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TABLE OF CONTENTS

CONFLICT EARLY WARNING SIGNALS IN THE EXECUTION OF CONSTRUCTION PROJECTS

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ABSTRACT

Most conflicts in the construction industry have long incubation periods. Meeting project objectives in terms of time, cost and quality benchmarks is the bane of the industry. Therefore, the need to identify Early Warning Signals (EWS) of potential conflicts in construction project delivery has become very imperative. This research aims at evaluating the efficacy of existing theoretical models of EWS. This is vital in trying to avoid potential conflicts. The methodology involves extensive review of relevant literature and evaluative study by means of questionnaire. The results of the study revealed that a probabilistic model approach to managing construction project will mitigate conflicts by showcasing EWS that have higher probabilities of occurrence than others; by this, necessary mitigation measures can be taken in a timely fashion. The study concludes that EWS probabilistic models will help stakeholders in the construction industry to identify potential construction conflicts with appropriate response strategies. The study recommends the use of EWS probabilistic model and brief description of EWS functional components.

Keywords: Conflicts, Construction, Early Warning Signals, (EWS), Project.

INTRODUCTION

The rising cost of conflicts and the limited success of their resolutions have led to a growing realisation that prevention is much better than cure. Looking at it from the cost – control point of view, more action of a preventive nature should be taken. This has led to the increasing demand for the development of conflict Early Warning Signals (EWS) in the execution of construction projects. Early warning is first in successful conflict prevention. Its goal is not just to predict whether or not conflict will occur, but to facilitate prevention by calling attention to potential dangers. Ghali (1992) posits that prevention achieved by employing inter – alia early warning is evidently better than having to undertake major efforts to resolve conflicts after they have broken out.

The concept of EWS is not new; it has mainly been developed for natural disasters such as climatologic changes, earthquakes, drought and floods, ensuing flow of refugees; and the effects of these disasters on people. Recently, there has been a growing interest in the concept which is geared towards detecting conflicts at the initial stage for the purpose of making possible the use of preventive action instead of reactive action. Today, this interest has extended as far as those responsible for shaping policy, and the importance of early warning is being increasingly recognised. However, the purpose of EWS lies

elsewhere to contribute to finding conflict remedies in such a way that they are 'fought-out' in a nonviolent manner. Thus, early warning must be seen as one element of a wider strategy whose guiding principle is long-term development Doom and Vlassenroot (1995).

The first indicator that a potential conflict is developing is the identification of its Early Warning Signals (EWS). Conflicts take place within societies and the construction industry is one such area of economic activity. The problem usually points to the fact that these conflicts are as a result of serious imbalances within the system and projects in the industry being more often than not in the hands of privileged few with the rest jostling to be accommodated under subletting; hence, the tussle to be in control or have a fair share of the 'construction cake' by stakeholders in the industry. These conflicts have resulted to increased project cost, project delays, reduction in productivity, loss of profits, damage in business/contractual relationships, waste of resources, decrement in staff motivation, etc.

EWS organises efforts against threats to successful execution of construction projects into logical and systematic framework. This framework illustrates to clients, construction professionals and other stakeholders in the industry the necessary components of early detection and rapid response, and facilitates the practical consideration and inclusion of important elements during planning and management activities. It is also for identifying gaps, weaknesses, and unnecessary redundancies in the detection and response, focusing research efforts to address gaps and weaknesses, and enabling significant improvements in information processes, networking, and organizational structures. It also highlights opportunities for increased cooperation and collaboration and serves as an aid for prioritizing proposed projects, management emphases, or available resources.

In view of the above, the study seeks to:

i. Identify Early Warning Signals (indicators) in the execution of construction projects.
ii. Identify construction stages/elements that are more prone to potential conflicts.
iii. Develop models for predicting actual occurrence of potential construction conflicts with a view to responding positively.

