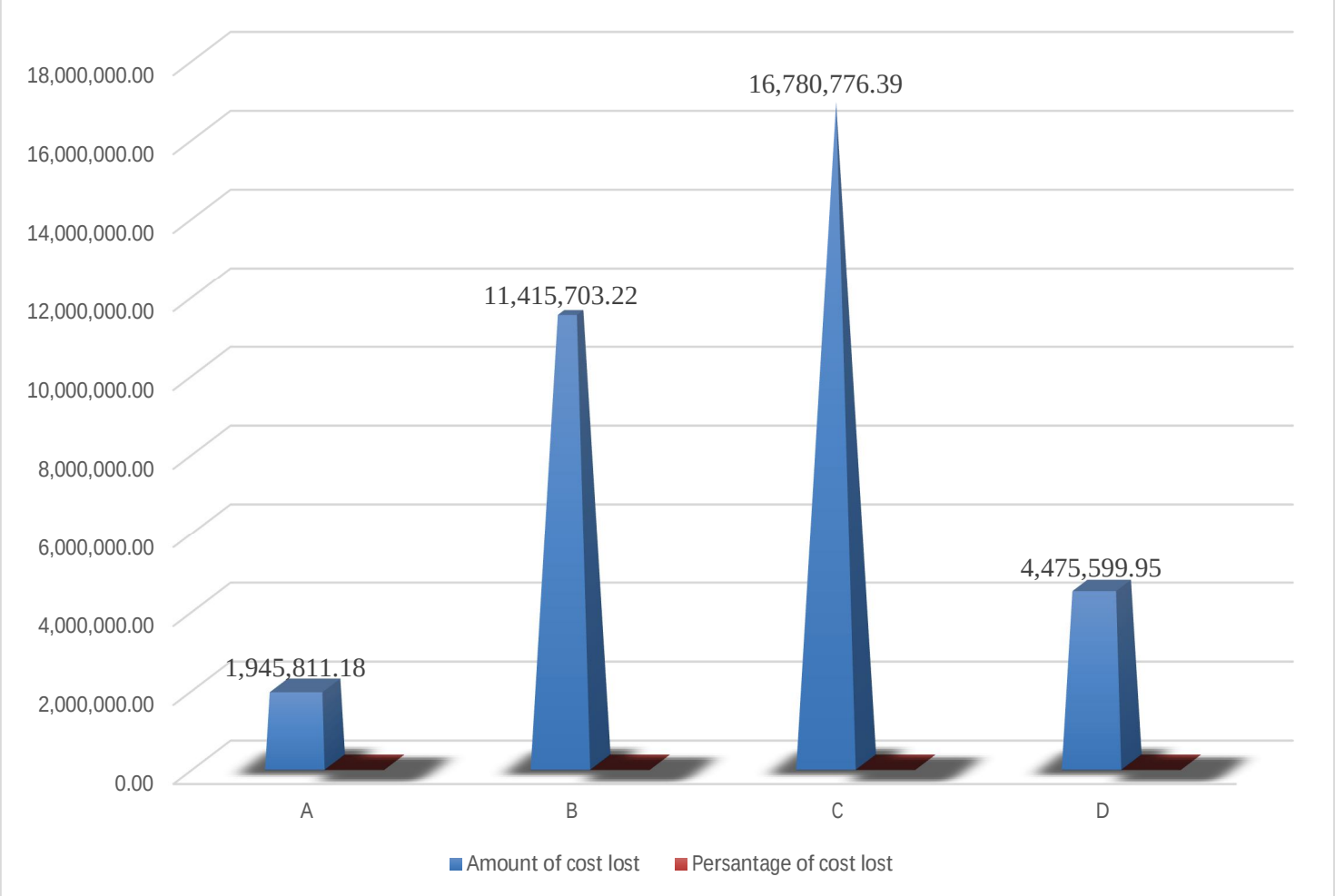


Table Result from case study

Presentation of case study				
Name of Projects	A	B	C	D
Amount of cost lost	1,945,811.18	11,415,703.22	16,780,776.39	4,475,599.95
Percentage of cost lost	46.3	48.11	43.32	34.5

