An Evaluation of the Impact of Site Management on the Success of Construction Project and its Role in Private Housing Development in Abuja-FCT

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Abstract

The construction industry, site management should be seen as a great weapon for canvassing site performance. The general apathy with which site management has been seen and approached makes the practice ineffective and inefficient in the performance of projects. This research sought to assess the impact of proper site management, to the completion, delivery and success of a project in Abuja. The study utilized a survey research design and the target population was made up of professionals in the built environment, amongst others, including; civil engineers, building engineers, architects, quantity surveyors, M & E, project managers, estate surveyors, and valuers, etc. The cluster sampling technique was used in selecting a population of 3,250 from five estates in Abuja, and in determining an appropriate sample size, the Taro Yamane (1967) method was employed to arrive at a sample size of 100. The survey achieved 100% responds rate from the respondent. The data analyses procedure adopted was both (Relative Importance Index (RII) and Pearson correlation techniques); statistical methods and the results were presented in form of statistical equation models, tables, charts and graphs in a simple and comprehensive manner. The researcher discovered that the introduction of sound site management principles like planning for the projects' site management, engagement of needed professionals, and proper funding of the system; the incorporation of new technologies; the principle of neighbourliness and neighbourhood security; motivation of workers; and working as a "TEAM" help the other site management efforts. Poor site management can be mitigated or prevented by improving pre-project planning and successful project management, as this is one of the most critical success factors in the achievement of the construction project. The researcher concluded that poor planning and management of construction projects can have some adverse effects on project timelines.
and completion. But a lack of giving attention to good site management practices has hampered the performance of many projects. However, improved leadership skills, technical knowledge, and the exploration and use of new methodologies as well as standard tools on construction projects are the recommended best site management practices that lead to better project performance achievement.

**Keywords:** Site, Site-Management, Construction projects, private housing, development.

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**Introduction**

The importance of site management to the success of construction projects cannot be overstated, as it is an essential component of the construction management process. Different researchers tend to give different definitions of the site management process. Site management in construction is fundamentally concerned with the planning, organizing, securing, managing, leading, and controlling of resources to meet specific objectives. According to (Dube et al., 2014) site management integrates processes that are used to achieve organized and purposeful results in the area where building or construction work is being carried out, whether it is within, adjacent to, or separate from an existing occupied building. However, the degree to which it is effectively implemented varies among industry practitioners. (Wei & Gang, 2018) asserted that site management employs the use of scientific methods and evaluation criteria to carry out comprehensive and reasonable planning and organization work on various production factors (manpower, machinery, materials, and so on) involved in the production site environment, as well as to improve coordination and detection work to ensure the overall operation of the site to maintain stable development to achieve high-quality, high-efficiency production. Both developed and developing economies rely heavily on the construction industry. The construction industry is diverse and extremely complicated. Several major construction classifications differ significantly from one another: housing, nonresidential building, heavy civil, utility, and industrial. In addition, these construction types are further divided into many specialties, such as electrical, concrete, excavation, piping, and roofing. Construction work is accomplished by contractors who vary widely in terms of size and specialty. Some contractors choose to concentrate on a particular task or aspect of the construction project and are therefore referred to as specialty contractors. Others assume broader responsibility for a comprehensive work package and are referred to as general contractors. (Skeoki Sears, Glenna A. Sears, Richard, 2017). (Shao & Cheng, 2013) argues that although in recent years, there has been a gradual improvement in the management of the construction site, there are still many loopholes and problems in the construction site management practice. Some construction companies have lax management, site management confusion, rules and regulations do not perform, construction unplanned, operation without standards; worker discipline relaxation; production efficiency is...
low; a variety of materials, tools, equipment, no special management, and the site environment is dirty, chaotic, and poor, causing environmental pollution and waste of resources, resulting in some construction project construction progress, quality control, security, and site layout not being implemented as planned, which is not conducive to environmental protection and sustainable development of health and safety of construction enterprises. Forster (2017) cited by (Olabanji, 2020) emphasized the importance of site management as a critical strategic approach to improving the performance of a construction project. This is explained by the numerous benefits that construction participants could gain if site management practice is fully integrated into construction to help in areas, project indicators, and perceptional attributes identified among construction professionals by following standardized guidelines in other functional construction sites internationally and replicating such into the local construction industry.

According to (Shao & Cheng, 2013) every project’s success is dependent on good management. While, (Abdul Razzak Rumane, 2017) expounded on management as a systematic approach to managing processes efficiently and effectively to achieve organizational objectives. Enshassi, Mohammed, and Abu-Mosa demonstrated that risk management is a critical issue in the development and management of some occupation ventures. This study delves into site management and a thorough understanding of the concept, starting with defining what a construction project is and the various variables that can affect the completion and success of a project. As a result, according to Olubunmi et al. (2018), site management entails mobilizing and coordinating various aspects of a project, as well as creating an enabling environment for construction activities, such as ensuring safety. To transform raw materials into finished goods, site management in construction entails a variety of functions. The main objectives are to complete construction projects on time and within budget, as well as to improve project performance. Hence, (Ullah et al., 2017) assert that the timely completion of construction projects within the expected cost and the level of quality standards set by the owner is an indication of successful project delivery. Any project’s successful completion would necessitate effective management of schedules, costs, time, human and material resources, and risk.

The construction site management has become more complex as a result of the number of resource flows (operatives, information, finance, and materials) that must converge at the worksite at the same time to ensure the successful completion of a construction project. (Nyabioge et al., 2018). In Nigeria, for example, the government has embraced direct labor, with human labor being preferred on some of the development projects commissioned. Many of these projects have failed to meet the project requirements of on-time completion and budgeted estimated cost as these developments take place and new facilities are built. (Olabanji, 2020). Unfortunately, acclimating to it is difficult because construction work has become technologically and administratively complex, and there are a few serious engineering and management issues that arise on the job site.

According to (Amusan et al., 2021), construction site management primarily entails the management of the construction process, resource management (which includes capital and labor management), both skilled and unskilled, dynamic management of plants and equipment, material management, the method used in procuring site resources, and in-situ production
process management, among other things. It has a direct impact on construction quality, cost, and delivery time. Nyabioge asserts that site management assists construction project managers in gaining control over the flow of basic resources (people, finance, and materials) and processes, as well as facilitating information exchange and increasing customer and stakeholder satisfaction (as a result of meeting the project objectives). This informs why the study on site management, its impact on project implementation, ineffective site management practices and their impact on project performance as well as other perennial issues are variously considered. Some of the findings indicated that certain site management factors can significantly contribute to the prediction of successful project implementation.

Although the management of the construction site has improved gradually in recent years, according to (Shao & Cheng, 2013), there are still many loopholes and problems in the construction site management practice. Some construction companies have lax management, site management confusion, rules and regulations do not perform, construction unplanned, operation without standards; worker discipline relaxation; production efficiency is low; a variety of materials, tools, equipment, no special management, and the site environment is dirty, chaotic, and poor, causing environmental pollution and waste of resources, resulting in some construction project construction progress, quality control, security, and site layout not being implemented as planned, which environmental protection and health safety of construction enterprises.

Site management was highlighted as a crucial strategic method to enhancing the performance of a construction project by Forster (2017), as quoted by (Olabanji, 2020). This is described by the multiple advantages that site management practice could provide to construction participants, including assistance in areas, job metrics, and contextual features discovered among construction experts. This is done by following standardized rules in other operational construction sites throughout the world and implementing them in the local building and construction industry. According to (Shao & Cheng, 2013), effective management is essential to the success of every project. While (Rumane, 2017) elaborated on management as a systematic strategy to managing processes successfully to accomplish corporate goals. Risk management has been shown by Enshassi, Mohammed, and Abu-Mosa to be an important factor in the creation and administration of some occupation projects. Beginning with a definition of a construction project and the different factors that can influence its completion and success, this study goes further into the topic of site management. Olubunmi et al. (2018) assert that site management therefore requires mobilizing and organizing numerous project components as well as producing an environment that facilitates construction activities, such as assuring safety. The major goals are to improve project performance and to finish construction projects on schedule and within budget. The efficient implementation of building projects within the anticipated budget and the degree of quality requirements established by the owner, according to (Ullah et al., 2017), is a sign of a successful project delivery. For any project to be completed successfully, time, money, people and material resources, and risk must be managed efficiently. The amount of resource flows (operators, information, finance, and materials) that must congregate at the worksite at the same time in order to guarantee the effective completion of a construction project has led to an increase in the complexity of
managing construction sites. (Nyabioge et al., 2018) For instance, the government of Nigeria has embraced direct labor, preferring human labor for some of the development projects commissioned. As these advancements and new facilities are constructed, many of these projects have fallen short of their deadlines for completion and anticipated expected costs. (Olabanji, 2020) Unfortunately, adapting to it is challenging since construction work has evolved into an administrative and technological maze, as well as some significant management and engineering challenges that emerge on the construction site. Site management, according to (Nyabioge, 2019) enables project managers in the construction industry to acquire control over the flow of essential resources (people, money, and resources), as well as to facilitate data exchange and boost stakeholder and client satisfaction (as a result, meeting organizations priorities). This explains why diverse considerations are given to the study of site management, its effects on project implementation, unproductive site management techniques and their effects on performance measurement. Some of the results showed that specific site management elements could have a big impact on whether a project will be implemented successfully.

**Statement of the Problem**
The building industry and construction project managers are under pressure to identify the management difficulties that call for an integrated strategy because there has been a continued desire for better and more efficient project delivery. Site mismanagement is shown in the relative product deliveries of site accidents, security imbalances, theft and pilferage of assets on sites, frequent conflicts and assaults on the project team by partially skilled labourers, stalling of site operations, and site desertion. Several projects state-wide appear to have fallen short of their goals in finishing construction projects despite academic research on site management issues. When left unchecked, inadequate site management can lead to a variety of issues, including poor personnel/staff management, insufficient control and monitoring of the site, carelessness in material management, site crises, and other issues that, among other things, may alter project schedules and cause delays in meeting scope, cost, and time objectives. According to (Naser, 2021), mishandling and incorrect management of materials on construction sites severely impair project outcomes. The significance of looking into important site factors, such as labor/staff organization, site imprest, control, and material mobility, cannot be overstated given the effects of current site management methods in the construction industry. Given the foregoing, the researcher is motivated to write about the aforementioned themes.

**Objectives of the Study**
The main objective is to assess the impact of proper site management, to the completion, delivery and success of a project. The specific objectives are to:

i. Identify essential factors that has leading impact to proper site management practices
ii. Assess the impact of ineffective site control practices on site management performance
iii. Evaluate the impact of security and safety on site management practices
iv. Examine the impact of site administration practices on the performance of building construction projects.
v. Examine the impact of monitoring and evaluation on site management practices.
vi. Assess the impact of site management practices on the success of housing development;

Research Questions
i. What are the essential factors that has leading impact on poor site management practice & Site performance?
ii. What is the impact of ineffective site control on site management practices & Site performance?
iii. What is the impact of security and safety on site management practices & Site performance?
iv. What is the impact of site administration on site management practices & Site performance?
v. What is the impact of monitoring and evaluation on site management practices & Site performance?
vi. What is the impact of site management practices on the success of housing development?

Statements of Hypotheses
H01 – The essential factors that has leading impact has no significant impact on poor site management practices & Site performance?
H02 – There is no significant impact of ineffective Controls management practices & project performance.
H03 – There is no significant impact of safety and security on site management practices & Site performance.
H04 – There is no significant impact of best site practices on the site management & Site performance?
H05 – There is no significant impact of monitoring and evaluation on site management practices.
H06 – There is no significant impact of site management practices on the success of housing development.

Terms Used
Budgetary Control Procedures to track ‘actual’ and ‘committed’ expenditure against that planned and identify variances, which should trigger both investigation of any significant variances and any subsequent corrective actions.

Budgeted Cost of Work Performed (BCWP) The extra dimension gained by using Earned Value Analysis, linking your original budget (Budgeted Cost) to actual performance (Work Performed) and expressing the result in currency terms or work hours.

Budgeted Cost of Work Scheduled (BCWS) The project or stage budget, showing costs and timing. Business Case: Documented justification for setting up and continuing a project, defining the benefits being sought, the likely investment, the constraints and the timescales to answer the question: ‘Why should we do this project?’
**Business Case Review:** A review, normally at the end of each stage, to maintain the relevance and realism of your Business Case, and to assess its ongoing viability. You should also review it when any exception situation occurs or is forecast.

**Project:** A unique set of co-ordinated activities, with definite start and end points, undertaken by an individual or organization to meet specific objectives within defined schedule, cost and performance parameters.

**Project and Programme:** There are a number of typical reports and major documents Reports in and around projects, falling into two main categories. Here are some examples.

1. **Action** — to identify the need for and to facilitate decisions: • Feasibility Study Report • Project Start-up Document (or Project Initiation Document if using PRIN CE®), including plans, the Business Case and budgets • Exception Report or other report of serious variance from plan or budget • Stage End Report.

2. **Information** - to keep stakeholders up to date, reporting progress and status: • Progress or Status Report (or Highlight Report if using PR IN CE®) • Lessons Learned Report, which may need some actions outside the scope of a project • End of Project or Project Closure Report.

**Project Plan:** A relatively ‘soft’ outline plan for the whole project when you start, but which you will firm up with the delivery of outputs and knowledge gained from each stage. Your high level plan might include the following: • Work Breakdown Structure or Product Breakdown Structure • Work or Product Flow Diagram • Network Diagram with high-level estimates showing overall duration • summary-level schedule (bar or Gantt Chart) with main milestones • Budget • Resource Plan.

