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Compressing Construction Project Schedules: A Fast-Tracking Technique in the Administration of Construction Projects with Case Studies.

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ABSTRACT
Project scheduling with fast tracking is a technique used to shorten the overall duration of a project without reducing its scope. This mostly involves identifying tasks that are originally scheduled to be performed in sequence and performing them concurrently instead. Construction project managers often use this method to address tight schedules or make up for lost time due to project delays. While fast tracking can greatly speed up project delivery, it also brings additional risks. These mostly include more problems with coordination, less quality control and a higher chance of having to redo work because of overlapping jobs that can lead to mistakes in project phases or tasks that are already going on. This study aimed at exploring the key principles, benefits, challenges and risk management strategies associated with fast tracking in project management. These insights offer a deeper understanding of fast tracking in the construction. Through a thorough review of literature, practical case studies and an online survey, this study was able to achieve its objectives. 105 people responded to a survey questionnaire that was distributed among construction project managers. The collected data was analysed using descriptive statistical methods. The findings identified that a large number of project managers strongly agree that fast tracking practically shortens their projects' timelines. The study established that fast tracking can serve as an effective technique for compressing project schedules. Though it must be carefully planned and closely monitored to mitigate potential risks that would compromise project success. Future research can build on this work by exploring additional overlooked related issues attached to fast tracking technique.
Key words: *fast tracking, construction project management, delays*

1.0 INTRODUCTION

1.1 Background

Timely project completion is widely recognized as a key indicator of success in the international construction sector mainly because this reflects the effectiveness of both planning and project execution (Doloi et al., 2012; Elhusseiny et al., 2021; Marzouk & El-Rasas, 2014; Vijayalaxmi & Khan, 2022). Economic pressures, intensifying market competition and the rapid pace of urban expansion collectively have significantly increased the demand for faster construction schedules from clients, contractors and other key stakeholders involved in the industry(Doloi, 2013; Doloi et al., 2012). In response, project managers continually seek effective strategies to complete construction projects more quickly without compromising the scope, budget and quality (Khoueiry et al., 2012; Taiwo, 2006). This review study aims to explore the tools used, key principles, benefits, challenges and risk management strategies associated with fast tracking in construction project management from a global view to provide a comprehensive understanding of its use in diverse regional contexts. To achieve this, a thorough review of existing literature from various projects was conducted. The mentioned case studies in this review point out some of the conditions under which fast tracking was implemented. An online survey with 105 responses was also conducted to offer a deeper understanding of the fast-tracking technique in construction from project managers' perspective.

2.0 Theoretical framework

A comprehensive literature review was conducted to investigate tools used; key principles, benefits, challenges and risk management strategies associated with fast tracking in construction project management as documented in prior studies. This chosen approach thoroughly analyses existing knowledge and scholarly perspectives on fast-tracking approach in construction project management. The review employed systematic searches using recognized academic databases and relevant keywords such as "scheduling in construction," "fast tracking in construction," and "reduction of project timelines in the construction industry." Additionally, the process of cross-referencing, which involves examining the

reference lists of identified studies to locate further relevant works, was utilized. This approach was subjectively guided by a research team to ensure methodological rigor in the selection process. The team employed criteria such as relevance to the research objectives, methodological soundness, and citation impact to identify and prioritize studies, thereby enhancing the credibility of the review. The review of existing literature aimed to build a comprehensive understanding of the concept, examining its practical applications, key benefits and commonly encountered challenges. Furthermore, it aimed to seek some mitigation strategies used for the risks associated with fast tracking. This review simply offers a well-rounded basis on fast tracking in project management assessing its efficacy in real-world construction projects and guiding future studies and practices in the field.

Figure 1: A diagram showing the methodology of the theoretical study/framework

2.1 Fast tracking in construction project management

Fast tracking is one such technique in project management which serves as a schedule compression technique. This involves executing project phases or activities concurrently rather than sequentially, with the intention to shorten the overall project duration (Garrido Martins et al., 2023; Hastak et al., 2008; Radman et al., 2022). In project management, fast tracking is a scheduling approach where tasks that are normally completed one after another in a sequential manner (Hastak et al., 2008). These tasks are intentionally overlapped and performed simultaneously in order to shorten the overall project duration (Altuwaim & El-Rayes, 2018; Bakry et al., 2014; Mitra, 2016). In construction, this frequently entails overlapping the design and building phases or beginning foundation work while design elements are being finalized (Hao & Mei, 2022). It can shorten delivery times, but it also raises the possibility of mistakes, rework, and problems with coordination (PMI, 2021).

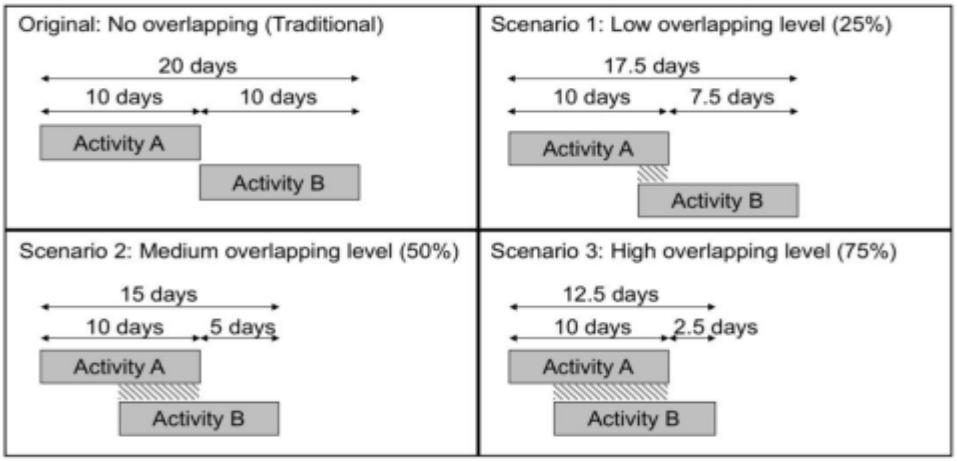

Figure 2 : Example of a traditional schedule from (Garrido Martins et al., 2023) showing three different scenarios of overlapping

