

Risk Assessment for Fast Tracked Commercial Interior Fit-Out IT/ITES Projects in India

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Abstract - This paper is about risk management in fast-track commercial interior fit out projects. The aim of the study is to identify risk in interior fit out projects such as in offices of IT/ITES, also to understand how to manage those risk and to propose a framework to mitigate risk in interior fit out projects. An effort has been made to study and identify the factors which includes overall risks and delivery risk in an interior fit out. Various Strategy such as delay management, Resource Management and technological choice has also been taken into consideration. Factors based on available literatures were taken and a questionnaire survey was floated having total 25 questions and factors are selected based on ranking based on Relative importance index.

Keywords: Interior Fit Out Projects, IT/ITES Projects, Project Management, Risk Assessment, Risk Management

Fast tracking is the method of parallelizing and overlapping consecutive tasks or phases to shorten the project's timeframe. It is a method used in construction to reduce time of the project by overlapping the activities and crashing activity time by concurrent engineering approach in order to deliver project on time as projects are inherent to delays throughout world.

Clients opt for fast-track projects because they want to achieve or preserve a competitive advantage; they want these projects to be completed faster than normal, while still maintaining high quality (Smith, Merna & Jobling, 2009). Effective time management is thus crucial to the success of fast-track projects as poor timing can not only cause delays but also incur additional costs (Aleshin, 2001).

I. INTRODUCTION

Fast-tracking in project management is a way to manage time, schedule and activities. Fast-tracking in project management involves executing activities at the same time rather than sequentially. This is called performing in parallel. Unlike one activity following the other as most projects are done, fast-tracking doesn't wait for one activity to end before another begins.

However, conventional project management tools are inadequate to solve the problems that arise in fast-track projects in terms of time, cost and quality (Odeh & Battaineh, 2002). It is therefore the purpose of this study to propose techniques and tools to manage the risks associated with the radical compression of project schedules while still ensuring that project quality meets international standards.

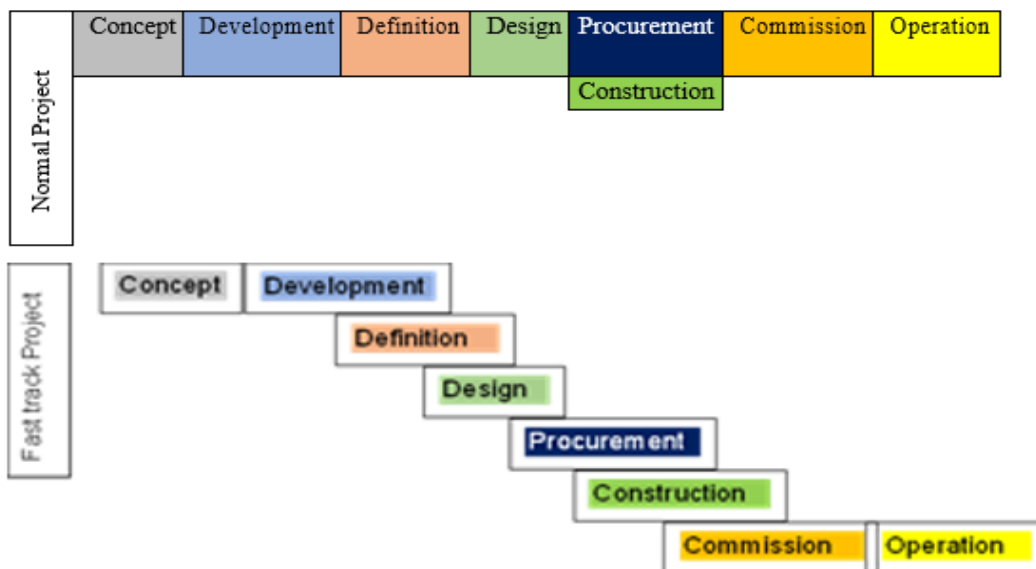


Fig. 1 Comparison of normal project and a fast-tracked project

Greater rivalry among international, corporate, and government entities in the construction sector and real estate market has resulted in increased customer demand to preserve profitability while assuring high standards, commitments, and on-time project completion. In most cases, project management methods contain the following steps: planning, execution, performance monitoring, and closure.

Project completion timelines can be hastened, albeit they may vary depending on the project's design, finances, and scope. The project duration can be reduced by adopting the fast-track construction delivery technique. Figure 1 depicts a comparison between a conventional project and a fast-tracked project.

