

# Study of Innovative Technologies for Effective Construction and Management of Project

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**Abstract** - The history of the construction industry can be traced to ancient roman period where the humans have created the structures and infrastructural components like pathways, aqueducts, baths, walls, houses, temples etc. which constitutes the large numbers of empires available throughout the world. Despite the advancement and adoption of construction techniques/technologies in Greek infrastructural components the roman were reluctant to adopt the newly introduced technology for the construction of various monumental structures. Owing to the importance of the construction techniques, the classical romans used many advanced and complicated engineering forms to create the intricate infrastructure components. The adoption of new technique to the construction resulted in the extremely creative structure of the era. The precious elements of the history are pyramids, The Lighthouse, The Huge Serpent Mound, The Roman Forum, Trajan's Bridge, etc.

The project emphasized on the study of the project technologies which are currently available and likely to be usable in nearby future in the industry of construction.

**Key Words:** Construction, Infrastructure, Technology, Efficiency etc

## 1. INTRODUCTION

The project involves the study of the technologies which are playing and will play key aspect decisive role in the field of construction and management of project. The advanced tools like modelling will enable to presentation platform to be equipped with time and cost which is probably the new era of the working environment that covered under building information modelling and common data environment. More frequently than human involving equipment's.

The objectives of the project are elaborated as below,

- ✚ To study the innovative technologies for effective construction and management of the infrastructure projects.
- ✚ To study the case studies in which the modern techniques are adopted for optimization in terms of resources.
- ✚ To study the application of modern technologies in the infrastructure project from construction and management point of view.

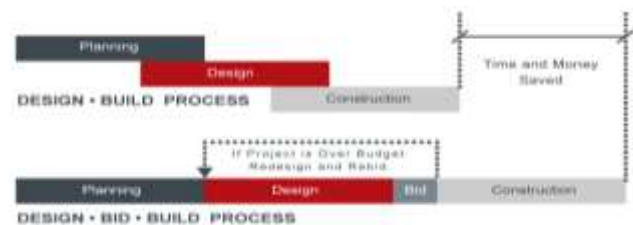
✚ To study the key benefits such as monetary and time bound because of involvement of innovative technologies.

## 1.1 Need Statement

The infrastructure projects involve the multidisciplinary work of dynamic nature. Each element such as Transportation, Environmental, Industrial etc have their unique set of features in concerning to the construction and management. The construction aspects involve the large numbers of task for the successful completion of the project. The set of tasks can be grouped as typical and extensive. The extensive task requires large number of human resources pertaining to dynamic nature of work. These have been followed traditionally for most project across the globe. With the advancement in the technology the difficulties in the construction industry are resolved to some extent which are also facilitating to derive the proactive solutions. The project consists of study of such modern technologies which will useful for effective construction and management of the project.

## 1.2 Literature Review

Construction industry solutions form a range extending in different directions. Material and technological hardware trends are universal, special emphasis is put on integrated actions for example Integrated Management, Integrated Project Delivery, System of wireless monitoring, Internet on things, Case Base reasoning, Building life cycle management, integrated building information modelling.



Dr. R. Casey Cline, Boise State University and Dr. Kirsten A. Davis, Boise State University, carried out research on the "Mobile technology in construction management "hands-on" laboratory. The paper discussed the role of Mobile device in execution process in concern with the hands-on dynamic materials and method statement in practical enclosure.

1. For plan reading,
2. For RFI documentation includes
3. Safety Meeting- Initiatory tolling
4. Data recording and Management

The paper elaborated the use of mobile technology in a “hands-on” laboratory setting, the challenges of the incorporation, lesson learned and student reactions to the use of mobile device.

### 1.3 METHODOLOGY

Methodology of the project consist of study of innovative technologies for effective construction and management of project, literature review, study of prevalent technologies nationwide, study of case study wherein the tools are adopted, study of practical implications of the tools, study to derive the role of technologies in construction economics, study and projection of future technologies in construction management, conclusion and objectives compliance report.

### 2.0 INNOVATIVE TECHNOLOGIES

The innovative technologies include the tools, equipment's, smart machineries, robots, real time system, dynamic controller, software's, programmes etc. Each element is useful at particular stage of the project. The crucial technical elements are described in the chapter. The current generation technology not only deals with the measurement but also deals with the computing, communications and geospatial data mapping. The spatial analysis mainly deals with the Geographic Information System. Geographic Information System and the underlying geographic information science that advances these technologies have a strong influence in the infrastructure field. The innovative technologies include the tools, equipment's, smart machineries, robots, real time system, dynamic controller, software's, programmes etc. Each element is useful at particular stage of the project. The crucial technical elements are described in the chapter. The current generation technology not only deals with the measurement but also deals with the computing, communications and geospatial data mapping. The spatial analysis mainly deals with the Geographic Information System. Geographic Information System and the underlying geographic information science that advances these technologies have a strong influence in the infrastructure field.



