

## ADOPTION OF DIGITIZATION IN CONSTRUCTION MANAGEMENT

DHWANI PRAJAPATI

M. Tech, Project & Construction Management,  
Management Department, MITCOM, Pune, Maharashtra, India- 412201

PRITESH SHEJWAL

M. Tech, Project & Construction Management,  
Management Department, MITCOM, Pune, Maharashtra, India- 412201  
kulchandanim@gmail.com

PUJAN SHAH

M. Tech, Project & Construction Management,  
Management Department, MITCOM, Pune, Maharashtra, India- 412201

### ABSTRACT:

Construction industries in countries like India are continuously growing over last two decades. The main problems faced by the industry are lack of planning, technology and skilled manpower. The research proves that, the construction industry is lacking in terms of adopting the digitization approach. The Information and Communication Technologies (ICT) applications have made the effective communication and monitoring possible for construction projects. Other technologies like 3D and 4D printing have made it possible to imagine the fast construction of the projects in smallest possible time.

**KEYWORDS:** Digitization, Technology enhancement, Construction Industry, etc.

### INTRODUCTION:

The construction industries in India are mostly the small or medium scale industries. The problem with SME's is the lack of budget for enhancement of the technology. With implementation of ICT in construction, the real time monitoring of the project is possible. The decision making can be fast as the real time parameters can be considered as a basis. The ICT is useful for communication, monitoring of the projects and management of the resources in construction projects.

The performance of the team working for construction projects can be improved with proper coordination and proper communication. It is more helpful to use ICT when a company is working on multiple projects at a time. The team management and the workforce monitoring and operation control are possible with ICT. In India scenario, the internet and cellphone users have suddenly increased in last decade.

The better services and the government policies for digitization have made the digital transformation of the businesses possible. The movements like Digital India are very useful to widely spread the awareness of digitization. The availability of the digital infrastructure is possible and nominal charges as per requirements. From perspective of the construction industries the advantages of digitization are as follow:

- Real time monitoring of the project is possible
- Assigning the tasks to the workers will be easy
- Effective communication is possible
- Easy coordination of different project

- Workforce management
- Resource monitoring and planning
- Quality improvement of the project

The cost involved in implementation of the ICT can be very easily recovered from the equivalent savings and process improvements.

### **ICT for Construction Projects Management:**

The ICT applications for construction management can be widely considered in four categories viz. Project, financial, resources and designing and controlling. The onsite activities can be monitored and the instructions can be given for the improvement of the day to day activities. The designing and the improving the designs is easy with the ICT tools. The end user can specify the requirement in designing phase and can suggest the changes as per need during the design phase only.



Fig.1: ICT in Construction Management

The resource monitoring, controlling and management are possible with application of ICT effectively. ICT applications can be useful to order, real time track and keep record of material utilized at site. This reduces the wastage of the resources and improves the performance of the construction project. A manager seating at office can handle the complete process at different sites with proper communication.

### **Adoption of Digitization in Construction Industries:**

Digitization is the concept where we are moving from physical data handling to the virtual data handling. The data when present in a digital form can be accessed from any place with the help of internet. The complete database of each project can be the guideline for the next project.

One can easily understand the mistakes made during the progress of the project and overcome the lacunas in upcoming project. Whenever any problem arises, the complete project can be studied with all the minute details. Different digital tools are available for the project management which helps in proper management and corrective measures to be taken during the progress of the project. Different stakeholders can coordinate very effectively with the digitization and the processes can be made more effectively in order to enhance the deliverability of the project.