Fast tracking has become a prominent and widely used method for managing construction projects, especially in commercial and large-scale infrastructure developments where delays can have serious negative effects on both financial outcomes and the reputation of the organizations involved (Gibson & Gebken, 2003; Levitt, 2011). The method is frequently applied when project deadlines cannot be negotiated or when unanticipated events, such as supply chain interruptions, financial problems, or delays in permits require delays to be recovered (Ghosh & Jintanapakanont, 2004). Typically, fast tracking entails finishing architectural and structural work simultaneously or by overlapping the phases of design and construction. This method, sometimes known as design-build delivery, speeds up project deadlines by doing activities concurrently (New Series of Contract Documents Enhance Construction Projects | ASCE, n.d.) This necessitates close collaboration and coordination amongst interdisciplinary teams as well as constant real-time communication to guarantee that all tasks are in line and possible problems are resolved quickly (Alaghbari et al., 2007; Doloi et al., 2012; Hastak et al., 2008; Loch & Terwiesch, 1998; Marzouk & El-Rasas, 2014; Vijayalaxmi & Khan, 2022).

Notwithstanding its potential advantages, fast tracking greatly increases project risks such as scope creep, design defects, difficulties with quality control and the likelihood of expensive rework(Fazio et al., 1988; Hobbs et al., 2008; Joslin & Müller, 2015). All of these can affect the project's overall success and budget (Javed et al., 2022; Love et al., 2008; Magnussen & Olsson, 2006). Additionally, assumptions about the results of incomplete earlier work/tasks must be made when interdependent work/tasks are completed concurrently. If these assumptions are incorrect or the process is not properly managed, this approach raises uncertainty and the chance that the project will fail (Loch & Terwiesch, 1998). These risks are increasing in global construction practice especially in developing nations greatly due to some enduring issues such as lack of skilled labour, the limited use of cutting-edge building technologies, fragmented and ineffective supply chains. Together, these elements make fast tracking more difficult and necessitate more supervision to guarantee project success. Around the world, fast tracking is becoming increasingly popular, especially in areas like Asia, the Middle East, and sub-Saharan Africa that are seeing tremendous infrastructural construction. Because of the pressing development needs and unique project timelines in these areas, fast tracking is a tempting tactic to speed up building schedules and satisfy rising demands. Mega projects like the Beijing Daxing International Airport in China and the Lusail City project in Qatar adopted fast tracking strategies to meet demanding timelines in preparation for major global events (Mitra, 2016). In developed economies such as the United States and Western Europe, fast tracking is usually supported by advanced project management software Building Information Modelling (BIM) and integrated project delivery (IPD) methods. These enhance visibility, reduce miscommunication and improve coordination during project execution (Eastman , Charles M; Chuck Eastman, Paul Teicholz, Rafael Sacks, 2018).

However, in many developing nations the successful adoption of fast tracking in construction project management is often hindered by a number of persistent challenges. These include weak or poorly defined contractual frameworks, regulatory hurdles, a significant shortage of skilled labour and the limited use of advanced planning tools and technologies essential for effective project management. Collectively a thorough evaluation with consideration of geographical contexts, the unique character, complexity of projects and other factors are all therefore necessary for the successful use of fast tracking on a worldwide scale, particularly in various construction environments (Ofori, 2001). Conducting a comparative analysis of fast-tracking practices across different countries provides valuable insights into the key factors and conditions that influence its successful implementation. This analysis highlights best practices that can enhance efficiency and effectiveness. This analysis also identifies potential pitfalls or common challenges that project managers should anticipate and also proactively address.

2.1.1 Common and recommended Project management tools that facilitate fast-tracking technique.

According to Ben Aston, a digital project manager and founder of thedpm.com. has been in the project management industry for more than 20 years. He explains that projects can be done quickly and efficiently when project stakeholders are on a similar page. He also explains that this can be achieved using some project management tools described below to plan projects, track progress and ensure collaboration within the project team.

- Microsoft Project

Project Scheduling Software is a specialized tool used in construction project management to plan, organize and manage the timeline of a project. It helps project managers and teams coordinate tasks, set

deadlines, allocate resources and track progress. This provides a visual representation of the project schedule, facilitating better time management and ensuring that all activities are completed on time.

- Primavera P6

Primavera P6 by Oracle is designed for large-scale projects and is widely used in industries like construction and engineering. It provides advanced scheduling, resource management and critical path analysis.

- Asana

Asana is a versatile project management tool that helps teams organize tasks, set deadlines and track progress. It includes features like task dependencies, timeline views and real-time collaboration tools.

- Zoho Projects

Zoho Projects is a project management platform that does not compromise on quality and functionality. A project manager can break down your project activities, allocate resources and schedule your work items using the Gantt chart. A comprehensive task management module, intuitive Gantt charts, efficient resource allocation and effortless collaboration are some of the reasons why a large number of project managers recommend this tool.

- Wrike

Wrike is a project management and collaboration software used by project teams to plan, track and manage projects, streamline workflows hence improve overall productivity. It offers many features for task management, team collaboration and resource management.

2.1.2 Benefits of Fast Tracking

- Reduced project duration

Fast tracking is a project scheduling technique that compresses overall schedules and speeds up delivery by permitting tasks that are typically performed in sequence to be executed in parallel. For example, construction activities can commence while the design phase is ongoing, not yet fully completed. This approach is highly beneficial for projects with tight deadlines due to market pressures and regulatory restrictions or pressing operational requirements. Overlapping some key tasks of the project lifecycle enables teams to significantly reduce delays and compress schedules. This makes for earlier use of facilities and quicker realization of benefits for the project.

- Early revenue generation or occupancy

By speeding up the overall project timeline and enabling certain facilities or parts of facilities to become operational earlier than anticipated, fast tracking allows stakeholders to begin utilizing the asset and generating revenue earlier than expected. This approach has the ability to significantly enhance the cost performance of a project and improve the return on investment (Reinschmidt & Trejo, 2006).

