

# A Study on Technical Advancements in Construction Industry

Amarender Kadian

Assitant Professor, Dept. of Civil Engg.

BMIET, Sonipat, Haryana

**Abstract:** From ancient times to current modern era, the construction industry is among those very few businesses which not only affects the daily lives of humans but also affects the economy as well as the environment throughout the globe. As human quality of life is directly related to the build-up environment surrounding us, not only it is the quality of life but construction industry also offers basic requirements such as shelters, spaces and infrastructures for doing business to other industries resulting in employment of millions of people around the globe. According to the World Economic Forum the construction industry alone accounts for over 6% of the global GDP and with an average of over 2,00,000 people moving towards world's urban areas daily, the construction industry has revolutionized itself for the modern world as per its requirements through the adoption of latest trends and techniques such as the Drone Surveying, 3-D printing and other eco-friendly techniques like the use of Recycled plastics etc. for the betterment of the society. This study discuss an overview of various innovative advancements through which the construction sector has gone with time, as these advancements and technological developments are mainly compiled on the basis of previous researches and reports.

## INTRODUCTION

As the technologies developed in all the fields in engineering, it is essential to develop new tendencies to researches and innovations in civil engineering area additionally, so that we can minimize the time of construction and price of creation and effort of humans. Civil engineering has usually readily adopted new technologies, the usage of improvements like GPS to devise new roads and suspension structures to construct bridges. And as generation continues to evolve, we are able to assume that the civil engineering area will best hold incorporating this current technology in an increasing number of innovative ways. In fact, it already is. New technologies – the ones that have been released in the final 5 years – are about to revolutionize the civil engineering area and allow innovations previously no longer possible.

## NECESSITIES OF IMPLEMENTING RECENT TRENDS IN CONSTRUCTION INDUSTRY

Basically all the conventional code books, creation exercise are prepared with view of safety and durability best. That's why we are able to attain so many challenging constructions. But once we break monotony and start exploring new developments we can achieve any difficulties arising in production and when we start imagination into

implementation we can alternate the world Safety in creation Less time ,Less effort & cost, Aesthetic appearance.

## SAFETY IN CONSTRUCTION

In olden days the protection and precaution level is just too low in production discipline that's why so many lives were lost during construction. For an example, in the course of time creation of Panama Canal it's miles expected that over 25,000 labors lost their lives all through the massive and dangerous project, with most are demise from disease and landslides. So that with the aid of implementing new tendencies can provide protection to the workers

## LESS TIME, EFFORTS & COST

Following the old tendencies in creation effects in delaying or long term of production, which increases the price of production, substanceswastage, nice reduction etc., however by way of adopting the few recent traits can minimize the above drawbacks and helps in constructing the systems within the time. In traditional or antique creation practices there's no use of gadget's which increases the effort of the workers , however incurrent traits by means of use of current device's which includes computerized rendering machines for plastering, portray reduces each time and effort.

By imposing contemporary traits in creation enterprise, we will lessen the fee of creation ex: - with the aid of the use of modern-daydevice's, ideas we will limit the number employees and working days there by way of it proves that low-cost

## AESTHATIC APPEARANCE

Most of the structures constructed now days are in view of aesthetic point of view, some of the skyscrapers, are built without the restriction of price, for achieving this component the construction industry has to adopt current traits, substances, system. Some of the systems enlisted right here to prove, the ones are Burj Khalifa, Petronas Twin Towers, Empire State Building, World Trade Centre, Shanghai Tower and Abraj Al Bait Towers etc

