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Impact of Technology in Construction Management

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Abstract: ***Technology is re-shaping the face of the industry from its conventional perspectives to the modern era. The technological transition had begun by shifting away from the traditional method to reduce carbon emission, which is one of the unresolved mysteries of climate change. Technology can help the industry carry out large-scale projects while considering the impact on the environment as well. Earlier, there was a higher volume of waste produced at the site. One of the advantages of technological development is that it helps the industry to reduce, reuse and recycle materials which in turn largely reduces carbon emission by avoiding burning of waste materials.***

While minor construction projects can be managed manually from planning to execution, a company becomes handicapped when it executes large-scale projects. Without technology the process would be strenuous. Therefore, companies are investing a lot of money to develop internal software and application in order to manage projects under one roof. Application is developed in the way the project has been managed from pre-construction, scheduling, soil testing, designing, material procurement, supply chain, payment, field reporting to the back office and so on. The entire process documents have been uploaded to the cloud and can be accessed whenever any changes arise. Such a process would be seamless for companies and the customer to follow up on what is happening with the construction work. Technology helps bring transparency to one another..

Keywords: Odisha Electricity Regulatory Commission (OERC), captive power sources, Indian Energy Exchange (IEX), etc

I. INTRODUCTION

Everything evolves around technological advancements and transitions and that includes human beings too. If we detach from technology, the world will be in chaos and may even become a non-entity. Ever since technology spread its wings, most of the industry has transformed itself from manual work processes to complete automation. The construction industry cannot fly in the face of, instead, the industry had to embrace the new era.

The Indian construction industry stands as the second-largest employer, employing over 49 million people in the sector, and expected to become the world's third-largest construction market by 2025. The construction industry is expected to record a CAGR of 15.7 per cent to reach $738.5 billion by 2022. Despite this robust growth in the industry, companies are grudging to invest on the technological front. According to the international data corporation, India's construction companies have spent around 1-3 per cent of their annual turnover on technology, and only 3 per cent of the companies are on their way to technological transformation.

II. LITERATURE REVIEW

A. Construction Technological Transition

Technology is re-shaping the face of the industry from its conventional perspectives to the modern era. The technological transition had begun by shifting away from the traditional method to reduce carbon emission, which is one of the unresolved mysteries of climate change. Technology can help the industry carry out large-scale projects while considering the impact on the environment as well.

Without technology the process would be strenuous. Therefore, companies are investing a lot of money to develop internal software and application in order to manage projects under one roof. Application is developed in the way the project has been managed from pre-construction, scheduling, soil testing, designing, material procurement, supply chain, payment, field reporting to the back office and so on.

B. Mobile Technologies

Construction companies are contemporarily adopting mobile technologies and mobile apps in order to superintend the project to maintain the process flawlessly. Mobile technology can collect real-time data and transmit it between the job site and project management team, which assists both to make alterations, if necessary. It allows submitting time cards, expense reports, work records and other documents, which save plenty of hours in data entry and increasing the productivity hours at the site.

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C. *Emergence Of Pre-Fabrication*

Technology has brought an additional dimension to the construction industry, which is eco-friendly. In prefabrication construction, the building components are built offsite and then installed at the site.

D. *Virtual Reality*

Virtual reality, though in its nascent stage in India, has been a game-changer in the industry and has given customers an adequate understanding of what would be their future home designs and how will it look like. This helps them to pre-plan their home interiors and alter whatever they want before the construction itself.

E. *Blockchain*

Blockchain is another disruptive technology that can make a difference in the Indian construction sector. It can bring transparency between the two parties without any intermediary interferences. It is essentially about sharing databases and processes. It uses concepts such as artificial intelligence and the Internet of things to process run, by integrating databases in real time. For example, two users can edit Web documents simultaneously and upload the same document.

F. *Artificial Intelligence*

Artificial intelligence has the ability to solve a lot of problems by learning and helping the industry to protect itself from last-minute glitches. During the pre-construction stage, AI can be used to ensure a flawless construction process and avoid frequent changes in the plan. AI can be integrated with finance, marketing and procurement to keep the flow of work undisturbed.