This is particularly important for commercial, residential and infrastructure developments where any delay in completion can result into huge financial losses, lost market opportunities or reduced competitive advantage. Early occupancy of parts of a building project completed can boost overall financial viability by increasing cash flow and generating earnings earlier. The fast-tracking strategy can also greatly improve the return on investment by reducing the payback period and increasing profit margins. In addition to the short-term financial benefits, earlier operation of project parts can offer strategic benefits such as capturing market share, addressing urgent community needs and responding more quickly to pressing market or community needs.

- Increased responsiveness to market demands

The fast-tracking approach allows for quicker delivery that closely matches more effectively with changing customer needs and increasing competitive pressures hence greatly improving a project's ability to respond to market demands. In changing markets with rapidly changing consumer needs, legal conditions and economic conditions, the ability to reduce construction timelines enables firms or organisations to take advantage of new opportunities or react quickly to pressing needs. Fast tracking also allows for the flexibility to change project specifications or add late changes without incurring significant delays by having both the design and construction phases in parallel. In sectors such as public infrastructure, retail, healthcare and commercial real estate where timing has a direct bearing on stakeholder satisfaction and market positioning, this adoptability can be very crucial. Additionally, by enabling the earlier completion of projects sooner, fast tracking helps reduce exposure to risks related to shifting market conditions such as increasing material costs or labour shortages.

- Better integration of design and construction

Fast tracking encourages the concurrent progress of the design and construction phases which otherwise occur in sequence, thus improving the coordination of the design and construction processes. From the outset, this overlapping approach provides a more cooperation environment between architects, engineers, contractors and clients greatly improving coordination and communication. Given that decisions on design are always open to changes influenced by construction realities, construction firms find this form of integrated workflow beneficial hence minimizing the occurrence of expensive changes or rework in the project's later stages.

The early involvement of the contractors also plays a critical role in enabling value engineering, enhancing more accurate scheduling, cost estimation and resource planning. The feedback mechanism established through the simultaneous progress of activities by the project team helps to detect design errors and potential conflicts or constructability issues early therefore minimizing rework. This proactive collaboration enhances the overall project efficiency and quality. For firms, this improved integration strengthens teamwork, optimizes project delivery and builds stronger client relationships by demonstrating responsiveness and agility throughout the project lifecycle.

Table 1: Summary of benefits of Fast Tracking

Benefit	Description
Time Savings	Significant reduction in overall schedule by overlapping tasks
Early Return on Investment (ROI)	Projects reach operational phase sooner, improving financial performance
Enhanced Collaboration	Promotes cross-functional teamwork between design and construction teams
Competitive Advantage	Enables firms to meet tight deadlines and outperform competitors

2.1.3 Challenges Associated with Fast Tracking

- Increased design errors due to incomplete information

Due to the intentional overlap between the design and construction phases in fast tracking, construction often begins before the full set of design details is finalized or thoroughly examined. This can lead to inconsistencies, omissions, or conflicts within the design documents that only become apparent during the construction process. As a result, valuable resources may be wasted, project timelines disrupted and costly rework required to address the emerging issues.

The pressure to maintain accelerated schedules may cause project teams to overlook or underestimate some critical design coordination issues, further exacerbating the risk of errors. Furthermore, if not handled appropriately, quick adjustments made to account for stakeholder requirements or on-site realities may cause confusion.

- Lack of coordination between overlapping teams

Fast tracking frequently necessitates the contemporaneous, rather than sequential execution of several project activities. This overlapping execution of tasks typically involves different teams working simultaneously on interdependent tasks. This approach, however, may lead to misunderstandings, duplicated efforts, redundant work and uneven results if efficient coordination systems are not firmly established and actively maintained throughout the project. Teams may be unclear about scope modifications, revised designs or other people's development which can lead to delays, rework, and disagreement. The absence of cohesive communication and collaboration tools further worsens the problem thus lowering the potential time gained through fast tracking and increasing the chances of project failure.

- Cost overruns from rework and poor planning

The speeding up of project schedules can be done using a strategy called fast tracking where multiple tasks or stages such as design, procurement and construction proceed concurrently instead of in a sequential manner one after the other. While this approach speeds up the completion of the project overall, it also increases the possibility of rework because of inadequate designs, changing scope definitions or unexpected conflicts between overlapping tasks. Starting the construction earthworks before all design components are finalized can cause mistakes, misalignments and expensive adjustments when contradictions on the construction site are found. Rushed decisions and sloppy planning in the early phases are usually a result of the necessity to keep a rapid pace of project progress thus increasing the likelihood of errors. All these factors contribute significantly to delays, resource inefficiencies and cost

overruns which eventually compromise the scheduling and cost benefits that fast tracking is intended to bring.

- Scope creep and documentation gaps

Fast tracking can speed up execution of projects by initiating construction earthworks even before the entire project scope is defined fully, documented fully or completely comprehended by all stakeholders involved. Initiation of construction works at this early stage contributes to scope creep. Scope creep is a condition which can be defined as the informal addition and integration of extra features, work or new changes incited by the client into the construction process without proper evaluation or approval. Such unexpected additions can significantly impact project schedules, costs and resource allocation. The need to progress quickly by the project team may result in the use of outdated or incomplete documentation including technical reports, design drawings and change orders. As such, project teams are likely to suffer from confusion resulting from the gaps in the documentation. This in turn results in misunderstandings and non-uniform performance on-site. This situation also contributes to the occurrence of construction mistakes, delays, rework and client-contractor conflicts. The dynamic aspect of evolving project needs combined with poor control of documents undermines effective management of deliverables, schedules and budgets. This thus makes scope creep and poor documentation high risks in projects subject to fast-tracking.

2.1.4 Risk Management Strategies for Fast Tracking

The implementation of effective change management systems that guarantee that all changes are appropriately assessed, approved and documented is necessary to effectively resolve this challenge. Regular interdisciplinary coordination meetings allow early identification and resolution of problems and clearly established communication procedures are necessary to ensure transparency and consistency to all stakeholders. The management of changing design information and the accurate dissemination of that information to all teams depend heavily on these procedures. The expected benefits of fast tracking may be threatened in the absence of such organized procedures resulting in misunderstandings, construction errors, decreased project quality and longer schedules.