## LATEST ADVANCEMENTS IN CONSTRUCTION INDUSTRY

### **SURVEYING WITH DRONES:**

Civil engineering has developed to the point of readiness with applications for unmanned aerial vehicles, which

could help in scanning and mapping creation sites as nicely as capturing photos and motion pictures for surveying purposes. UAVs often proves that a cheap measure for aerial mapping, as a drone does not require a pilot, however rather, a technician. UAVs are useful to behavior the aerial surveying for several times around the same construction discipline, which way in the destiny, UAVs can capture a style of pictures and motion pictures at the same time as the task is being finished and that will allows to better manage task progress and maintain document UAVs will additionally transforms civil engineering through using photo scanning, an photograph capture technique that uses photos (rather than lasers) to capture photographs. Photo scanning captures not just the ground surface, but additionally buildings, plants, benches, and other nearby structures – and represents them in 3dimensions. With those advanced capabilities, drones will allow for extra correct and extrainter active realistic representations of civil engineering initiatives there are also potential troubles regarding federal aviation administration (FAA) regulations, citizen's right to privacy, and how liability insurance could deal with drone usage.

### 3-D PRINTING IN MARRYING DESIGN AND CONSTRUCTION

3-d printing is gaining lots of scope in creation industry not simply creating a model, however also in business – and with 3-d printers coming down in rate each year, it's now not long before we will see them used in civil engineering. 3-D printing offers benefits for each layout and creation, with 3-d printing, it is smooth to design custom and innovative creation resources and then construct them the usage of nearly any kind of material imaginable. In fact, 3-D printers are already in use in production initiatives in Europe. Dutch construction enterprise Heymans – maximum famous for its "clever highway" and its sparkling bicycle paths, which use luminescent paint to really mark street lanes at night – has created the world's first 3-d- revealed bridge. The bridge, which was first designed in October 2015, will span across the Oudezijds Achterburgwal canal when it's miles completed in 2017. MX3D's 3D printer, though, isn't like those that we've traditionally seen. Rather than a desktop 3-D printer, MX3D's era is composed of a fixed of large mechanical arms that hold a torch-like tool for welding. These robotic arms build 3-dobjects in an open warehouse space in place of inner a container as most 3-D printers do. The arms can also print in all directions, unlike standard three-D printers, which lets in for an awful lot extra creativity and variability in the design stage. Heymans Innovation Manager Jarred van der Venn says that 3-d printing joins design and production into a single procedure, rather than two separate processes as has traditionally been seen in creation. Van der Venn notes that this alteration will require web site managers and designers to start

searching at the design technique in a new manner. However, 3-d printers do pose numerous challenges for civil engineering. First and foremost, three-D printers are limited in the types of materials they can print – as an example, 3D printers that could print circuit boards are nevertheless in improvement and won't be ready for commercial use for several years. 3D printers also pose a danger to production jobs, and schooling staff to apply three-D printers may also require a enormous capital investment.

### USE OF RECYCLED PLASTIC IN CONSTRUCTION

Plastic is one of the maximum commonly recycled merchandise in now days, with plastic substances maximum often being recycled into bottles, bags, toys, containers, and lots greater. But now, a Dutch enterprise is attempting to recycle plastic into some thing plenty larger: Roads and constructing materials. VolkerWessels is a Dutch construction organization that is preparing to construct a Plastic Road in Rotterdam. While VolkwerWessels' Plastic Road is nevertheless most effective a concept, it's becoming quite famous in Holland, where 96 million lots of carbon dioxide are released into the air through road constructing and maintenance alone. VolkerWessels expects that its Plastic Road will reduce greenhouse fuel emissions at the same time as making roads stronger and increasing their lifespan Holland's infrastructure industry expects that those new roads will slowly trade the way, thus development occurs. Relative to laying an asphalt street, building the plastic roads is extensively faster, and will take only a few weeks to construct. These Plastic Roads are also useful in the upgrading of infrastructure. As the street is hollow, which allows town planners to run pipes and wires inside the road itself. By the diverse researches and scientifically it's been proved that the street's hollow cavities are useful in draining floodwater throughout heavy rainfall. If Holland's plan succeed, it might forever change the manner of civil engineers all over the arena approaching the street building. There are issues about the plastic roads that Netherland plans to construct. Environmentally, there are concerns that the plastic may additionally integrate with the soil and harmful to the local flora. The street's additives are also quite volatile, and exposure to chlorine will cause the street to release hydrogen chloride – a color less fuel that, when exposed to atmospheric humidity turns into hydrochloric acid. When it turns into sufficiently concentrated, hydrochloric acid forms an acidic mist which can cause irreversible harm to human tissue and if it's far mixed with an oxidizing agent, hydrochloric acid synthesizes into toxic chlorine fuel. That means the engineering method would require strict safety measures a good way to protect the on-web page crew, and the substances engineers responsible for the plastic street has to take the remedial measures to create a protect or additional water-proof layer

that stops leaching and exposure to chemicals.

