

Impact of Inflation Rate on Construction Project Using Primavera P6 A Review

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ABSTRACT

Construction of high-rise structures was initiated in complex and dynamic problems resulting in circumstances of high uncertainty and risk, which were compounded by demanding many constraints. The occurrence of risk accidents in the phase of multi-storey construction will lead to great losses to the proprietor and construction enterprises if the construction risk of the structure has not been paid more attention to. The worst catastrophic may occur during structural construction is collapse of permanent or temporary construction. If risk management is not considered in bridge construction projects, there is chance for unwanted problems and uncertainties, by these risks objective cannot be achieved on time, within budget, or with suitable quality results.

Construction industry is taken into consideration as one of the maximum crucial industries in India. These phenomena may additionally have an effect on the development of construction industry in India. In addition to may additionally expose many establishments of construction to be destroyed. Delays in addition to disruptions are sources of capacity risks that studies are looking into techniques to manipulate along with technical, social, monetary, felony, economic, useful resource, creation and commercial. To evaluate the reasons of delays and conflicts are due to: layout modifications, delays in price to contractors, facts delays, investment troubles, bad challenge management, compensation problems and disagreement at the valuation of labor accomplished. On the other hand, time overrun, cost overrun, bad social effect, idling assets and disputes are the principle outcomes of delays and disruptions. The observe concludes the reasons of delays and disruptions and their outcomes placed construction projects at extremely great risk that have an impact on their performance the use of primavera.

Keywords: Analysis, Cost overruns, Delays, Risk and Primavera.

I. INTRODUCTION

Many factors affect the accuracy of building construction projects cost estimating which should be considered in the early stage of the estimating process. Some factors can incorrectly increase the estimated costs and the possibility of contractual disputes between the various parties involved. Other factors can help the estimator to decrease the unnecessary cost of an item and hence lead to successful tendering in a very competitive market.

Construction industry is very important in the economic development of any nation especially in expanding economy like India. It controls the capital flow, as well as labour resources, which had cost implications. As a result of this, proper management of these resources is considered an important aspect of project works. Likewise if the resources are adequately harnessed, issues that relate to cost overrun would not arise which could result to variations and claims. Some firms rely on claims as a result of variation incurred during the course of the project execution and afterward evaluate their profit after incurring necessary and unnecessary costs on a project.

Therefore, accurate estimating requires detailed study of the bidding documents and the environmental situation. It also involves a careful analysis of all projects' data in order to arrive to the most accurate estimate of the probable cost consistent with the bidding time available and the accuracy and completeness of the information submitted.

The purpose is to test whether the project as specified will be economically viable or whether it will generate good value for money. Leaving such feasibility studies until after a project has started, may mean that potential problems are not revealed in time to influence project planning. Although the economic and financial evaluation of the project is probably the most obvious element of the feasibility stage, external factors can play a major role in determining whether

a project will proceed. The project's political context, its relationship with the local community, the general economic environment, its location and the physical conditions in which it will be built, are the most important external factors.

There are both empirical and anecdotal evidence which suggest that delays in the completion of a project, cost escalation, as well as rate of inflation significantly impact on project delivery. Indeed, overruns in both time and cost is not only a general occurrence but equally a huge problem faced during project execution. This usually manifests as an extension of project duration time (time overrun), and/or an increase in the cost of execution (cost overrun). A cost overrun occurs when the cost incurred in executing a project exceeds the estimated cost. Time overrun on the other hand is the extension of time beyond planned completion dates traceable to the contractors. The Department of Housing and Public Works noted that cost overrun could be used interchangeably with the term cost escalation - the anticipated increase (usually over a defined period) in the cost of executing a project.

Direct Cost

Costs of completing work that are directly attributable to its performance and are necessary for its completion. In construction, the cost of installed equipment, material, labor and supervision directly or immediately involved in the physical construction of the permanent facility (AACE 2013).

Indirect Cost

Costs not directly attributable to the completion of an activity which are typically allocated or spread across all activities on a predetermined basis. In construction it is costs which do not become a final part of the installation, but which are required for the orderly completion of the installation and may include, but are not limited to, field administration, direct supervision, capital tools, start-up costs, contractor's fees, insurance, taxes, etc. (AACE 2013).