III. TECHNOLOGY AND MATERIALS

Sustainability has been the main driver behind construction technology with the main goal centred on how the industry can continue to develop projects on a mass scale whilst considering the effects on the environment too.

Every year, more and more research is conducted to improve the longevity and safety of materials used in the construction of everything from large scale operations to our homes. From Cardiff University's study on self-healing concrete to reflective self-cooling paint – sustainability and safety are at the forefront of developing construction materials.

IV. TECHNOLOGY AND METHODS

3D rendering software programs such as BIM allows projects to be designed digitally from start to finish. This means that the whole project team can analyse and plan the whole construction process before moving a single shovel of dirt. It also allows for step by step re-evaluation of the project and reduces the risk of any costly and timely errors.

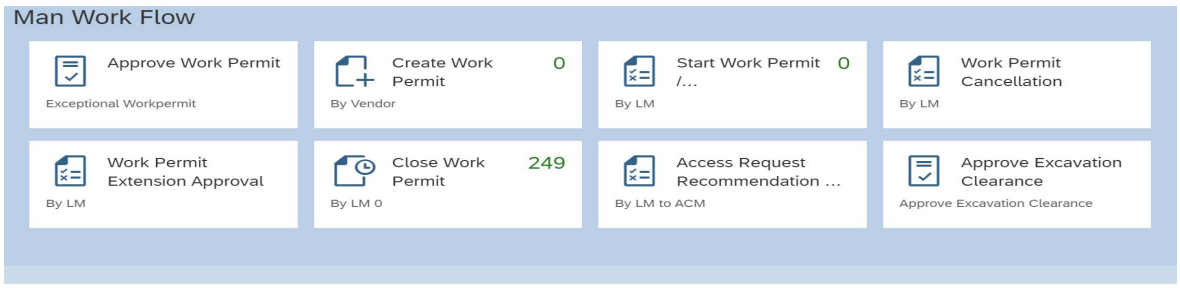
Benefits of modular and pre-fabrication construction are:

1) Buildings produced in less time – up to 90% faster than conventional methods
2) Better construction quality management
3) Improves overall safety and security
4) Up to 80% less waste and more products recycled for future use
5) Reduces transport, labour and site preliminaries by around 80%

Whilst the many benefits of technology in the construction industry are clear, it's important to note that not everyone in the industry will benefit from these changes.

Sample Dashboard of the planning and starting of the job (Manpower).

Table 1. Man Work Flow



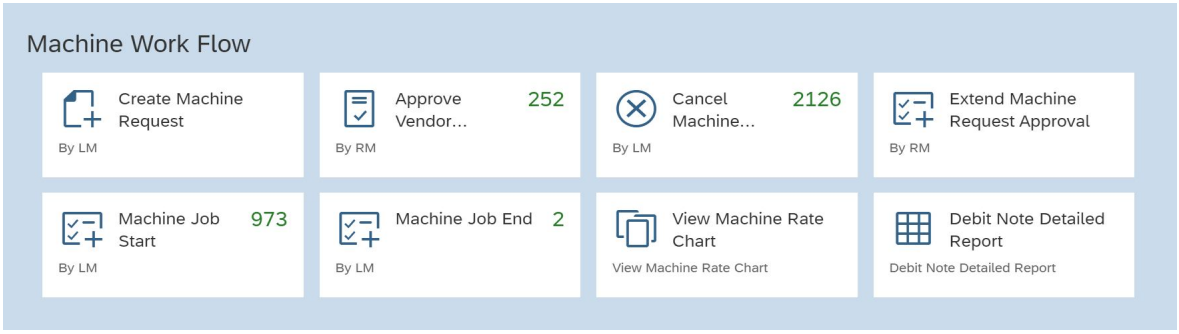
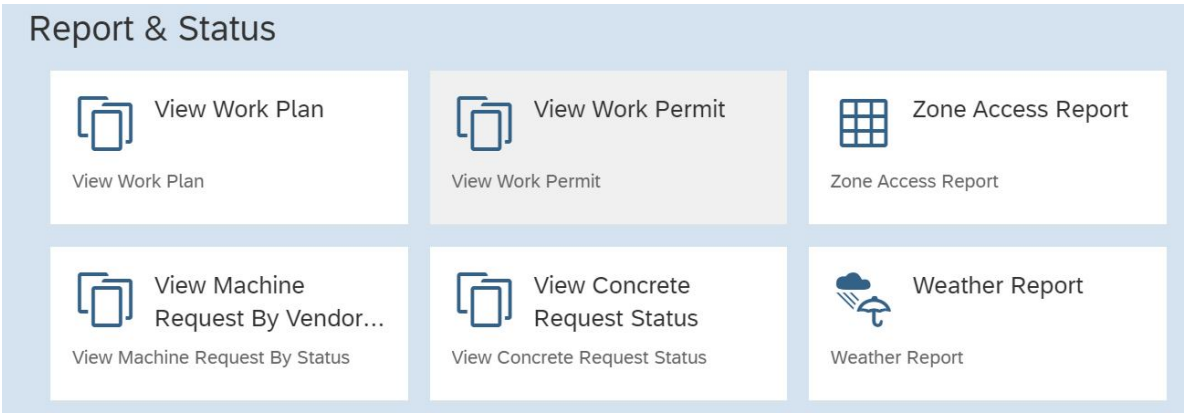