#### USE OF HOLOGRAPHIC COMPUTERS

Giving More Accurate Information to Engineers in Real Time, Holographic computers The next revolution in civil engineering is here, and it's going to be a forever change in the facts management and communication processes. Microsoft has been promoting its new Holographic for over a year, guiding the world's most respected era journalists to a secret underground bunker at the enterprise's Redmond campus for tightly controlled product demonstrations. Holographic is a mixed truth headset that layers 3-d holograms over physical world photos in order to convey beneficial records to the wearer. Using the Holographic, civil engineers can see virtual input drawn over physical items, share that enter with collaborators thru Skype, fine-tune designs in three-D, and discover designs in actual time. A style of businesses are currently the use of Microsoft Holographic to modify the manner manufacturing happens. Volvo, for example is the usage of. Holographic generation to design and configure its vehicles in completely new ways now a days. Meanwhile, NASA's Jet Propulsion Laboratory is planning to use the Holographic to make holographic representations of the Mars landscape based on Mars Rover snap shots. Currently, businesses in the architecture and production industries are piloting the Holographic and growing progressive new processes that leverage 3-D holographic models to enhance the layout phase. However, the Holographic additionally having a few of the disadvantages. The headset could serve as a workplace distraction that impede productivity. The prototype model also has a completely limited discipline of view, allowing boom in truth imaginative and prescient of simplest certain items.

#### USE OF RFID CARDS FOR ADDITIONAL SECURITY

RFID protection cards Site protection is usually a priority, and with technology evolving, website managers need more and more safety features at their disposal. The subsequent big aspect in web site security is contactless safety cards. These cards assist in identifying precise cardholder, and can deliver users get admission to to stable offices, secure parking, and even pc networks. The excellent benefit that these clever cards offer is that security turns into plenty less difficult to manage. Employees can take a look at themselves into and out of the worksite with just a swiping of a card. However, security cards also having certain disadvantages. Firstly, safety cards can be lost or stolen. That method safety cards that are said as stolen or misplaced will need to be right away deactivated. Card-based totally web page get entry to structures are also vulnerable to hacking website. Workers won't even recognize their card has been hacked.

#### ADVANCED SOFTWARES RESHAPING THE FUTURE OF CONSTRUCTION INDUSTRY:

Modern software's being the tools to predict the structural parameters in modern construction industry, helps in

getting the realistic image of the project even in the 3D view, Apart from that such software's also let designers and contractors to know about the structural behavior, age of deception etc. along with the weak zones of the project that they have to deal with during the construction process in the future.

Based on the functions and uses, such software's are classified as follows:

##### ► **MODELLING SOFTWARE'S:**

- AUTO CAD
- SKETCH UP
- ARCHI CAD
- SP 3D
- PLANNER 3D

##### ► **DESIGNING AND ANALYSIS SOFTWARE'S:**

- STAAD PRO
- SAP 2000
- SAFE
- ANSYS

##### ► **SOFTWARE'S FOR HIGHWAY DESIGNING AND PLANNING:**

- MX ROADS
- HDM
- HEADS
- AUTO PLOTTER

#### CONCLUSIONS

In this study we have discussed some of the latest advancements and developments in the construction industry and found out that, by studying and using current developments in practice, the construction industry throughout the world can achieve greater quality of work while attaining the cost-efficiency at the same time fulfilling the requirements of both present and the future. By using modern technologies, we can achieve milestones in the architectural beauty, structural strength, cost efficiency and many more.

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