THEORETICAL FRAMEWORK

Construction Projects and Conflicts

Construction projects cover areas such as building construction and mineral extraction; heavy and industrial engineering; mechanical and electrical engineering; civil and structural engineering; cost and production engineering; town planning and urban development; surveying and geo-informatics; environmental economics; landscaping and interior decoration; etc. Construction conflict is a state of opposition between people (parties), ideas or interest in the industry. It is endemic, inevitable and could be constructive or destructive. From a project point of view, conflict can be classified into

intra-project and interface conflict – with internal and external stakeholders (Awakul and Ogunlana, 2002). Ness (2013) avers that these internal and external stakeholders typically involve participants from disciplines and organizations with different loyalties, expertise, interests and priorities. Yet, their inputs are interdependent. These often produce conflicting views which oftentimes are the consequences of historical factors that have built up over a long period, and of sudden dynamic accelerating factors.

Conflict seems to be very synonymous with construction projects. This implies that construction projects encourage potential conflicts of interest among parties involved. The two primary parties on any project are the owner and the contractor. A project owner wants a project completed on time at the lowest cost with the least exposure to risk of regulatory attention or enforcement. On the other hand, a construction contractor's goal is to complete the project in the least amount of time and with maximum profit. When the clients' and the contractors' goals do not exactly coincide, the potential for conflict is present (Bilezikjian, 2012).

Early Warning Signals (EWS)

Construction projects can be executed more economically if conflicts are contained at the initial stage. The first step in construction conflict prevention is to identify potential and existing threats so that detection activities may be planned and implemented. Identification of potential threats entails gathering, analysing and organising pertinent information (sourced from research institutes, construction professional bodies, government ministries, media houses, Non-Governmental Organizations (NGOs), 'fact-finding missions' and local networks) in ways that facilitate awareness and detection of potential threats. This is what EWS is all about.

According to Brahm (2005), early warning provides the opportunity to do something to prevent the emergence and/or escalation of conflict. It aims at averting potential conflicts before they become costly. The ultimate goal is to prevent damage from new threats and reduce to acceptable levels the impacts of existing threats. It is designed to detect areas of tension for the purpose of making possible the use of preventive action instead of reactive action. Early Warning reveals how to: change strategy to meet new realities; learn from the mistakes of others; avoid common tactics like benchmarking and using consultants, which may do more harm than good; and tell executive what they need to know - not what they want to hear (Gilad, 2003). Early Warning Signals (Indicators) among others include repeated delay in payments, frequent use of derogatory remarks, excessive variation orders, false accusations and refusal to honour payments.

RESEARCH METHODS

A survey research was adopted after which probabilistic and component models were developed. Questionnaire comprising 2 research questions (in line with the objectives of the study) with 34 multiple choice items was administered to 50 construction professionals of various disciplines selected through a disproportionately stratified

sampling technique. The questionnaire was constructed using Likert Five-Point Scale Response Alternative and analysed using weighted mean. The decision rule of acceptability was 3.5 points and above while below 3.5 points was rejected.

PRESENTATION OF RESULTS

Table 1: Results of Questionnaire

SA – Strongly Agree, A – Agree, UD – Undecided, SD – Strongly Disagree, D – Disagree.
Research Question One: What are the Early Warning Signals (indicators) in the execution of construction projects?

S/N	Description	SA	A	UD	D	SD	VOID	MEAN	REMARKS
1	Repeated delay in payments	23	23	1	0	3	0	4.26	ACCEPT
2	Denial of access to relevant documents	10	13	17	7	0	3	3.56	ACCEPT
3	Late handover of site	0	27	17	0	6	0	3.30	REJECT
4	Denial of access to security arrangement/network	3	23	7	7	7	3	3.18	REJECT
5	Excessive variation order	13	27	4	3	3	0	3.88	ACCEPT
6	Frequent use of derogatory remarks	0	17	10	16	7	0	2.74	REJECT
7	Unwillingness to attend site meetings	0	30	4	10	3	3	3.30	REJECT
8	Non response to calls and mails	7	20	6	10	0	7	3.56	ACCEPT
9	Exaggeration of minor problems	7	27	13	3	0	0	3.76	ACCEPT
10	Refusal to honour payments	30	10	3	7	0	0	4.26	ACCEPT
11	Unnecessary complains	3	23	11	10	0	3	3.41	REJECT
12	False accusations	7	23	10	3	7	0	3.40	REJECT
13	Lateness to work or any other official	10	23	4	7	3	3	3.64	ACCEPT
14	Late response to queries	7	23	10	7	3	0	3.48	REJECT
15	Incessant communal disturbance	23	20	0	7	0	0	4.18	ACCEPT
16	Frequent threats to terminate the contract	23	13	7	0	0	7	4.38	ACCEPT

TGE – To a Great Extent, TCE – To a Considerable Extent, TME – To a Moderate Extent, TFE – To a Fair Extent, NAA – Not at All

Research Question Two: What stages/elements of construction projects are prone to potential conflicts?

