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# REVIEW OF ENHANCING CONSTRUCTION EFFICIENCY: REAL-TIME PROGRESS MANAGEMENT WITH BIM

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### ABSTRACT

There are many Construction Sites and Infrastructure Projects going on in India, which provides facilities (luxury) to their clients whiling to invest on such projects; and as a project manager it is necessary to monitor progress work correctly on sites as per the plan; as well execute a plan on time. Different departments in the construction field require safety for which safety rules and regulations play an important role. For Safety measures, the Traditional Method is adopted, which is tedious and time-consuming but could be improved with ease that can reduce time as well as Cost with latest tools and technologies in the market. For example: BIM 360, Radio Frequency identification devices, Virtual reality, 3D Scanning, etc. In this Study, the exact elaboration is mentioned as to how this updated tools and techniques cut down the maximum time consumed as well as provides collecting accurate data from site and also looks after maximum safety which is important at the same time. Integrated technology is proved as the best combinations for better results and monitoring purpose. Aim of the paper is to review the availability of resources and methodology which can be helpful for the Indian Construction Industry and compete with other countries worldwide (Same Industry). Access various technologies suitable one pertaining to Indian Construction Industry. Access the different Personal Protecting Equipment (PPE) and safety measures for the employee doing fieldwork in this industry.

Keywords: BIM, real-time, management, feasibility, progress, RFID, 3D scanning, latest technology

### 1. INTRODUCTION

The infrastructure sector is the largest sector, encompassing numerous activities, tasks, and substantial information management. Achieving better performance requires accurate, real-time access to project data. Managing infrastructure projects is challenging, with a high risk of errors. Thus, it is crucial for everyone on-site to report progress, address problems, and ask questions promptly and efficiently. Insufficient information can lead to poor productivity and rework, contributing to time and cost overruns. A revolutionary technology Building Information Modeling (BIM) can mitigate, the need for re-formatting, re-gathering, and reworking data (Matthews, 2015). Several factors hinder performance improvements in the infrastructure sector: the competitive bidding system, project-specific nature of construction, the temporary and nature of relationships.

The integration of real-time data capturing using the lacheck mechanism alongside BIM holds substantial promise in enhancing resolution-making processes within the infrastructure sector. This approach not only enhances automation levels, as evidenced particularly in mechanical, electrical, and plumbing (MEP) sectors, but also presents opportunities for more efficiency and accuracy. However, despite its potential benefits, numerous factors impede the broad implementation of these mechanisms in most infrastructure projects, as highlighted by Yitmen (2018). Nevertheless, there has been noticeable growth in recent years, indicating a gradual shift towards embracing new mechanism within the Indian construction sector. This trend indicates an increasing acknowledgment of the threshold and potential of modern mechanism in enhancing project outcomes and overall industry performance.

### 2. LITERATURE REVIEW AND METHODS

Leung [1] presented a money-saving construction area observation system adapted farsighted cameras, an online collaborative platform, and a wireless network. And also, it concentrates on scheming a observation framework to convey a money-saving solution on quality assurance for construction plans by using technology. The approach assimilates IP cameras, wireless communication technology, and joint systems to configure a extensive observing and connecting atmosphere for project group applicants. The process is examined in real construction area and investigation of photo quality and dependability are more than acceptable until now.

Golparvar-Fard et al. [2] explained visualization method for monitoring development by presenting that envisage advance alteration by superpose four-dimensional (4D) as-designed on evident time-lapsed images in one visual

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portrayal. It conveys a compatible visual system and a common technology of designed construction that could be stretched out to observing stage.

Bryan [3] indicated the starting proof of concept on merging RFID mechanism with DRONE mechanism to expand construction site logistics delivery management. This research provides concept validation and highlights technological challenges like the continuous exchange uniting RFID transponder frequencies & drone telemetry. Experimental findings show that an RFID transponder mounted at drone can recognize and show the geolocation of targeted items. Significant mechanical limitations comprehend the mass of the RFID transponder and the distance between the transponder and the tags. The experimental findings of this proof of concept stipulate that drones equipped with RFID accomplishable to supply details for logistics delivery management processes and can be integrated with Building Information Models (BIM).