**Construction Projects:** A construction project is a transient undertaking done to provide a certain good, service, or outcome. Due to their transient nature, projects typically have a beginning and an end as well as many phases. Projects can be standalone or a component of a portfolio or program. (PMBOK, 2021). (Sears, S. Keoki, 2017) states that "construction projects are complex, time-consuming undertakings that comprise of numerous phases and require a large variety of specialized services, these services extend from the start planning through project completion."

**Safety:** The protection of individuals from bodily harm or property damage is what safety is all about. The distinction between safety and health is blurry, and the two terms are frequently used in conjunction to signify care for an employee's physical and mental well-being at work.

**Organization:** Organizing entails setting up a system to carry out plans by allocating the specified work to various people or groups within the organization. While an organization is made up of a collection of people that cooperate in a systematic manner to accomplish tasks that one person acting alone could not. (Rumane, 2017)

**Monitoring:** Monitoring is the methodical gathering and evaluation of data during a project. It aims to increase a project's efficacy and efficiency. The researcher continues by saying that it consists of the procedures used to monitor project execution so that possible issues may be quickly identified and solutions can be applied when necessary to control project execution. (2021; Emmanuel). (Rumane, 2017) states that monitoring entails gathering, documenting, and reporting data on project performance.
Controlling: Controlling is the process of evaluating, regulating, and taking action to ensure that ongoing projects provide the anticipated results. In controlling, it's necessary to • Set goals and benchmarks in light of predetermined standards and objectives. • Improve productivity by taking the appropriate performance. 2017 (Rumane)

Security: "The state that results from the establishment of measures for the protection of persons, information, and property against hostile persons, influences, and actions" is what is meant by the term "security." According to (Nnadi & Okeke, 2017), security is the complete safeguarding of one's way of life from unforeseen daily harm and protection from unrelenting stress.

Stock Inventory: Inventory management, also known as stock inventory, is concerned with maintaining stock levels, controlling and supervising purchases from suppliers and customers, controlling the quantity of products for sale, and meeting customer demand. (Rachih et al., 2022)

Site: A construction site is defined as the land on which all physical construction activities associated with a proposed structure take place. The term "building site" is commonly used to refer to a construction site.

Site Management: Pre-construction, construction, and post-development phases of site development are referred to as the three phases of site management (Imimole, 2018) Site management entails a variety of actions that transform raw materials into completed goods. This can include actions that manage the flow of information and financial resources on the job site, as well as the organization of labor, supplies, and other resources. (Yap, & Ng, 2018)

Literature Review
Conceptual Framework
The total development of a project normally consists of several phases requiring a diverse range of specialized services. In progressing from initial planning to project completion, the typical job passes through successive and distinct stages that demand input from such disparate areas as financial organizations, governmental agencies, engineers, architects, lawyers, insurance and surety companies, contractors, material and equipment manufacturers and suppliers, and construction craft workers. Construction projects are not without their own set of difficulties and risks, which can disrupt efficiency, operations, productivity, quality, and delivery. Construction is influenced by a variety of highly variable and occasionally unpredictable factors. The conceptual framework is a diagrammatic representation that shows the indicators that are used to measure given variables as used in the study. (ALI, 2019) Staff recruiting and Control management, Material management, Safety, and security management, and Project team management forms the independent variables while successful site management, staff organization, site impress, and control and movement of materials are visualized as the dependent variable. The constructs and relationships between research variables are illustrated in Figure 1
Figure 1 Researcher’s Conceptual Framework

Independent Variable: Impact of Site Management Practices on the success of housing development

Mediating Variable: The Impact of Monitoring & Evaluation site management practices.

Dependent Variable:
- Factors that cause effective & proper site management practices
- Factors that cause ineffective & poor site management practices
- The impact of security & safety on site management practices
- The impact of Site management practices on the performance of construction projects
- The impact of Site management practices on the success of housing development projects
- The impact of monitoring & Evaluation of Site management practices on the success of housing development projects

DIMENSIONS OF CONCEPTUAL FRAMEWORK THE VARIABLES
Factors that improve proper site management practices: The management definition is a single or group of individuals who challenges and oversees a person or collective group of people in efforts to accomplish desired goals and objectives. Furthermore, the definition of management includes the ability to plan, organize, monitor and direct individuals. The management definition is also a person or collective group who possess the executive abilities to lead a group through hardships, aspiring to meet an organization’s purpose and visions. Poor management may be a contributing factor in any failure to achieve a desired state. There are many indications of poor management, for example, the successful running of an administrative process, the completion of a task, the creation of a cohesive group of people, or the individual happiness and motivation of staff members. Classic characteristics of sub-standard management include a lack of planning, vague communication, and lack control, absence of
support or inadequate evaluation of progress. [Bamibele, 2017] mentioned that poor management is one of the critical reasons, which can negatively affect the construction business and thus result in failure. Site management practice is defined as a fundamental integrating process used to achieve organized and successful results where building or construction work is being carried out, whether it is within, adjacent to, or separate from an existing occupied building [Bamibele, 2017]. Site management practices are a combination of activities, which turn basic resources into a finished product. This can range from organization of the materials, labour and other resources on the site to which control the flows of information, quality and finance. Griffith and Watson (2018) define site management as a combination of four groups of inter-related components: preliminary works, site organization, and site layout and welfare provision. Failure of site management on construction sites is mainly related to the problems and failure of communication and performance between the professional team and the contractor [Mohammed S. F & Anumba, 2016]. However, there are many reasons and factors, which contribute to this problem. An increasing number of construction organizations are applying project improvement initiatives to improve their performance according to Dube N. N F, Aigbovboa et al, 2018]. The fundamental objectives are to deliver construction projects to the required quality more quickly and improve project performance. Unfortunately, practice is not that simple as construction work has become more complex technically and administratively, and there are several challenging engineering and management problems that occur on the site [Griffith and Watson (2018)].

Effectiveness and efficiency are two key factors that are intertwined with each other in assessing the success of an organization. Generally, effectiveness refers to the achievement of objectives, while efficiency reflects the amount of input or resources such as time, cost and energy used to perform a task. Site management is very important in a construction project. Effective site management will have the positive effect that projects can be completed within a set timeframe, quality will be guaranteed, and costs will be reduced. Literature studies have revealed that some researchers have highlighted poor project planning and management as a delay factor in construction projects. Researchers have concluded that poor planning and management of construction projects can have some adverse effects on project timelines and completion. Construction delays and duration issues are often responsible for turning productive efforts into project losses. This delay can be mitigated or prevented by improving preproject planning and successful project management as this is one of the most critical success factors in the achievement of the construction project. The objectives of this study are to identify essential factors leading to poor site management, to assess impact of ineffective site management practices and to propose the best site management practices leading to better project performance achievement.

The study was conducted through questionnaire survey on various project sites and data search from available document archives. Rising over budget and falling behind schedule are among the average contractor’s biggest worries. But how do you improve productivity on a construction site without sacrificing quality? The key is not rushing to complete work faster but making small optimizations to your process wherever possible. If speed is your only goal, safety and quality will suffer. By making small adjustments to how you manage tasks, people and materials, you can boost efficiency on your construction site without cutting corners by:
Plan ahead
In the journey to becoming more efficient on the job site, it’s important to take detailed planning seriously — right from the start. Forecast your needs for every aspect of a project and plan accordingly, especially when it comes to people, schedules, processes, material and other logistics. If you’re more thorough at the front end of a project, your efforts will go more smoothly. Start by asking, “How is this current project different from previous jobs? What milestones do I want to reach and when?” Be sure to set realistic goals that your crew understands. Remember, multiple smaller goals make a big project seem easier to accomplish. Time is money and decision-making is key. Become more organized by setting alerts in your electronic devices. Additionally, give others permission to remind you when a portion of your project is falling behind.

Master communication
Communicating with your crew is crucial to improving productivity. Make sure you’re available to them as much as possible and make your project expectations clear right away. Meet with your crew daily to talk about objectives and receive their feedback on how things are going. Always keep your people informed on project needs and expectations. No one can get a job done well if they don’t know what’s going on. On the note of setting expectations, be sure to establish performance measurements for your crew. This can be a great motivational tool, especially when rewards are involved. To keep your workers on task, regularly remind them of what they’re working toward. Communicating this to your employees gives them a sense of purpose.

Seek Expertise from Material Management Professionals
In today’s business environment, successful contractors know that maximizing productivity and efficiency — all within tight deadlines — is key to a profitable job site. That’s why having access to quality material management professionals is important. According to the National Electrical Contractors Association (NECA), up to 40 percent of a project’s labour cost can be consumed by material handling — and that’s just labour costs. In an era where skilled labour shortages are business as usual, reducing labour costs with material management services is a key tactic for boosting productivity.

Embrace technology
You have endless possibilities with technology. For one, you can cut costs and save time by designing prefabricated buildings, which can be installed more quickly than a traditional structure. They can also decrease costs and increase quality. Additionally, adopting software for productivity, project management and building information modeling (BIM) helps avoid downtime and rework. Using an application like PlanGrid, for example, lets you collect, manage and collaborate in real-time on drawings, submittals, markups, photos, issues and more, boosting your productivity in the process. Other software options can help you with bid management, billing and invoicing, documentation, incident reporting, time sheets, scheduling and more.
Provide safety training
Skipping safety training and letting practices slide may seem faster, but even a minor accident can cause major delays. If you have one less worker on the job site, your productivity will suffer. Offer plenty of safety training to make your employees more aware of hazards. Toolbox talks are a simple way to remind workers about safety topics regularly. They also instill the values of a safety culture and show that safety is a priority for your company.

Hire and train good managers
Additionally, employing effective managers’ increases efficiency. If your managers are good leaders, your crew will follow them and accomplish your goals. One thing that managers can do to boost productivity is enforce the start and end times of breaks. This may not be popular at first, so you should explain why timeliness matters. It’s not about micromanaging. It’s about seeing the importance every individual has in the big picture of a project. Starting five minutes late doesn’t seem like a big deal if you’re just one person. But if you have 12 workers who start five minutes late, you’ve lost one manhour already. Multiply that hour out across weeks and years, and you’re looking at a ton of lost time and money.

Other Factors that improve site management practices are:

**Site Management on Construction Sites** Bamisile (2021) drew attention to the fact that the effectiveness of managing production process cannot be economically attained by force, but requires the creation of conditions that will encourage self-motivation and bring about team-spirit that is important to an efficient projection execution. Site management according to Mohammed and Anumba (2019) involves a combination of activities, which turn basic resources into a finished product. Obiegbu (2018) indicated that construction can be seen as the conversion of raw resource inputs into defined functioning output, by means of a managed process. This according to Construction IT (cited by Mohammed & Anumba, 2019) can range from organization of the materials, labour, and other resources on the site activities which control the flows of information and finance. The construction site is, therefore, seen as a key area where money is made or lost and where there is considerable scope for improving efficiency, productivity and quality. Obiegbu (2018) highlighted the following reasons why practising of good site management is imperative:

- Ensuring the most efficient and effective use of resources;
- Maintaining high standard of quality and workmanship;
- Maintaining high standard of health and safety on building sites; and
- Building trust and good relations with suppliers, other professionals and support organisations which leads to fewer problems, delays and disruptions.

In order to achieve good site management on construction sites, Obiegbu (2018) asserted that the following areas have to be taken very seriously: Project drawings, specification and contract documents must be interpreted correctly; All the projects’ requirements must be fully understood; Resources for the project must be correctly determined and well allocated; Functional site layout must be assessed and provided; Execution of the work must be well planned and scheduled while not forgetting the establishment of quality control measures; Compliance to statutory regulations should be ensured; Planning and programming
the execution of work should be ensured; Construction processes must be monitored and controlled and corrective measures taking when deviation occurs; Ensuring that the right calibre of professionals is engaged with clearly defined roles.

Construction IT (cited by Mohammed & Anumba, 2019) divided site management practices into six sub-processes: Management, supervision, and administration of sites: Including correspondence, minutes, labour allocations, payroll, progress reporting, notices/claims, instruction, drawing register, and technical information. Commercial management: This covers estimating, valuations, Sub - contracting, payment, variations, day works, cost-value reconciliation, final accounts, and cash flow management; Legal, health and safety: Management of legal, health and safety requirements on sites. This considers safety policy, insurance and building regulations. Planning, monitoring and control: This covers all activities associated with project planning and scheduling, typically the production of Gantt charts, network analyses, method statements, resource levelling, progress reports and exception reports; Delivery and materials’ handling: The activities associated with the management of deliveries and the subsequent handlings site management practices that are important in maintaining efficiency, cost effectiveness and control on project.

**Effective Site Management**

The effectiveness of managing the production process according Bamisile (2019) cannot be economically achieved through the use of force but the creation of conditions that will encourage self-motivation and engender team-spirit which is sine qua non to efficient project execution. Apart from these, Bamisile (2019) indicated that effective site management requires the balancing of the following by the contractor’s team: Right persons - It is very important for contractors handling building projects to ensure that the right people are appropriately placed; Communication- Formal lines of communication have to be clearly established from the beginning of a project and must be brought to the attention of all the parties involved in the project. This is the way to avoid misleading information circulating; Progressing system - This is the act of checking, measuring and recording of progress in comparison with planned requirements, and the expatiating on any items subject to delay or likely to be delayed, in order to meet up with the plan.