Markup

As variously used in construction estimating includes such percentage applications as general overhead, profit, and other indirect costs. (AACE2013).

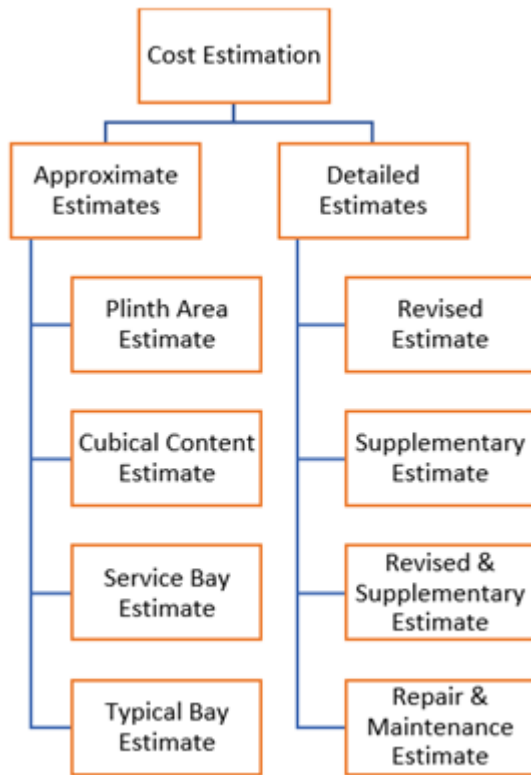


Fig 1 Types of Cost Estimation

II. LITERATURE SURVEY

Abdel et.al (2022) objective of the research paper was to narrate the current management of cost and time in construction sites in Khartoum state. A relatively high response of more than 80% was received from eligible identified professionals, and the data were analyzed using SPSS software. Author used the questionnaires to collect the data and process it using the SPSS software present amicable solutions to overcoming the obstacles faced by Engineers, developers, and clients, starting from the beginning to the end of projects.

Results concluded that natural, political, and economic factors are the most important factors affecting cost and time control. Furthermore, good

coordination, monitoring, and appropriate fund management are the key factors that play an essential role in reducing construction project implementation duration and cost delays.

H.A.Tarkasband and S.D. Joshi (2022) author stated that the practices adopted in different regions for qualitative risk assessment in project and time management and measures taken to overcome the failures in overall project management. It was learnt whether the construction companies are following the project management tools and techniques for effective execution of the plan in the completion of the project successfully. Different regions follow varied aspects of project management dependent on the resource availability, costs and labour work culture in the respective region. Certain regions may discover new models specific to their problems and introduce the same for the effective realization of solutions. Identification of the risk factors affecting the project well in time is important so as to tackle such risk factors.

The conclusion stated that there was a lack of usage of risk assessment tools and techniques during construction project management and hence affects on project time management, costs and labor intensive. Also it increases the risks during project execution and has hazards on health and safety. Time overrun and cost overrun are the main issues arisen due to improper project management.

W. T. Borku and E. Yeniale (2022) author investigated the factors that might contribute to cost inflation on construction materials is significant in order to notice attention to specific areas of improvement for building construction projects in Wolaitasodo. This research attempted to assess the impact of cost inflation, and identify problems of cost inflation on construction materials and adjustment and methods to manage/administer cost inflation on construction materials in Wolaitasodo building

construction projects, which can serve as the way forward for future work in coping with this inflation. The results revealed that the major impacts of cost inflation on construction materials which have been occurring on the projects are improper risk management and improper team organization. Quality of workmanship, risk of project abandonment and Lack of firm price quotes are the factors that cause the cost inflation on construction materials and adjustment problems on Wolaita sodo building construction projects.

III. OBJECTIVES OF THE STUDY

- To identify potential problems before they occur so that the risk impact can be handled or made under control for minimizing losses in high-rise structure projects.
- To identify the approaches that will help to effectively involve risk management systems in multi-storey projects.
- Project delay and cost overrun are recognized as the most common problems faced by contractors, including for High rise Construction projects. Based on those conditions, the objectives of this study are to identify the most probable potential inflation risks and the impact level of the risk can affect to the objectives the high rise Construction project, in order to minimize the risks of Costs and/or Time overruns.
- Conduct comparative analysis between two blocks of structure on the class of planning and scheduling to identify the delay in project and cost overrun.