- Early stakeholders' engagement

Key project stakeholders such as project owners, architects, engineers, contractors and consultants require early engagement to foster the agreement on project goals, expectations, roles and responsibilities. This proactive engagement allows these stakeholders to actively participate in key design decisions, project sequencing, scheduling strategies and thorough risk assessments long before construction activities start to overlap. Incorporation of varied inputs into the planning process improves the quality and workability of the proposed solutions. Especially in difficult cases or fast-tracked phases, early stakeholder input also improves interdisciplinary coordination, fortifies communication channels and builds trust. Such input creates more predictable results and smoother project execution by lowering the possibility of late-stage adjustments, misunderstandings and expensive rework.

- Use of Building Information Modelling (BIM)

During the project's lifecycle, the visualization, simulation and integration of architectural, structural and system components are augmented by the powerful digital tool known as Building Information Modelling (BIM). BIM is essential in fast-tracked environments with numerous stages happening at the same time because it allows architects, engineers, contractors and other stakeholders to collaborate in real time. This collaborative work platform enables constructability analysis, early detection of design clashes and data-driven decision-making. With the use of a shared BIM model which is continuously updated, all project stakeholders have access to the most recent design information thus avoiding errors and gaps in documentation. Project teams are able to meet tight deadlines without compromising quality or performance because of BIM's significant boost in overall project efficiency.

- Clear and Flexible Contractual Arrangements

The ability of contract types such as Design-Build and Guaranteed Maximum Price (GMP) to accommodate overlapping design and construction phases makes them particularly well-suited for projects with tight schedules. By encouraging the coordination of designers' and contractors' interests in early engagement, these contract types encourage a more integrated project delivery process by optimizing cooperation and communication. Design-Build contracts reduce decision-making complexity and fragmentation by consolidating responsibility. GMP contracts place a cap on project costs thus improving financial management while maintaining flexibility and providing more cost predictability. Both contract

types encourage collaborative solving of problems and offer structured mechanism for management of scope changes, reducing the possibility of disputes and expensive delays.

- Regular Progress Reviews and Change Control Approaches

Regular project review is necessary to monitor the performance parameters, maintain continuous monitoring and determine any potential risks or obstacles in the early stages of the project duration. These reviews allow for free open communication and well-informed decision-making keeping all the project teams on the same page. In fast-paced projects where changes can happen frequently and activities are performed quickly; the use of established change control processes becomes extremely important. Any proposed changes in the project's scope, schedule or budget are properly evaluated, approved, documented and communicated effectively to all concerned stakeholders through the established control processes. The use of a systematic change management process can help teams to both prevent and solve misunderstandings or inefficiencies that are accountable for most of the rework, cost overruns and delay of schedules. This systematic change control approach ultimately ensures better monitoring of projects, encourages accountability and contributes to successful project delivery in fast-paced environments.

Table 2: Risk Mitigation Strategies in Fast Tracking

Strategy	Application in Construction Projects
BIM and Digital Tools	Enhance visibility, coordination, and simulation of overlapping tasks
Design-Build Contracts	Integrate design and construction for better collaboration
Rolling Wave Planning	Allows planning in increments, supporting flexibility in overlapping phases
Change-Control Processes	Prevents scope creep and uncontrolled design changes during construction

3.0 METHODOLOGY

Survey design for project managers' perception on fast tracking

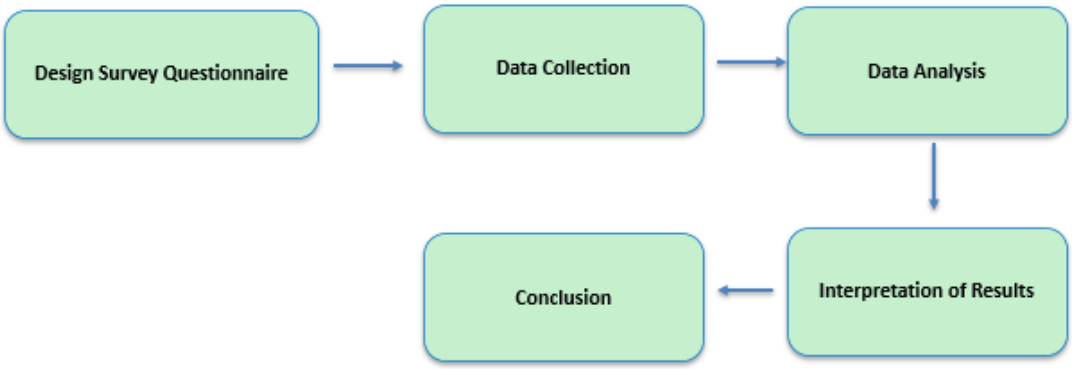

Figure 3: A diagram showing the methodology of the survey

A survey was meticulously crafted to offer project managers' perception on fast tracking in construction. The objective was to gain a broad understanding of how fact tracking techniques and tools impact project timelines from a manager's point of view, providing actionable insights for construction management. The survey was divided into two sections: first section gathered demographic information about the participants, including age, years of experience, academic qualifications, marital status, and gender. The second section employed a Likert scale to assess participants' perceptions of their professional experiences, focusing on the use and impact of fast-tracking tools/software.

The survey was constructed using Google Forms to facilitate efficient data collection and distribution. The survey link was shared with construction project managers through an online platform, ensuring accessibility. Participation in the survey was entirely voluntary, and stringent measures were taken to ensure the quality and reliability of responses. The data was subjected to a filtering process to verify that responses were complete and of high quality, focusing on data from construction professionals who could offer relevant insights into the topic. In total, over 150 construction project managers were approached, with 105 completing the survey and providing comprehensive responses. Although the response rate (70%) was lower than anticipated, this is not uncommon in construction industry research, as similar

studies have faced comparable challenges in achieving high response rates (Abowitz & Toole, 2009; Bröchner & Badenfelt, 2011). Despite a moderate response rate, the sample size was deemed adequate for drawing valid and meaningful conclusions, consistent with the sample size recommendations for qualitative research in construction studies (Fellows & Liu, 2021). The participants exhibited a wide range of professional experience, with an average of seven years spent in the construction sector. This variation in experience levels enriched the data, providing a broad perspective on the impact of fast-tracking technique.