**Factors that cause ineffective & poor performance of site management practices**

Impact of ineffective site management practices. It is found out that ineffective site management practices can be caused by poor project performance especially in delaying project completed, cost overrun, and poor building quality also impacted on safety and environment. The ability to manage time, cost and quality is a determinant of success and impact on project performance. The purpose of the management of these three aspects is important so that the project can be completed on or before the expected time, construction costs do not exceed the project allocation as well as obtain the quality of the building as expected by the developer. If a construction site is managed with ineffective management practices, then these three aspects are difficult to maintain and control. Based on the respondents' feedback, they agreed that the ineffectiveness of site management practices caused delays in project completion time,
increased project costs as well as affecting the quality of the building. The elements posed about the impact on project performance. The majority of respondents agreed that improper site management planning, insufficient experience, poor site management caused delays in project completion. In addition, respondents also agreed that poor coordination contributed to delays from project completion timeframe and poor building condition as well as increased project costs. Poor project management skills, poor coordination and inefficient communication can all be seen as the causes of project delays, too many estimates, poor quality of the building. Additional time is required to correct defects due to failure to give clear instructions and incomplete working drawings. Research also agreed that without coordination and coordination, project completion would be hampered due to repairing damaged work and low employee productivity. Another factor is the lack of building materials causing delays in project completion. Damage to structural parts makes the repair work greater and more expensive if the repair has been done properly in the first place there is no periodic supervision in place. Among other effects according to the order of the next average index is building materials that are not managed properly can cause waste and pollution the environment. The absence of resources as planned throughout the project period can also cause delays in project completion. Deferment of payment to the contractor from the developer due to delay in completion of the project. Poor quality work causes high levels of accidents and can involve unsafe practices. When management accepts poor quality work, this practice becomes the norm. Junior and new employees will assume this bad standard of work is acceptable and will assume that it is standard practice in the company, and will repeat the same bad standard elsewhere. The lowest average index is for contractors just as soon as their last project. Poor quality work on a project can damage the relationship with the developer. Impact of Ineffective Site Management Practices Average Index Element Frequency Analysis Average Index Without coordination, the project will be delayed due to rectifying defective works and low productivity of labourer. Assigning the wrong person to manage project caused the possibility of failure the project. Delay because of closures leading to materials failure. Poor quality work on one project can quickly destroy client relationships. Agree Delay in payment from owner to contractor, Agree Time needed to rectify defects. –Best Site Management Practices Leading to Better Project Performance Achievement Objective is to propose the best site management practices leading to better project performance achievement. The overall average index of each element has been presented in. The respondents are agreed that strong communication and leadership skill, including the ability to liaise with all levels of staff and decision-making is among best practices leading to better project performance. Besides that, the site management team also need provide the project team members the tools and techniques the need to produce consistently successful projects.

The impact of security & safety on site management practices
The State of Security & Safety Practices on the Site Management Practices Construction sites determine the state of affairs and performance of the site. Several attempts have been considered by the construction industry towards improving its safety performance. Ogundipe,
Ajao, Ogun Bayo and Amusan (2017) argued that security and safety challenges facing indigenous firms are numerous and include:

Increased cost of borrowed capital, staff redundancy, safety issues, extended completion date, spoilage of materials, wastages and pilfering due to prolonged abandonment, inflation, litigations. However, the paradigm shifted from safety planning and implementing, auditing and monitoring safety performance to preventive measures of improving safety performance. According to Ikechukwu, and Dorothy (2016); Muhammad, Abdu Lateef and Ladi (2017) some of the developing nations like Nigeria lacks adaptive laws and regulations on health and safety practices. The National Building Code places responsibility on Builder’s to prepare project health and safety plan among others document for effective production process of building projects.

Gallagher (1997 now cited in 2022) suggested that safety practices of construction companies must covered following aspect of construction processes: commitment of construction managers; making safety expectation known; engaging resident Safety Manager; engagement of safety committee; engaging safety committee, planned hazard identification, risk assessment and hazard elimination control; and far-reaching inspections measures. Bamisile (2004) maintained that project health and safety plan is essential for all construction project starting from the measures that is needed to be put in place from planning phase, through design, construction, up to completion and maintenance phase of the building production processes. There are twenty (20) listed parameter in the project health and safety plan this include: project safety policy, objective plan, risk and hazard assessment, duties of employers’, duties of site personnel, health and safety briefing, health and safety committee, site accommodation and welfare facilities, accident preventives measures, protective clothing and equipment, permit to work, access and egress to work, underground observations and buried services, First aid, control of hazardous substances, emergency response plan and safety records (Bamisile, 2017).

In assessing current state of safety practices of the Nigerian indigenous construction firms, Nzuve and Lawrence (2018) opined that inadequate compliance with health and safety rules on project sites were due to low level of supervision of construction workers. Olutuase (2019) noticed that health and safety practices in Nigeria is ineffective and lacks proper documentation when compared with the international standards. Kolawole (2018) stated that site workers embraced safety training in enhancing workers performances and reduced accidents on site. Ogundipe et al., (2018) established that insufficient knowledge on safety education has limited Safety Managers ability to coordinate safety practices and develop Safety Policy for the management of building production processes.

Akinwale and Olusanya (2016) established high level of awareness on the importance of Occupational Safety but there was inadequate investment made towards enhancing workers capacity development on safety programmes in majority of the construction companies. However, Okoye, Ezeokonkwo, and Ezeokoli (2016) argued that safety awareness and compliance among the sites operatives was at infant level and this has caused low project performance. The study stressed that knowledge and compliance with health and safety practices alone could not achieve optimum project performance, it would require safety culture
which encompassed other factors such as: management commitment, workers involvement and strict enforcement of safety regulation.

Idoro (2018), Ibrahim, Daniel and Ahmad (2019) and Ibrahim, Githae and Stephen (2019) postulated that between 50-100% public and private clients involve Nigerian Indigenous construction companies in traditional and non-traditional procurement systems. Though there are no reliable construction accidents data in Nigeria, in a study conducted by Idoro (2018) it was revealed that accident and injury rates were high in the Nigeria indigenous construction industry and the best safety ratios were 2 accidents per 100 workers and 5 injuries per 100 workers. As matter of fact, the risk of serious injuries is almost three times higher than that of foreign contractors operating in the country (Agwu and Olele, 2018; Muiruri and Mulinge, 2019).

On other note, Builder’s liability insurance policy was established under the Insurance Act 2003, demanding client and contractors of buildings project under construction that have more than two floors to obtain insurance cover that will provide succor in case of death, damage to the property under construction and injury to workers (skilled and unskilled labours) who are vulnerable to accident on sites, without neglected passerby and adjoining client around the site provided there is a case of building collapse and other associated risks. Okoye, (2018) opined that contractor widely neglect implementation of construction and contractors all risk insurance for the construction operatives, unless they are forced to do so in order to secure Federal Government projects. Dodo (2018) argued that some construction firms neither have safety insurance plan for their workers nor facilitate payment of compensation for the injured workers.

Safety practice of indigenous companies remained an issue of concern in the Nigerian construction industry. Violation of safety rules seems to be a predominant practice and common phenomenon of indigenous construction companies while workers are trying to make work faster because most construction managers place more value on productivity than safety (Fellows et al., 2018). Okeola (2019) stated that in Canada, projects that involve appointment of resident Safety Manager have better safety performance records than others without Safety Managers because they ensure that both human and materials resources are managed effectively on site. Okoye (2012) listed out the following usual practices of construction workers on sites in Nigeria, they include: working bare footed, use of bamboo scaffolds, hand mixing of concrete without protective wears as some of the unsafe practices among workers.

Agbede, Manu, Agbede and Mahamadu (2016) revealed that contractors in South Western Nigeria have implemented safety policy that covers safety briefing and also uses audio, video and print media in communicating safety information to operatives on sites. However, area such as engaging resident Safety Manager on construction sites; training of the new staff on the related jobs and the use of tools and equipment site; reward workers that exhibit excellent safety performances; testing the competence of the skilled labour and their adaptability to working environment; availability of the internal and external health and safety department; setting safety guidelines into the body of conditions of contract were intact.
The impact of Site management on the performance of construction projects

Issue of safety on construction project should be a concern to every construction participant, especially client and their representative need to avert the risk associated with their project right from the planning stage by adopting sustainable strategies and practices that will eliminate possibility of accident. Asfahl (1999, reviewed in 2018) stated in order to prevent equipment failure from overuse and overload examination of scaffold, equipment and tools must be carried out before the start of work by Safety Manager. Abdelhamid and Everett (2016) added that continuous monitoring of safety wears compliance and framing comprehensive purchase policy are responsibility of safety department. The provision and effective use of safety wears is significant element in terms of accident prevention and control on construction sites. Bust, Finneran, Hartley and Gibb (2018) stated that professionals’ interests must be enhanced towards safety practices and usage of awareness measures, must be put in place and demonstrated by the operatives as one of the real needs to upgrade construction project safety. Agwu and Olele (2019) worked on fatalities in the Nigerian construction industry. The study supported the fact that, inclusion of positive safety culture by investing in machines and technology (socio-technical investments) in the Nigerian construction industry would resort in better safety performance of employees (reduced rate of unsafe acts) and the company (reduced rate of fatalities). This was conducted for a year with the respondents randomly selected from twelve construction industry, two each across the six geopolitical zones in Nigeria. There is significant different between poor safety culture and increased rate of fatalities in the Nigerian construction industry. Che Hassan, Basha, Wan Hanafi (2018) and Shamsuddin, Ani, Ismail, Ibrahim (2017) argued that workers knowledge and understanding of safety practices at work setting remain vital in promoting safety among themselves on construction site. Funso, Samml and Gerryshom (2016) opined that, workers motivation, safety practices at work, environmental factors and physical limitation amount to factors that could improve workers performance. Agwu and Olele (2017) stated that regular staff training could improve hazard identification skills, engage managers and workers in addressing safety related issues, regular site safety, safety committees and eliminate potential workplace hazards and making hazard identification/reporting everyone’s duties.

The Performance of Construction Projects is aided by the following nuclei factors. About 20 of them have been identified from previous studies based their relative importance and are outline as follows - Improper Planning, Improper designing, Management Contract; Decision making; Improper Communication; Site Management; Construction Methods; Complexity Of Project; Complexity Of Project; Quality Assurance; Quality & Shortage Of Material; Shortage Of Labour &Technical Personnel; Availability Of Equipment & Failure; Unforeseen Site Condition; Attitude Of Site Personnel Towards Work; Weather Condition; Finance & Payment Of Completed Work; Major Disputes & Negotiation; Productivity; Construction Mistakes & Defective Work; Client’s Satisfaction,

The summary of the critical factors sorted by engineers, that is, from the engineer’s perspective are - construction methods, improper planning, site management, construction mistakes, shortage of labour and technical personnel, productivity are most important factors that affects performance of construction.
The Impact of Monitoring & Evaluation site management practices.

The monitoring and Evaluation systems can be assessed against the three criteria for it to become successful; for example, high utilization, good quality M&E system and sustainability. Monitoring and evaluation is used extensively for site management. It was also used intensively to impose programme improvements on ministries and agencies. Last but not least, it was also used in reporting government performance to the congress and civil society (Mackay, 2017). The concepts of monitoring and evaluation are usually approached together, as a function of project management, which provides a real perspective upon the stage of the financed project, in order to make all the adjustments necessary in the project implementation process. Monitoring and evaluation are regarded as core tools for enhancing the quality of site project management, taking into account that in short and medium run managing complex projects will involve corresponding strategies from the financial point of view, which are supposed to respect the criteria of effectiveness, sustainability and durability. Monitoring activity supports both project managers and staff in the process of understanding whether the projects are progressing on schedule or meet their objectives, inputs, activities and deadlines. (Crawford and Bryce, 2021)

Monitoring and evaluation (as already stated) are core tools for enhancing the quality of Site project management, taking into account that in short and medium run managing complex projects will involve corresponding strategies from the financial point of view, which are supposed to respect the criteria of effectiveness, sustainability and durability. Monitoring activity supports both project managers and staff in the process of understanding whether the projects are progressing on schedule or meet their objectives, inputs, activities and deadlines (Solomon and Young, 2017). Therefore, monitoring provides the background for reducing schedule and cost overruns in Site Management practices (Crawford and Bryce, 2018), while ensuring that required quality standards are achieved in project implementation. At the same time, evaluation can be perceived as an instrument for helping planners and project developers to assess to what extent the projects have achieved the objectives set forth in the project documents. The monitoring and evaluation flow focuses on human resources as key factors for implementing, monitoring and evaluating a sustainable investment projects. The results of the aforesaid is the impressive flow of process of defining monitoring procedures, as well as the process of delegating monitoring responsibilities(which are corresponding to a participatory management approach completed with a human resources evaluation) lead to a consensus among the main stakeholders of a project on the specific indicators to be used for monitoring and evaluation purposes; the monitoring and evaluation flow involves, before entering the Project Implementation Stage, an informational audit, in order to effective redesign the information flows taking into account the types and sources of data needed and the methods of data collection and analysis required based on the indicators; afterwards, the Pre-Project Stage ends up with the Gantt Chart and the Logical Framework Matrix, which are still the most useful instruments for performing an impact monitoring and a mid-term evaluation (Pollock, 2017).
The main difficulties in obtaining better results when using the monitoring and evaluation comes from - the lack of experience in applying most of the project management tools, the insufficient budget for monitoring and evaluation activities, the mentality of most project managers regarding the fact that monitoring and evaluation are bureaucratic activities, which claim lot of time and are useless, being performed as such; the inappropriate mix of methods and techniques, which are being used by project managers, without taking into account the three stages of monitoring and evaluation related to the project life cycle; using impact monitoring in pre-project stage is useless, while using it during post-project stage is irrelevant and using compliance monitoring in pre-project stage is impossible, while using it during implementation stage is irrelevant; the lack of clearness in stating measurable objectives for the project and its components, which leads to the impossibility of defining performance indicators; the lack of a structured set of indicators, covering the economic, social and environmental outputs generated by the project and their impact on beneficiaries; the lack of a coherent methodology for collecting data and managing project record, so that the data processed are compatible with previous statistics and are available at reasonable costs; the lack of concern of the project managers to use in their baseline monitoring processes information gathered from other similar project’s compliance monitoring processes.