IV. METHODOLOGY

Step 1- To create enterprise project of a company to execute company profile.
In this step, creation of the company profile with division in which company operates was prepared.

These divisions were further subdivided into streams such as Structure Urban and Structure Rural.

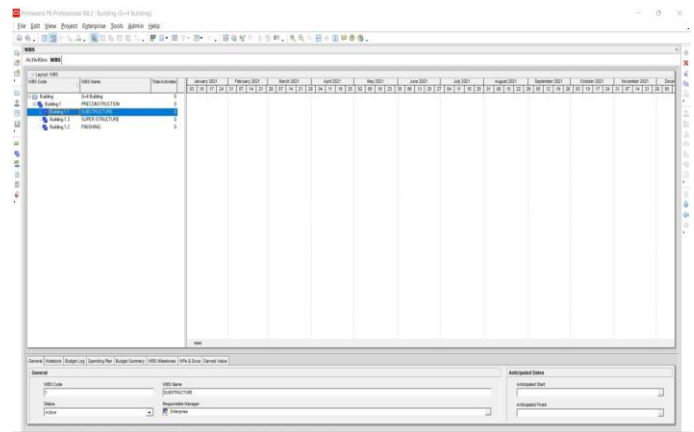


Fig 2 Project Structure

Step 2- Assigning roles and organization structure constituting of company management and responsible managers profile.

The job roles are assigned one the expertise of the employee and the task are assigned as per their qualifications and their experience in the similar tasks as efficient resources are responsible for completion of any project in right intervals and are important for development ventures.

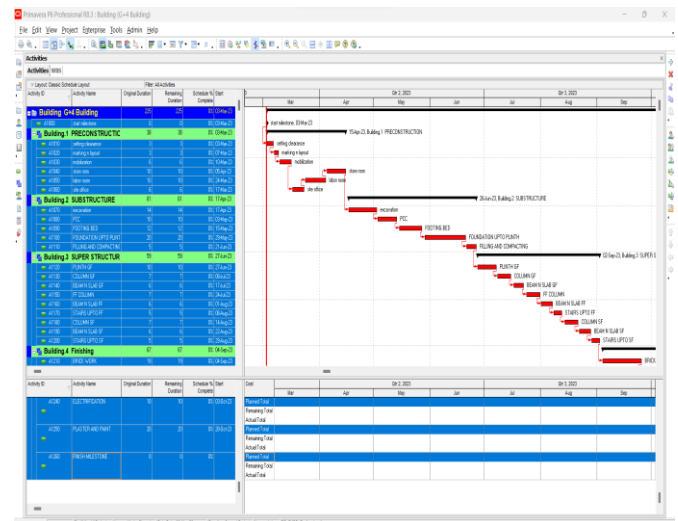


Fig 3 Assigning Job Roles

Step 3- Creating working calendar as per working hours and shifts to be assigned in project:

Before the start of project, the activity list is entered and the calendar are characterized and utilized to display the working time for every action in the task. Calendars are additionally used to characterize the working and occurrence design over the length of the task. These are three unique kinds of schedules namely Global, Venture and customized. The working shift is considered as 8 hours and six days working. The point to point working hours are from 08:00 AM to 05:00 PM. Meal break is of an hour from 12:00 PM to 01:00 PM.

