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# Application of Building Information Modelling in Construction Project in Coordination with Digital Transformation

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**ABSTRACT:** BIM has a group of software's which are used to share the information with other so work in more simplified and efficient manner in which information can be Extracted, Exchange or Networked to support decision making regarding a building or any built asset. BIM can optimise overall construction time by highlighting bottlenecks & site constraints during construction work. In the USA, since 2007, it is mandatory to use BIM within the design process on any project funded by the GSA. Integration of BIM within the process may not reduce design & documentation time, but can minimize the efforts time and money required during the various construction phases. Moreover, good use of BIM improves participants efficiency & effective collaboration, thus speeding-up the entire process & produces operative information to run the facility.

## I. INTRODUCTION

Building Information Modelling essentially means developing a system which can house or manage all the information needed in a particular project in a single DATA REPOSITORY that could be accessed by all project participants and readily incorporated into all project documents. BIM is a kind of technology, that is, how to use information technology to carry out the construction of technical activities. At the same time BIM is a kind of thinking, how to analyse the whole process of thinking, how to use the analysis of the problem and solve the problem of thinking. BIM is the abbreviation of building information model. Building information model integrated geometric model information, functional requirements and performance of all components, the use of all the information the whole life cycle of a building model covers separate buildings within the project, including the process of information, such as the construction schedule, construction process, maintenance management and property management etc. BIM technology is a platform (integrated professional information model, field model, mechanical model and temporary model, schedule, budget, drawings and other business data; (three) the direction of technology, production, business), five core (integrated model, construction simulation, schedule control, cost control, quality tracking and management, ten application: basic application; pipeline management, construction simulation, schedule control, volume and price inquiry, material extraction, animation disclosure, quality tracking, drawings management, collision detection. As an important tool of information management, work efficiency can be greatly improved. Basically there are three types of Models made as follows

## II. LITERATURE SURVEY

The section provides information regarding data collection from offline and online sources such as major journals, online publication sources, magazines, articles, websites and other literature which are linked relevantly to the research objectives and hence, form a part of the study. The major steps involved in the selection of literature are presented below sequentially –

*Paper 1: Decision Making with use of Building Information Modelling.*

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We found in this paper is focus on important characteristics of BIM and Useful for decision making, BIM Works in different aspect of construction, so decision making is important factor as per authors study



We need to correlate decision making with digital transformation in BIM which can help us to its great output. Development of BIM technology creates completely new opportunities for gathering information on buildings. This allows for easy and quick access awareness of delay in construction is important parameter for smooth construction work, so decision making help us to better evolution of project in terms of cost. In the early 21st century and in 2021, BIM seemed to offer a solution to the problem of data incompatibility in construction trade. However, as it turned out later, it may solve many more problems than it was initially expected, and which help us to progress it in digital transformation

***Paper 2: BIM & the 5D Project Cost Manager***

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This paper focus on global issues regarding beam, 5D integrates all the information with cost data such as quantity, schedule, price, inventory management etc. 5D Focus mainly on cost, such as 3D is object model, 4D planning process, 6D operation, 7D sustainability and 8D safety.

5 dimension to become key process in the BIM environment and the 5D Project Cost Manager The literature review and industry interviews will examine the issues associated with this and will identify the leading part and best practices in the field by professional project cost management firms which were applied worldwide. Govt. do not compulsion to BIM in many countries but its amazing results impress to stakeholders. Author examine the issue of BIM applications in Australia. The use of BIM is generally considered to be currently more suited to larger projects with larger clients and contractors means the skyscrapers project must need BIM models like 4D, 5D, 6D models etc.

***Paper 3: Scope of Building Information Modelling (BIM) in India, J. Vinoth Kumar and Mahua Mukherjee***

As we all know India is Growing in construction industry The design communication is gradually being changed from 2D based to integrated 3D digital interface. As per paper and author Building Information Modelling (BIM) is a model-based design concept, in which buildings will be built virtually before they get built out in the field, where data models organized for complete integration of all relevant factors in the building lifecycle which also manages the information exchange between Architects, Engineers and Contractors professionals, to strengthen the interaction between the design team. In India there is limited approach to BIM to 3D, 4D built model but the BIM is upgraded to 10D model, the client requirement and budget also varies in India so the construction companies avoid its use in India but they don't know BIM saves their costs, money as well as time also

BIM is a shared knowledge about the information for decisions making during its lifecycle as mentioned in 1stpaper also. There's still much to be learned about the opportunities and implications of this tool. This paper deals with the status check of BIM application in India, to do that a survey has been designed to check the acceptance of BIM till date, while this application is widely accepted throughout the industry in many countries for managing project information with capabilities for cost control and facilities management. But in India there is no effective use of BIM in cities as well as in villages, it may be or may not be useful society directly but is profitable to contractor's, construction companies to gain profit.