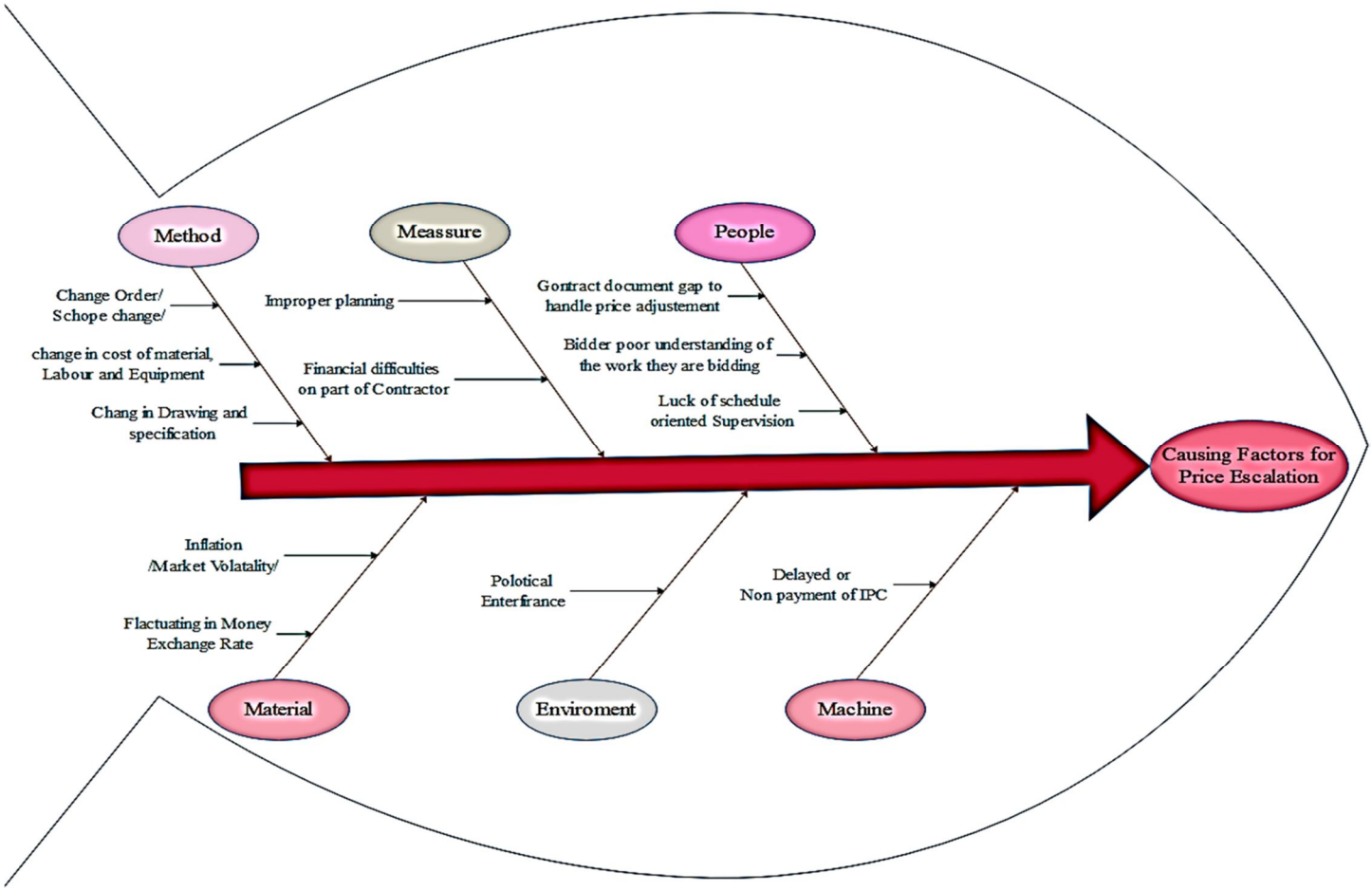
Figure. Percentage and cost Difference



V. RESULTS AND DISCUSSIONS OF CAUSING FACTORS FOR PRICE ESCALATION

A. *Preliminary Analysis Result*

Preliminary Analysis	Result
✓ Discriptive Statics	✓ OK missing data is sorted before
✓ Correlation Matrix	✓ 0.014>P(0.00001) Ok
✓ KMO	✓ 0.594>0.5 OK
✓ Anti-image correlation matrix	✓ 0.5= 0.5 OK
✓ Factor Extraction	✓ >1 Eigen Values OK
✓ Total Variance	✓ 74.314%>50% OK
✓ Reproduced Correlations	✓ 27% <50% OK