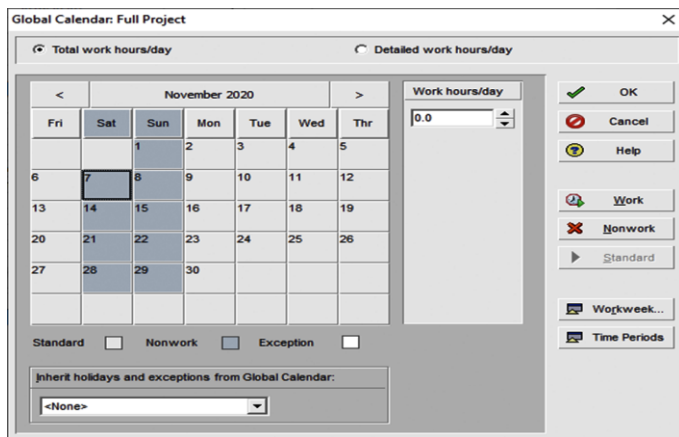


Fig 4 Global Calendar

Step 4- Preparing WorkBreakdown Structure

A WBS is the progression of work used to achieve the project to finish a task. WBS is organized in levels work point by point starting with final task and latter formation of different forms into identifiable work components. WBS is based on the individual sub venture and the undertaken WBS is figured beneath:

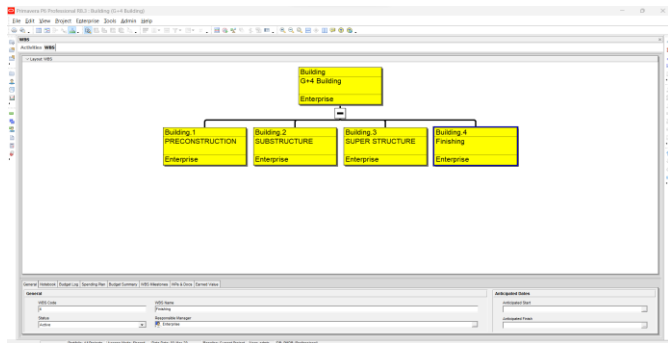


Fig 5 WBS Structure

Step 5- Assigning activities of each WBS as per scheduling data with links in between activities using Gantt chart.

Critical advance in the undertaking arranging is to distinguish the activities to finish the task and furthermore anticipate or valueate the number of days required in the completion of the project. The term of exercises is evaluated based on meetings, research, estimation and strategies of costing. These lengths are relegated in every activity. As the undertaking is of a tedious kind, in order to identify the approach connected by utilizing CPM as PP apparatus.

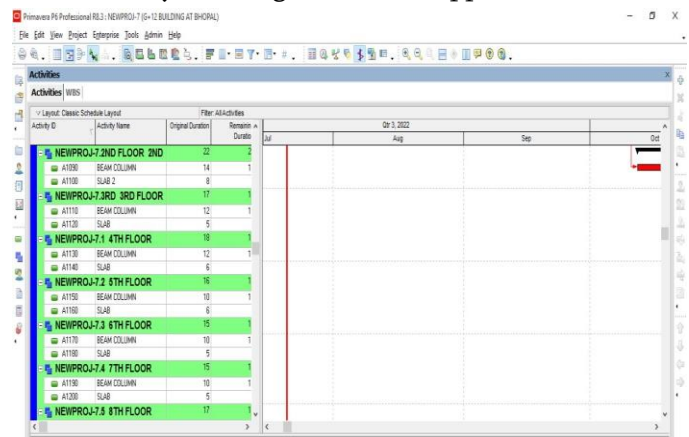


Fig 6 Activity List of Block G

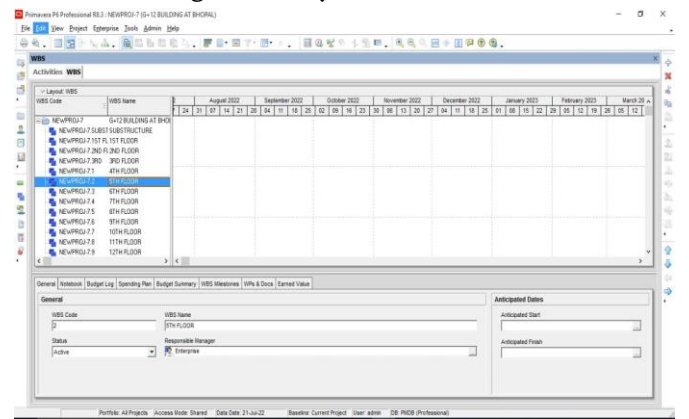


Fig 7 Activity List for Block B

Step 6- Creating Resources (Manpower, Machinery and Material) The assets are prepared using big business asset, where an option is received to get the choice of including new assets. Cost of assets relies on its unit as cost of work is on daily wages, material

relies on their weight and machinery relies on its working hours along with its maintenance.