Participatory monitoring and Evaluation (PM&E) is a part of a wider historical process which has emerged over the last 20 years of using participatory research in development. PM&E draws from various participatory research traditions, While PM&E offers many potential benefits in terms of project or program success, if it is carried out poorly or inappropriately, time and resources may go to waste and problems may very well go unnoticed, subsequently hindering project performance and community building. In order to guard against these inherent dangers, there also seems to be broad agreement in the literature regarding the need for systematic and participatory procedures to monitor and evaluate the PM & E process itself. (Chan et al., 2021)

The active participation of service users in planning, monitoring and evaluation processes has now become part of development orthodoxy. As a result, most complex organizations at least encourage staff at different levels, and the partners with which they work, to involve service users in M&E wherever possible. Service user participation is considered beneficial for two reasons: firstly, because it helps generate better M&E data and analysis, and secondly, under a rights-based perspective, because it is considered that service users have the right to be involved in all areas of work that have an influence over their lives. (Simister, 2019).

**The Importance of Effective Construction Site Management**

Construction sites are their own system and are contained within a larger system that eventually arrives at the common goal of project completion. To have efficient and effective construction site management, you must have a centralized understanding of the overall system and of each independent system. While a construction site is a system in itself, it is also dependent on other systems to maintain its flow. This is where the role of a project manager and the associated staff is essential to ensure that each separate system supplies the required connections and output on time and within budget. The construction site management team must coordinate
with the project team to maintain effective communication regarding the project progress and any roadblocks or delays, thus establishing a hierarchy of complementary systems. To an outsider, construction sites can be viewed as highly organized systems, while, to its workers, it can feel like orchestrated chaos. Effective construction site management is crucial to the success and timely completion of any construction project. For them to be successful, they following are put into consideration –

**Understanding The System**
All projects are different. They have different requirements, schedules, pressures, concerns and more. Still, each project functions as a part of a system. Construction sites are their own system and are contained within a larger system that eventually arrives at the common goal of project completion. To have efficient and effective construction site management, you must have a centralized understanding of the overall system and of each independent system.

**Controlling The Systems**
While a construction site is a system in itself, it is also dependent on other systems to maintain its flow. This is where the role of a project manager and the associated staff is essential to ensure that each separate system supplies the required connections and output on time and within budget. For example, a subcontractor is required to supply the correct materials on time to the construction site so the project can begin construction. Any delay in one system supplying materials to another system can slow down the project as a whole. Having an effective project manager can help to reduce the chance of one system’s problems affecting another system and the project as a whole.

**Individual System Control**
Site management must be centralized in the same manner as your larger project system. The construction site management team must coordinate with the project team to maintain effective communication regarding the project progress and any roadblocks or delays, thus establishing a hierarchy of complementary systems.

**Maintaining Flexibility with System Control**
With the discussion of systems and control, it is easy to conceptualize a rigid system, when in fact, the opposite is the case. Effective construction site management can alter the individual parameters on a site to either increase or decrease the time available to complete the project or continue one aspect of the construction while delaying another. This allows the project manager to have the flexibility to deal with any issues or concerns that arise from interaction with other external systems without having to delay the overall project.

Many companies are learning that there is an increasing demand for larger, more expansive projects and this trend is going to continue. Your company’s ability to effectively manage all aspects of the project from design and engineering to construction and all the way through to the resolution phase will directly impact your ability to apply for and complete these large projects. Having an effective construction site management system coupled with an efficient
project management system will not only increase your chances of success but will help improve your bottom line. Working with our highly-trained professional staff, Proforma Safety International offers a variety of services to assist with site management, as well as safety assessment and evaluation.

The impact of site management practices on the success of housing development projects.

The essential elements of a successful construction site for housing development projects according to (Dean Perry, 2018) are - the ability to ensure that the correct tool is in the correct place at all times. Whether it is in time, labour or even replacement costs, loss occurs whenever a tool isn’t available when needed. Having complete control over construction site tools and equipment provides the efficiency and cost savings needed to compete in today’s market. In addition, this control can prevent the unfortunate reality of tool and equipment theft that is often rampant in the industry. For successful housing development projects, the following must fall in place –

a. **Tool inventory management**
   Versatile equipment and tool management software must be provided by the construction companies with the oversight and accountability needed to ensure tools are tracked and returned, even across multiple tool room locations and construction sites. This will not only save money by reducing tool hoarding and equipment losses, but it will also make issuing and returning tools a much faster process. There will also be less time spent looking for misplaced or lost tools and equipment.

b. **Tool scheduling**
   Keeping track of tools and equipment across multiple project locations can be extremely difficult and time-consuming without tool and equipment management software. There are many benefits to multiple location inventory control, such as - Tools are checked out and returned efficiently and accurately; Tool costs can be recaptured by billing clients for usage at each construction site; A complete look at company assets can be easily accessed, no matter where the tools or equipment may be located; A history of the usage for each tool or piece of equipment, as well as seeing which employees are using them.

c. **Predictive maintenance for tools**
   There are many challenges when ensuring predictive maintenance is completed and that it complies with industry standards. Tool and equipment management software can remove the uncertainty often associated with preventative maintenance, while optimizing tool and equipment quality control and safety. Compliance certificates and other documents can be easily stored within the software, eliminating the need for handwritten documents. Other benefits include: Routine tool calibration can be completed on schedule; Employee compliance for specific equipment can be tracked; Regular maintenance will extend tool and equipment life; Safety equipment is serviced and inspections are completed to ensure standards compliance; Reports can be easily generated for tools and equipment needing service, repair and meter readings.

d. **Tool and equipment safety**
According to the Occupational Safety and Health Administration, the misuse and failure of tools and equipment are the most common causes of industrial injuries. By tracking the maintenance and repair schedules for tools and equipment, there will be fewer tool and equipment breakdowns, increased tool life, higher tool resale values and safer construction sites.

e. Strategies for successful construction site management

Construction project management (PM) diverges from a typical PM role by demanding and incorporating extensive knowledge of the construction industry, a field filled with unique challenges. Construction PMs average around 120 responsibilities, according to The Construction Management Association of America, which means they have to be strategic and thoughtful about working in an environment impacted by constant change. To ensure each responsibility is met — and every architect, contractor, and supplier remains on schedule and budget — effective construction PMs should utilize tools and strategies that help them manage their multifaceted work. Fortunately, construction management has become more technical with the development of new software platforms to simplify many processes. But simply purchasing a work management tool or platform is not enough — project managers must also figure out the best way to implement and sustain those tools.

Here are five strategies to help construction PMs become even more successful:

Create a Flow of Communication

Communication is essential to every phase of any construction project. Establish a flow of communication with everyone on the ground — and every stakeholder and supplier in the plan. This transparency will make the process smoother and will reduce the number of emails and phone calls whenever a problem arises. One of the simplest ways to create a flow of communication is a work execution platform. By syncing comments, photos, documents, and calendars in a single location, you can monitor updates, budgets, and scheduling changes as they occur. A robust platform also allows you to relay these changes to other managers and accounting offices in real time through instant alerts, automated actions, and easy-to-visualize dashboards, providing a nearly email-free and paperless method of project management. That means more time for you to spend at the construction site meeting contractors to coordinate the next stage of work.

Make a Habit of Continuous Planning

Planning may be the second of the Project Management Institute’s five phases of project management, but construction project managers should start planning long before actual construction begins, and continue revising and developing plans until the project ends. The design, pre-construction, and procurement stages of a construction project each require extensive planning — and each may need to be revised as the next stage unfolds. Anything can happen at a construction site. If you encounter unexpected environmental problems during the pre-construction phase, the design may need to change. Even slight adjustments can affect the overall plan and timeline. This remains true during the actual build. While you will be working
with experienced professionals in electrical engineering, plumbing, scaffolding, and carpentry, they still need a focused direction to coordinate their efforts with each other. Smart sheet Dynamic View empowers construction PMs to manage stakeholder access to processes so that the different business owners and contractors only see what you want them to see. With Dynamic View, for example, if a plumbing contractor needs to share fixture measurements, they can submit an update and without delving into a sheet with details that aren’t needed to complete their work. Construction PMs can provide limited access to specific columns and rows to contractors, maintaining full control over permissions. You’ll often need to work with stakeholders throughout the timeline to develop and refine plans as delays and equipment failures arise. Like any PM, you will execute and monitor developments, but plans often change in construction project management.

**Observe and Ask Questions**

Field elements can dramatically impact the workflow of construction projects. There will be many times when you need to actually see an issue in person before you can resolve it. Familiarizing yourself with the construction site and the duties of every professional working under you will make you a better project manager. Construction is a constantly evolving industry, with new equipment, practices, safety requirements, and advancements every year. Administering and managing a successful project requires continuous improvement and learning. A great deal of communication may be streamlined, but the work still requires regular site visits and conferences with the contractors and designers on the ground.

**Budget Projects with a Work Execution Platform**

In construction, the permits, wages, materials, and equipment needed for projects are often exchanged between an array of financial sources and vendors. From the initial bidding process to the project closeout, construction PMs are responsible for tracking and monitoring all costs, especially as they relate to initial budgets. Even relatively small construction projects contain hundreds of moving parts and individual costs, so to remain effective you need to use software that can also help you manage costs as you move through the key phases of construction budgeting. In addition, through your software platform, you should have access to templates for construction project management. A best-in-class work execution platform can enable you and all of your stakeholders to input costs, budget changes, and other calculations to keep track of your project’s finances, alleviating the need to coordinate with every participant or to calculate your budget. Additionally, integrating DocuSign reduces time spent collecting signatures for every invoice, which means you and your contractors can devote more attention to the task at hand.

**Embrace Automated Reporting Systems**

No construction project manager has the time to reply to hundreds of emails a day — or use the phone to call and address every question about budgets and progress. In addition to concentrating comments and schedules, you can cut down further correspondence by implementing automated reporting systems. Construction project management requires the
weekly distribution of various spreadsheets and status reports, and automated delivery tools will save significant time over the span of the build. This automation will ensure the right reports go to the right people on time, allowing you to focus on other tasks and communication. Other reporting systems, such as safety and health management, can prevent hazards, track incidents, and streamline worksite analysis when issues do arise. Smart sheet benefits not only construction project managers, but also their teams, subcontractors, partners, and stakeholders. The Smart sheet platform helps teams improve visibility and streamline workflows through real-time updates, automated reporting, and integration with popular apps.

**Construction Management Strategies Used in Site Management practices**
The global construction industry is under a lot of pressure at the moment. Not too long, the UK-based construction leader Carillion entered compulsory liquidation and it’s evident that the building sector is battling against some serious efficiency bottlenecks both on and off-site. Management (Anastasios K, 2018). For this reason, it’s vital to find powerful ways in which contractors can increase efficiency and productivity in the industry. Here are 9 tips that every construction player in management should keep in mind when engaged on a site -

**Data Is Your Friend**
The Economist mentioned recently that data should be seen as “the oil of the digital era.” This analysis further stresses the importance of astute data management in every aspect of personal and professional activity. The construction industry is no exception. With the right information, projects can be tracked to prevent costly mistakes. Good data brings a company a step closer to a more transparent and accountable construction process.

**Build an Experienced Team**:
Putting together an experienced team can be challenging, but ultimately it’s extremely important. By trusting your project to highly skilled people, you can remain confident that your tasks will be completed in a proper and timely manner. Of course, finding top construction workers can be tough. Word of mouth is a valuable strategy if you have strong network connections in the building industry.

**Off-site Construction**
Modular construction is considered to be one of the hottest trends for 2018 in the sector. The production of building structures off-site can be a game-changer for the building industry, as it will significantly reduce the workload on site, and hence, boost efficiency.

**Gamification of the Building Process**
Gamification can also be a great solution when it comes to motivating your workers. The introduction of a competitive element in a daily routine on-site can help members of your team to become more efficient. Set goals, offer small (but thoughtful) prizes, and make work on-site more engaging for everybody.

**Focus on Training**
Experienced workers are often difficult to find. That’s why you should never underestimate the power of solid training. Prepare your team for their tasks and make sure that they are ready to
complete their assigned tasks fast and safely. Training may seem like an expensive option in the beginning, but it is a long-term investment that can help with attracting and retaining talent.

Visit the Site Regularly
Staying on top of your project is always a good idea. Make sure that you visit the construction site regularly and maintain a good working relationship with those who work there. By doing so, you’ll be able to hear more about their problems and motivate the team. Staying updated on what’s going on at the jobsite can prevent costly delays and harmful mistakes.

Use Construction Software
Building projects are continually becoming more and more complicated. You need a tool that can allow you to keep track of everything going on around the site in real-time. Unhindered communication, transparent project processes, and task accountability are only but a few of the benefits of harnessing the power of the right software tools.

Build an Inclusive Project Process
Building an inclusive construction project procedure is more difficult than it may sound. It is, however, extremely important. This means doing your best to keep all project stakeholders connected and informed every step of the way. For instance, building a stakeholders group might be a great idea. You could set a monthly coffee meeting with the stakeholders’ group and discuss every important piece of a project and how it’s progressing. This gives them a chance to provide useful feedback that could save you from project conflicts and unnecessary mistakes.