### III. METHODOLOGY



As a part of our research, the studies from specific fields of EPC projects BIM & digitalization such as EPC projects housing, EPC projects infrastructure roads, EPC projects planning, EPC projects technologies & devices as well as the possibility to integrate EPC projects model with BIM. Based on findings and analysis, solutions and suggestions are proposed. We should know the premise of developing a country street. From these contextual analyses, we came to know the street network, improves the work of the individuals, all things considered and occupations. The advancement in Planning didn't coordinate the desire, developing comparative harvests that are developed customarily and furthermore the social practices rehearsed regardless of the transfer of significant limitations to the progression of innovation with the assistance of good access streets and well-performing vehicle administrations. Cultivating project units have more simple entry to business sectors and contact with purchasers in the market square. They are never again subject to purchasers visiting their territory. Better streets and accessible vehicle administrations improve the conveyance of different taxpayer driven organizations to poor people. It additionally gives authorities adequate measures of time to proficiently screen the advancement of their projects for poor people.



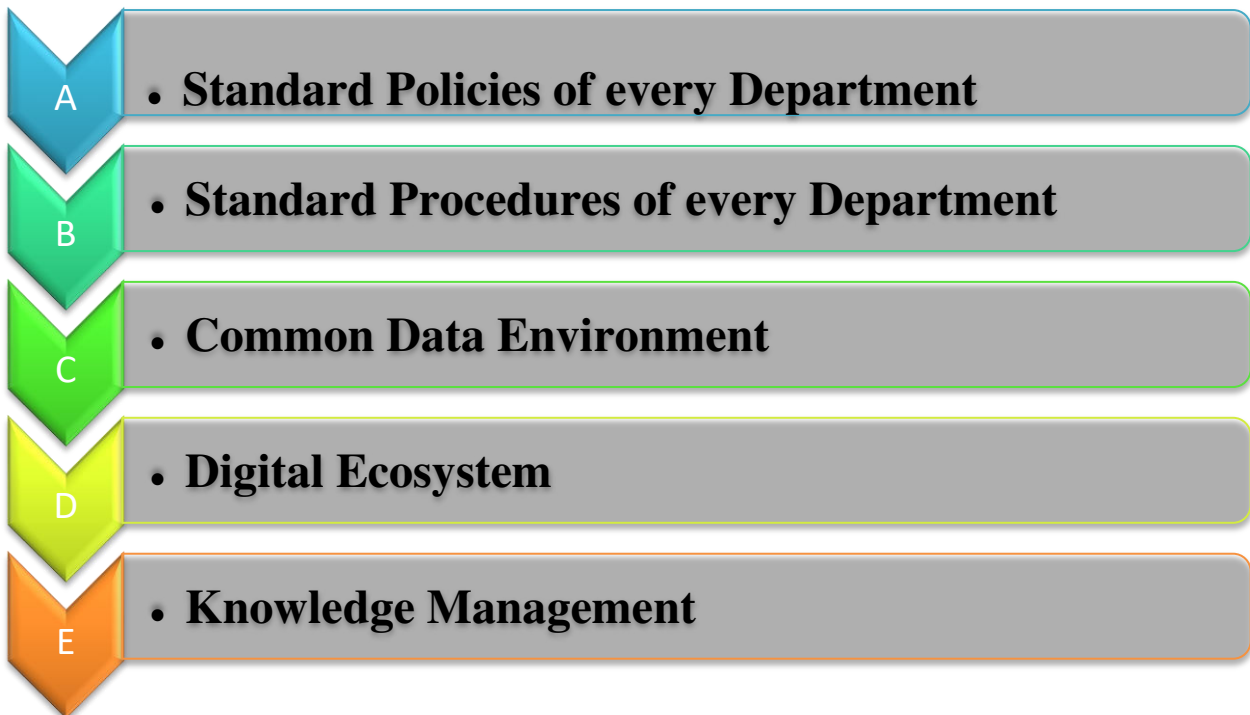


#### IV. EXPERIMENTAL RESULTS

The main idea is not to move from Analogue to digital process instead, “Use of digital Platform to optimize the process of our operations” This will lead to the creation of healthy Digital Ecosystem in companies which will Save time, Reduce Cost, Ensure Quality and also establish proper communication mechanism. This will smoothen the process by establishing RACI, so that it can be easily identified that who is responsible, Who is accountable, whose consultation is required and where the information is used.



- **Structural Modelling** helps to quantify the structural elements of project like PCC, RCC, Footing, Slabs, Columns etc.
- **Architectural Modelling** helps to quantify the architecture elements of project like Brickwork, GRC, Doors & Windows etc.
- **Services Modelling** helps to quantify the services elements of project like Ducts, sprinklers, Cable trays, pipelines etc.





## V. CONCLUSION

BIM is a progressive shelter for the AEC business. BIM Digitalises the existence of a structure or a gathering of structures to convey streamlined arrangements in each stage from its origination to destruction. Cycles like conflict identification and energy examination diminish a significant expense of the structure and improve the productivity of the development. Foster nations like the USA or UK have effectively received rewards from BIM. In any case, the BIM utilization and level of BIM appropriation in agricultural nations like India is low. The Indian development industry can handle deferred conveyances and identify configuration conflicts effectively by utilizing BIM. A cooperative exertion is fundamental from the Government and private area firms to expand the utilization of BIM in India. Utilizing BIM innovation, the joining of plan, obtainment, and development is gainful to the buyer in the administration of the venture, to facilitate with the plan and development, to bring together and normalize the model, to build the actual attributes and elements of the task Which depends on building data and gives dynamic to each phase of the development project. The buyer can know the material sort and amount all the more precisely through the model and better comprehend the construction of the material in the crash test.