Descriptive statistical analysis was utilized to analyse the gathered data. Measures such as mean, median, and pivot tables were utilized to offer a detailed interpretation of the responses, particularly in relation to how NMFs contributed to employee turnover from the perspective of construction professionals. Descriptive statistics, such as these, are commonly used in organizational studies to distil key insights from large datasets, ensuring that complex patterns and trends are adequately understood (Meier & Hicklin, 2007).

It is crucial to note that the survey was designed with an emphasis on validity, ensuring both content and construct validity. To minimize bias and ensure the research captured relevant non-monetary factors, some factors were drawn from existing literature on employee turnover (Lepak, 2024; Zhang, 2016). This approach was critical in enhancing the robustness of the survey design. Furthermore, to ensure content validity, the initial set of survey questions underwent review and verification by a third-party expert specializing in employee turnover and the construction industry. This pilot testing phase allowed for the refinement of questions before distribution, ultimately improving clarity and precision of the survey (Karakhan et al., 2024). Feedback from this pilot testing phase was incorporated to make necessary adjustments to the wording and structure of the questionnaire, strengthening its overall validity and relevance.

4.0 RESULTS AND DISCUSSION.

While fast tracking offers substantial benefits in shortening project schedules, evidence from both academic literature and real-world case studies clearly shows that its success depends on sophisticated planning, effective communication and precise execution ("Fast Track Construction," 2020). Developed countries enjoy the advantages of access to cutting-edge technologies, efficient procurement processes and well-established project management frameworks. On the other hand, developing nations often have to deal with significant institutional and infrastructure-related obstacles (Mitra, 2016; Ofori, 2001). However, even developing counties can use fast tracking to meet their strategic infrastructure goals, provided they have access to the appropriate resources, adopt effective planning methods, and actively engage all relevant stakeholders throughout the project lifecycle.

4.1 Insights derived from some case studies: Fast tracking success in some global regions

Due to significant differences in some aspects such as labour competency, technical capabilities, levels of economic development, legal and regulatory frameworks, the implementation of fast tracking has achieved different degrees of success in various locations worldwide. It is important to understand these regional differences in order to put global best practices into context and adapt fast-tracking strategies to match specific national or regional circumstances (MacDonald et al., 2024). These differences play an important role in figuring out the speed at which tracking should be applied to ensure successful project outcomes in diverse construction contexts.

Africa

In many African countries, the implementation of fast-tracking in construction projects faces several significant challenges. These include institutional weaknesses that hinder effective project governance, low levels of adoption of Building Information Modelling (BIM) and other advanced technologies, weak enforcement of contracts, fragmented and unreliable supply chains (Application of Fast-Tracking Practices on Construction Projects: Evidence from South Australia - University of South Australia, n.d.; Bouhmoud et al., 2022). Despite these constraints, fast tracking is often used out of necessity, particularly in urgent public infrastructure projects. Government urgency, such sometimes comes with compromises in cost and quality and donor support can drive implementation, as seen in Uganda's COVID-19 hospital expansions (Uganda Treats COVID-19 Patients in National Soccer Stadium | Global Health | CDC)

Case Study 4: Mulago Specialized Women's and Neonatal Hospital, Uganda

The Mulago Specialized Women's and Neonatal Hospital in Kampala, Uganda, is a $25 million public health infrastructure project initiated to address critical gaps in maternal and neonatal healthcare services.

This hospital, located in the country's largest and most densely populated urban centre, was funded by the African Development Bank and the Ugandan government. The project adopted a fast-tracking model primarily in response to the country's urgent maternal and neonatal healthcare needs, coupled with strict donor-imposed timelines. Construction began in 2015, while several architectural and medical planning aspects were still under refinement ("Mulago Specialized Women and Neonatal Hospital to Start Receiving Patients next Week," n.d.). The fast-tracking approach for the project involved conducting design-finalization and foundation works in parallel. It also included the early procurement of critical medical equipment to ensure readiness upon completion. Additionally, the project implemented a phased handover approach, allowing usable sections of the hospital to become operational while construction continued in other areas. The hospital was officially commissioned in 2018.

Results were mixed. While the facility opened relatively on schedule and helped to close important gaps in health service, there were serious quality concerns raised during construction. This was due to many design changes and rework thus slowing overall installation of the critical medical systems. Inefficient technical capacity in utilizing advanced digital technology like Building Information Modelling (BIM) resulted in inefficiency in planning. There were also persistent contractor coordination issues which led to workflow disruptions and delays in the disbursement of funds. This further affected timely procurement and construction progress. The project demonstrated that fast tracking is indeed viable in Uganda with support of strong political will, phased project execution and donor oversight. This case also suggests that there is a need to strengthen local project governance and technical capacity to reduce or even avoid delays and ensure quality in future fast-tracked projects.

Asia

In East and Southeast Asia, findings indicate fast tracking has achieved widespread success in the construction industry, largely due to strong and proactive government involvement, the integration of advanced technologies such as Building Information Modelling (BIM) and Artificial Intelligence (AI) and the presence of centralized project governance structures. Robust and well-established contractor networks further enhance and support the rapid execution of construction projects. However, there are a number of notable obstacles to fast tracking, such as tight labour markets due to the limited workforce especially in countries experiencing rapid population aging and the ongoing possibility of political influence affecting project decisions. China's Belt and Road Initiative serves as a prominent example of the effective use of fast-tracked modular construction methods in delivering large-scale infrastructure projects (Belt and Road Initiative - Wikipedia, n.d.; China's Massive Belt and Road Initiative | Council on Foreign Relations, n.d.; Liu & Lim, 2019; Loh, 2021; Richter, 2020; Shah, 2019; Shen & Chan, 2018; Yan & Sautman, 2024).