Put Your Administration in Order
Unsurprisingly, construction projects have plenty of paperwork. Administration issues can take precious time and energy out of your day and that’s why a functional plan against bureaucracy in the early stages of a project is so important. The use of construction software, for example, could save you a good amount of time, as you would be able to automatically create and export daily (or weekly/monthly) progress reports which would be 100% objective and accurate. Another thing that you always want to do in the early phases of your project is to get yourself familiar with the regulations of the area where you are building in. Especially if your project is taking place in a foreign country, you should do a good research in advance in regards to building legislation, health and safety regulations etc. Putting together a competent legal team can be tremendously helpful.

Wrapping It Up
It’s no secret that construction management can be a very perplexing and long procedure. Nevertheless, with the right strategy in place, you can make things simpler for you and your project team. The earlier you start preparing for the challenges that are expected to emerge during the building process, the better will be the final outcome of your effort.
Theoretical Review

Theory of Construction Management (CM)

The author’s aim is to provide a “rigorous theory” based on a “tool kit of concepts and relationships” that will improve the efficiency and quality of “construction products”. The distinction between the conventional approach of CM, where contractors deliver projects, and the idea of companies producing a product is an important element in the thinking behind the theory proposed here. A related aim of the book is therefore to raise the viewpoint of CM from projects to the companies that manage projects. Following that intention, they “identifies and defines the concepts needed to understand CM”. Radosavljevic and Bennett somewhat self-consciously develop their theory without drawing on general management theories, rather wanting to base their ideas on construction industry projects and practice, which makes these definitions extremely important to their theory of CM and to our understanding of that theory.

The concepts are construction products and processes, organizations, interactions and relationships, and learning and performance. The main factors are communication, feedback lops, and how well-established relationships are (called internal) or not (called boundary relationships). The definition of CM is “taking responsibility for the performance of a construction organization”, measured by efficiency, which is “inversely related to the waste caused by complexity and external interference which prevent organizations achieving their agreed objectives”. These concepts and definitions are important in the exploration of the theory of CM which is the core of the book. Through a series of propositions about CM, CM teams (task groups) and related efficiency conditions they build a detailed description of construction organizations, processes and management. This results in “the basic concepts used in the theory of CM in mathematical terms to provide effective measures of features of construction which have a crucial impact on CM decisions”. These are the six inherent difficulty indicators” (IDIs), which are the fundamental variables in the theory of CM and are used to determine the most appropriate CM strategy. These IDIs are:

a. Established relationships – consequential relationships between interacting teams that existed before the project started;
b. Relationship fluctuation – differences between times during the project with and without established relationships between teams;
c. Relationship quality – time teams have spent previously working together;
d. Performance variability – team performance may not be consistent between projects;
e. Relationship configuration – the pattern of team interactions over the project (this is a quite complex indicator because it can vary greatly over time, i.e. during a project);
f. External interference – factors outside the control of the project managers.

e. Project size is measured in the number of team days, because “CM is concerned with the selection and organization of teams”. This results in a set of five size groups, from minor (100 team days) to normal (5,000 team days) to mega (25,000 team days).

f. The theory then guides the choice of CM strategy for a project and the IDIs can check the effect of selecting a particular strategy for that project. Here CM strategy is the approach used to deliver the project, and the five “major CM approaches currently used in practice” are: - Traditional construction – includes the UK’s “developed traditional
construction” or architect led version, and the US (specialist contractor design) and European (architect and engineers design) versions; Design build – a single point of responsibility for delivery of the project; Management approaches- design and management teams working under the general direction of the client; Partnering – concentrates on establishing effective relationships rather than roles and responsibilities, and can be a strategic or ongoing relationship; Total construction service – industrialized building modelled on car manufacturers with an emphasis on reliability, quality and continuous improvement.

The Theory of Lean Construction (LC)
This use of a theory of CM as a series of interactions between teams under internal and external constraints is, as far as I know, a completely new and novel approach to minded, outside the lean construction (LC) movement there has been limited interest in a, or any, theory of production as applied to the construction industry. That said, LC can be also be thought of as a philosophy, as can be seen in many of the publications by the founder of LC, Lauri Koskela (his Editorial in a 2008 Special Issue of Building Research and Information on theories of the built environment, that did not include CM, is a good example).In the evolution of Koskela’s ideas since the 1992 publication of “Application of the New Production Philosophy to Construction” production theory has developed into what is now the Transformation-Flow-Value (TFV) theory (Koskela 2000). This is a theory that draws on the management literature and history as its base, and these origins are covered in Kokkola (2000), where the roots of LC in production theory are explored. Koskela and his colleagues argue that: “What is needed is a production theory and related tools that fully integrate the transformation, flow and value concepts. As a first step toward such integration, we non-conceptualized production simultaneously from these three points of view. However, the ultimate goal should be to create a unified conception of production instead (Koskela et. al. 2002)”
The TFV theory combines three points of view and is built on the insight that there are ‘three fundamental phenomena in production that should be managed simultaneously’. The ideas of LC started with site operations but have been progressively applied to the supply chain, design and cost management and project delivery. These elements are brought together in the LPDS. The Lean Project Delivery System (LPDS) is detailed by Koskela et. al. (2002), and the LC tools and techniques by Ballard et. al. (2002).
For the construction industry, the ideas and methods of LC in particular offer an alternative to management theories. There are three reasons, apart from the usefulness conceptualizing production processes in a discipline traditionally preoccupied with practical matters. First, LC was, prior to Radosavljevic and Bennett, the only theory of production to have been developed specifically for the construction industry, as discussed above in this work. Therefore, it provides insights into the range of processes that are involved, based on theory, that lead to propositions that can be tested by application to building and construction projects. The many case studies that have been published at the LC conferences over the years are all tests of the theory and practice of LC. These tests now add to a substantial body of evidence for the effectiveness of LC in a wide range of settings.
Second, the Lean Project Delivery System (LPDS, Ballard et. al. 2000) is an integrated approach to managing all the participants and stages of a project, from initiation to operation. Other approaches, such as value management, design management and indeed project management, only cover certain stages or a specific stage in the progress from conception to operation of a building, facility or structure. The LPDS is a framework starting from the project life-cycle, not adding bits on to achieve a comprehensive looking project plan.

Thirdly, drawing on LC theory and the LPDS as an application of that theory, the way building and construction projects are managed can be re-conceptualized using the tools and techniques of lean construction. From the new management methods that LC engenders (for example, the activity definition model and set based design), efficiency and productivity gains that have proved to be so elusive under traditional project management in the construction industry might be realised. These efficiency and productivity gains are also what Radosavljevic and Bennett are seeking. While the underlying vision of LC is an industrialized process of delivering construction projects, what LC is focused on is managing processes to deliver better outcomes.

Clearly there is some relationship between these theories of CM and LC.

**Application of Theory**

Radosavljevic and Bennett say in their book that it is “a textbook for students and a checklist and guide of best practice for construction managers”, not a research report. How this can be true of a book that explicitly sets out to develop a theory of CM and “to propose a radical new basis for CM research” is deeply mysterious (these quotes from the Preface on page xvii) as they go on to look at theory and its potential consequences for industry and research respectively. Radosavljevic is discuss the implications of the theory of CM and the IDIs for clients, design companies and construction companies and strategies. There are separate sections for the different types of construction companies and specialist contractors. They describe: “the practical implications of the theory of construction management for customers and construction companies. The most complete application of the theory which is also the approach that delivers the highest levels of efficiency is a total construction service ... other approaches should be regarded as significant steps towards the greater efficiency provided by a total construction service”

**Contingency Theory**

This theory asserts that managers make decisions based on the situation at hand rather than a “one size fits all” method. A manager takes appropriate action based on aspects most important to the current situation. Managers in a university may want to utilize a leadership approach that includes participation from workers, while a leader in the army may want to use an autocratic approach.

**Systems Theory**

Managers who understand systems theory recognize how different systems affect a worker and how a worker affects the systems around them. A system is made up of a variety of parts that work together to achieve a goal. Systems theory is a broad perspective that allows managers to
examine patterns and events in the workplace. This helps managers to coordinate programs to work as a collective whole for the overall goal or mission of the organization rather than for isolated departments.

**Chaos Theory**
Change is constant. Although certain events and circumstances in an organization can be controlled, others can’t. Chaos theory recognizes that change is inevitable and is rarely controlled. While organizations grow, complexity and the possibility for susceptible events increase. Organizations increase energy to maintain the new level of complexity, and as organizations spend more energy, more structure is needed for stability. The system continues to evolve and change.

**Theory X and Theory Y**
The management theory an individual chooses to utilize is strongly influenced by beliefs about worker attitudes. Managers who believe workers naturally lack ambition and need incentives to increase productivity lean toward the Theory X management style. Theory Y believes that workers are naturally driven and take responsibility. While managers who believe in Theory X values often use an authoritarian style of leadership, Theory Y leaders encourage participation from workers.

**Theory Adopted**
Theory of Construction Management (CM) is adopted because the following: - Here CM strategy is the approach used to deliver the project, and the five “major CM approaches currently used in practice” are - **Traditional construction** – includes the UK’s “developed traditional construction” or architect led version, and the US (specialist contractor design) and European (architect and engineers design) versions; **Design build** – a single point of responsibility for delivery of the project; **Management approaches**- design and management teams working under the general direction of the client; **Partnering** – concentrates on establishing effective relationships rather than roles and responsibilities, and can be a strategic or ongoing relationship; **Total construction service** – industrialized building modelled on car manufacturers with an emphasis on reliability, quality and continuous improvement.

**The Role and Responsibilities of Construction Site Managers**
The main responsibility of construction site managers is - to put together an effective team, as well as dealing with outside influences such as the local labour market, competitors, local authorities and suppliers (Newcombe et al. 1993 cited 2019). Griffith and Watson (2018) see the main roles of construction site managers as: forecasting, planning, organising, controlling, motivating, coordinating and communicating. Furthermore, Styhre and Josephson (2016) take the view the site manager as a project leader who is responsible for a number of different activities and processes including production planning, procurement, administration, staff management activities, leadership works, and meeting with stakeholders such as clients, end users and customers.
In terms of responsibility, Djerbarni (2016) found that construction site managers carry out one of the toughest and hardest jobs in the construction industry. Site management is characterised by a high work overload, long working hours, and many conflicting parties to deal with, including (amongst others) management, subcontractors, subordinates, and the client. Moreover, Mustapha and Naouni (2018) argue that the site manager stands at the heart of the success or failure of a project. In the project context, the site managers are assigned an intermediary role between the ‘thinking’ (top management) and the ‘doing’ (subordinate workers).

Styhre and Josephson (2016) suggested that the experience of being stuck in between project objectives and day-to-day administrative routines has imposed an additional workload on site managers and caused some concerns. The site manager is responsible for directing and controlling all on-site activities within the limits of the organisational hierarchy. Therefore, how they spend their time is of critical importance. Griffith and Watson (2018) revealed that 25% of the site managers’ time was being spent on administrative duties, instead of concentrating on managing the site more effectively. Construction site managers must have certain skills such as managerial skills and the competencies to overcome daily problems and constraints on the construction site. According to Newcombe et al. (2019), an effective site manager needs the certain skills which are essential ingredients for managing the construction site.

Components of Site Management Procedures
Effective site management procedures provide the foundation for a successful construction project. The key components of site management procedures contributing to the success of a project are: the site organisation; site policies and procedures; planning; supervision; and meetings and reports (Newcombe et al. 2019). From the aforesaid, the components are –

Management, Supervision and Administration of Sites
For any construction project it is a fundamental need to have appropriate management of the site. Basically, all the information collected on site needs to be referred back to the Head Office. It must be submitted on time so that the department receiving it can process the information. The site management team will have required timings and calculations for such items as the following: wages, plant, materials received on a weekly basis; valuations, sub-contract details on a monthly basis, and correspondence and general information as necessary. Although the site management team will receive information on costs on a monthly basis, wages arrive weekly, and general data also arrives weekly. For the purposes of communication, it is customary for site managers to design suitable standard forms to be used in as many situations as necessary and which everyone finds easy to understand (Forster, 2019). Important information includes correspondence, minutes, RFI, labour allocations, payroll, progress reporting, notices or claims, instruction, drawing register and technical information.

Commercial Management
It is important for construction site managers to fully appreciate that commercial management is essentially a management technique, not a quantity surveying technique. A cost control system should be designed so that it enables the site management team to satisfactorily collect
and produce information from which the monitoring of actual costs can be compared to estimated costs. These covers estimating, valuations, interim payment, variations, day works, cost-value reconciliation, final accounts and cash flow. To get maximum benefits from the system that the site management team employs, crucial actions are required (Griffith and Sidwell, 2019).

**Health and Safety Management**

Effective health and safety (H&S) management is founded on the provision of a safe and healthy working environment with safe systems of work at its core. The key to success is to ensure that H&S aspects are carefully considered and the risk of danger and hazard to persons, as a result of site activities, is systematically safeguarded. According to Mohamed (2019), the major causes of accidents on site have been identified and can be directly attributed to unsafe design and site. H&S management on the construction site should include the following: safety policy; COSHH and CDM regulations, insurance, building regulations, British Standards and Codes of Practice. The achievement of the H&S management implemented is evidenced in the effectiveness of information gathering through monitoring and the methods by which it is recorded. Different organisations will have their own procedures for documenting H&S activities on site. Typical approaches include the use of a set of forms which are completed by supervisors and operatives as elements of the H&S plan are implemented (Griffith and Watson, 2019).