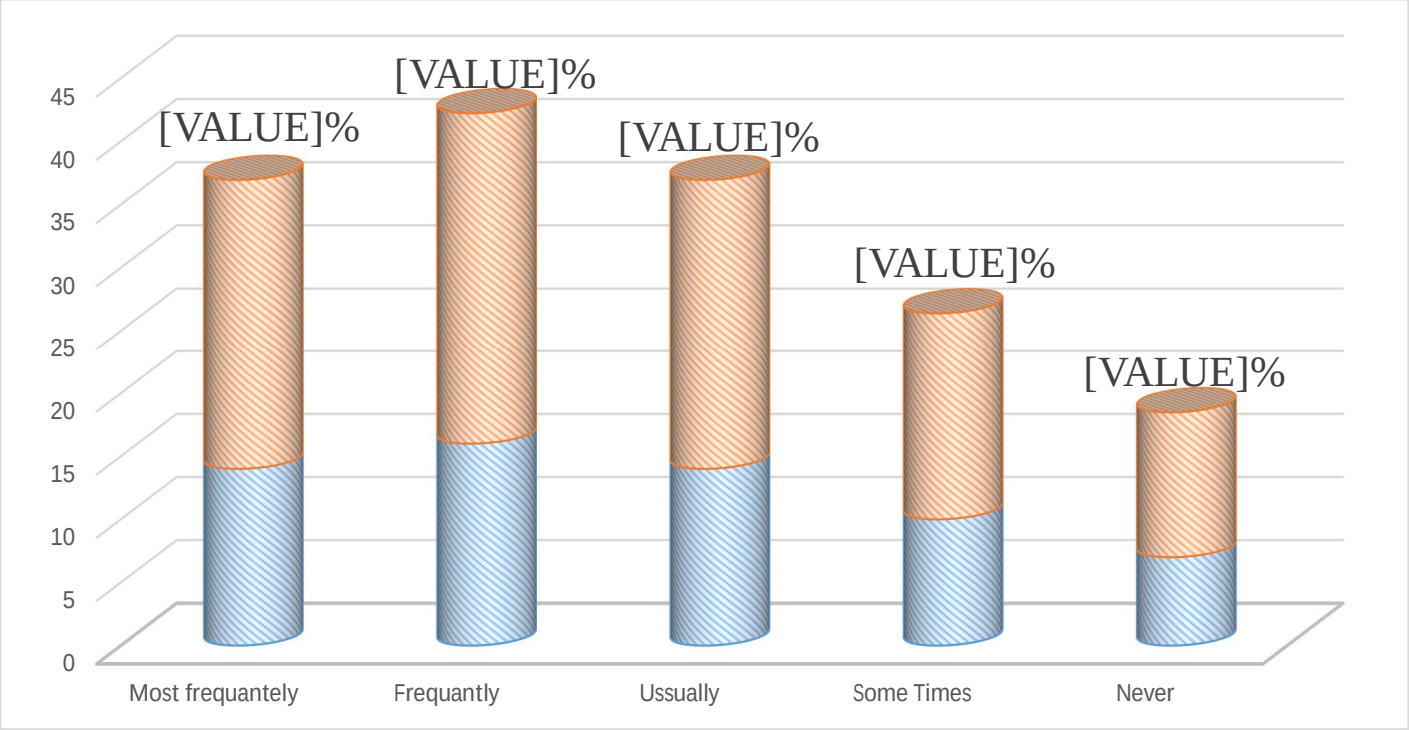


B. *Result and Discussions of Challenges of Price Adjustment Practice*

Table Frequency and percentage of change in the project cost

Change in Project Cost	Most frequently	Frequently	Usually	Some Times	Never	Total
Frequency	14	16	14	10	7	61
Respondent Percentage	22.95	26.23	22.9	16.4	11.5	100

