

Analysis of Innovation in Construction from the Perspective of Modern Project Management

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Abstract:- “Innovation management (IM) is a term and basis of a big debate, which is argued by some people who believe because of the term of innovation definition, it means that it is not manageable, whereas some other people powerfully believe in processes and building systems to create more innovation.”. In the context of construction management, this research used a qualitative systemic review method to collect data for this research. When compared to quantitative research techniques, qualitative research methods are effective along the lines of a descriptive or exploratory approach. As a result, this research, it showed that project managers' roles are changing and that they are being asked to take on more duties outside of traditional project management. According to the results, most people learn what they need to know to keep their abilities up to par and meet these constantly shifting demands via their own direct information. Thus explaining innovation in construction requires constant uplift over time, with effective project management.

Keywords:- Project Management; ERP System; Innovation; Effective Communication; Workflow Tools.

I. INTRODUCTION

The primary duty of a construction project manager is to ensure that the owner's physical development is completed on time, on budget, and to the appropriate standards of quality and safety. They are thus vital to the functioning of architectural and engineering construction firms and to the development of infrastructure in every nation. Since the early 1990s, the construction industry's economic environment has seen remarkable dynamics as companies adapt to rising competitiveness in a flattening or contracting market. Clients are shifting to a more risk-sharing model in their procurement contractors, which is transforming the market. Widespread use of design-and-construct contracts as an alternative to open competitive bidding for procurement public projects has an effect on the position of project managers (Choudhury and Uddin. 2018). In a similar vein, many businesses, especially those in the construction industry, are beginning to challenge the fundamental tenets of their management procedures and

practises in light of the resurgent emphasis on quality, productivity, and performance. As the business environment evolves, project managers are held responsible for more than simply the project's technical substance, such as the quality of the engineering and construction, the dependability of the facility, and the efficiency with which it operates. The project managers themselves are facing challenges and taking on responsibilities that have not historically been their duty (Dimech et al. 2022).

A. Innovation in the Construction through Modern Project Management Process

Innovation management (IM) therefore denotes to the management of every activity needed to "introduce something new" that actually means things similar to outcome concepts, developing them, prioritizing them and applying them, and put them into practice, for instance by the initiation of new products or presenting new inner developments. Project management is the profession that helps to divide the management of a project from its professional design and planning. On modest projects, the design team leader may nevertheless be expected to serve a dual role in management and design. Project management has developed in response to the growing demand for specialised management of more complex and expansive undertakings. The project of project management is to ensure that a given project is planned and executed in such a way that it may be finished on time, within budget, and to the required quality standards while also satisfying the needs of the customer (Al-Hajj and Zraunig. 2018). The construction industry has been a major user of project management, however, its projects vary in size and complexity. The success of every development or construction project relies on the concerted efforts of several experts working together to achieve certain goals. One of the most important roles of project management is to bring together the many experts and professionals working on a project at just the appropriate moment so that they may make their contribution effectively. Professionals in this industry are relied upon for the insight and expertise they bring to bear in making judgments based on the data collected for a given project. Decisions at every stage of the project might benefit greatly from the pooled expertise and experience (Charles and Chang. 2021).

Daily management skills and in-depth familiarity with the construction and planning processes are essential for successful construction design management. Construction projects have their own unique sets of requirements and goals ("Past working groups of Code of practise for project management," 2015). The mission-oriented nature of a project is often what distinguishes project management from business management in general. As soon as the goal is reached, the project team disbands (Petroutsatou, 2022). Management of projects is defined as the process of organising and directing resources (both human and non-human) to meet defined goals (in terms of quality, timeliness, cost, scope, and stakeholder satisfaction) throughout the project of a project utilising current management practises (Sankaran et al. 2021).

To complete any given project successfully, the engineering team must have a thorough management of the specific area of knowledge associated with that endeavour and the ability to effectively manage that information. However, there are certain projects that are abandoned before they are finished because they are obviously unsuccessful owing to a lack of good planning and wrong feasibility assessments (Song, 2019). Any decision made during a project's development has a greater impact than those made afterwards, thus the sponsor or owner must remember this. Construction and design will also affect lifetime operating costs and income (Apaolaza et al. 2020). The owner needs to hire professionals for feasibility studies and planning:

Many building owners lack in-house construction and engineering management knowledge, so they must create recurrent connections with outside professionals. Some construction and engineering company owners consider their divisions independent for reimbursement and tax reasons. False economies in reimbursing such divisions' expenses might be costly to the corporation, thus such arrangements shouldn't prevent their legitimate distribution (Rezvani and Khosravi, 2018).