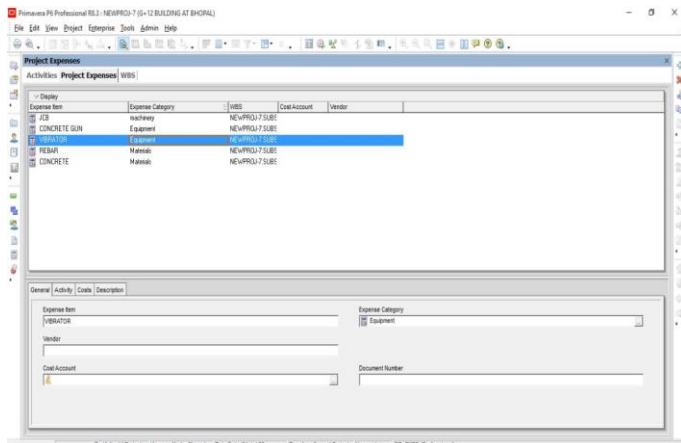


Fig 8 Analysis of Resources

Step 7- Assigning Resources in each activity as per IS. 7272

IS 7272 provide inexact necessity of labour according to the assigned activity. It provides consistent working labour according to sort of work, this code depends on the prerequisite of work for exercises relying on the jobs required for usage.

Step 8- Comparison of scheduling proposed as per site scheduling using Primavera P6.

Primavera provides another instrument to correlation of standard versus current advancement of the task known as Project Scheduling. It furnishes legitimate booking and checking of every last exercises managing and investigating different parameters.

Step 9- Network Diagram

A network diagram represents a project plan in detail graphically; it displays the job logic and basic activity succession. In broad the network diagram displays the 'big picture' like what next and what is the order of occurrence. This feature makes the network diagram accurate, efficient and dependable review method to prevent any bad logic from getting lost in the scheduling software tool and therefore it is important that the parties involved know to read the network diagram and evaluate them. The precedence diagramming method PDM is most powerful, popular,

flexible and effective programming method used in the construction industry. Due to the ease of generation and use and also due to its incorporation of four major activity relationships the network diagram is used in most of the scheduling software.

Projects are introduced to network diagrams. These diagrams provide powerful visualization of the status of position and relationship among numerous project activities. These are the basic resource of communicating among planners and observers in the project.

