

# A Critical Literature Review on Main Cause of Delay in Construction Projects

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**Abstract** – An in construction industry time is a very important measure and crucial resource in project management life cycle! In construction project context we can explain the delay of time as postponement of time to finish the project progress. It is the driving force for the project success. If we didn't use time properly even it is one cause for failure. So, in Construction Project cycle delay is the greatest common problems. When the real project work duration is more than planned project duration we call it project time delay. The result of delay will cause many unwanted effects on projects; like the conflict between the project owner and contractors or claim between the project participants, overstated prices, loss of production and income, and contract closed. Delay is a very recurrent and non-planned phenomenon which is almost related to all ongoing construction projects. This review work attempts to find and investigate the main factors perceived to affect delays in projects. On this review, the basic delay causes in construction project reviewed on the past literature review. The frameworks and the delay critical review was obtained based on past literature reviews conclusion. The researcher achieves their aims to get the main cause of delay on building constructions by inviting the construction stakeholders specifically contractor, developers, designer, and client. The most conducted method to find the main cause of delays is Relative Important Index (RII) and Importance index based on the degree of severity and degree of frequency.

**Key Words:** (time, delay, cause of delay, Construction project)

## I. INTRODUCTION

This Construction industries are an industry, which contains planning of project work. Scheduling of project duration, organizing, evaluating, executing project progress and observing of all project works. The Structural organizations such as infrastructures, energy and communication & energy-related construction works, water supply & disposal construction work etc., are some of the the-work to be performed construction industry. From the management function (planning, organizing, staffing, scheduling, executing, monitoring) scheduling can relate with a completion time of the project, also related with time delay. If the project duration (real work duration) is either above finishing point date detailed in a contract document, or above the date that the project owner and contractors agreed upon for transfer of the project, and exceed the expected time is identified as time delay. This is when the project work is out of date, and it requires more cost of construction and addition working time on before agreed

planned scheduled on contract document. For project holders delay can be defined loss of income in the absence of construction services and rentable space or a dependency to the services on the hand. For contractors or project developers delay is a loss of a lot of finance for the reason that the work takes long time duration to be progressed, higher cost of construction material due to inflation, increasing of workers cost. Usually delay in the construction industry by many factors linked with the performance of time, quality, and cost. The construction project is universally approved as successful when it finished on time, within budget, according to specifications and to stakeholder's satisfaction. Delay increases work sliding and late finishing of the project, disagreement of client and contractors. This may cause disturbance of project progress and loss of services, also increases time linked costs, and finally, it may cause termination of construction project work and its contract.

## II. LITERATURE REVIEW

Definition: delay is a period of late time of project that identified in a contract agreement or greater than the date that contractor and client decided upon submission of a project. It is a project time lag over its planned schedule and is well thought-out as common difficulties in the construction industry. To the project holder's side, a delay is known by a loss of income through lack of manufacture services and rentable space or a dependency on present services. In another case, to the project developer/ contractor side, delay means higher loss of costs because of the extended work period and late project submitting, a high cost of material than at cost at before through cost rise, and due to workers cost increases than previously planned within the estimated time duration.

Construction Project: construction projects are those of projects related to the construction field who have limited time dimension with specific allocation of resources, and a particular purpose. To finish construction projects, have adhered to the boundary three obstacles are:

Project cost (Budget): the construction project should be efficient.

Project time duration: (Schedule): the construction projects to be effective.

Required project quality (Quality): performance must meet the required of specifications and criteria. The main elements that are within a project:

- Cost: finance and investment required for project completion
- Quality: the scope of the wanted quality and understandable requirements.
- Quantities: scope of the project.
- Time: how long and when it takes for progress of the construction.

Many of researches and studies have completed to explore the reasons why delays happens in construction projects; both nearby and globally research have been reviewed.

Doloi, Hemanta, Sawhney, Anil,Iyer, and K. C. Rentala, Sameer(2012) developed the study on cause of delay on Indian construction, and they categorized the cause of delay:(1) Site related (2) project related (3) process related (4) human related and (5) technical issue related [1]

In Egypt, Cairo Mohamed M. Marzouk \*, Tarek I. El-Rasas(2014) also study to analyse the cause of delay in Egypt construction and according to his analyzing result the following are the main groups of cause of delay(1) project holder,(2) advisors,(3), developer (4) Material,(5) workers & machines),(6) Project,(7), External related delay factors,[2]

El-Razek et al. (2014) identified basic causes of delays in Egyptian construction projects and summarized that, most of construction parties do not agree on the RII of various delay, more censuring each other of delays by IMP.I. He recognizes significance of team roles in the achievement of a project. [2]

