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INNOVATION IN CONSTRUCTION MANAGEMENT

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ABSTRACT:
The construction industries in the 21st century are passing through revolution in terms of the change in material production methods, construction technology and innovative machines to support the construction activities. The construction industry was facing many problems on the issues like project management, management of the material, cost of the material and proper implementation of the processes. The technology has helped the construction industry to improve the performance and as a result in the developing countries like India many mega projects are coming up. The construction industries with the technology implementation are handling very challenging projects and delivering it in time. Authors have presented the overview of the innovation in the construction industries

KEYWORDS: Construction industries, Construction technology, Innovation in construction projects Sustainable development, etc.

INTRODUCTION:

The problem with the innovations in construction industries have made the industries to work with lower efficiency in terms of completion of the projects in stipulated time and cost. The innovation in construction industries is possible in terms of the improvements in processes and the machineries to be used for completion of the work. The performance improvement is possible with the implementation of the innovative principles in the construction projects.

The manager of the project is handling the tasks like managing the manpower, material supply, resources, and implementation of the planning for effective delivery of the project. In this process the role of the manager is very crucial and if the manager fails to plan the activities with effective implementation strategies then it leads to failure of the project.

It needs the effective support of the technologies and gadgets to the manager which helps in simplifying the process of the project completion. With the help of the technological advancements the company can improve its performance to the certain level.

The innovation in construction industry is needed to improve the quality of the work, cost effectiveness and timely completion of the projects. The development in the construction quality results in the sustainable growth of any country.

The energy efficient buildings and the green buildings are becoming mandatory now days to control the environment related issues. The governments have made the several regulations to be followed in construction projects. Authors are trying to present the recent innovative practices and possible technological initiatives to be presented in this article. Following are the innovative practices to be implemented in construction projects:

- **ICT FOR CONSTRUCTION PROJECTS:**

Information and communication technology has made it possible to access the data, process, progress and information on fingertip. The cell phones are widely used in the world since last decade and the number of the smart phones in India has reached to 299.24 Million in 2017. The ICT in construction projects is the innovative way to get the information about the labours working on site, material utilized and available on site. On the other hand the progress of the work and the movement of the vehicles and machineries can also be observed with the help of ICT tools.

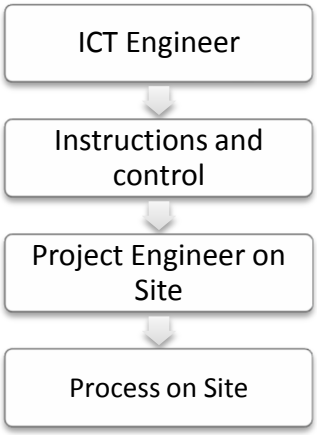

Fig.1: Implementation of the ICT in Process Control in Construction Projects

The concept of ICT implementation in construction management is represented in the figure 1 above. The ICT control engineer can observe all the processes, understands, interoperates and provides the proper instructions for the execution of the task. This helps the site engineer for effective implementation of the process with the available resources and the manpower.

- **SKILL ENHANCEMENT OF THE WORKERS:**

Innovation comes from the innovative and ignited minds. The labours working on the construction sites are most of the times the illiterate people. If a proper training is given to them, they will definitely improve the working efficiency which finally results in the effective work completion. The internal innovation system can be developed in order to improve the work efficiency.

- **EFFECTIVE MANAGEMENT**

Management of the construction projects is one of the challenging jobs. A construction manager is responsible for each and every activity and the process on the site. Manager has to control the flow of resources, manpower, money, material and machineries. An effective construction project management involves the use of the technology and the forecasting methods to achieve the target in time. A complete plan prepared is taking in to consideration the unexpected delays and causes of the failure.

There are several other technological support instruments and systems are available now days for effective completion of the projects. Few of them are as below:

- **USE OF DRONES:**

Drones are helping during the planning stage of the construction projects. The accuracy of the construction plays a vital role in its cost effectiveness. Use of the drones makes it possible to improve the accuracy. Drones can capture the live images of the work progress and the engineer can easily study the images to improve the accuracy.

Fig.2: Use of drone for construction sites

If the errors in the construction are avoided, it's really a great improvement in the project quality. The labours working for construction in India are not so skilled hence one can observe all the construction activities happening on site and guide the labours accordingly in order to improve the effectiveness.

- **USE OF PRINTERS (3D):**

The 3D printing technology has opened up the doors of opportunities there by providing the facilities of the metal cutting and the 3D model development. This is one of the great opportunities for the construction industries to improve the error free work completion. In the coming years, the days are not so long where the smart walls will be developed with the help of the 3D printing technology.

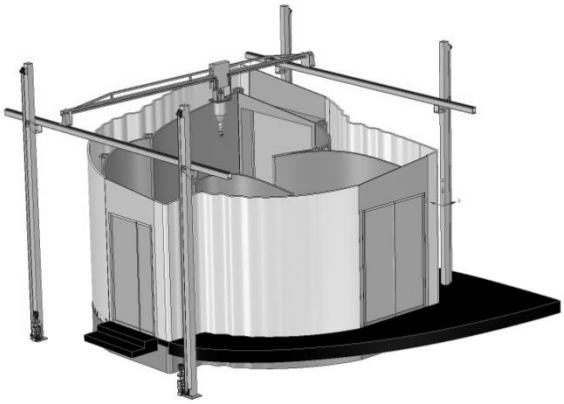

Fig.3: Implementation of 3D printing in construction

MODELLING OF CONSTRUCTION PROJECTS:

The modelling of the project has become very popular and essential stage in the planning of the project. The modelling of the projects is necessary for complete understanding of the effective design. During the planning stage itself a complete design must be prepared so that the project provides an innovative and effective space management.

Many modelling software are available especially for the construction project. When the modelling is done an accurate design of the project is prepared. It helps in preparing more than one designs of the projects and selecting the design with most effective features to the final execution.

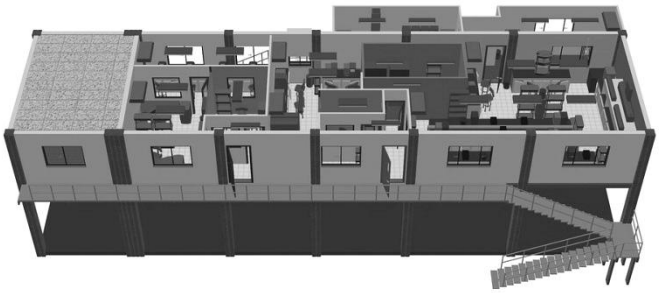

Fig.4: Modelling of the construction project

REPLACEMENT OF CONVENTIONAL MATERIAL:

The conventional methods for production of the building materials are getting replaced with the new technologies. The researchers are working with the goal of the sustainable development. Many alternative materials are added to the cement in order to replace it partially. This experimentation has helped allot for the utilising the waste material for the construction purpose. The production of biological furniture, bricks and cement is the milestone achieved by the researchers in the field of civil and construction industries.

CONCLUSION:

The construction industries were lacking in the use of the technology for effective implementation and completions of the projects. With the available enhancement in the technology, it is now becomes a reality, where the construction industries in India are using the technology to complete the projects effectively**.**
Authors have presented the overview of the innovations to be implemented in the construction. With the use of the software, gadgets, tools and machinery there is a hope that the construction businesses develop the globally accepted infrastructure at the challenging costs.

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