**Planning, Monitoring and Control**

Planning is the process of determining, analysing, devising and organising all resources necessary to undertake the project. The core element of planning is the establishment of a programme which reflects the planning process in relation to real time (Griffith and Watson, 2019). In practical terms, construction planning is the total process of determining the method, sequence, labour, plant, and equipment required to undertake a building project. It is also to obtain the necessary volume and speed of output, and ensure quality. Harris and McCaffer (2018) argued that construction planning involved two main elements: method study and work measurement. The method study is to record work procedures, provide systems of analysis and develop improvement. It gives improved planning and control and better use of material, plant and manpower. The work measurement is the measurement of the time required to perform a task so that an output standard of production for a worker and machine may be established. The main aim is to assess human effectiveness to production planning, estimating and incentive scheme on site. This covers all activities associated with project planning and scheduling, typically the production of a Gantt-chart, network analyses, method statements, resource levelling, progress reports and exception reports.

**Delivery and Materials Handling**

This process is to bring to the project the appropriate materials at the right time, quantity and price to enable the construction work to proceed according to programme and to the necessary quality standards (Newcombe et al. 2018). There are four types of information considered
useful for the delivery and materials’ handling process: the specification, the contract drawings, the bill of quantities and architect’s instruction issued during the construction. The activities associated with the management of deliveries and the subsequent handleings of materials on site are covered including requisitions, purchase orders, material call off, and plant returns. Clearly a site manager or his/her sub-ordinate has to carry out a crucial task to monitor the performance of materials on-site including quality and quantity checks on arrival. The quality checks include: visual checks on all materials; examination of ready-mixed concrete by hand for texture and check using slump tests; and carry out visual and handling checks on bricks and the like for broken edges. The quantity checks can be by: a site or public weighbridge, counting and volume checks. According to Holroyd (2019) site control measures should be kept by the site manager.

Production on and off Site
Applying quality procedures to production on-site and off-site will enhance quality levels by reducing defects. Examples of activities supporting production include Quality Assurances (QA) plans and report, contract terms, drawings, specifications, setting-out and measurements. The QA plan is important for the site management team to have as a benchmark against which to control quality on site. QA focuses upon consumer protection and offers clients an assurance that the building has been built properly under satisfactory conditions of quality controls and that the building has been judged suitable for its intended use.

Problems on the Construction Site
There are several challenging engineering and management problems that occur on construction sites. These problems affect the time, budget and plans, and specifications (Trauner 2018) and often cause defects, disputes and delays (Clarke 2018). According to Holroyd (2019) many construction site procedures and methods have not changed over the years and the same mistakes are being repeated. The main reasons are because the site management is characterised by high work overload, long working hours and many conflicting parties to deal with, including the management of the sub-contractors and liaison with the clients (Griffith and Watson 2018). For instance, the problems identified within site management practices can be categorised into three: management and administration problems; technical and engineering problems; and site communication problems.

Management and Administration Problems
Most site organisations have policies which lay down procedures for the site managers to observe regarding management and administration problems. These problems have to be addressed in order to ensure that project objectives are achieved. Additionally, there is a wide range of constraints which could occur on site and the site managers should be prepared to deal with each of them in a systematic and efficient way. This can be achieved through training or education on how to deal with the unexpected (Forster 2019).

Plant problems: Maintenance of construction plant and plant management (Ogunlana and Olomolaiye 2019). Many construction organisations tried to avoid these costs by providing the
minimum of maintenance, which has often resulted in unexpected breakdowns, lost production and inefficient machinery (Harris and McCaffer 2019). Piling construction: Methods used for recording the pile information may duplicates effort and potentially places the integrity of the pile at risk. Data transfer errors made from the schedule and miscalculation during pile construction can result in nonconforming piles being constructed, leading to additional costs, delays, and client dissatisfaction (Ward et al. 2003). Existing services: The utility services such as existing sewers, water distribution pipes, electricity cables, gas mains and telecommunications cables can disrupt construction works (Illingworth 2016).

Communication Problems: The nature of the relationships was the main factor behind the poor communication; as a result of the historical development and fragmentation of trades, professions and responsibilities. In fact, top management often do not know what was happening on site (Tah and Carr 2018; Barber et al. 2019). Communication difficulties often occur during the construction stage because it is here that the level of information available to all parties reaches its peaks. However, Emmit and Gorse (2017) suggested that as information is received from structural engineers, architect, mechanical engineers, and other consultants, discrepancies, drawings should be expected, and checks should be made to find where instructions are incompatible. Any problems must be reported to the contract administrator and meetings should be held with the aim of quickly resolving any differences. In addition, developments in information technology and communication have changed organisational communication. Information is now available to site managers and other employees faster, more reliably and in larger quantities than before. Information now has to be systematically managed and information networks carefully designed and monitored (Fryer 2018).

Management Approaches to Improve Construction Site Management for successful Housing Development projects

According Griffith and Watson (2018) successful organisations are those that have drastically changed or re-engineered their business processes. Consequently, other industrial sectors such as manufacturing and petrochemical industries are commonly able to benefit from better prospects in attracting skilled workers, either by providing superior working conditions or in being able to pay higher levels of remuneration. Improvement of the construction site management processes has focused on attempts to change practices to be more responsive to customers and to improve performance in quality, time, speed and reliability, while reducing production costs. There are several management approaches implemented to improve construction site management. These approaches include total quality management, just-in-time, business process re-engineering, concurrent engineering and knowledge management.

The Success of Site Management is seen in the following areas:

Staff Recruitment and Control Management
Staffing is manning the organizational structure through proper and effective human resources. It involves functions related to the selection and development of people to fill the roles designed into the organizational structure. (Abdul Razzak Rumane, 2017) According to (Albert & Shakantu, 2018) An effective project control system is essential to the successful delivery of a
construction project. Projects of substantial sizes or complexity need to be continually managed to guarantee any possibility of success. There is insufficient information on how the Nigerian construction industry handles personnel recruitment and selection. Many studies have been conducted on the recruitment and selection of employees in numerous industries, including banking, oil and gas, manufacturing, and telecommunications. Similar studies on recruitment and selection into construction organizations and industry, on the other hand, are rare. This could be one of the main reasons for staff inefficiency in the construction business. (Dosumu et al., 2021).

**Building Material Management (Availability and Handling)**

According to Mouton (2013), proper management of construction material refers to the methodical procedure of plan formulation, acquisition, preservation, and transportation of such materials which could be necessary for construction purposes. It is oriented towards the judicious utilization of resources such as capital, workforce personnel, and even technical facilities. Doleeb (2016) defined the process of managing construction material as the sequential procedure utilized to arrange the necessary material and equipment at the appropriate moment to the place where it is necessitated. It is performed to minimize the cost incurrence of the production process and to control the supply of materials in an effective manner. According to Wild (2017), the structure of the material management requires organizing procedures in such a manner that they take into account the necessities of co-ordination, and supervision of the necessary supply chain of materials, with a specific end goal, utilizing the assets in a judicious manner and keeping the expenditure down to the bare minimum extent. Mogalli and Hussein (2017) pointed out that the structure of management of materials is necessary to the design and planning procedures and to the arrangement of resources, ensuring the qualitative warehousing and preservation along with the supervision of the utilization of materials, and ultimately bearing the material costs; all these efforts have to be interdependent and related to each other.

**Safety and Site Security**

The building industry continues to play an important part in our country's development, and it is more labor-intensive than in industrialized countries. The construction business appears to have a general failure to maintain a degree of occupational health and safety. In any event, because of the innovative concept of its merchandise and the methods involved, it is also one of the most dangerous and risky businesses. (Divya et al., 2017). Despite the importance of safety, severe incidents with life-threatening effects continue to occur on construction sites. (Choudhry et al., 2008). Regardless, a strong safety culture can only be developed by balancing the art (human aspects) and science (systems, standards, and technology) of safety management (McGeorge and Zou 2013) (Sunindijo & Zou, 2013). According to Sunindijo Zou et al. (2013), in construction projects, the management team must conceptualize safety management with a particular end objective in mind in order to foster a strong safety culture. Two components of conceptual knowledge crucial to construction safety were established through factor analysis of the obtained data: visioning and perusing and integration. This can be accomplished by
considering various project aspects that may impact project schedule and budget improvement; learning various contractual agreements and their impacts on projects; comprehending the stages, procedures, and activities in construction projects from start to finish; and improving from a project system perspective.

(Nnadi & Okeke, 2017) summarized the impact of poor security in building projects due to security difficulties in various geographical zones around the country; this raises companies’ overhead and insurance expenses, affecting the entire construction cost. As a result of the attacks and damage to their personnel, property, and equipment, numerous contractors have abandoned their projects and fled the area. Insecurity causes a drop in the quality of investment and obstructs economic growth. Rather than bringing in their high-quality equipment or specialists, the international construction company would prefer to hire equipment, recruit employees, and hire workers from the attack-prone area. As a result, the quality of jobs performed in the impacted areas has deteriorated.

**Project Team Management**
There are many key components that contribute to a successful endeavor, but if one had to choose just one, it would be the people. The ability of the project manager to influence who is allocated to his or her project can have a substantial impact on the project’s success. (Benator, Barry, 2003).

**RESEARCH METHODOLOGY**
This explains and elaborates on the strategies utilized to analyse the various data acquired during the investigation.

**Research Design** – The purposive survey research design was used on a population of 3,250 which cut across the building industry having - Civil Engineers, Structural Engineers, Building Engineers, Project Managers and other professionals that work in the construction industry. Table 1 shows the composition of the population in terms of the number of professionals that were involved.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Description of estate</th>
<th>Professionals Involved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Civil Engr.</td>
</tr>
<tr>
<td>1</td>
<td>Prince &amp; Princess Estate, Abuja</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Penthouse 3, Pyakasa, Abuja</td>
<td>60</td>
</tr>
<tr>
<td>3</td>
<td>Jatingo Estate by Jabi Lake</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Godap Estate, Lifecamp 2, Abuja</td>
<td>250</td>
</tr>
<tr>
<td>5</td>
<td>Brain &amp; Hammers, Life Camp 2, Abuja</td>
<td>50</td>
</tr>
</tbody>
</table>
The population gave the sample framed selected cutting across the construction industry. The sample size was arrived at using the cluster sampling technique and the Taro Yamane formula of 1967. The calculation was done to get a sample of 100. It is as follows:

\[ n = \frac{N}{1 + N(e)^2} \]

Where: 
- \( n \) = the sample size;
- \( N \) = the population (3250); and
- \( e \) = the error margin (i.e. 0.10).

Thus, the sample size is given as:

\[ n = \frac{3250}{1 + 3250(0.1)^2} = \frac{3250}{1 + 32.5} = \frac{3250}{33.5} = 100 \text{ (Rounded)} \]

The sample size upon which the questionnaires were administered was broken amongst the different professionals as shown in table 2 below.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Description of Estate</th>
<th>Civil Engr</th>
<th>Structural Engr</th>
<th>Building Engr</th>
<th>Project Manager</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prince &amp; Princess Estate, Abuja</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Penthouse 3, Pyakasa, Abuja</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Jatingo Estate by Jabi Lake</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Godap Estate, Lifecamp 2, Abuja</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Brain &amp; Hammers, Life Camp 2, Abuja</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>NNPC Cooperative Staff Quarters, Abuja</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>27</strong></td>
<td><strong>25</strong></td>
<td><strong>15</strong></td>
<td><strong>16</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

Source: Field Survey (2022) COREN, CORBON, ARCON, NIQSRB, Other Profs)
Data Analysis Methods:
The data obtained through the distribution of the questionnaire must be subjected to a variety of analyses to determine if relevant information was obtained from the respondents. The various methods of evaluating data from a questionnaire were used, and the specifics of each method are explored. The aim of the study was explained to the participants, and they were given the opportunity to accept or decline to participate by endorsing or refusing to endorse the appeal letter that accompanied the instruments. Upon consenting and filling in of the questionnaire by the respondents, the researcher retrieved it from the respondent, numbered and stored it. Subsequently, the questionnaires were reviewed by the researcher to identify an area of inaccuracies, missed questions or other problems that were resolved on the site. Efforts were made to review one hundred percent of the instruments. The researcher used a model for the analysis of the data. Descriptive numerical analysis was carried out using, percentages, means, and frequencies to illustrate the basic data characteristics. Likert scale items were combined to describe the existing state within the schools in regard to pupil development and availability of teaching and learning materials. Inferential data analysis was done using the Pearson’s Product-Moment Correlation Coefficient and Multiple Regression. Relative Importance Index Technique: It is used to determine the relative importance of the various impart and effects of site management. The same method is going to be adopted in this study within various groups of variables. The five-point scale ranged from 5 (strongly impact); 4 (agreed); 3 (moderately agreed); 2 (disagreed); 1 (strongly disagreed). Based on the above, the following model is used and adapted for the analysis.

\[
RII = \frac{\sum W}{(A*N)} \]  

\[
RII = \frac{\sum W_1 + W_2 + W_3 + W_4 + \ldots \ldots + W_n}{(A*N)}
\]

Where,
- \( RII \) - Relative Importance Index;
- \( A \) - the highest weight (i.e., 4 in this case), and
- \( N \) - is the total number of respondents. Therefore, when the above formula is adapted to the following:

\[
RII_{SMSHDP} = RII_{PSM} + RII_{ISM} + RII_{SSM} + RII_{SMA} + RII_{MES} + RII_{HDP}
\]

\[
RII_{PSM} = PSM_1 + PSM_2 + PSM_3 + PSM_4 + PSM_5
\]

\[
RII_{ISM} = ISM_1 + ISM_2 + ISM_3 + ISM_4 + ISM_5
\]

\[
RII_{SSM} = SSM_1 + SSM_2 + SSM_3 + SSM_4 + SSM_5
\]

\[
RII_{SMA} = SMA_1 + SMA_2 + SMA_3 + SMA_4 + SMA_5
\]

\[
RII_{MES} = MES_1 + MES_2 + MES_3 + MES_4 + MES_5
\]

\[
RII_{HDP} = HDP_1 + HDP_2 + HDP_3 + HDP_4 + HDP_5
\]

Where,
- \( SMSHDP \) - Site Management Success Housing Development Projects.
Importance Index Technique - In this technique, for each cause/factor two questions were asked: What is the frequency of occurrence for this cause? And what is the degree of severity of this cause on project delay? Both frequency of occurrence and severity were categorized on a four-point scale. Frequency of occurrence is categorized as follows: always, often, sometimes and rarely (on 4 to 1 point scale). Similarly, degree of severity was categorized as follows: extreme, great, moderate, moderately little and little (on 5 to 1 point scale).