II. SYNOPSIS

A. Aim

To develop a framework for managing risk in Fast track commercial interior fit out projects.

B. Objectives

1. To identify the risks in commercial interior fit out projects and categories them according to their levels.
2. To investigate various risk management concepts and how they apply to commercial interior fit out projects.
3. To evaluate various risk mitigation frameworks and propose the most appropriate for controlling risks.

C. Limitations

Overlapping activities were studied for construction projects not for interior fit out projects.

D. Need

1. There is no extensive literature on accelerated (fast-track) projects and none focuses on risk management in interior fit out projects, hence needed for study.
2. Literatures are limited to construction projects, having smaller or typical activity. These activities were overlapped and crashed for a construction project.

E. Scope

1. I am confining myself to Commercial interior fit out projects having area between 50,000 Sq. ft (4646 Square Meters) to 1,00,000 Sq. ft. (9292 Square Meters)
2. I am only considering activities having risk at execution stage.

III. REVIEW OF LITERATURE

Multi-Dimensional Optimization Model for Schedule Fast-Tracking without Over-Stressing Construction Workers - (Zinab Abuwarda *et al.*, n.d.) developed a general

framework for schedule optimization that incorporates the four schedule acceleration dimensions of flexible activity overlapping, alternative network pathways, execution modes and linear activity crashing. The Constraint-Programming (CP) methodology was used to build a framework for managing complicated projects with a range of milestones, constraints, and resources.

Model of Trade-Off between Overlapping and Rework of Design Activities - Dehghan & Ruwnapura, 2014, Reza Dehghan Developed and discussed design activity overlapping time-cost trade-off. Detailed method and characteristics of design activity overlapping was explained.

Risk Assessment in Fast-Track Construction Projects: A Conceptual Model - Garrido Martins *et al.*, 2017 examined the overall timeframe of a fast construction project that was exposed to a variety of risks due to varying degrees of overlap. For a straightforward 35-day building schedule, In order to apply varying levels of overlapping for each process, a conceptual model was constructed using a Monte Carlo simulation.

Risk Management in Fast-Track Projects: A Study of UAE Construction Projects-Bader Ahmed Al Harthi studied Risk Management for UAE construction projects which considered all categories of risk such as financial, technical, political, socio economical etc. During this each Factors were ranked using RII. Ex- Contractors Risk had Lack of qualified staff in contractor's organization was a major risk having highest rank.

Analysis of Cost Overrun in Fast-Track Interior Fit-Out Projects: Balavenkatesh Ranked the factors responsible for cost overrun in a fast-tracked interior fit out project having 29 factors divided into 7 groups and found Design and documentation related factors as a crucial factor having a RII ranking of 2.63.

IV. STRATEGY STRATEGIES OF FASTRACK CONSTRUCTION

To finish the project in less time. Various tactics are used, three of which are as follows:

A. Delay Management

Delay is defined as time overrun that extends beyond the completion date indicated in a contract or beyond the date agreed upon by the parties for project delivery. This is highly prevalent in any project delivery system due to a lack of coordination, project complexity, project scale, stakeholder permissions, and so on.

B. Resource Management

The process of planning the resources required to accomplish the objectives and satisfy the client's expectations, without which the project's objectives will be

jeopardized. Man, Material, Machinery, and Money are the four basic resources.

C. Choice of Technology

Choosing appropriate technology for Construction plays vital role in time and cost of project. Correct Technology utilizes resources at it best and increases productivity of man, saves material in long run.

D. Linear Activity Crashing

This approach means shortening the time of specific actions (usually critical ones) at the risk of increased direct cost. Crashing is a sort of activity resource manipulation that often involves working overtime hours, different shifts, weekends, and/or adding more personnel (over manning). This technique requires in depth assessment of the linear time-cost function of each task.

E. Discrete Activity-Mode Substitution

This decision includes choosing between different execution possibilities. Outsourcing work rather than performing it using in-house resources is one example.

F. Path-Substitution (Alternative Paths)

This option entails replacing a sequence of activities with an alternative one. The additional costs of changing to a faster approach must be considered.

G. Activity Overlapping

To save time, the option makes use of soft predominance between qualifying tasks transforms the work process from in-series to substantially parallel. When two activities employ the same type of resource, overlapping decisions may involve hazards such as rework and resource over-allocation. As a result, while overlapping does not increase

the direct cost, the time & cost of rework must be looked into.