Figure : Percentage of Change in the Project Cost

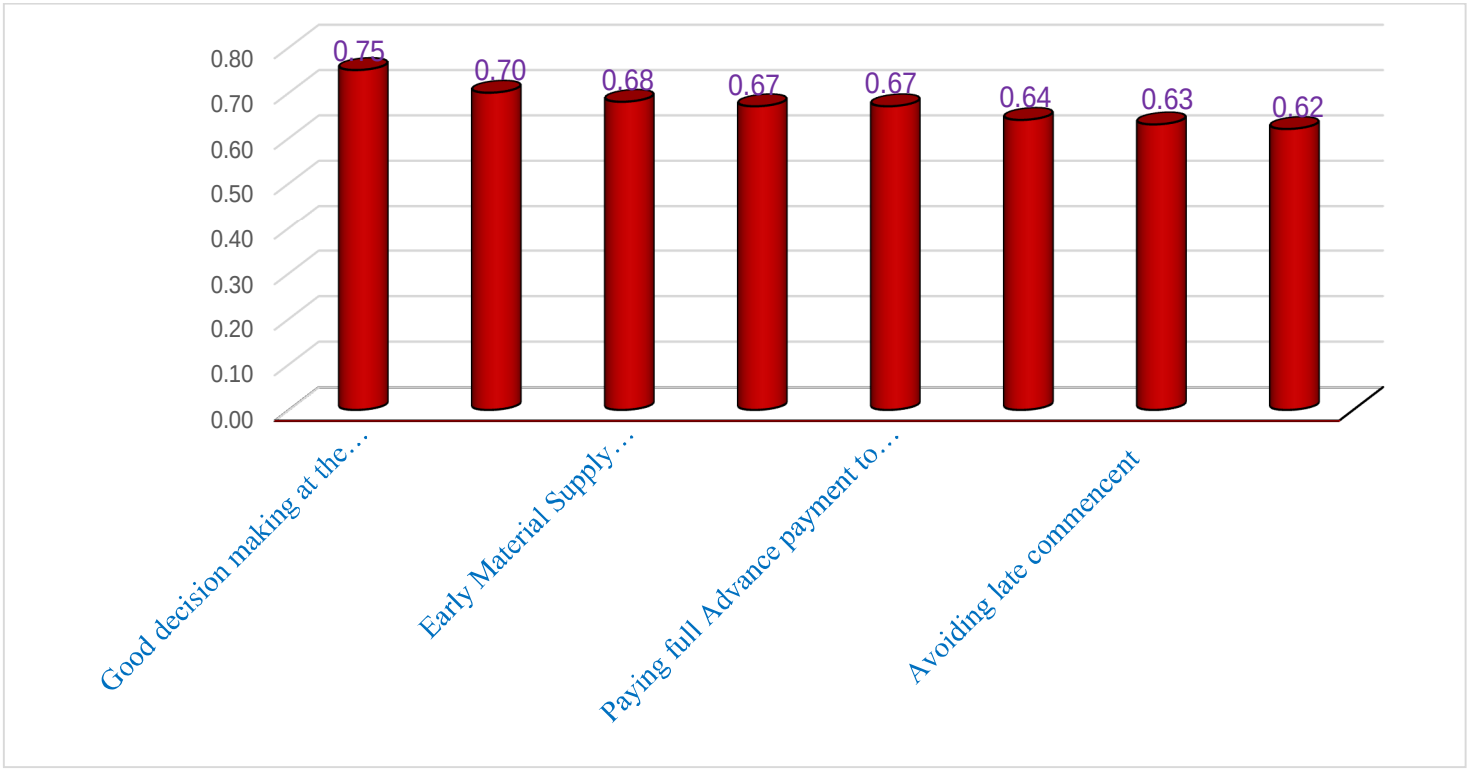


VI. RESULT AND DISCUSSION OF MITIGATION MEASURES FOR IIPAC