**Interrelationship between spatial components**

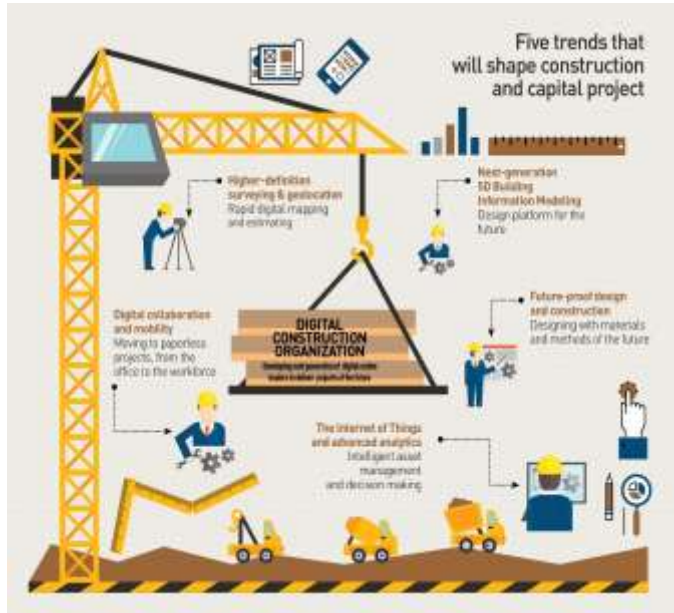


**Role of Unmanned Aerial Vehicle**



**Ground Penetrating Radar**

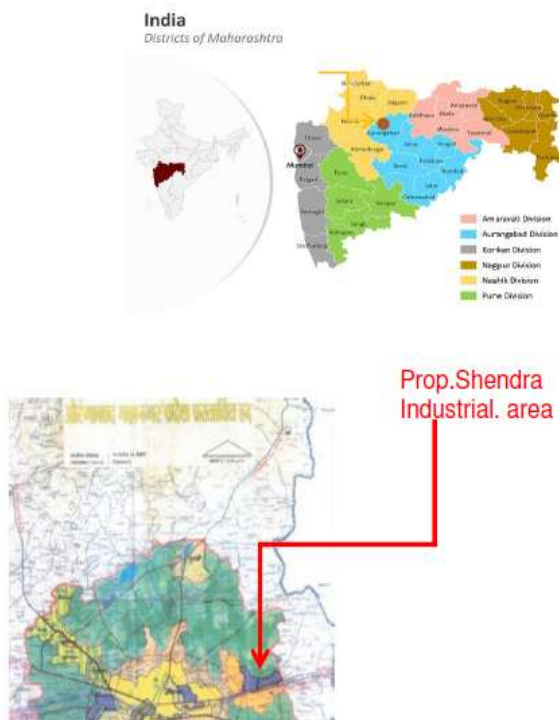
**5D (Five Dimensional) =3D (Three Dimensional)  
+Time Schedule (4 Dimensional) +Cost (5  
Dimensional)**



**Digital Construction Organization**

**2.1 CASE STUDIES**

The case study comprises of the nodal project of Delhi Mumbai Industrial Corridor.



**2.2 TOOLS/TECHNOLOGY IMPLEMENTED**

The tools and techniques are implemented at various stages such as reconnaissance survey, detailed survey, survey data validation, planning and design, estimation and costing, execution etc. The tools utilized are as GPS altimeter, GPS Tracker, Global Mapper, E-survey CAD, Primavera, MX Road, Earth movers, articulated dump truck, mobile bridge inspection unit respectively.

**2.3 ECONOMIC ASPECT**

The project explains the contribution towards monetary saving at each stage. The total saving as 6-7% consist of various stages like field studies and data collection, mobilization and planning stages, project planning and designing studies, WBS and Pre-Construction activities, Execution stage and project closure.

**3. CONCLUSION**

The various tools, technologies, software's are introduced in the project, their application with respect to the subsequent stages of the project are studied in details. It can be said that the it is imperative to adopt the innovation in day to day work especially with respect to the construction management field where the advancement is at its peak.

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