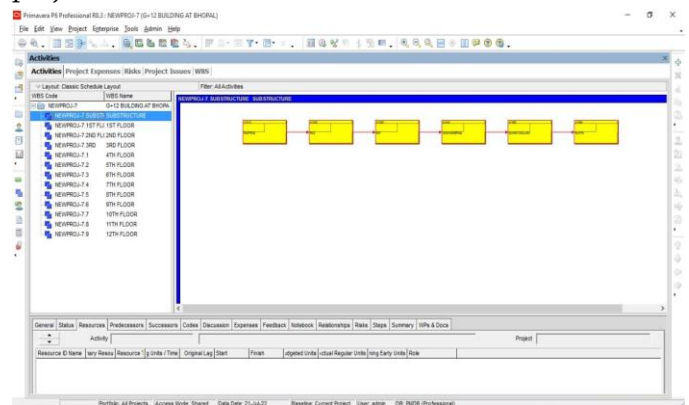


Fig 9 Network diagram of the project Activities

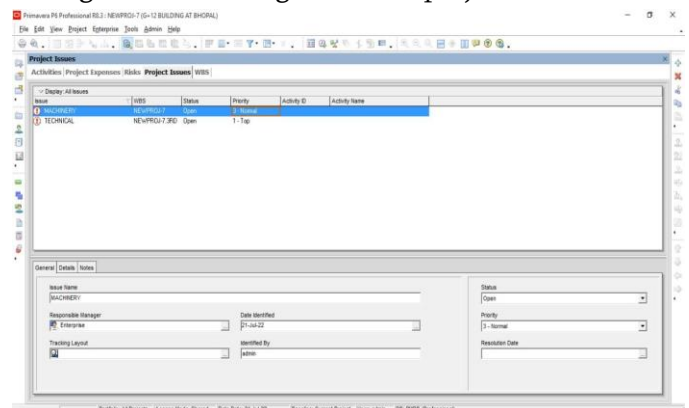


Fig 10 Defining Project Issues

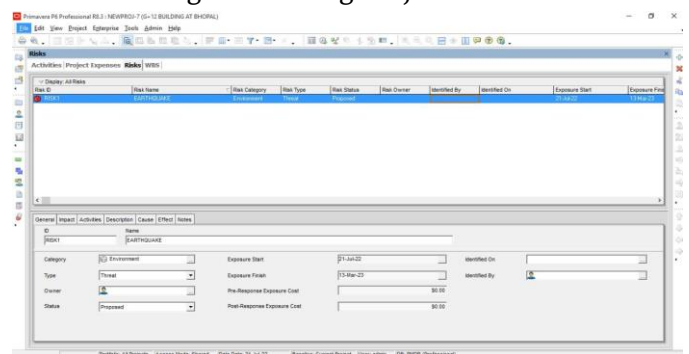


Fig 11 Defining Project Risk

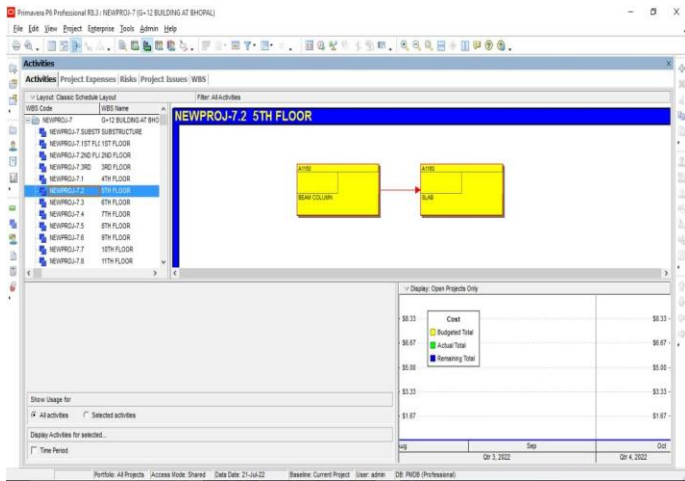
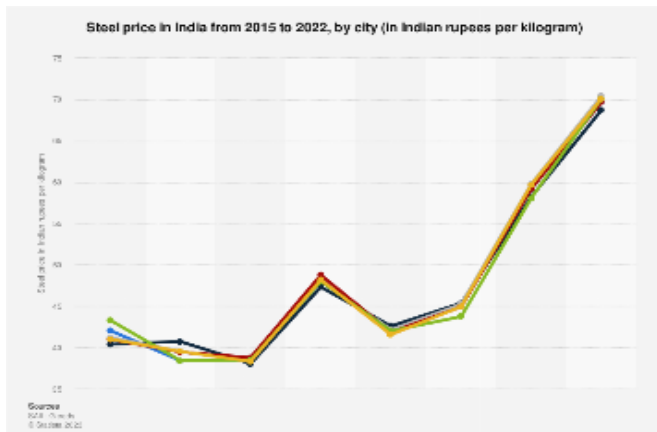
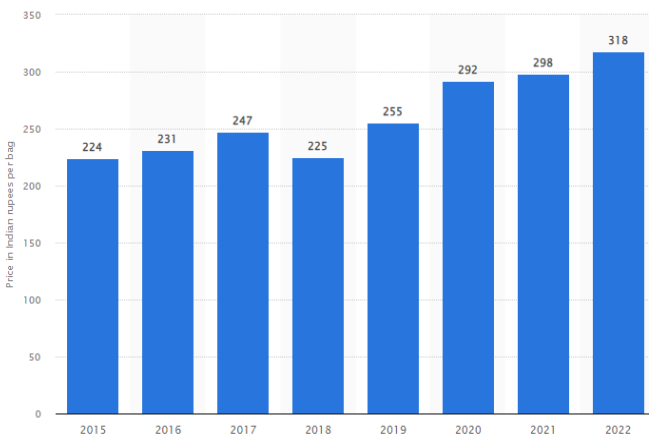