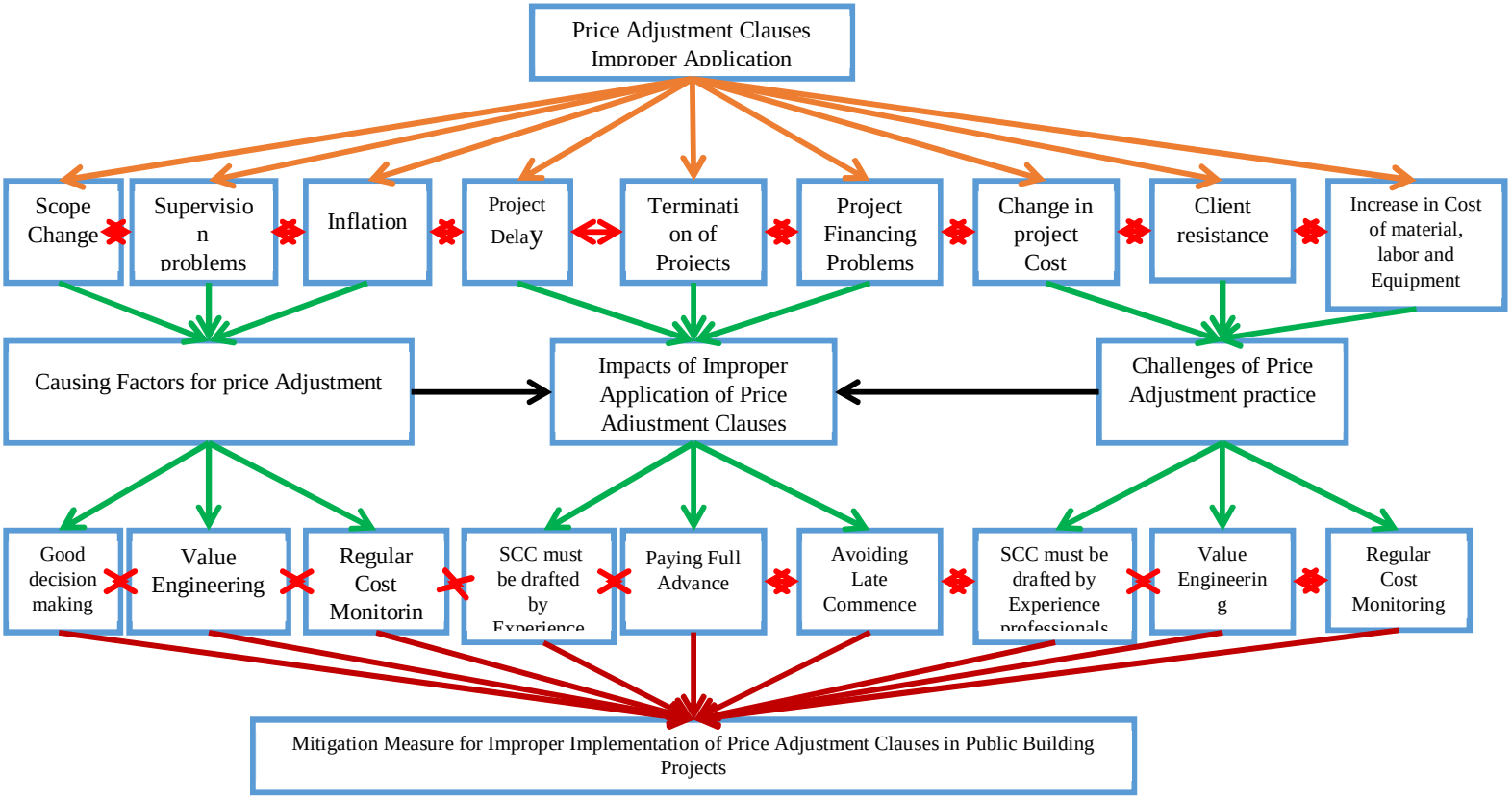
Table Mitigation Measures for Improper Implementation Price Adjustment clauses