Table 2

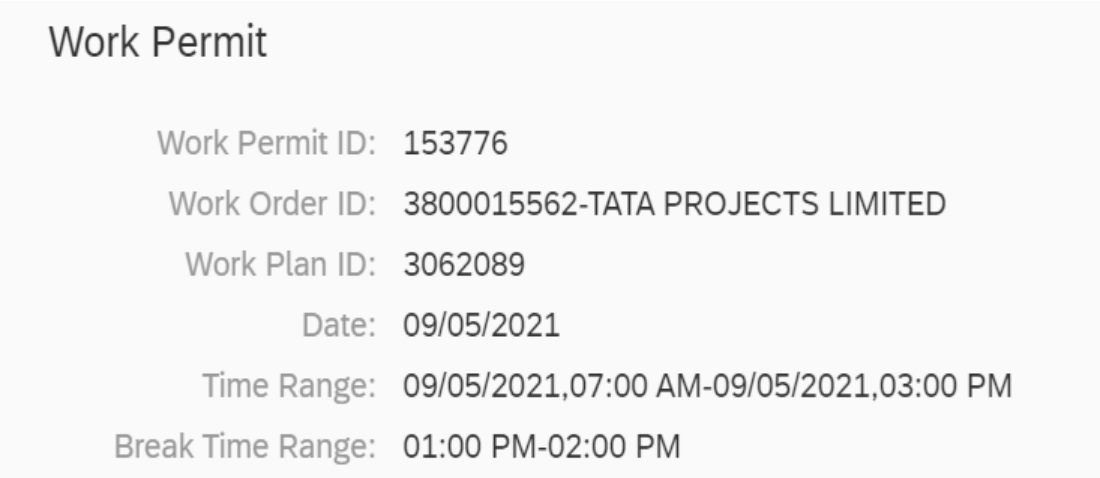


V. REPORT AND STATUS FOR THE WORK.

Comparison of the technology

This technology for monitoring the real time progr ess is in the beta phase but potential is more to extract the real time data with date and still linking with loud facility for data storage is for project end to end schedule is more. We can achieve more. Like BIM model gives the whole information about the structure.

Integration of the above process is used for the daily monitoring through schedule and real time use in Construction field. This is an online web-based application can be assessed from any-where and anytime. It can access the manpower and machinery list from excel based uploading facility. Further research for linking it to MS- Project Primavera for attending the critical path job and resource levelling in real time with web-based application.



