Abstract of the Master Thesis

Master’s Degree
International Project Management
(Building, Construction and Infrastructure)

Integration of Building Information Modeling in Target Value Design Projects: Develop a Framework to Show the Integration of 5D BIM Processes in TVD Projects to Optimize Cost Estimation Methods

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Construction cost overruns are one of the most crucial aspects in the industry that might lead to conflicts and project failures. Therefore, to avoid such problems, new methods and technologies were, and are still being developed to optimize construction processes. Target value design is a lean method used nowadays in the construction industry that is based on Target costing, a method that has been used for a long time in the manufacturing industry to reduce costs while sustaining the value of the product. Likewise, the idea of TVD is about defining the value targeted by the client for the project to be successful through having all key stakeholders working collaboratively from early stages of the project, thereafter, the design starts steered towards the targets set. Building information modeling is a tool that generates and manages the digitalization of construction processes. Several categories were defined depending on the use of BIM as dimensions, this research concentrated on 5D BIM which is responsible of the cost aspect, and specifically on BIM-Based cost estimation processes. Although BIM has been used earlier in TVD projects, its processes have not been clearly defined to optimize its benefits. Hence, the research question was as follows:

*How can Building Information Modeling (5D BIM) be efficiently integrated in the process of Target Value Design projects in order to optimize cost estimation methods?*
The researcher followed an interpretive paradigm in order to research the topic according to the understanding and experience of the participants. Since the author wanted to study the literature concerning TVD and BIM with a concentration on BIM-based cost estimation processes and then develop the main points to be discussed with field experts, an inductive approach was followed. Hence, a qualitative approach was adopted, where the author held several semi-structured interviews with experts from both fields to get their input regarding the topic of this research. The data gathered from 10 interviews were considered to be the primary data while the data gathered from the literature was considered secondary data. The data was analyzed and studied deeply aiming to develop a conceptual framework that would demonstrate the results concluded.

Finally, the researcher was capable of developing a conceptual framework based on the literature and the findings. This framework demonstrates the optimal means to integrate different BIM-based cost estimation processes into the TVD process. At first, the TVD process was studied thoroughly with its benefits and challenges identified, including the importance of having fast and efficient cost estimates in order to maximize the benefits of adopting the TVD method in construction projects. Then BIM-based cost estimation processes were defined using the existing literature and altered by experts in this specific field. The conceptual framework developed could be used to come up with efficient conceptual, schematic and detailed cost estimates in preconstruction phases in the TVD process where it identifies the best time to use each BIM-based cost estimation process, the LOD of the model used and the major linking points between BIM and TVD for cost estimation purposes.