Case Study 1: Beijing Daxing International Airport, China

Beijing Daxing International Airport, an estimated $17 billion mega project, was launched with the primary goal to alleviate congestion at Beijing's main airport and to significantly improve regional and international connectivity (Beijing Daxing International Airport, Beijing, Republic of China, n.d.), hence accelerating economic growth. This project was completed in just five years, having been opened in 2019, three months ahead of schedule. The project stands as a worldwide benchmark for fast-tracked construction, showcasing how large-scale infrastructure can be delivered efficiently. The project's fast-tracking approach relied heavily on overlapping design and construction phases, made possible through the vast use of Building Information Modelling (BIM), sophisticated 4D and 5D simulations and offsite prefabrication techniques that streamlined workflows and reduced delays (Beijing Daxing International Airport, n.d.). This integrated approach allowed for the efficient sequencing of tasks, real-time coordination among multidisciplinary teams and a significant reduction in costly rework. Through the use of digital tools and prefabrication, the project team identified and resolved potential conflicts early in the process. As a result, the project delivered a cutting-edge high-quality facility that was completed on schedule and within budget. The project also recorded fewer safety incidents compared to other large-scale infrastructure developments. However, there were also some noted difficulties with this approach particularly when it came to integrating multinational teams using various BIM systems and managing continuous design modifications. Overall, the project demonstrates how the vast use of digital tools and proactive risk management can contribute to the successful implementation of fast-tracking in complex infrastructure delivery.

Case Study 2: Lusail Stadium, Qatar

Lusail Stadium, the highlight venue for the 2022 FIFA World Cup in Qatar represented a landmark project with an estimate value of approximately $767 million. This project designed to host up to 80,000 spectators, represented not only a key sporting infrastructure but also a symbol of Qatar's rapid development and global ambitions. As the flagship stadium for the tournament, it was to have sophisticated architectural and engineering features integrating sustainability, cultural aesthetics and modern technology (Lusail Stadium - Qatar, n.d.). To meet strict tournament deadlines, the project employed a fast-tracking approach, initiating construction while the design development was still underway allowing for some time savings. Modular construction techniques, combined with the early procurement of long-lead items, allowed the effective overlapping of key project phases. Advanced Building Information Modelling (BIM) tools enabled real-time coordination and seamless collaboration between architects, engineers and contractors working across multiple countries (World Cup Qatar Stadiums, n.d.). The stadium was completed ahead of the event schedule and performed well operationally during the World Cup. Key benefits of fast tracking in the project included the timely delivery of construction milestones, effective containment of costs through efficient resource utilization and streamlined coordination among various project stakeholders. However, challenges included managing design revisions mid-construction, ensuring quality across distributed prefabrication sites and navigating complex approval processes under time pressure. Overall, the project demonstrates that fast tracking can be effective when combined with digital tools, preconstruction planning and global supply chain alignment.

Europe

In Europe, fast tracking is implemented carefully but successfully, backed by the use of sophisticated and reliable planning tools, strict adherence to high quality standards and well-established procurement procedures that guarantee transparency, efficiency and effective project delivery. Institutional strengths, such as effective and robust change management systems, play a crucial role in aiding the successful implementation of fast tracking. However, the overall flexibility of project execution is often constrained by regulatory hurdles and the influence of unionized labour. The Crossrail project in London serves as a clear illustration of both the advantages and challenges associated with fast tracking in highly complex infrastructure environments (The Construction Innovations Powering Crossrail's Ambition).

Case Study 1: Heathrow Terminal 5, United Kingdom

Heathrow Terminal 5 (T5), a £4.3 billion ($6.2 billion) aviation infrastructure megaproject located in London, was strategically developed to significantly expand Heathrow Airport's passenger capacity (Heathrow Terminal 5, 2020; McKechnie et al., 2008) hence to accommodate the growing demand for international air travel and improve overall airport efficiency. The project applied key elements of fast tracking by strategically overlapping the design, procurement and construction phases across its many interconnected subprojects. These subprojects included vital infrastructure components such as runways, terminals, tunnels and rail links - all of which were delivered under tight timeframes. A unique feature of T5 was the adoption of an integrated project model, where BAA (the client) assumed significant risk and brought all stakeholders under one contractual framework to enable concurrent execution (McKechnie et al., 2008). The extensive use of prefabrication, along with the implementation of the just-in-time delivery system significantly reduced on-site congestion thus improving workflow efficiency and accelerating overall construction progress. Despite opening on schedule in 2008, the terminal faced operational issues due to insufficient testing of critical systems, such as baggage handling. While the construction phase was largely successful, delivered on time and within budget, the project highlighted a key challenge of fast tracking: underestimating the time and complexity required for systems integration and commissioning. The T5 project underscores that fast tracking is required not only for efficient construction but also for rigorous planning ahead of handover and operational readiness.

Table 3 : Comparative Analysis of Fast-Tracking Effectiveness by Region

Region	Technology Usage	Risk Management Practices	Typical Challenges	Overall Effectiveness
Africa	Low	Reactive	Skill gaps, weak contracts	Moderate to Low
Asia	High	Proactive	Design coordination, political risks	High

Region	Technology Usage	Risk Management Practices	Typical Challenges	Overall Effectiveness
Europe	Very High	Formalized	Regulatory delays, labour constraints	High (selective use)

Table 4: Summary of mentioned Global Fast Tracking Case Studies

Project	Country	Fast-Tracking Strategy	Major Benefit	Key Challenges
Beijing Daxing Intl. Airport	China	Concurrent design and construction, BIM integration, prefabrication, 4D/5D simulations	Early completion with high-quality execution	Managing design changes; data interoperability across BIM platforms
Lusail Stadium	Qatar	Overlapping design and build phases, early procurement, modular construction, BIM coordination	Timely delivery aligned with international event	Design changes during build; quality control in prefabrication
Heathrow Terminal 5	United Kingdom	Integrated procurement model, parallel workflows, prefabrication, centralized risk management	Schedule and cost predictability in complex infrastructure	Delays in system commissioning; underestimated handover needs
Mulago Women's & Neonatal Hospital	Uganda	Parallel construction and design, early equipment procurement, phased delivery	Rapid response to urgent healthcare needs	Limited digital capacity; contractor coordination issues

4.2 Survey results and discussion

This presents the analysis of data from the online survey. Descriptive Statistical techniques are employed to evaluate the project managers' perceptions. Results will be displayed in tables, figures, and graphs to facilitate further discussion.