S/N	Description	TGE	TCE	TME	TFE	NAA	VOID	MEAN	REMARKS
1	Mobilization	2	9	1	1	2	0	3.54	ACCEPT
2	Demolition and alteration	6	6	2	0	1	0	4.08	ACCEPT
3	Groundwork (excavations, fillings, etc.)	3	7	1	2	2	0	3.44	REJECT
4	Concrete works (concrete, formwork and	2	6	2	3	1	1	3.39	REJECT
5	Masonry (block wall, damp proofing courses)	1	5	3	4	1	1	3.09	REJECT
6	Structural works (metal and timber)	2	5	3	3	1	1	3.32	REJECT
7	Cladding/Covering (e.g. roofing sheets)	3	5	2	4	1	0	3.36	REJECT
8	Water proofing (asphalting, tanking and damp	1	4	6	3	0	1	3.20	REJECT
9	Linings/Sheathing/Dry partitioning	2	6	2	3	1	1	3.39	REJECT
10	Windows/Doors/Stairs (balustrades)	2	8	0	4	0	1	3.60	ACCEPT
11	Surfaces finishes	2	7	1	5	0	0	3.40	REJECT
12	Furniture/Equipment	2	6	3	3	1	0	3.36	REJECT
13	Building fabrics sundries (e.g. ironmongery)	1	5	4	3	2	0	2.98	REJECT
14	Paving/Planting/Fencing/ Site furniture	2	4	2	4	0	3	3.35	REJECT
15	Disposal systems	3	9	1	1	1	0	3.82	ACCEPT
16	Transport system (e.g. lifts, cranes, gantries, etc.)	2	8	3	2	0	0	3.68	ACCEPT
17	Electrical and mechanical (plumbing) services	2	5	3	4	0	1	3.39	REJECT
18	Geotechnical processes (explorations)	2	3	7	1	1	1	3.32	REJECT

Table 2: BOQ Summary of a Proposed Fire Service Station

S/N	DESCRIPTIONS	AMOUNT (Naira)	Probability (A)	Duration (Months)	Probability (D)
	SUMMARY - FIRE SERVICE STATION				
D.	Ground Work	466,429.03	0.0254	3.00	0.0417
E.	Concrete Work	7,239,198.15	0.3940	15.00	0.2083
F.	Masonry	1,311,440.55	0.0714	8.00	0.1111
G.	Structural Carcassing Steel	2,855,788.87	0.1554	13.00	0.1806
H.	Cladding /Covering	1,574,870.03	0.0857	4.00	0.0556
L.	Windows / Doors / Stairs	1,163,614.41	0.0633	6.00	0.0833
M.	Surface Finishes	2,426,985.81	0.1321	11.00	0.1528
R.	Disposal System	355,406.63	0.0193	5.00	0.0694
Y.	Mechanical and Electrical Services Measurement	981,505.79	0.0534	7.00	0.0972
	Estimated Cost/Time	**18,375,239.27**	**1.00**	**72.00**	**1.00**

Note: Preliminaries and profits are included in the unit rates

Source: (excluding probabilities) – Airgof Konzorlt, 3 Okigwe Road, Umuahia, Abia State, Nigeria

Table 3: Probabilities of Project Profit and Duration of the Proposed Fire Service Station

S/N	DESCRIPTIONS	AMOUNT (Naira)	Probabilit y (A)	Duration (Months)	Probabilit y (D)	Profits
	SUMMARY - FIRE SERVICE STATION					
D.	Ground Work	466,429.03	0.0254	3.00	0.0417	46,642.91
E.	Concrete Work	,239,198.15	0.3940	15.00	0.2083	723,919.82
F.	Masonry	1,311,440.55	0.0714	8.00	0.1111	131,144.06
G.	Structural Carcassing Steel	2,855,788.87	0.1554	13.00	0.1806	285,578.89
H.	Cladding /Covering	1,574,870.03	0.0857	4.00	0.0556	157,487.01
I.	Windows / Doors / Stairs	1,163,614.41	0.0633	6.00	0.0833	116,361.45
M.	Surface Finishes	2,426,985.81	0.1321	11.00	0.1528	242,698.59
R.	Disposal System	355,406.63	0.0193	5.00	0.0694	35,540.67
Y.	Mechanical and Electrical Services Measurement	981,505.79	0.0534	7.00	0.0972	98,150.58
	Estimated Cost/Time	**18,375,239.27**	**1.00**	**72.00**	**1.00**	**1,837,523.98**

