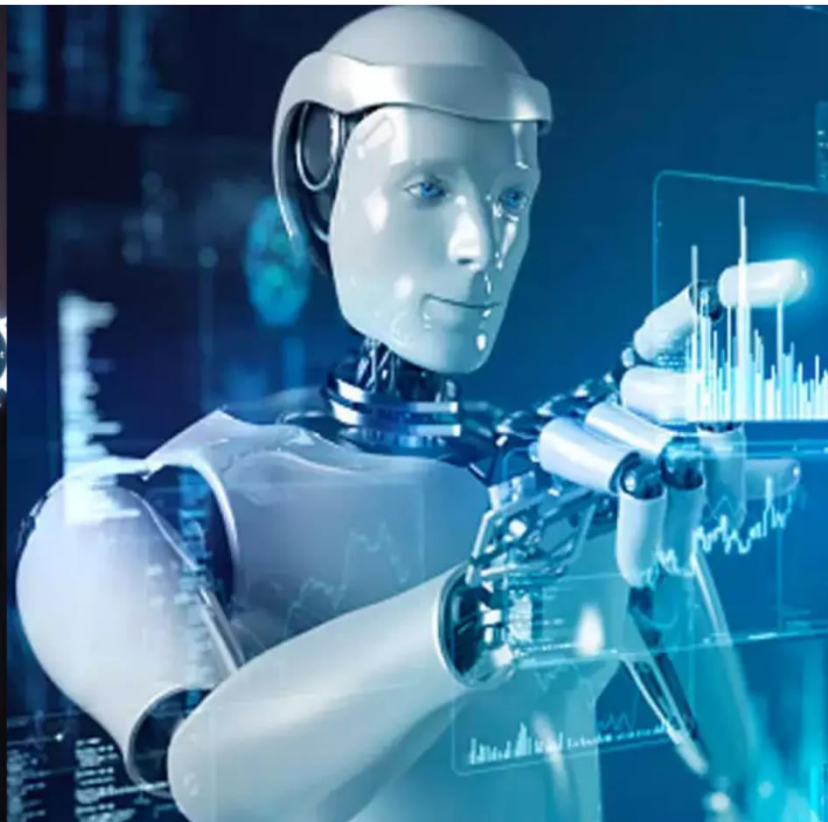




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Emerging Housing Technology in 21st Century for India

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ABSTRACT: Everybody has the ambition of owning a home. The government is working to guarantee that Indians can obtain cheap housing. One of the major issues facing emerging nations is providing everyone with affordable housing. India now has a severe housing shortage. For low- and middle-income groups in particular, the ideal of home ownership has become a challenging reality. In order to enable the general public to purchase homes at an accessible price, it is thus vital to use innovative, cost-effective, and environmentally friendly housing technologies. This research study presents a housing scenario, identifies significant problems, gaps in housing ecosystem and policy, and case studies of current state level incentives compared between traditional and technology-driven approaches.

KEYWORDS: Emerging Construction Technology, Low Cost housing Techniques, sustainable material.

I.INTRODUCTION

Everybody has the ambition of owning a home. The government is working to guarantee that Indians can obtain cheap housing. One of the major issues facing emerging nations is providing everyone with affordable housing. India now has a severe housing shortage. For low- and middle-income groups in particular, the ideal of home ownership has become a challenging reality. In order to enable the general public to purchase homes at an accessible price, it is thus vital to use innovative, cost-effective, and environmentally friendly housing technologies.

II.OBJECTIVES OF RESEARCH

1. To study the existing scenario of the affordable Housing for 21st century.
2. To identify key issues with respect to low cost housing construction.
3. To study emerging housing technology for India.

III.RESEARCH WORK

BASIC REQUIREMENTS OF BUILDING

- Strength and stability
- Amenities
- Durability
- Economy
- Aesthetics
- Security
- Resistance to moisture ingress
- Fire protection
- Thermal insulation
- Day lighting and ventilation
- Sound insulation
- Termite protection

1. Precast Concrete Construction System - 3D Precast volumetric

Prefabricated Prefinished Volumetric Construction (PPVC) and concrete modular construction are other names for three-dimensional (3-D) volumetric building. Similar to Lego bricks, rectangular factory-finished modular components are stacked during construction to create an entire structure on-site. Usually, joints are grouted with unique interface elements. The components must be mostly finished with little site work in order to achieve speed and high output. This article examines some of the crucial design techniques and factors that designers should keep in mind while utilizing this kind of building method.



Fig No 1: *Precast Concrete Construction System - 3D Precast volumetric*

2. Light Gauge Steel Structural System & Pre-engineered Steel Structural System

Cold-formed steel is used in the Light Gauge Framing System (LGFS) or Light Gauge Steel Framing (LGSF) building method. It may be used to decks, complete structures, roof systems, floor systems, wall systems, and roof panels. As studs, joists, headers, and truss members, they can also be used as individual framing members. Light steel frame are also capable of acting as both primary and secondary structures. Webbed steel trusses are an illustration of a basic structure made of light steel framing. Since exterior wall finishes depend on the primary structure for support, steel studs serve as secondary structures by offering lateral support.



Fig No 2: *Light Gauge Steel Structural System & Pre-engineered Steel Structural System*

3. Prefabricated Sandwich Panel System

Since India's population is growing quickly and needs housing, the construction industry has recently experienced the fastest growth. The construction industry uses a substantial amount of natural resources and generates a lot of garbage

from development and destruction. These wastes have a large negative impact on the ecosystem. Prefabricated Sandwich Panel System in India is needed.



Fig No 3: *Prefabricated Sandwich Panel System*

4. Stay in Place Formwork System

The plant-made rigid polyvinyl chloride (PVC)-based polymer components are already in use in Canada and Australia as a permanent stay-in-place final form-work for concrete walls. The formwork system being employed creates instantaneous, pre-finished walls that don't need plaster.

This system is appropriate for low-rise to high-rise residential and commercial structures of any height. In the current project, a composite structure using Pre-Engineered Steel Structural System as structural components is being employed to achieve faster construction, strength, and resource efficiency permanent stay-in-place finished form-work for concrete walls. The formwork System being used acts as pre-finished walls requiring no plaster and can be constructed instantly.

This System is suitable for residential and commercial buildings of any height from low rise to high rise. In order to achieve speedier construction, strength and resource efficiency, the composite structure with Pre-Engineered Steel Structural System as structural members is being used in the present project.



Fig No 4. *Stay in Place Formwork*

5. Lightweight Concrete Building

In over 40 countries, including India, the Lightweight Concrete Methodology (LCM), created by Alex Liew Chung Meng, is being used as a speedier, more affordable, durable, and ecologically friendly technique of construction. There is a significant need for high-quality, affordable homes all across the world. According to the UN, there is a yearly need for 21 million more affordable housing units. the persistent and on-going enormous backlog. Growing demand requires modern, incredibly speedy building techniques using high-quality, reasonably priced materials. Here is LCM, a low-

cost modern construction technique that is non-combustible, has good fire ratings, and provides excellent thermal and sound insulation.



Fig No 5.Lightweight

IV. CONCLUSION

- Rural housing can now be constructed quickly and affordably without sacrificing the quality of the materials or their strength. All of the strategies and procedures mentioned above aid in energy conservation.
- The idea of low-cost building is broad and is based on three elements: the structural design, the process of budgeting and cost-cutting, and the materials chosen. This means that for low-cost building, all three of these parameters must be optimised.
- Increasing the number of houses available at affordable prices and utilising innovative, cutting-edge processes that lower project costs are the key driving forces behind this. Overall, this research will be very helpful for the recent past, present, and future.

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