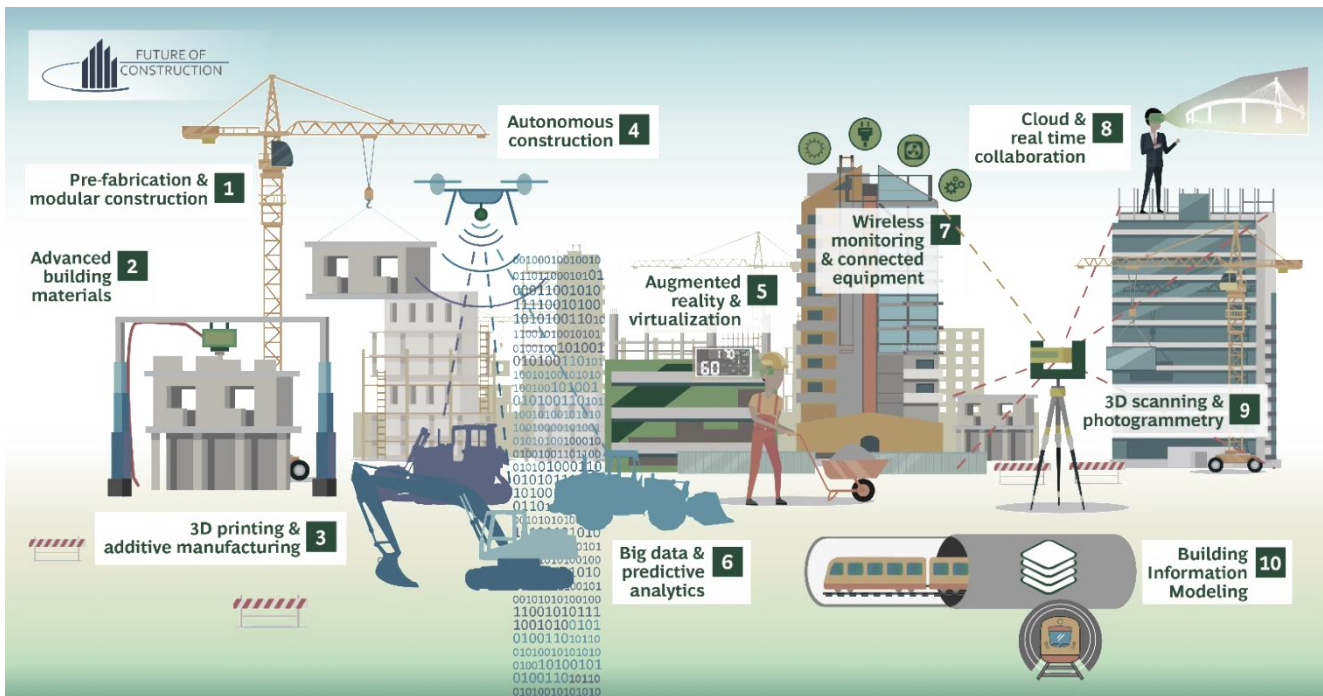


Fig.2: Adoption of Digitization in Construction Industry

Digitization can help in performing various tasks simultaneously and in coordination with each other. The digitization of the processes reduces the chances of mistakes and improves the quality of the project as the human errors can be completely removed.

**Smart Construction Sites:**

With enhancement in the technology the normal construction site can be transformed to the smart site as shown in figure 3 below.

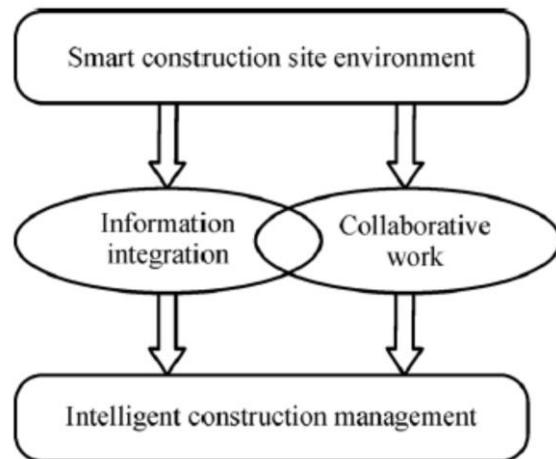


Fig.3: Concept of smart construction site

A smart site implements the intelligent management of the project. Work collaboration and the coordination is the basis for such site. The information is used to complete the tasks effectively. The communication at different stages of manpower and the machines makes the site to perform in a controlled manner.

## CONCLUSION:

The construction industries in modern world are to be empowered with the technology not only in terms of the machinery but also the digitize approach like ICT and the software to design the project. The different management and engineering principles are useful for making the operations effective. The small and medium scale industries are contributing to remarkable construction projects in India. Such industries when empowered with the digital tools works with better effectively.

## REFERENCES:

1. Ahuja, Vanita, Jay Yang, and Ravi Shankar. "Study of ICT adoption for building project management in the Indian construction industry." *Automation in construction* 18.4 (2009): 415-423
2. Ahuja, Vanita, Jay Yang, and Ravi Shankar. "Benefits of collaborative ICT adoption for building project management." *Construction Innovation* 9.3 (2009): 323-340
3. Ryoo, Boong Yeol, Mirosław J. Skibniewski, and Young Hoon Kwak. "Web-based construction project specification system." *Journal of computing in civil engineering* 24.2 (2010): 212-221
4. Zhou, Hongtao, Hongwei Wang, and Wei Zeng. "Smart construction site in mega construction projects: a case study on island tunneling project of Hong Kong-Zhuhai-Macao Bridge." *Front Eng Manag* 5.1 (2018): 78-87
5. Mr. Patil Yogendra R. , "Feasibility Study of Just in Time Inventory Management on Construction Project", *IJIERT - International Journal of Innovations in Engineering Research and Technology, NITET-18, ISSN : 2394-3696, Page No. 79-79*
6. Leviäkangas, Pekka, Seong Mok Paik, and Sungkon Moon. "Keeping up with the pace of digitization: The case of the Australian construction industry." *Technology in Society* 50 (2017): 33-43
7. Jacobsson, Mattias, and Henrik CJ Linderöth. "The influence of contextual elements, actors' frames of reference, and technology on the adoption and use of ICT in construction projects: a Swedish case study." *Construction management and Economics* 28.1 (2010): 13-23
8. Zhu, Kevin, et al. "Innovation diffusion in global contexts: determinants of post-adoption digital transformation of European companies." *European journal of information systems* 15.6 (2006): 601-616
9. Björk, Bo-Christer. "RATAS project—Developing an infrastructure for computer-integrated construction." *Journal of Computing in Civil Engineering* 8.4 (1994): 401-419
10. Agarwal, Rajat, Shankar Chandrasekaran, and Mukund Sridhar. "The digital future of construction." *Voices, Global Infrastructure Initiative, McKinsey & Company, Mumbai.[Google Scholar]* (2016).
11. Saad, Ihab Mohammad Hamdi, and Donn E. Hancher. "Multimedia for construction project management: project navigator." *Journal of Construction Engineering and Management* 124.1 (1998): 82-89