Table 4: Probability of Mean of Slack Time and Tolerable Loss of Profit of the Proposed Fire Service Station

S/N	DESCRIPTIONS	Percentage (%)	AMOUNT (Naira)	Duration (Months)	Probabilities
	SUMMARY - FIRE SERVICE STATION				
1	Profit	10%	1,837,523.93	-	0.1000
2	Tolerable Loss of Profit (TLP)	25%	459,380.99	-	0.0250
3	Slack (Extra) Time (ST)	5%	-	3.60	0.0500
4	Mean of ST and TLP	-	-	-	0.0375

(Profit, TLP and slack vary from organizations to organizations)

FINDINGS/MODEL DEVELOPED FROM STUDY

EWS Component Model

EARLY WARNING SIGNALS (INDICATORS)

1. Repeated delay in payments
2. Denial of access to relevant documents
3. Late handover of site
4. Denial of access to security arrangement/network
5. Excessive variation order
6. Frequent use of derogatory remarks
7. Unwillingness to attend site meetings
8. Non response to calls and mails
9. Exaggeration of minor problems
10. Refusal to honour payments
11. Unnecessary complains
12. False accusations
13. Lateness to work or any other

→

CONSTRUCTION STAGES/ELEMENTS

1. Mobilization
2. Demolition and alteration
3. Groundwork (excavations, fillings, etc)
4. Concrete works (concrete, formwork and reinforcement
5. Masonry (block wall, damp proofing courses)
6. Structural works (metal and timber)
7. Cladding/Covering (e.g. roofing sheets)
8. Water proofing (asphalting, tanking and damp proofing)
9. Linings/Sheathing/Dry partitioning
10. Windows/Doors/Stairs (balustrades)
11. Surfaces finishes
12. Furniture/Equipment
13. Building fabrics sundries (e.g. ironmongery)
14. Paving/Planting/Fencing/ Site furniture
15. Disposal systems ((e.g. soak away pits, inspection chambers, septic tank, etc}
16. Transport system (e.g. lifts, cranes, gantries, etc)

→

ASSESSMENT

If the Probability of Risk – Mean is Tolerable, continue with work else, respond (i.e. move to the next EWS component)

→

RESPONSES

(STEP BY STEP)

1. Pause
2. Observation
3. Disarmament
4. Inquiries
5. Source tracing
6. Identification of stakeholders
7. Mediation
8. Discussion
9. Negotiation
10. Conciliation
11. Arbitration
12. Adjudication
13. Litigation

By using EWS models, trends are detected from historical information and then carried through into the future.

CONCLUSION

Conventional approaches to construction conflict resolution can no longer effectively mitigate project failures. A contemporary strategy is the application of EWS model. The models give direction to help prevent construction conflict by finding out who to warn, when, how and what to be warned about. The outcomes of the application must be derived from operational set of indicators which in turn contain construction stages/elements, EWS and tolerable risk. These indicators help in understanding the causes of construction conflict and whether or not the conflict is likely to escalate beyond control.

RECOMMENDATIONS

1) Development of very explicit indicators which reveal both the background conditions against which conflicts come about and the escalation dynamics of conflicts.
2) Regular updating of information gathered on EWS.
3) EWS models should be based on statistical data for a particular construction project within a region which has been gathered over a long period.
4) The setup of Construction Conflict Data Bank (CCDB) to network all EWS and information sources. The network should gather data obtained from a wide spectrum of information suppliers in a lasting (i.e. regularly repeated), speedy and standardized manner with a view to providing basis for further analysis.
5) EWS arrangement should be strengthened in such a manner that information gathered can be synthesized with environmental indicators to assess whether a threat exists and to analyse what actions might be taken to alleviate it.

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