Table 5 presents demographic information of the survey participants, offering insights into the workforce composition. The analysis aimed to project managers' perception on the use of fast-tracking technique. The results, summarized in pivot charts, provide a comprehensive overview of the demographic characteristics of the 105 participants. The majority of participants are male (65.71%), reflecting the traditional gender distribution in the construction sector, which is often male-dominated due to physical demands of the job. However, the presence of female participants (34.29%) indicates a positive trend towards gender diversity. The age distribution shows that the workforce is relatively young, with a mean age of 31.2 years. Specifically, 55.23% are aged between 21-30 years and 36.19% between 31-40 years. This suggests that the industry attracts younger individuals who may be seeking professional growth opportunities.

The marital status data reveals that 53.33% of participants are single, while 46.67% are married. This balance suggests that both single and married individuals find opportunities in the construction industry. Education qualifications indicate a highly educated workforce, with 51.42% holding a bachelor's degree and 39.04% a master's degree. This high level of education is essential for technical and managerial roles in construction. The total work experience data shows that 41.90% have 1-5 years of experience. The average tenure in an organization is about 3 years.

Table 5: Demographic information of survey participants.

Demographic		**Count**	**Percentage** (%)
Gender	Male	69	65.71
	Female	36	34.29
Age	21-30	58	55.23
	31-40	38	36.19
	41-50	7	6.66
	51-60	2	1.90
Marital status	Single	56	53.33
	Married	49	46.67
Education qualification	Certificate	1	0.95
	Diploma	9	8.57
	Degree Holder	54	51.42
	Post graduate/Master degree	41	39.04
Total work experience	1-5	44	41.90
	6-10	40	38.09
	11-15	15	14.28
	16-20	3	2.85
	20-25	1	0.95
	>25	2	1.90
Maximum number of years in an organization	About 1 year	11	10.47
	About 2 years	28	26.67
	About 3years	38	36.19
	About 4 years	14	13.33
	About 5 years	8	7.62
	About 6-10 years	4	3.80
	>10 years	2	1.90

Fig. 4(a) bar chart illustrates the participants' knowledge on fasting tracking technique in construction. This suggests that our participants are highly qualified to use this technique and are willing to recommend it to others so as to improve productivity.

Fig. 4(b) bar chart illustrates that our project managers highly use this since always and often account to over 70% of the responses.

Fig. 4(c) shows that MS Project and Asana are the mostly used project management software when it comes to using the fast-tracking technique.

A significant number of respondents shown in fig. 4(d) confirm that this technique has an influence in shortening the timelines in their projects from over 10-50% reduction in schedule.

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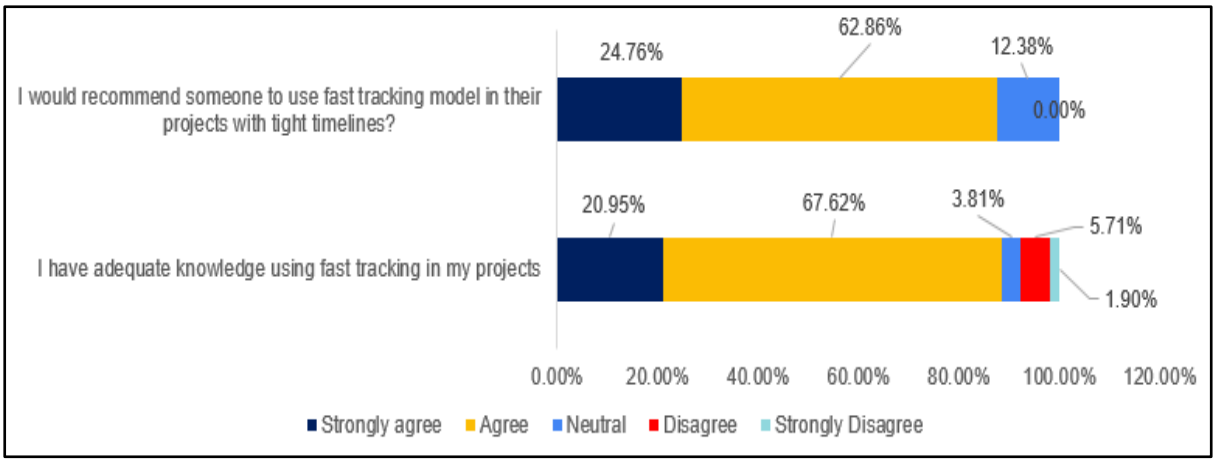
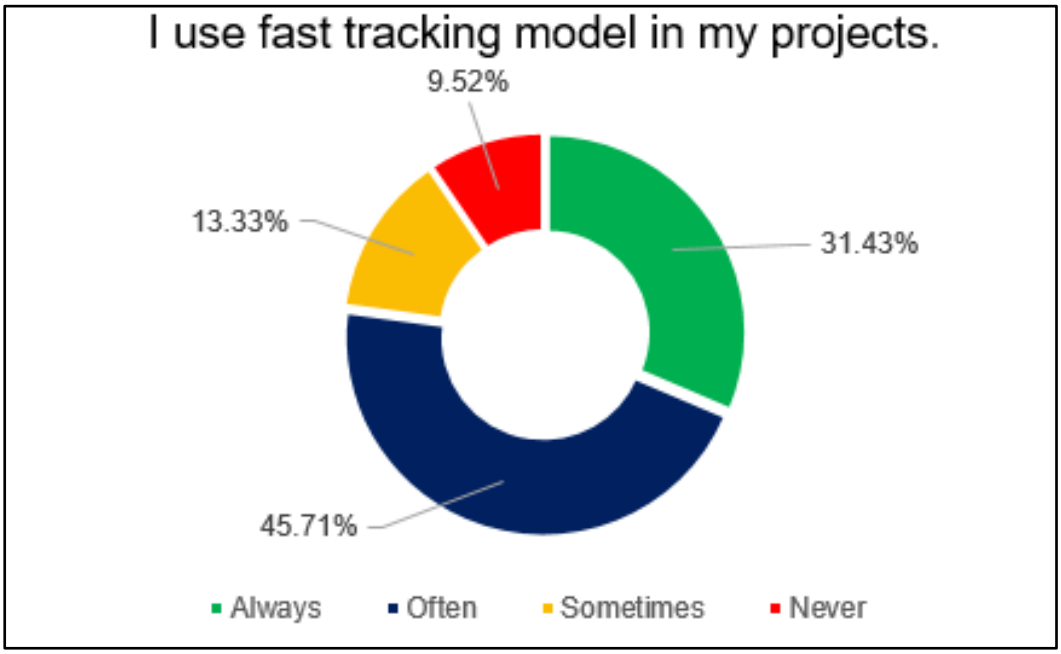
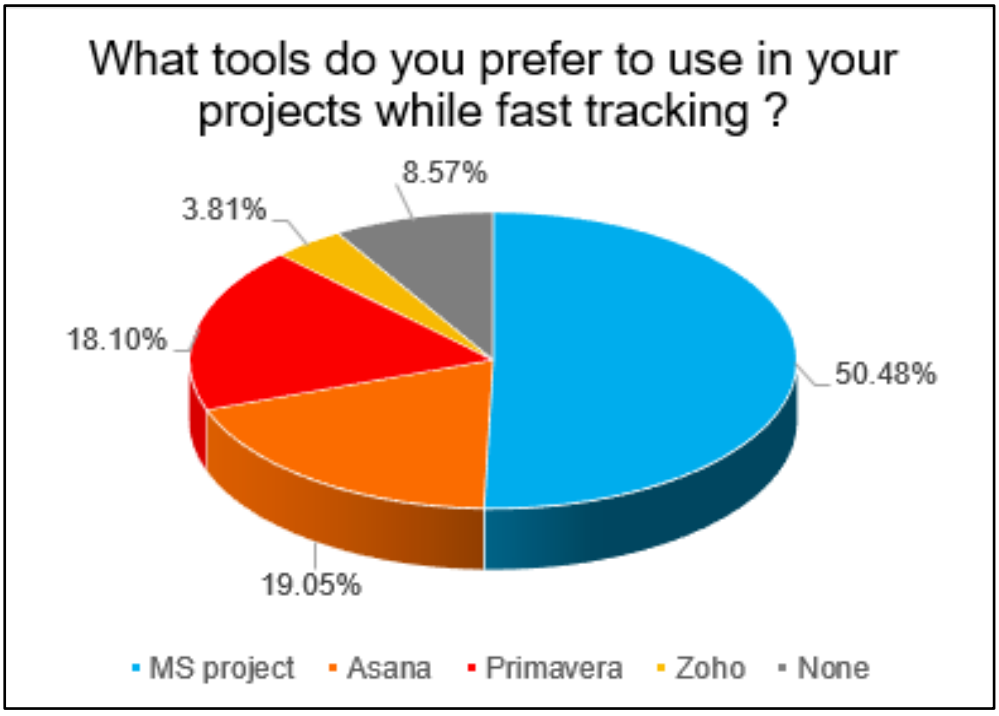