B. Transformation in the Construction Industry through Modern Project Management Practice

The construction industry is undergoing radical change as a result of digital technologies. Consumer tastes are evolving with the globe as a modern generation takes hold. As a result of these alterations, more complicated technologies are required. With the help of digital technologies, the construction industry is undergoing a dramatic transformation. Since the advent of technological advancements, not only the methods of construction but also the materials used in building have undergone rapid transformation, and it has had a profound impact on construction (Lian and Liu, 2021). The process of construction is improved by using digitalization and quality construction materials. The future of the construction industry depends on the decisions, changes, and actions taken today. Everyone in a position of authority, therefore, must remember future generations while making choices today. Each choice must be taken with caution since the direction digitalization takes in the construction industry is unpredictable and the technologies we use now may be outdated in the near future (Ernstsen et al. 2021).

New enterprises are providing their services for construction, bringing digitization to construction and a willingness to contribute to the industry. Management of the organisation, structure, and atmosphere is required, as change at the grass-roots level (such as bolstering the team with technologists, for example). The project Management team needs to inject new thinking at the highest levels, team must have awareness of updated technology and cutting-edge innovation that overcome risks. All these new technologies are intricate and need careful management; otherwise, even a little slip-up might have a catastrophic effect on the company. Problems might arise if there isn't a clear plan of action, so it's important to map out the whole procedure and create a step-by-step framework. Everything from the formulation of guidelines to the execution of those guidelines is crucial to the success of construction policies, and both the pros and the downsides must be considered. With the advent of data analytics technologies, the construction industry stands to benefit greatly from this newfound trove of information, which can be used to plan out a site's layout in advance, as well as determine how much time, industry, and supplies will be needed for the construction (Dimech et al. 2022).

C. Importance of Modern Project Management Knowledge and Skills for Managers and Experts

Acquiring the information and abilities necessary to perform at a professional competency as project management requires both classroom instruction and hands-on experience. To handle construction projects effectively, they require specialised expertise that is only found in project management (such as critical path analysis and project cash flow forecast). College-level project management courses often cover a broad swath of the aforementioned areas of expertise. Although Accreditation Bodies exist, their purview does not extend to the knowledge areas project managers need for practice (Wang, 2022). This calls for the understanding of a broader setting than is often covered in engineering degree programmes or by the narrower topic limits imposed by regulatory certification. It's true that the standards for certification don't compare to those of engineering degree programmes, but it gives an idea of how standards are shifting, which is useful information for project managers. Therefore, the technical parts of conventional engineering fields cannot be the exclusive focus of modern project management practice; additional general and management knowledge and skills are required. Since projects are often part of a functional organisation, most of the supplementary expertise will be similar to that needed for managing businesses in general (Charles and Chang, 2021).

➤ *Effective Communication*

Due to a large number of individuals and constant communication is all about sharing knowledge and ideas with one another. An effective communicator has to draw on a wide range of expertise, not only that which is specific to the project at hand. A project manager's ability to communicate effectively across several channels, written, spoken, and listening all are crucial competence (Choudhury and Uddin, 2018).

➤ *Problem Solving*

To solve the problem of construction, the project manager must be able to define the problem at hand and make decisions based on that analysis. Part of defining the problem is figuring out what's causing the issues that have arisen. It's possible that the issues are technical (differences of opinion on the best approach to create a product), managerial (a functional group is not producing according to plan), or interpersonal (personality or style clashes). Decisions made by the project manager regarding the identified issues may need prompt action. The new approach to project management is the result of the combination of these abilities with the conventional technical expertise of the project manager. This requires both a broad business/industry perspective and a narrow focus on the specific project at hand. The project manager is responsible for managing the project as a whole. Human resource management, supply chain administration, data analysis, and organisational logistics all are examples. Technology's potential as a tool for gaining a market edge is vital to the successful completion of projects today. This affects both output and the use of IT assets. To maximise the efficiency of the project, the project manager must have keen insight into the many technological innovation strategies that may be put into play. Planning, scheduling, estimating, cost management, managing contracts, and buying all are parts of the building production process. The project manager's responsibility as a production engineer is to oversee the efficient implementation of each of these steps in order to maximise productivity (Song, 2019).

D. Developing Project Management knowledge and skills focused on construction

To examine the competency of professional project management skills, the construction sector provides a useful case study. This is because the project management methodology underpins the vast majority of its operations, making it replete with examples of effective project management from which other industries might learn. In order to better understand how active construction project managers, gain the expertise of professionals to do their jobs successfully, a survey was conducted with this population. Two major concerns were raised by the project managers in the poll (Wang, 2022). Therefore, the research focused on what specialists in the construction industry needed to know and be able to do in order to become project managers. These elements included both formal education and practical experience. The opinions of working project managers on the relative relevance of the aspects to their professional success also provide alternatives for building training programmes for aspiring project managers (Lian and Liu, 2021).

II. METHODOLOGY

This research uses a qualitative systemic review method to collect data for this research. When compared to quantitative research techniques, qualitative research methods are effective the lines of a descriptive or exploratory approach. The following plan differs from the previously discussed quantitative method in that it relies on qualitative, non-numerical information such as expert opinion. Interviews are a frequent means of collecting data in this methodological

framework, which is often employed when the study is grounded on an interpretivism stance (Rahman, 2017). The researcher used inclusion and exclusion criteria to collect data for this research and data is completely dependent on the qualitative secondary data-based research and studies. Researchers using the qualitative research approach acquire specific, in-depth, and categorised data from secondary sources (Khan, 2014). Given the subjective nature of the technique, it is conducive to collecting an abundance of information without bias or prejudice. Data analysis is determined using thematic analysis and themes are developed after coding of the data.