V. METHODOLOGY

1. To understand the problem in current literatures and find what has not been done.
2. To identify risk factors w.r.t interior fit out projects.
3. To study and identify suitable scale and typology of building (end use).
4. To understand activities and risk factors in interior fit out for selected scale.
5. To filter out important factors applicable to interior fit out projects.
6. To rank the factors based on literature review and questionnaire survey and derive strategy.
7. Verification of ranked factors through case study or personal interviews.
8. Derive findings and conclusion.

VI. DATA COLLECTION

The data is collected in following ways,

1. Questionnaire Survey
2. Case Study
3. Interview

A. Questionnaire Survey

A detail questionnaire was prepared based on factors from review of literature and telephonic interview. A total 25 number of questions were asked and 16 questions having scale of 1 to 5 with percentages on each scale. 45 respondents have responded the survey.

Relative Importance Index (RII) is used for calculations. The most Important factors were ranked and has to be managed on priority. The framework shall be prepared after complete data collection. The survey had 16 questions with scale of 1 to 5.

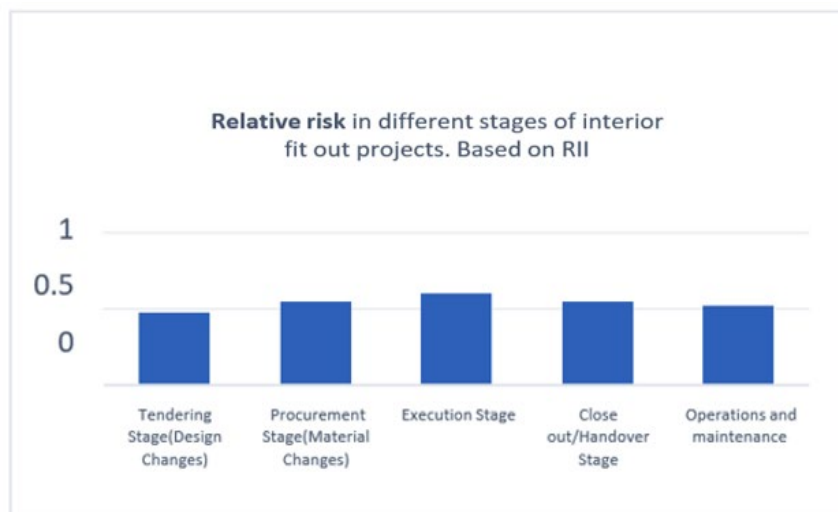


Fig. 2 RII for Various stages in interior fit out project

1. Experience - Around 58% had up to 5 years & 34% were freshers.
2. Role - Around 54 % were Architects/Designers , 22% were project managers & 7% were Construction Mangers.
3. Projects dealt - 48% dealt around 1-5 projects and 25 % dealt 5-10 projects.
4. Around 48% responded agreed that accelerated fit out are common.
5. Around 62% Respondents didn't work as individual decision maker in interior fit out project.
6. Around 66% were responsible for managing risk in fit out projects.
7. Around 58% believed that risk related to projects were partially allocated in Fit out projects in India.
8. Around 55% responded the owners have been pressing for changes in design frequently in advanced stages of projects.
9. Around 43% agreed that accelerated fit out projects has overstressed workers in terms of work environment.

TABLE I QUESTION FOR QUESTIONNAIRE SURVEY WITH RII

Sl. No.	Question	Impact on Time	Impact on Cost
1	Q24. Unavailability of materials and equipment's (affecting Accelerated construction)	0.702	0.600
2	Q17. Low productivity of labor (Unskilled Labor or Labor diverted to other sites)	0.689	0.569
3	Q23. Poor quality materials supplied/installed causing reorder/rework.	0.680	0.618
4	Q22. Delay in supply of materials (Lead time not calculated accurately)	0.671	0.551
....16	Q14. Deficiencies in drawings and specifications by consultants (PMC, Architects and various Service Providers	0.556	0.547

B. Case Study

A case study of IT/ ITES in Pune has been taken up having Area of fit out as 50,000 sq. feet (4646 Square Meter). Structure was about 20 years old, the space was utilized for office of an IT or ITES company, the deadline of completion of the project was 6 months which included major works of Interior fit out such as Hardscape and Landscape Demolition, Building Aluminum Composite panel replacement, Lift Installation, Lift Lobby Interior

works, Atrium 10 m height and all services such as MEP, Firefighting and IOT sensors.

