BUILDING INFORMATION MODELING BETTER BUILDING THROUGH DIGITAL PRACTICE - STUDY OF PROCESSES & ROLES

Student. No. 4039572 Manasi Jadhav MSC THESIS: Design & Construction Management **ROBLEM STATEMENT ESEARCH AIM:** • The current AEC industry building process has been fragmented and the paper based To contribute more knowledge on the changes in the processes due to BIM and how the roles get affected result-**RESEARCH MODEL** communication is considered to be the main reason behind this. *ing from this change: role of project manager* • Most people feel that the introduction of 2D computer drafting in design MAIN RESEARCH QUESTIONS: Case study Literature Study analysis firms did not significantly change the way architects practiced, but it simply computerized their practice. • RQ 1: What are the changes in the process when implementing BIM in a traditional project (Initiation Stage)? Theory **Literature Cases** Case as planned Case as realized • 3D computer modeling and BIM on the other hand bring a culture change that in-• RQ 2: How does the role of project manager change in relation to other actors when BIM is implemented in a fuses all aspects of practice not just the drafting portion. project? **Conclusion 1** Frame of Reflection • In order to reap the maximum benefits from BIM, processes have to change to incor-**SUB RESEARCH AIMS: Conclusion 2a Conclusion 2b** porate these technologies. Reflection 1) Developing a descriptive and holistic framework for studying the initial stages of a BIM Project. 2) Establishing the framework tool • However, may AEC firms are 'forcing' BIM in the traditional process resulting in situa-Conclusion 2a Conclusion 2b **Conclusion 1** 3) Studying BIM Literature cases and strengthening the framework tion of 'square peg in round hole' 4) From the previously described framework, analyzing the role of the project manager and his changing responsibilities with respect to client and architect (representing the design team) • In addition to this, BIM benefits to clients, consultants are known, but how does the 5) Identifying the added skills and tools needed by project manager to manage the Initial Stage of the BIM project. role change in order to gain these benefits are not known 6) Analyzing information exchange in a traditional process that prepared 3D Model Management Conclusion 7) Analyzing the role of the project manager in the above mentioned information exchange • Even serious is the **problem for project managers; neither the benefits nor the** changes in the role of project manager are mentioned in literature Recommendations & Vision SCHEMATIC PREPARATION STAGE PREPARATION STAGE DESIGN **BIM PROJECT INITIATION STAGE** PARTICIPANT INVOLVEMEN DECISON MAKING STRUCTURES **BIM PLAN** Process BIM GOALS & USES INFORMATION EXCHANG





CONCLUSIONS- BIM PROCESS AS PER LITERATURE

• New roles & responsibilities of the client are identified

• It is expected that the client and consultants have to be quite knowledgeable of BIM

• A lot of new activities like: collaboration goals, communication strategies, model exchanges, integrated information exchange have to be performed

• Also, immense amount of preparation is demanded before a design can start

• Role of project manager is not described; his activities, tools he should use are not identified

• What if the client is a one time builder? Then who takes the responsibilities of overviewing the BIM Process?

CONCLUSIONS- BIM PROCESS AS PLANNED

• A large number of expectations have to met by the consultants

• The steps, tools, benefits that can be achieved are not case specific

COMPETITION STAGE	PRELIMINARY DESIGN STAGE	
	Starting Point	
	Mid way of PD Stage PD Plans NEN2057 Technical Brief	

IMPLICATIONS OF THE FINDINGS

The findings indicate that a number of steps have to be taken before the BIM project actually starts its design phase.

• The case study analysis linked a large number of explored factors with to processes and roles responsible for smoother integration of BIM.

• It is not just the early involvement of participants important for BIM Preparation, but their openness to collaboration, admitting the lack of skills or difficulties in adjusting their work cultures is equally necessary.

• The findings also indicate the importance of understanding and handling downstream and upstream interdependencies between strategies and guidelines for implementation, and the needs and experiences of actors involved in real-life projects.

• Learning a new technology is not so difficult. Today a number of high end softwares are being available in the market and they can be mastered in a few weeks time. The greater challenge is process. How we integrate the new tools to help make the process faster and organized.

• The disciplines started in the case project to develop their design solutions successively (for instance; at first the architect, then the structural engineer, HVAC and other consultants). The findings indicate, however, a need for simultaneous development and specification of geometry and design information across the design disciplines to enhance the potential of the technology to support interdisciplinary work

• The final process solution integrated the project manager in the BIM Process. However, he is needed to learn just a few BIM Tools (4D modeling, design authoring and design reviews) to help him manage his decisions. This implicates that it is not a difficult task for the project managers to use BIM. However they should know what is BIM and how can the client benefit from it.

•BIM was adapted to traditional processes and established practice of design. The implemented technologies have not fundamentally changed the practitioners' work and interactions. The findings imply that upskilling is not only a matter of mastering and operating software, but also of learning and adapting new work method



PROBLEMS IN THE INFORMATION EXCHANGE

• BIM Model not used for communication

• The architect is in the centre of the entire communication

• The input of project manager is not direct

• Number of communication loops happened successively

• A number of problems could take place if the message is not conveyed to the right consultant or if there is a loss of information

• The process takes place sequentially. This result in a lot of time wasted in waiting for the information

• Analysis could take place for a fixed number of times due to lack of interoperability.

• Also, the model had to be recreated for analysis since the analysis software considers central line and the actual engineering model has wall or external line for defining a space

IMPROVING THE INFORMATION EXCHANGE PROCESS