III. RESULTS AND DISCUSSIONS

A. Modern project management requires innovation construction process by using modern tools

Due to a large number of individuals and the constant flow of information in a construction project, mistakes are inevitable. In order to successfully manage a project, one must maintain strict vigilance over a vast amount of management, including but not limited to: submittals, transmittals, RFIs, emails, materials, change orders, job cost, inventory and WIP reports, union rules, labour hours and wages, insurance, safety regulations and bonding information, as well as compliance data. While it's true that even the well-laid plans may and will be altered, it doesn't imply you should stop making any at all (Dimech et al. 2022). As a result of technological advancements, project managers are able to improve their preparation, technology, and flexibility during the duration of a project. Allows for changes to be made quickly without derailing efforts or derailing the project altogether. Most likely, it is technological advancements that are allowing it to happen at this technology. A revolutionary shift is occurring in our technology as a result of technological advancements. Construction Dive spoke with Mortenson Construction's president in Minneapolis, Dan Johnson. As of today, the most significant is building information modelling (BIM), often known as virtual design and construction. Combined with the introduction of mobile devices and their accompanying collaboration technologies, we are now able to collaborate in real-time, wherever on the work site, with all the relevant parties. Many new developments have been sped up as a result of it (Choudhury and Uddin., 2018).

- Just a few examples of what cutting-edge technology top construction firms are using to expedite processes, effective data analysis, and creation of modern construction processes.
- Instead of utilising several sets of drawings for different parts of a building, BIM (Building Information Modeling) encourages a unified, collaborative process of design. BIM uses three-dimensional computer modelling to save money, cut down on mistakes, and save time. Many contractors see this method as the wave of the future since it allows them to explore and implement novel approaches to building design and construction. Check out our BIM primer (Lian and Liu, 2021).
- Integrated accounting, project management, job costing, human resources, equipment management, document management, inventory management, and more are just some of the features that full-service construction ERP software offers. Data may be exchanged instantaneously

across all aspects of the project by utilising a single system rather than entering the same information numerous times into various software applications, some of which may show or alter the data in different ways, making it more difficult to evaluate when necessary (Apaolaza et al. 2020).

- Plans, specifications, invoices, change orders, submittals, time cards, and reams upon reams of additional paper documents and communication are used to fill a contractor's office like a sea of file cabinets. Now that scanners and advanced document imaging and archiving solutions are widely available, more and more contractors are opting to digitise their information. As a result, it's less of a hassle to keep track of and retrieve, and in certain construction management software programmes, it's even simpler to link to other pieces of information, reports, or collaborative communication tools (Rezvani and Khosravi, 2018).
- Improvements in construction management applications have increased prospects for streamlining and automating formerly labor-intensive tasks. Workflows designed specifically for the construction industry are now a standard feature of many applications used in the industry, boosting productivity and easing communication. Approval requests for things that need to be directed to specified persons, groups, or even defined roles within the organisation may be set up to occur automatically, and whole processes or specific tasks can be arranged to follow automatically. We can make projects more efficient and productive while decreasing the amount of time spent on them if we set up an automated system for sharing information and notifying us of pending tasks (Charles and Chang. 2021).
- Designing user-friendly dashboards that give a rundown of construction project information as well as a strategy to dive down into the information has been one more innovation driver of productivity. This kills the need to learn new programming menu designs and saves time. It additionally guarantees that the project supervisor generally has moment admittance to the data that is generally vital to their everyday activities. Kiosks and entries custom fitted to specific programming bundles work with the data and utilization of information for explicit user populaces. Subcontractor kiosks give a focal area for getting to their relegated project information and submitting required consistent desk work (Ika and Pinto, 2022).

IV. CONCLUSION

The rising popularity of smartphones and other mobile devices has led to the development of an increasing number of mobile apps specifically tailored to carry out tasks associated with project management. Contractors can keep their companies running smoothly with just a few taps or swipes on their mobile devices, and they have access to a wide variety of alternatives. Some examples of these include applications that help with bid management and communication, some that let you examine blueprints and specs from any device, and still more that function as markup tools. The contractor's business cannot thrive without the use of these mobile applications. This work was undertaken to provide light on how previously acquired skills may be adapted to the dynamic nature of the sector's business environment. The research showed that project managers' roles are changing and that they are being

asked to take on more duties outside of traditional project management. According to the results, most people learn what they need to know to keep their abilities up to par and meet these constantly shifting demands via their own direct information. While this is certainly useful and usable right away, it lacks the comprehensive view necessary for a senior post such as a project manager.

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