In the EPC general contracting mode, BIM innovation is utilized to coordinate different expert substance into the BIM model. The absolute bundle, plan, development, management and expert subcontractors share assets and speak with one another in an ideal way. An excellent social advantage. EPC mode BIM use of a helpful investigation, will actually want to enhance the portion of work, material hardware approach, cost control, program Management, improve the productivity of the executives, yet additionally accelerate the development of the undertaking speed, So that the different BIM members in various conditions can profit, has extraordinary monetary worth and potential, yet additionally for the green, natural security, low-carbon development gives a dependable information data support.vBIM plan strategies in the measure of factual engineering contrasted with the first CAD drawings of hardware and materials enjoy a more prominent measurable benefit. After the drawing is done, the engineering amount insights can be done by the capacity of the actual product, and the pertinent value data can be gotten, so the engineering cost can be acquired, and the functioning proficiency of the expense financial plan can be significantly improved contrasted and the CAD plan. Be that as it may, in such manner isn't wonderful capacity, like electrical expert link length of the insights, its absolutely impossible to choose the line, and the real measure of a hole. Need to sit tight for additional improvement of the product to tackle these issues. It can likewise give more exact and instinctive information and perspectives for conclusive records.

## REFERENCES

1. Li Songdong. EPC general contracting model design management research. *construction economy*, 2012 (7): 68-70.
2. Wang Shuangjun. Combined with the research on schedule management mode of. housing industry EPC engineering BIM technology, 2016 (7): 46-60.
3. Liu Huan, Liu Shangyang. BIM technology applied to the total contract cost management advantage points Analysis of. *building economy*, 2013 (6): 31-34.
4. Tang Xiaoling, Tian dawn. Building information model (BIM) technology diffusion and Application Research Study. *building economy*, 2013 (6): 98-100.
5. Liu Wenping. BIM EPC in Guo REDCOLLAR in highway engineering application mode of. *construction economy*, 2014 (9): 31-34.
6. Shen, W.; Tang, W.; Wang, S.; Duffield, C.F.; Hui, F.K.P.; You, R. Enhancing Trust-Based Interface Management in International Engineering-Procurement-Construction Projects. *J. Constr. Eng. Manag.* 2017, 143, 04017061. [CrossRef]
7. Du, L.; Tang, W.; Liu, C.; Wang, S.; Wang, T.; Shen, W.; Huang, M.; Zhou, Y. Enhancing engineerprocure-construct project performance by partnering in international markets: Perspective from Chinese construction companies. *Int. J. Proj. Manag.* 2016, 34, 30–43. [CrossRef]
8. Galloway, P. Design-Build/EPC Contractor's Heightened Risk-Changes in a Changing World. *J. Leg. AffDisput. Resolut. Eng. Constr.* 2009, 1, 7–15. [CrossRef]
9. Shen, W.; Tang, W.; Yu, W.; Duffield, C.F.; Hui, F.K.P.; Wei, Y.; Fang, J. Causes of contractors' claims in international engineering-procurement-construction projects. *J. Civ. Eng. Manag.* 2017, 23, 727–739.
10. Aldhaheri, M.; Bakchan, A.; Sandhu, M.A. A structural equation model for enhancing effectiveness of engineering, procurement and construction (EPC) major projects: End-user's perspective. *Eng. Constr. Archit.Manag.* 2018, 25, 1226–1252. [CrossRef]
11. Digital transformation necessitates change for EPC firms – Report from EPC world



12. IHS Herold Global Project Database 19 November 2013
13. Mubarak S 2015 Construction Project Scheduling and Control (New Jersey: Wiley)
14. Nicholas J and Steyn H 2012 Project Management for Engineering, Business and Technology (Oxon: Routledge)
15. Koo B and Fischer M 2000 Feasibility study of 4D CAD in commercial construction J. Constr Eng. Manag. 126 4 p 251-60
16. Swapnesh P R and Valunjkar S S 2017 Improve the productivity of building project using building information modelling (bim) based 4d simulation model IJRASET 5 p 45-98
17. Pitake S A and Patil D S 2013 Visualization of construction progress by 4D modeling application IJETT 4 p 3000
18. Boton C, Kubicki S and Halin G 2015 The challenge of level of development in 4D/BIM simulation across AEC project lifecycle. A case study. CCC 2015 123 p 59-67
19. Elshakour A H A, Al-Sulaihi I A, Al-Gahtani K S 2012 Indicators for measuring performance of building construction companies in Kingdom of Saudi Arabia JKSES 25 p 125-3
20. John D D 2018 Building Information Modeling (BIM) Impact on Construction Performance (Georgia: Georgia Southern University)



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