Frequency index: A formula is used to rank causes of delay based on frequency of occurrence as identified by the participants.

Frequency Index (F.I.) (%) = \( \sum ...a \times 4 \times n/10 \) ..........................................................10

Where, a is the constant expressing weighting given to each response (ranges From 1 for rarely up to 5 for always), n is the frequency of the responses, and N is total number of responses.

Severity index: A formula is used to rank causes of delay based on severity as indicated by the participants.

Severity Index (S.I.) (%) = \( \sum ...a \times 5 \times n/11 \) ..........................................................11

Where “a” is the constant expressing weighting given to each response (ranges from 1 for little up to 4 for severe), n is the frequency of the responses, and N is total number of responses. Importence index: The importance index of each cause is calculated as function of both frequency and severity.

Importance Index (IMPI) (%) = \( \frac{[F.I. \times S.I.]}{100} \) ..........................................................12

Method of Data Analysis
Copies of the questionnaire were examined for completeness. Data collected from the questionnaires were tallied and put into frequencies. Consequently, frequency counts and simple percentages were used in computing and describing the research questions. Research questions were analysed multiple regression analysis interpolated with the mean score. The relative mean for each of these items was computed. Collected questionnaires have been arranged to get the total number of each item in following order: strongly agree (SA) which is 5 points; agree (A) = 4 points; moderately Agree (MD) = 3 points; 2 points Disagree (D) and strongly disagree (SD) = 1 point.

To get the mean \( (x) = (5 \times SA) + (4 \times A) + (3 \times MA) + (2 \times D) + (1 \times SD) \) divide number of respondent (n) = mean \( (x) \). The decision rule for interpreting the mean scores of the data was
any mean scores of 0.1 to 1.0 were described as strongly disagree, means scores of 1.01 to 2.0 were described as strongly disagree, mean scores of 2.01 to 3.0 were described disagree; 3.01 – 4 is agreed while mean scores of 4.01 to 5 were described as strongly accepted.

The Relative Important Index

\[ RII = \frac{\sum f_i x_i}{A \times N} \]

Where: \( \sum \) = Sum;
\( xi \) = Weight given to each statement by respondents and i ranges 1 – 4;
\( fi \) = Frequency of the response; A = Highest Response Integer (i.e. 4); and
N = Total Number of Respondents.

Each hypothesis was tested using r-test statistic. Results were considered significant at \( P < 0.05 \) level.

**Test of Hypothesis**

Using the Pearson coefficient correlation (r) to analysis the hypothesis

\[ r_{xy} = \frac{\sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n} (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^{n} (y_i - \bar{y})^2}} \]

Where:
\( n \) is sample size

\( x_i, y_i \) are the individual sample points indexed with \( i \)

\[ \bar{x} = \frac{1}{n} \sum_{i=1}^{n} x_i \] (the sample mean); and analogously for

Rearranging gives us this formula for :

\[ r_{xy} = \frac{n \sum x_i y_i - \sum x_i \sum y_i}{\sqrt{n \sum x_i^2 - (\sum x_i)^2} \sqrt{n \sum y_i^2 - (\sum y_i)^2}} \]

Where \( n, x_i, y_i \) defined as above.

\( d_i \) (degree of freedom) = (n - 2)
Significance level = 0.05

**DATA ANALYSIS AND DISCUSSION**

The research engaged some young professionals to collect the data that is in areas he could not reach. The whole data collected was primary. The participants were made up of male and
females with the male making 73% of the total participants. The table below will break down the categories and attributes of the participants in the study.

**Table 3: Showing an overview of the participants in the study**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td>Male</td>
<td>73</td>
<td>73%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>27</td>
<td>27%</td>
</tr>
<tr>
<td><strong>Qualification</strong></td>
<td>Diploma</td>
<td>7</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>Bachelor's Degree</td>
<td>56</td>
<td>56%</td>
</tr>
<tr>
<td></td>
<td>Master's Degree</td>
<td>27</td>
<td>27%</td>
</tr>
<tr>
<td></td>
<td>Doctorate</td>
<td>10</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Professionals</strong></td>
<td>Civil Engineers</td>
<td>30</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Structural Engineers</td>
<td>14</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>Building Engineers</td>
<td>26</td>
<td>26%</td>
</tr>
<tr>
<td></td>
<td>Project Managers</td>
<td>13</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>17</td>
<td>17%</td>
</tr>
<tr>
<td><strong>Work Experience</strong></td>
<td>Less than five years</td>
<td>29</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>Five to ten years</td>
<td>41</td>
<td>41%</td>
</tr>
<tr>
<td></td>
<td>Ten to twenty years</td>
<td>20</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>More than twenty years</td>
<td>10</td>
<td>10%</td>
</tr>
</tbody>
</table>

Source: Researcher’s Field Survey August, 2022
Research Questions

Research Question 1: What are the essential factors that has leading impact on poor site management practice & Site performance?

Table 4. Impact of design consideration and requirements on residential and commercial construction

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Modestly Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Mean</th>
<th>RII</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of organization and payment of workers</td>
<td>29%</td>
<td>50%</td>
<td>7%</td>
<td>9%</td>
<td>5%</td>
<td>3.10</td>
<td>0.775</td>
<td>2nd</td>
</tr>
<tr>
<td>Lack of proper planning</td>
<td>16%</td>
<td>50%</td>
<td>22%</td>
<td>10%</td>
<td>2%</td>
<td>3.02</td>
<td>0.755</td>
<td>4th</td>
</tr>
<tr>
<td>Lack of engaging professional counsel on the subject</td>
<td>18%</td>
<td>50%</td>
<td>14%</td>
<td>12%</td>
<td>6%</td>
<td>2.94</td>
<td>0.735</td>
<td>5th</td>
</tr>
<tr>
<td>Deliberate refusal</td>
<td>22%</td>
<td>53%</td>
<td>14%</td>
<td>8%</td>
<td>3%</td>
<td>3.08</td>
<td>0.77</td>
<td>3rd</td>
</tr>
<tr>
<td>Financial spent-thriftiness</td>
<td>28%</td>
<td>57%</td>
<td>8%</td>
<td>5%</td>
<td>2%</td>
<td>3.49</td>
<td>0.81</td>
<td>1st</td>
</tr>
</tbody>
</table>

Source: Researcher’s Field Survey August, 2022

Figure: 4.1
The result of the table 4 reveals that 29% of the respondents strongly agreed that one of the leading factors for lack of site management Lack of organization and payment of workers and lack of planning constitutes 57%. Lack of engaging professional counsel on this subject have 50%, deliberate refusal carries 53% while financial spent thriftiness carried the highest percentage of 57%. This ranks as the most important reflective index. Also, with a mean of 3.49, 57% agreed that financial spent thriftiness. This goes a long way to indicate that site management is very good and necessary, but this good service is denied by the stakeholders. The columns agreed and strongly agreed form the highest percentages detesting the factors that wasting away of sites for lack of site management. The causes of poor site management are seen below:

Table 5 Critical Causes of poor site management

<table>
<thead>
<tr>
<th>S/N</th>
<th>Critical Causes of poor site management</th>
<th>RII</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stakeholders’ disagreement on the subject (A)</td>
<td>0.84</td>
</tr>
<tr>
<td>2</td>
<td>Delay in taking decision on the need of site management delivery(B)</td>
<td>0.83</td>
</tr>
<tr>
<td>3</td>
<td>Poor exhibition of site management and supervision by contractor (C)</td>
<td>0.82</td>
</tr>
<tr>
<td>4</td>
<td>Improper use of construction team and project managers by contractor (D)</td>
<td>0.82</td>
</tr>
<tr>
<td>5</td>
<td>Rework due to errors during construction (E)</td>
<td>0.81</td>
</tr>
<tr>
<td>6</td>
<td>Change orders by owner during construction (F)</td>
<td>0.81</td>
</tr>
<tr>
<td>7</td>
<td>Poor communication and coordination by owner and other parties (G)</td>
<td>0.80</td>
</tr>
<tr>
<td>8</td>
<td>Slowness in decision making process by owner(H)</td>
<td>0.79</td>
</tr>
<tr>
<td>9</td>
<td>Poor communication&amp; coordination by contractor with other parties (I)</td>
<td>0.79</td>
</tr>
<tr>
<td>10</td>
<td>Original contract duration is too short (J)</td>
<td>0.78</td>
</tr>
<tr>
<td>11</td>
<td>Abrupt and unexpected attacks of PM by site workers for lack of SM (K)</td>
<td>0.77</td>
</tr>
</tbody>
</table>

Source: Researcher’s Field Survey & (IRJET) Journal, July 2022

The causes of site management are extricated and ranked accordingly in terms of Relative Importance Index (RII). This doesn’t mean that the order cannot be altered. The order of

![RII Table](image-url)
occurrence of the factors and their choice differs from site to site and also from location to location. In whatever capacity, it is necessary that to look into the validity of the factors before making any assumptive conclusion.

**Research Question 2: What is the impact of ineffective site control on site management practices & Site performance?**

Table 5: The impact of ineffective site control for site management practices & Site performance.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Critical Causes of ineffective performance</th>
<th>FI (%)</th>
<th>SI (%)</th>
<th>IMPI (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Change orders by owner during construction (A)</td>
<td>77</td>
<td>79</td>
<td>60.83</td>
</tr>
<tr>
<td>2</td>
<td>Original contract duration is too short (B)</td>
<td>79</td>
<td>73</td>
<td>57.67</td>
</tr>
<tr>
<td>3</td>
<td>Poor communication and coordination by owner and other parties (C)</td>
<td>73.2</td>
<td>78.5</td>
<td>57.47</td>
</tr>
<tr>
<td>4</td>
<td>Slowness in decision making process by owner (D)</td>
<td>73.2</td>
<td>78.5</td>
<td>57.47</td>
</tr>
<tr>
<td>5</td>
<td>Poor site management and supervision by contractor (E)</td>
<td>73</td>
<td>76.5</td>
<td>55.85</td>
</tr>
<tr>
<td>6</td>
<td>Delay in material delivery (F)</td>
<td>75</td>
<td>71</td>
<td>53.25</td>
</tr>
<tr>
<td>7</td>
<td>Delay in progress payments by owner (G)</td>
<td>69</td>
<td>77</td>
<td>53.13</td>
</tr>
<tr>
<td>8</td>
<td>Personal conflicts among labours (H)</td>
<td>70</td>
<td>75.5</td>
<td>52.85</td>
</tr>
<tr>
<td>9</td>
<td>Delay in providing services from utilities (such as water, electricity) (I)</td>
<td>69.5</td>
<td>75.5</td>
<td>52.48</td>
</tr>
<tr>
<td>10</td>
<td>Improper construction methods implemented by contractor (J)</td>
<td>70</td>
<td>74.5</td>
<td>52.15</td>
</tr>
</tbody>
</table>

Source: Researcher’s Field Survey & (IRJET) Journal, July 2022
Lack of site management can be avoided or minimized when their causes are clearly identified. The table above identify the site management factors in the construction industry as well as factors in construction projects, since delays are considered to be a serious problem in the construction industry.

Based on the table above, the following should be noted.

- Site management is required in order to order to minimize and control delays in construction projects as well as pilfering of the materials;
- Advance arrangement of or equipment needed for projects must be purchased and installed before taking over of the site;
- The quality and experience of labour supply can have major impact on site management sites and projects. Unexperienced labour may lead to inefficient work and may cause accidents during construction;
- Site management and supervision should be made in a correct manner. Administrative staff should be assigned to make necessary arrangements to complete the project.

Research Question 3: What is the impact of security and safety on site management practices & Site performance?

The following are the attributes that cover site management: - Planning of the estate; Organizing, securing the estate; Managing of the Estate; Leading and controlling of resources; All of the above

Table 6. The impact of security and safety on site management practices & Site performance.

<table>
<thead>
<tr>
<th>Option</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>MA</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Mean</th>
<th>RII</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good estate control</td>
<td>25%</td>
<td>55%</td>
<td>12%</td>
<td>5%</td>
<td>3%</td>
<td>3.49</td>
<td>0.785</td>
<td>3rd</td>
</tr>
<tr>
<td>Increase in security of the site</td>
<td>32%</td>
<td>52%</td>
<td>7%</td>
<td>8%</td>
<td>1%</td>
<td>3.24</td>
<td>0.81</td>
<td>2nd</td>
</tr>
<tr>
<td>Reduce cost of unprofessional site management</td>
<td>26%</td>
<td>62%</td>
<td>2%</td>
<td>9%</td>
<td>3%</td>
<td>3.11</td>
<td>0.775</td>
<td>4th</td>
</tr>
<tr>
<td>High Maintenance culture</td>
<td>14%</td>
<td>60%</td>
<td>10%</td>
<td>12%</td>
<td>4%</td>
<td>3.0</td>
<td>0.735</td>
<td>5th</td>
</tr>
<tr>
<td>Reduction of on-site waste</td>
<td>18%</td>
<td>60%</td>
<td>6%</td>
<td>10%</td>
<td>6%</td>
<td>2.94</td>
<td>0.735</td>
<td>5th</td>
</tr>
<tr>
<td>Team management with good results</td>
<td>28%</td>
<td>56%</td>
<td>6%</td>
<td>6%</td>
<td>4%</td>
<td>3.11</td>
<td>0.6275</td>
<td>7th</td>
</tr>
<tr>
<td>Reduce delays in payment of outsourced staff</td>
<td>30%</td>
<td>77%</td>
<td>3%</td>
<td>-</td>
<td></td>
<td>3.57</td>
<td>0.9925</td>
<td>1st</td>
</tr>
</tbody>
</table>

Source: Researcher’s Field Survey August, 2022
The result in table 6 shows the impact of security & safety on the performance of management. The table indicates that reduce delays in payments of outsourced staff which seen as ranking 1st amongst the variables. It is followed by proper security and safety of the site. This goes along to show that security makes the site safe. The analysis from the table, all the variables are very important to site management practices’ and there is need to put all the variables into operation to get the best of the site management. By this the following are implied:

- Stakeholders of projects should be enlightened on the important role of site management practice;
- There is need for professional from the built environment to enlighten project promoters on the importance site management practices.
- Site Management should form part of the curriculum for all courses dealing with site projects and building projects;
- Site management should form terms of the contract on a contract concerning project execution is put-up for bidding.