Fig 12 Cost Analysis

V. ANALYSIS RESULT



WBS	Planned Original Duration	Actual Original Duration	Days Delayed	% Increase

Foundation	42	80	38	90.4
Shell Superstructure	126	180	54	42.8
Interior Finishers	49	95	46	93.8
Flooring	50	100	50	100
Elevators	35	36	1	2.85

WBS	Budgeted Total Cost (Rs)	Actual Total Cost (Rs)	% Increased
Planning and Design	151,100.00	154,250.00	2.09
Approval	210,050.00	212,460.00	1.16
Foundation	20,990,500.00	20,994,780.00	0.02
Shell Superstructure	89,527,900.00	89,770,550.00	0.27
Shell Exterior Closure	186,900.00	188,100.00	1
Interior Construction	479,700.00	482,320.00	1
Interior Finishes	505,250.00	510,060.00	1
Flooring	676,000.00	683,685.00	1.14
Elevators	2,591,050.00	2,659,175.00	2.63
Shell Enclose Roof	690,900.00	695,640.00	1
Exterior Glazing	2,042,250.00	2,213,800.00	8.4
Exterior Doors	92,400.00	92,400.00	18.62

Plumbing	4,361,550.0	4,399,520.0	1
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VI. CONCLUSION

The study showed that the construction industry inflation rate is not equal to the economy wide inflation. Increase in construction materials prices is not only caused by inflation but inflation is an important factor. Other macro-economy factors such as supply and demand transportation, energy costs, raw materials and input costs, exchange rates, import duties and crude oil prices also contribute to these increases and have an effect on the trend in price movement.

Hike in prices in construction industry

The recovery in global oil prices raised energy prices, impacting the cost of production of building materials. Salary raise, taxes, and exchange rates contribute to the increase in the cost of construction materials. The prices in cement raised from Rs. 224 to rs. 318 and are continuously increasing due to numerous factors and the same reasons were seen in rise in prices of rebar. The prices of different bricks were further tabulated and the calcium silicate bricks were found to be on a higher side in comparison to other kinds of bricks.

Overrun

The causes of delay were characterized under four main groups of consultant related, contractor related, client related and external related and then assessed their impacts on delay using relative importance index (RII) as a basis for analysis. The RII for all delay factors and group of categories was computed so as to rank the factors.

Planned and Actual Duration

The plan versus actual comparison is a tool businesses use to measure predictions against real-world results. You start by creating a financial forecast, then develop strategies to help ensure that what you

predicted occurs. After the event you based your predictions on passes, you review the actual data for variance. The planned duration was considered and compared to actual from the stage of foundation till placement of elevators.

Cost Analysis

The purpose of a cost analysis is to identify the parts of a project or parts of a business which are not getting good return on investment. The budget total cost and actual cost are compared and % increase is evaluated on the parameters of scheduling and current work reports generated via Primavera.

Planned and Actual Schedule

Planned duration is 169 days and Actual duration is 195 Days. Totally 26 days delayed from the planned schedule i.e. 15.38 %. Planned progress is measured in Primavera P6 using schedule % complete. Actual progress is specified with performance % complete, a more complex term in Primavera P6 Professional. The planned schedule was for 169 days but the actual outcome came as 195 days.

Planned schedule cost is RO 150,901. During execution of the work, the cost is increased to RO 181,134 (19.37%).

Future Scope

The Proposed model can be implemented to different construction projects effectively. It can aid the decision maker with an accurate cost and time data.

The presented model in this research could be improved considering the following points

- Integrate the risk factors on the cash inflow as some of the studied risk factors have a higher effect on it and it will provide a highly detailed cash flow.
- Recommendations based on results of measures framework shows the government's role in the development of construction sector and the issuance of suitable legislation considered as a comprehensive solution.
- this research does not take into consideration those influential factors on final project delivery

as control variables within the study model. Last, there may be some bias information from the respondents since expectations of the company management towards company owners may vary.

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