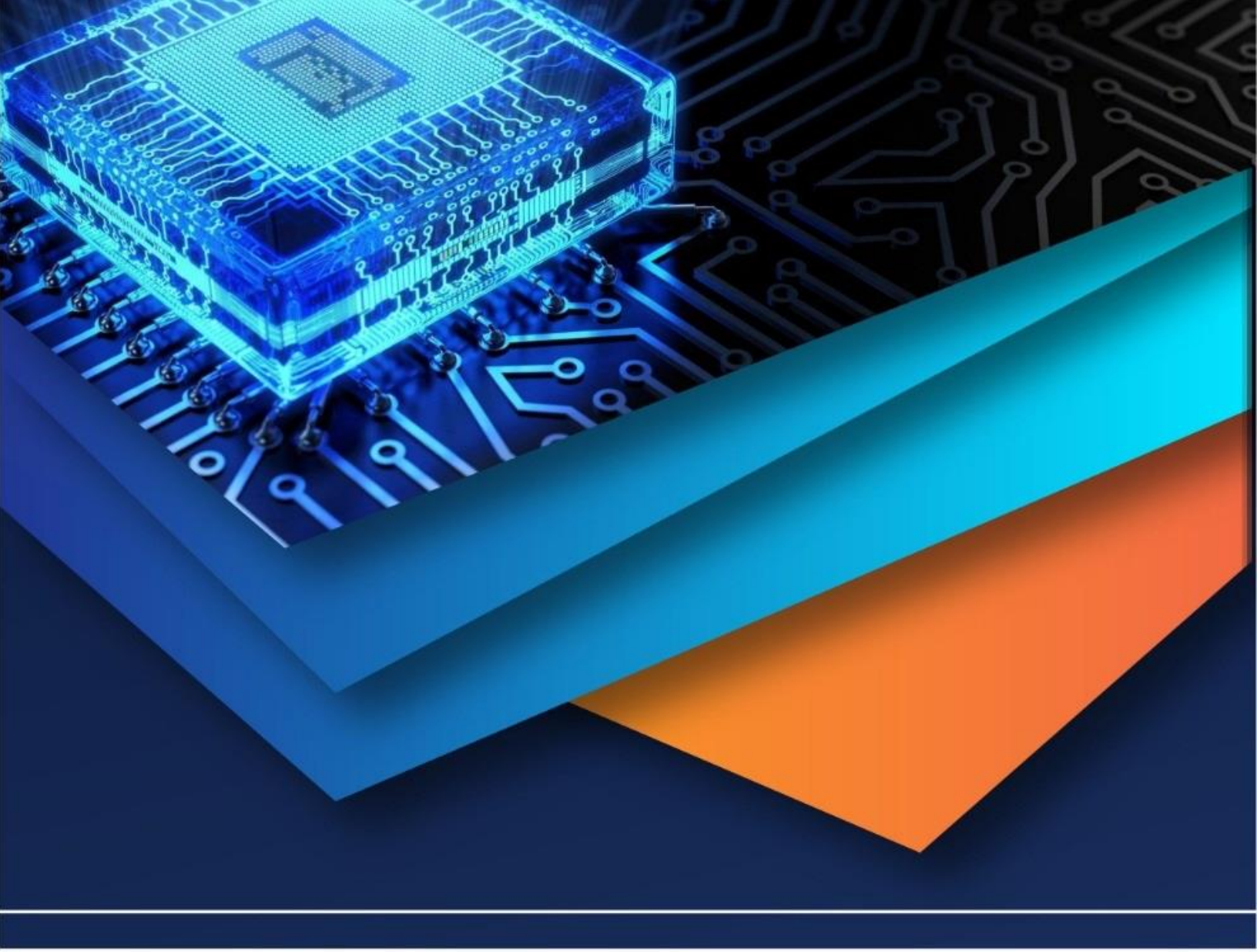
Impact of technology in constrcution management

VI. SUMMARY

The Top Construction Industry Trends significantly improve efficiency, worker safety, construction speed, and implement sustainability practices. Collaborative robots, autonomous equipment, drone-based inspection, and laser-based terrain mapping reduce labor costs and increase accuracy. Further, companies use advanced materials such as self-healing concrete, engineered wood, and nanomaterials in modular construction and 3D printing. These materials ensure lower construction time and higher adherence to budgets. In addition to these, IoT-based solutions such as wearables, smart helmets, and vests enable remote worker monitoring while increasing worker protection.

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