Project Location - Pune Maharashtra India.
 Project type - Fit out Construction (Commercial Office Space)
 Service Category - IT/ITES service.
 Scale- 50,000 Square Feet (4646 Square Meter)
 Scope of Work - Demolition & Construction of same as per Table II.

TABLE II SCOPE OF WORKS FOR REFURBISHMENT INTERIOR FIT OUT PROJECT

Sl. No.	Scope of Work	Sq. Ft
1	“Hardscape Demolition, consisting of Flooring Tiles Removal, Driveway area Tiles removal, Landscape enclosure cladding removal, Waterbody Demolition, plumbing lines/Electrical Cabling/ Lighting Fixtures to be removed.”	50,000 SFT
2	“Ground Floor Atrium (10m HT) & Lift Lobby Demolition- (2 Nos x 1500 SFT), consisting of Flooring Tiles Removal till base slab, Wall cladding removal, Gypsum Partition/Wall paneling removal, ACP Panels Removal inside Atrium, Gypsum Ceiling with installed MEP services removal etc.”	3,000 SFT
3	Lift Lobbies on Respective Floors- (8 Nos x 500 SFT), consisting of Flooring Tiles Removal till base slab, Wall cladding removal, Gypsum Ceiling with installed MEP services removal etc.	4,000 SFT
4	Lift Lobbies in Basement Floors- (4 Nos x 500 SFT), consisting of Flooring Tiles Removal till base slab, Wall cladding removal, Gypsum Ceiling with installed MEP services removal etc.	2,000 SFT

C. Risk Factors - Case Study Inferences

1. Hardscape demolition work on GF enabled cracks to basement roof of B1 And B2.
2. Draining lines of hardscape area broken due to heavy machinery and unskilled labor workforce in action.
3. Broke waterproofing layer and PCC layer of GF slab which now has to be done for entire area of 50,000 sq.ft as water in Pune plays major effect on building.
4. ACP removal was completely different task as building elevation is not straight.
5. Interior Lobby (Atrium-10 m) has to be redesigned as stone cladding and wood work with concealed lighting and HVAC system, but client is not sure about the design from architects and requires changes.
6. Inhouse team coordination issues as there were no SPOC. And client wants project within time, but time coordination was a big issue for this project.

7. Lack of safety awareness and improper facilities for workers leading to migration/dislocation/ reduced productivity.

D. Interview - Factors of Risk During Execution Phase

1. Location of the services.
2. Interior finishes and texture, examples: paint finish, floor finish, interior fittings.
3. Services and landscape changes.
4. Material change
5. Electrical layouts, additional sockets.
6. Change of scope, change of vendor for furniture and material.

VII. RESULTS AND DISCUSSION

A variety of methodologies were employed to collect and analyze the data and report the results and discussions. These methodologies included reviews of the literature on risk management and fast-track projects, the development of a survey questionnaire, which included the creation of a risk breakdown structure, risk matrix analysis and Likert scaling, and the use of a focus group to validate the methodology and propose an appropriate risk mitigation framework.

1. Co-ordinations with various stakeholders are a key aspect in managing risk.
2. Transportation of HVAC materials and equipment was a major risk as building was situated in dense area.
3. Changes Location of the services- according to Clients Buyer/leaser invites various changes and risk to schedule and planning.
4. Activity crashing and overlapping cannot be done for various fit out activities such as washroom, HVAC work.

VIII. CONCLUSION

The approach of fast tracking is quite suitable in construction (Base build), since activities are similar and repetitive, in case of interior fit out projects fast tracking is significant but invites cost escalations and over stressed workers. In refurbished projects - the dilapidation report has

to be made mandatory before entering into any work. The mitigation plan depends upon the type of commercial facility undertaken, if it is green field the plan shall be different whereas for brownfield projects are more certain to risk during execution phase, as many times the facility are functional and operations can only be performed in limited hours, in such cases the framework adopted shall not be completely effective Excessive schedule compression can lead to space congestion and overstressed workers, compromised work environment in terms of Health and safety. To implement timely project delivery, Procurement plays the most significant role. Excessive schedule compression can lead to space congestion and overstressed workers.

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