Yiannis [4] found out through his study that the penalty and claims for reimbursement to the contractors and builders for the delay in time which could be more than normal cost. Hence innovative technology and machinery should be used to alleviate time delay and cost overrun. This proof of concept covers modern usage of Building Information Modeling (BIM) and drone mechanism within infrastructure sector for data collection and monitoring. It highlights how usage of drones & BIM can lead efficient data gathering and tracking of a project's progress throughout its lifecycle, resulting in more accurate record keeping, task management, and later analysis.

Matthews [5] found out through his study the persuasiveness of cybernetical BIM for quick transmission. It indicates how steps can be better prepared to upgrade the transfer of information and permit the time-management (4D) and money-part (5D) over integrating mechanism (as RFID tags /Ray tags, AR and frame by frame Camera's) with BIM in real-time by using cloud based BIM collaboration. Jane and peter used data gathering method in this paper which were amorphous examination and document recording sources. This method was adopted to ensure that the suggested system could be combined with existing process.

Fan-Xue [6] stated a certain RFID accustomed recognise materials and improves quick transmission of information evident and detectable, for the time being progressively attached to BIM as a central detail system. This proof of concept delivers experts by five-step instruction by attaching BIM to RFID for numerous customer satisfaction management needs. Further it delivers experts with a place to begin for detailed investigation of advance towards improving the importance of RFID, BIM, and the assimilation of the other with one.

Jing [7] used BVRS process, which relies upon an inventive centralized computing BIM data cite clarification & correspondence process. BVRS empower customers towards revive BIM mechanism changes in (VR) mouthpiece. Moreover, BVRS is attempted within variable of arrangement new conditions including new article estimations, target regions, and thing types. Results affirmed the ease of use and capability of BVRS. This exploration intends to advance a creative information exchange convention that mechanizes the updates of plan data in VR shows continuously, called BVRS. To succeed this objective, we utilized a metadata elucidation framework and a Cloud based foundation.

Shuang [8] gave a successful strategy to consequently perceiving PPEs abuse conducts with incorporating situating innovation and weight sensor and assesses the individual security execution of labourers agreeing their reaction to threat takes note. This included the improvement of a supporting multiuser stage to acquire the constant position of labourers in connection to virtual unsafe zones. As now a days manually safety management is very tough because of various reasons like, (One) they depend on very much expert and profoundly learned wellbeing spectators, (Two) abstract perceptions or studies required that outcome in oversights or inclinations, (Three) they don't allow constant watching for early enough input (Four) The results found that gathering level appraisal can unduly hide individual performance. Numerous related innovations alike RFID and digital substantial framework had been utilized for PPEs utilization checking, however mentioned techniques can just distinguish in case labourers convey the PPEs with themselves with no end on if they utilize the PPEs accurately at spot required.

Yitmen [9] created a mechanism for BIM-based site information catching mechanism and investigate the effect of site information catching advances at robotized venture advance checking looking at 3-dimension model and BIM work processes. The basic condition demonstrating process was utilized to check the speculations and mature the aptitude model. This investigation affirms the significance of utilizing the field information catching innovations with BIM in two fundamental stages to improve mechanized task advancement checking execution. Then, the purpose of the current examination abide propel a model or structure to extend dissimilar points within use of data field getting advances and BIM jointly as thorough mechanized development checking system. Methodologies used are 1) data sampling 2) data collection 3) measures.

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Zhen [10] gave a short survey to assess and illuminate the condition of-workmanship for the incorporation of BIM and sensor innovation. An orderly survey approach was embraced. The outcome unveils that albeit much work has guided. The data furnished by the sensors acclimatizing with the structure data winds up important in changing the structure data into significant and full state data that is increasingly precise and modern. There are two procedures to screen building essentialness use. One is to introduce a couple of sensors into structures to assemble related data, for instance, get temperature, wetness, CO2, and power use data; another is to lead external checking to work to get its warm conditions.

## 3. CONCLUSION

Many researches have taken place for using BIM for real-time progress monitoring and management in other countries but not in India. The various mechanisms have not found any implementation in the Indian construction sector. No feasibility study has been carried out for assessing the requirement and usage of various mechanisms utilizing BIM for real time progress management.

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