Item (Factors)	Frequency of "4" Response	Frequency of "3" Response	Frequency of "2" Response	Frequency of "1" Response	Frequency of "0" Response	Total Respondent (N)	Weighted Total 4n4+3n3+2n2+1n1+1 n0	A*N	RII	Rank	Item Mean =(Weighted total) /N
Good decision making at the right time	19	27	12	3		61	184	244	0.75	1	3.02
Special conditions must be drafted by experienced professionals to minimize contradictions and ambiguities with general condition	16	24	15	5	1	61	171	244	0.70	2	2.80
Early Material Supply Commitments	12	28	15	4	2	61	166	244	0.68	3	2.72
Regular cost monitoring throughout the project	13	22	22	2	2	61	164	244	0.67	4	2.69
Paying full Advance payment to commence the construction of the main work	12	27	15	5	2	61	164	244	0.67	5	2.69
The use of combination of index formula and price difference adjustment based on the nature of the items is better.	10	24	18	7	2	61	155	244	0.64	6	2.54
Avoiding late commence	13	22	13	9	4	61	153	244	0.63	7	2.51
Value Engineering for Substitute Materials	11	20	19	9	2	61	151	244	0.62	8	2.48

Figure: Relative Importance Index Result for Mitigation Measures



Mitigation Measures Framework



Literature Review

A. Criticizing Frame work and Implications of the Study

1) Frame Work Critics

This framework criticized and accepted by:

a) Consultants: ECO,KULCE,AZUHD Engineers

b) Contractors: ABDI construction PLC-G-1,Girma G/S B.C G-2

c) Client Side: AZEO,AZHO Engineers and regulatory body

B. Theoretical Implications

The researcher added new variables on theory so that it could cover wider perspectives.

C. Practical Implications

The research result used to mitigate the hot issue facing the industry fore going currently.

VII. CONCLUSIONS

A. Based On The Study We Can Finally Come To The Following Conclusion

1) (3C's) and regulatory body understand, recognize and work on these identified changes in price.

2) Practicing bid contingency cost, increasing the client awareness, continuous cost database, conducting regular market assessments are good practice to solve PA practice problems.

3) Including the issue of the price adjustment clause by bringing up the national rate adjustment as part of the contract document are good solutions to reduce its impact.

4) working together to overcome the poor implementation of the price adjustment clause with corresponding stakes, and assigning the right person to the right position can solve the problem

B. Recommendations

1) 3C's and the regulatory body should play their role to work with banks, suppliers, and factories collaboratively to reduce price escalation issues.

2) The regulatory body should advise the government to minimize the challenges of price adjustment practice

3) making price escalation indexes as a part of the contract document to alleviate the impacts of price adjustment problems

4) The construction sector should be administered and managed by engineering professionals to solve the price adjustment issues early.