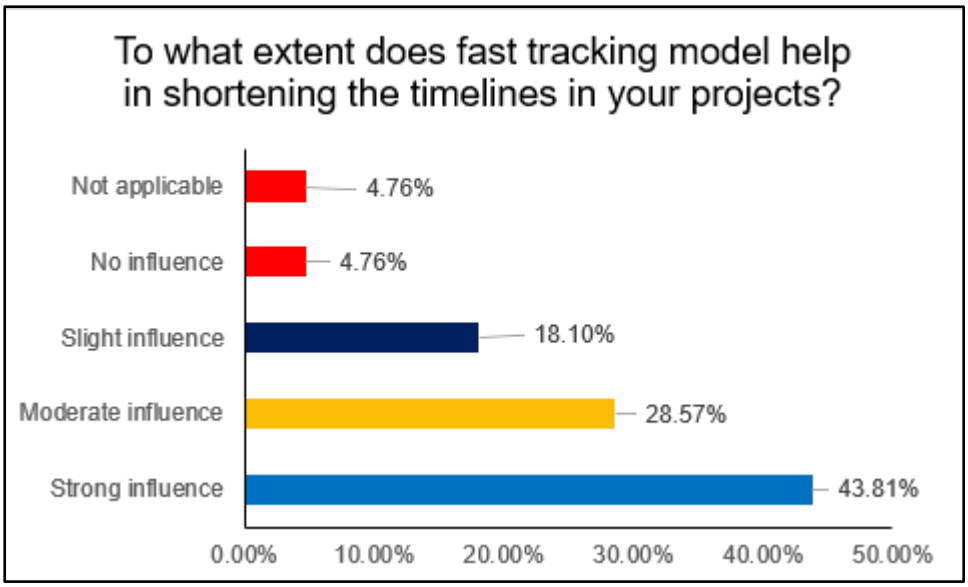
(a)



(b)



(c)



(d)

Fig. 4 Analysis of participants' responses towards (a) knowledge on fast tracking, (b) use of fast tracking in various projects, (c) commonly used fast tracking software, (d) the extent to which fast tracking shortens the project timelines.

5.0 CONCLUSION

Fast tracking presents a practical and effective strategy for significantly accelerating project schedules especially in situations where meeting tight deadlines is essential. The success of fast tracking is heavily dependent on comprehensive planning, implementation of proactive risk management practices, strong and decisive leadership. Existing literature and real-life examples from different parts of the world show that successful fast-tracking depends on a number of important factors. Some of these include engaging of all the important stakeholders involved early and actively, using advanced technologies like Building Information Modelling (BIM) effectively, the use of contracts that are flexible and adaptable and setting up regular progress reviews and change control approaches throughout the project's life cycle. The fast-tracking approach offers significant benefits such as getting projects done faster and getting back on track with schedules that have been delayed. However, when it is not managed properly, it also amplifies exposure to various risks. These include scope creep, frequent design changes, increased likelihood of rework and potential cost overruns. Project managers must thus balance the benefits against any potential drawbacks and make sure that institutional capacity, clear communication and adaptive project controls all support fast tracking. Fast tracking should ultimately be used as a strategic tool within a broader, well-structured project management framework rather than as a stand-alone solution.

This study provides insightful information regarding the potential of fast tracking within construction industry. It is important to acknowledge certain limitations. The literature examined in this research is not exhaustive and additional information may be explored from various other case studies in different parts of the world.

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