Reviews done by Assaf, Sadi A.Al-Hejji, Sadiq (2006) defined fifty six basic causes of delay in huge construction projects. He grouped the delay causes into nine (9) basic groups with dissimilar levels and dissimilar parties. As he concluded, out of hundred percent 76% project developer have specified that average of delay is between 10 percent and 30 percent (10%-30%) of original duration. And twenty-five percent of construction consultants (advisors) have specified from 30 percent to 50 percent (30%-50%) average time delay. According to his research survey owners explains that cause of project delays are related to labors and contractors. Research identifies that consultants and clients realize that giving the contract for the list (lowest) bidders is the most frequent cause of delay, while, construction contractors thought as owners are severe reason of delay [3]

Al-Ghafly (1995) explained about the delay in public water and sewage projects. He finds and group sixty (60) cause of the delay. Al-Ghafly decided the following: most of the time delay happened in large and medium project scope (projects size), and measured as very severe in a small project. Based on his research and its summary, the main delay causes are related to the project holder, contractor's activity, the original planning, duration forecast and preparation of the project. Main causes are (1) finance (2) delay in agreement and decision-making by owner, (3) variations in the plan and size (project scope), (4) problem in

gaining a work permit, and (5) organization and communication problems. [4].

Al-Momani (2000) surveyed causes of delay in 130 public projects in Jordan. So, according to his research survey the important delay causes were interrelated with: (1) design, (2) user changes, (3) weather, (4) site conditions, (5) late supply, (6) financial conditions and (7) rise quantity of work. This scholarship proposed that special care to factors causing delay will help production consultants in reducing contract disputes. [5]

As Megha Desai and, Rajiv Bhatt (2250\*):59 factors of delays are identified for residential construction projects. These factors are collected into nine (9) main are delay related to : (1)Project,(2) project holder (user), (2) construction developer (3) Consultant (4) Design, (5) construction Material, (6) Equipment (7) workers and (8)External factors based on their nature & way of its existence.(9) project related [6]

Aziz, Remon Fayek (2013) explored ninety-nine (99) factors of delay in construction project and the discovered causes were categorized under the following 9 primary category: (1) Consultant (2) Contractor (3) Design; (4) Equipment (5) External (6) Labour (7) Material; (8) Owner and (9) Project related factors of delay. [7]

Aziz, remain Fayek(2013) also analysis and identifies high-impact value of delay causes in Egypt as follows: Funding problems, different strategies patterns for bribes, Shortage of equipment, Ineffective project planning and scheduling, Poor site management and investigation, Poor monetary control on site, Rework, Selecting non-skilled contractors, Sudden Accidents ,poor planning, low-skilled working team, Inadequate contractor experience, Frequent equipment breakdowns, Global financial crisis, Complexity of the work (project type, project scale, etc.) Project Legal arguments between project stakeholders, disagreement between joint-ownership variation, poor construction method, non-skilled labor, Conflicts [7]

Tsegay Gebrehiwet and Hanbin Luo (2017) studied that contrast between the three construction stages and overall result as the overall is the most similar to all stages of delay causes. And they conclude the top greatest main causes of delay in the Ethiopian construction project identified from overall. According to their research analysis, the highest rank of the cause of delay in Ethiopian construction is corruption. Also unavailability of services (utilities) at the site, inflation, less quality material, late design and design documents, less speed of material supply, late in agreement of contract and receiving of completed project work, poor site management and performance, late release budget/ funds, and unsuccessful project preparation and scheduling. The result of this research shows that the two most basic cause of delay in Ethiopian construction projects are cost overrun and time overrun. Also, they grouped the main cause of delay as the following: 1) Responsibility Related Causes, 2) Resource-Related Causes, 3) Contract condition related causes Absence, 4) External Causes Adverse.[8]

L. Muhwezi, J. Acai, and G. Otim (2014) prepared a research in Uganda on "An assessment of the factors causing delays on building construction projects in Uganda" and as they concluded a whole of eighty-one (81) reasons that cause delay were known and grouped into 4 groups of advisors related factors of delay, contractor related delay cause, client-related delay cause, and external related delay cause. [9]

Tushar Khattri<sup>1</sup>, Sohit Agarwal<sup>2</sup>, Vaishant Gupta<sup>3</sup>, Mukesh Pandey<sup>4</sup>(2016) addresses the most noteworthy variables and groups to reasons for delays by using Important Index (IMPI) method and they listed the most critical top ten cause of delay as follows 1) Delay in material supply, 2) Price Variation, 3) Robberies at project site, 4) Less quality Material, 5) Delay in material inquiries, 6) Unreliable sub-contractor, 7) Poor productivity workers, 8) Critical weather condition, 9) Variation in specification and material at working time, 10) Delay in providing services from utilities [10]