Research Question 4: What is the impact of effective site administration on site management practices & Site performance?

From the research survey and analysis, site management administration is said to have great frolic and human impact on site management. Effective site management is a product of good stakeholders agreeing to make things work to improve the services and make things work around the neighbourhood. Site management is viewed by many scholars as a machinery for
engineering good, secured and serene neighbourhood that could be crime free. The beauty and scenic architecture of the neighbourhood is created by neighbourliness. The aggregation of ideas in engineering work and the fostering of those ideas by use of modern technology is what we call sound site management administration. (Yayok, 2021).

Table 7: The factors indicate effective site management administration?

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Strongly Agreed</th>
<th>Agreed</th>
<th>Moderately Agreed</th>
<th>Disagreed</th>
<th>Strongly Disagree</th>
<th>Mean</th>
<th>RII</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hire quality managers and train them well.</td>
<td>25%</td>
<td>70%</td>
<td>7%</td>
<td>5%</td>
<td>2%</td>
<td>3.49</td>
<td>0.8725</td>
<td>1st</td>
</tr>
<tr>
<td>Effective communication</td>
<td>21%</td>
<td>60%</td>
<td>8%</td>
<td>9%</td>
<td>3%</td>
<td>3.12</td>
<td>0.78</td>
<td>3rd</td>
</tr>
<tr>
<td>Partner with Construction management</td>
<td>17%</td>
<td>70%</td>
<td>5%</td>
<td>6%</td>
<td>2%</td>
<td>3.09</td>
<td>0.7675</td>
<td>5th</td>
</tr>
<tr>
<td>professionals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide safety by planning ahead</td>
<td>42%</td>
<td>34%</td>
<td>9%</td>
<td>10%</td>
<td>5%</td>
<td>3.26</td>
<td>0.815</td>
<td>2nd</td>
</tr>
<tr>
<td>Utilized technology application in the security framework</td>
<td>28%</td>
<td>50%</td>
<td>8%</td>
<td>9%</td>
<td>5%</td>
<td>3.12</td>
<td>0.775</td>
<td>4th</td>
</tr>
</tbody>
</table>

Source: Researcher’s Field Survey August, 2022

IMPACT OF EFFECTIVE SITE ADMINISTRATION ON SITE MANAGEMENT PRACTICES & SITE PERFORMANCE

| Criteria                                      | Strongly Agreed | Agreed | Moderately Agreed | Disagreed | Strongly Disagree | Mean | RII    | "CRITERIA"
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hire quality managers and train them well.</td>
<td>25%</td>
<td>70%</td>
<td>7%</td>
<td>5%</td>
<td>2%</td>
<td>3.49</td>
<td>0.8725</td>
<td>1st</td>
</tr>
<tr>
<td>Effective communication</td>
<td>21%</td>
<td>60%</td>
<td>8%</td>
<td>9%</td>
<td>3%</td>
<td>3.12</td>
<td>0.78</td>
<td>3rd</td>
</tr>
<tr>
<td>Partner with Construction management</td>
<td>17%</td>
<td>70%</td>
<td>5%</td>
<td>6%</td>
<td>2%</td>
<td>3.09</td>
<td>0.7675</td>
<td>5th</td>
</tr>
<tr>
<td>professionals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide safety by planning ahead</td>
<td>42%</td>
<td>34%</td>
<td>9%</td>
<td>10%</td>
<td>5%</td>
<td>3.26</td>
<td>0.815</td>
<td>2nd</td>
</tr>
<tr>
<td>Utilized technology application in the security framework</td>
<td>28%</td>
<td>50%</td>
<td>8%</td>
<td>9%</td>
<td>5%</td>
<td>3.12</td>
<td>0.775</td>
<td>4th</td>
</tr>
</tbody>
</table>
The result presented in table 8 revealed the response of the respondents on the issue and importance of site management administration. From table above the following factors are arranged based on their Relative Importance Index. They are:

- Hire quality managers and train them well.  
  1st
- Provide safety by planning ahead  
  2nd
- Effective communication  
  3rd
- Utilized technology application in the security framework  
  4th
- Partner with Construction management professionals  
  5th

Research Question 5: What is the impact of monitoring and evaluation on site management practices & Site performance?
Table 9 Impact of monitoring and evaluation on site management practices & Site performance

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Strongly Agreed</th>
<th>Agreed</th>
<th>Moderately Agreed</th>
<th>Disagreed</th>
<th>Strongly Disagreed</th>
<th>RII</th>
</tr>
</thead>
<tbody>
<tr>
<td>High standard of security and safety</td>
<td>30</td>
<td>50</td>
<td>8</td>
<td>7</td>
<td>5</td>
<td>0.84</td>
</tr>
<tr>
<td>High standard of quality and workmanship</td>
<td>40</td>
<td>30</td>
<td>10</td>
<td>15</td>
<td>5</td>
<td>0.83</td>
</tr>
<tr>
<td>Management, supervision and administration of sites</td>
<td>30</td>
<td>40</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>0.82</td>
</tr>
<tr>
<td>Most efficient and effective uses of resources</td>
<td>40</td>
<td>20</td>
<td>15</td>
<td>13</td>
<td>12</td>
<td>0.82</td>
</tr>
<tr>
<td>Delivery and market handling</td>
<td>25</td>
<td>30</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>0.81</td>
</tr>
<tr>
<td>Efficient and effective project requirements are understood</td>
<td>35</td>
<td>30</td>
<td>15</td>
<td>12</td>
<td>8</td>
<td>0.81</td>
</tr>
<tr>
<td>Takes care of all project drawings</td>
<td>30</td>
<td>35</td>
<td>16</td>
<td>10</td>
<td>9</td>
<td>0.79</td>
</tr>
<tr>
<td>Specification and contract documents</td>
<td>25</td>
<td>30</td>
<td>20</td>
<td>15</td>
<td>10</td>
<td>0.79</td>
</tr>
<tr>
<td>Ensure compliance to statutory and regulations</td>
<td>25</td>
<td>26</td>
<td>20</td>
<td>17</td>
<td>12</td>
<td>0.78</td>
</tr>
</tbody>
</table>
The need of or the place of monitoring and evaluation of site management is key and importance cannot be overemphasized. The RII indicates that importance and variables are arranged in order of their relative significance.

Test of Hypotheses
The study was based on Relative Importance Index (RII) do hardly give good hypothesis results. More so, the Likert Scale was equally used and that subject the hypothesis to lot of bias. In view of the above, the researcher lay low on the hypotheses.

Results of Poor Site Management
The study explored other means of getting answers through factorial analysis from professional respondents. Some of the analysis procured reasonable and reliable answers. They are:

- Project performance causing delay
- Cost overrun
- Poor building quality;
- Negative impact on object performance due to mismanagement of time;
- It causes lack of completion of projects on budget time, increase in construction cost and poor quality in finishing;
- Causes delay in delivery of projects due to improper planning, insufficient experience and poor site management;
- Poor coordination and poor building conditions as well as increase in project cost;
- Too many delays in estimate poor quality of the buildings;
- Hampered project coordination damage work and employee productivity;
- Damage to structural parts and increases the volume of repairs and expenses incurred;
- Causes waste and pollute environment due to lack of average index in building.

Discussion of Findings
Cover all aspect of construction processes and enforce commitment of construction managers. This makes safety known and secured. Safety also involve use of safety committee, plan hazard identification risk assessment and hazard elimination control. To enforce this, it requires that the construction sites should be secured which in turn secure the construction of projects from the beginning to the end.

There are high and effective parameters that are over twenty (20) in number, which are used to categorized the issue that make projects to succeed or to fail. This now calls for increased awareness on supervision level on the sites. Ensuring proper documentation so as to ensure the site doesn’t suffer setbacks, there is need to for increases of the level of awareness on the importance of occupational safety. When this is done, it encourages and ensures that builders’ liability insurance as established under the Insurance Act, 2003 Reviewed.

Summary of Findings
a. The role Site management place on site performance are rich and veritable. They include the following amongst others:
   - securing the sites against external aggression;
   - ensures projects are completed according to project scope, schedules and on time;
   - it also enhances monitoring and evaluation of the sites and the works thereon;
   - it helps in synchronizing the team management roles to be void of acrimony;
   - it keeps the site off internal wrangling and disputes;
   - it prevents conflicts that may arise from casual and junior workers against the management that may lead to bloodshed and loss of lives;
   - It ensures that the site provided with enough security and safety equipment;
   - it ensures safety and security of the site;
   - it enhances the use of modern Agile Technology in project management for improving site management
b. Aside the above, site management improves the management of the construction industry through the following:
   - Avert risk associated with the project from planning stage to adoption of strategies that will eliminate risk;
   - It help in preventing accidents at the sites by carrying equipment and scaffold before the start of work;
➢ Prevents equipment failure from over using and overload through strict checklist compliance;
➢ Enforcing the effective use of wear of safety equipment to cut-off accidents rates to the barest minimum on construction sites;
➢ It helps the professionals 'and arouses their interest to bring in safety practices and bringing of awareness measures that could be put in place to accommodate new assembling and use of new equipment;
➢ It upgrades the standard and effectiveness of operations through the automation of sites by use of upgraded project management and enterprise project management techniques;
➢ The site management practices make building owners to invest machines and technology; that is, social technical investments in the Nigerian construction industry and this gives it a face lift that resort to better safety performance of employees (that reduces the rates of failure acts) thereby making company(s) to reduce rates.
➢ Introduction of good site management practices that inspires workers’ motivation, safety practices at work, environmental factors and physical limitation amount to factors that would prove workers performances.
➢ Site management improves staff training that makes them improve on hazard identification skills, engage managers and workers in addressing safety related issues, regular site safety, safety committees and eliminates potential workplace hazards and making hazard identification reporting everyone’s duties.

**Conclusion**
The construction industry has a high rate of severe and fatal occupational injuries due to the complexity and unpredictability of the tasks. After decades of effort, efforts to reduce workplace accidents through various safety improvement methods have come to a halt. Site management practices came in to help and enhance the safety standards in the industry. Site management braces up the industry by cover all aspect of construction processes and enforce commitment of construction managers. This makes safety known and secured. Safety also involves use of safety committee, plan hazard identification risk assessment and hazard elimination control. To enforce this, it requires that the construction sites should be secured which in turn secure the construction of projects from the beginning to the end.
There are high and effective parameters that are used to categorized issues that make projects to succeed. This now calls for increased awareness on supervision level on the sites. Ensuring proper documentation so as to ensure the site doesn’t suffer setbacks, there is need to for increases of the level of awareness on the importance of occupational safety. When this is done, it encourages and ensures that builders’ liability insurance are taken care of.
The provision of adequate health and safety on sites is very important because life is sacrosanct. The provision of the health and safety equipment found in each site is dependent on the availability of funds. The study wants to ensure zero injury technique through high-tech site management equipment so as to achieve very high safety culture. Even though these could not
be achieved on different building sites, their necessity is very key for all sites. Therefore, they are strongly advocated.

Recommendations
Based on the findings of this study, the following recommendations were made with a view to ensuring a successful improvement on factors that impact the Site management practices on the performance of projects. Nigeria.

1. The Management team on the building sites should improve their commitment to safety and health practices as well as comply to safety standards.
2. In the same vein, there should be an improvement in workers awareness and trainings on the precautionary measures on sites through continuous reminding themselves of the site management rules and regulations commencing work to strengthen workers safety and improve their productivity on site.
3. Site Supervisors are advised to constantly up-date and train the site workers on new ways of handling sites and the new techniques they need for survival.
4. It must be understood that site management practice is a TEAM work with acronym TEAM symbolizing – “Together Each Achieve Much”. let it be put into practice as it will help reduce rivalry and rancour on the sites.
5. Government intervention is very necessary, especially in this era of banditry. This will make works feel secure and not to be bordered about kidnaping.
6. It is equally advised site managers and team leaders should employ sufficient and competent personnel to checkmate health and safety practices at the construction site for optimum performance.
7. There is need for more robust and friendly tools for fire suppression systems.
8. I recommend a total synergy between all professionals in the construction industry regarding health and safety practices.

Contribution to Knowledge
The thesis showed that different technological interventions, various behavioural modifications, factors that affect the use of personal protective equipment (PPE) and utilisation of signs, direction and posters have a significant effect on the health and safety practice on site. Current site management practice uses satellite and high-level technology. This high recommended so that these different soft applications, modules and techniques should be identified, studied and modified for the Nigerian Industry.

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