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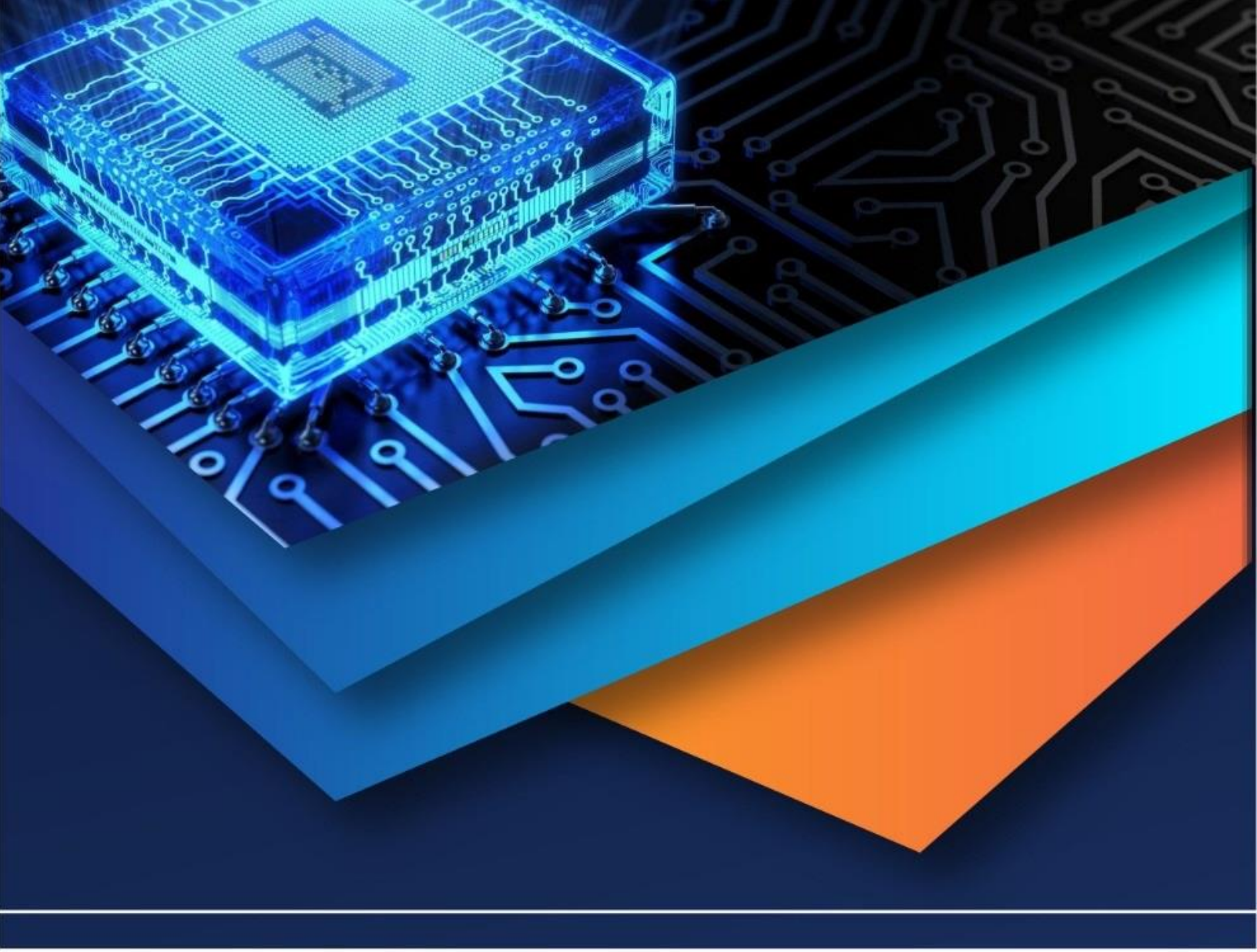
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