Dinesh Kumar R (2016) studies on Causes and Effects of Delays in Indian Construction Projects and the paper aims to find out the most significant Factors causing delays in Indian construction projects through literature review and questionnaire survey. This paper concludes that most significant factors causing delay in the construction, inadequate contractor's work & experience & their poor risk management and ignorance. By recognising this fact, awarding the project to the competent contractor who has lot of experience in the specific project type will avoid this kind of delay in the project, in which specialised and global contractors know well to tackle the pressurised situation by adopting effective risk management skills. [11]

### MAJOR FINDING FROM THE ABOVE REVIEW PAPER

L. Muhwezi, J. Acai, and G. Otim (2014) found that: Although most of the basic delay cause in Ugandan building construction project conduct the same methodology with the other research the highest rank among the top 10 main cause of the delay is "corruption tendencies". [9]

El-Razek et al. (2008) found that fiscal problem of a contractor (developer) is the basic cause. Poor site supervision and site management is definitely the other key cause of delay affecting time performance of most construction projects in India. [2]

Aziz, Remon Fayek (2013), by using RII method he listed the rank of top 20 main cause delay. According to his result the highest main cause delay is client related delay factor. [7]

### 3. CONCLUSIONS

Although different researchers from different areas study the cause delay in a construction project, some of the explored delay causes are similar. So, based on different literature study many delay causes were placed under different groups with their different subgroups. The main groups of delay and their sub-groups in construction projects are as follows

#### A. CONSULTANT RELATED DELAY FACTORS/CAUSE:

Lack of experience, disagreement with a design engineer, delay in approving project scope, delay in performing inspection and testing, poor site investigation, unskilled project management assistance, delay in approving and checking design documents, inadequate coordination and communication between project holders and developers, recurrent change of contractors and sub-contractors, kind of project award and bidding, variation during construction by owners, unfavorable weather condition during construction work, poor experience of consultant and contractors, delay in checking working drawing, error in design documents and discrepancies, less brief specifications in drawings, quality pledge

#### B. CONTRACTOR RELATED DELAY FACTORS/CAUSE

Dishonesty/problems in funding by contractor, ineffective site supervision, ineffective scheduling, revise due to mistakes during work, sub-contractors work related delay, poor experience of the contractor, delay in site arrangement, delay in preparation of working drawing and sample of material, delay in payment of executed work for a contractor by the owner, slow decision-making, late approving design documents, variation by owner, delay in procurement of materials, mistakes in design documents, recurrent changing of subcontractors, poor methods of construction, unskilled project crew, poor technology, poor coordination and communication between them, ineffective contractor's policies, unskilled sub-contractors, ineffective economic control on site, inadequate procurement of construction materials, improper equipment, frequent equipment breakdowns, shortage of equipment, subcontractor turnover, lack of labour, slow mobilization of labour, ineffective equipment, slow equipment delivery, materials damage, strike, conflict between labor and client

#### C. OWNER RELATED DELAY FACTORS/CAUSE:-

Corruption, intermittent termination of variation while project is ongoing, less on-time payment for developers, variation of specifications and material type during construction work, delay in checking contract document, variation of project scope, poor coordination with other stakeholders, slow decision-making, inadequate information during project feasibility study, delay in site delivery, lack of motivations for contractor to finish ahead of schedule, ineffective representative, poor experience, interference during actual project work, joint-owners disagreement, improper feasibility study, poor coordination and communication, interruption of work, slow document approve, nature bidding and award, impractical contract duration, unrealistic delay penalties

#### D. EXTERNAL RELATED DELAY FACTORS/CAUSE:

Claim, unexpected natural disasters, accidents at the site, social and environmental factors, escalation of local material prices and global economic rise, price rise on the

international market ,Unreliable suppliers, public enemy , war, and conflict, delay in obtaining permits from local authority, geopolitical stability, variation in government regulations ,late access to the site (like electricity, road , water) ,neighbors problems, delay by traffic restriction and control ,corruption, social factors, cultures, government policy and its commitment ,late certification from 3rd party, lack of communication ,thieves, international economic crisis, time delay by traffic restriction at the place of work, raw materials unavailability

## E.RESOURCERELATED FACTOR/CAUSE

**I.LABOURS RELATED FACTORS:-**Absenteeism, Low morale Low productivity, conflicts, Lack of labour, slow mobilization, strikes Poor labour experience injuries, less experience with equipment handling

**II .CONSTRUCTION MATERIAL RELATED FACTOR:-**Less qualified materials, late material supply, and Material variation during project work, Material Damage, Inflation

**III. FINANCE RELATED DELAY CAUSES:-**claims due to financial, funding processes by government, slow funds release by fund raisers, International economic crisis

**IV. EQUIPMENT RELATED CAUSES:-**Insufficient or shortage of equipment, Low efficiency and productivity of equipment lack of spare parts, lack of equipment, equipment failure, Delay in delivery of equipment, mobilizing problems of material

## F. PROJECT RELATED DELAY CAUSE

Unsuccessful delay punishments, too short duration of original contract, Legal disputes between various part

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