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Хассан Ахмед<sup>1</sup>, Доненко В.І.<sup>2</sup>, Іщенко О.І.<sup>3</sup>

<sup>1</sup> студ. гр. БАД-118ін НУ «Запорізька політехніка»

<sup>2</sup> д-р техн. наук, проф. НУ «Запорізька політехніка»

<sup>3</sup> старш. викл. НУ «Запорізька політехніка»

### **UNMANNED AERIAL VEHICLE (UAV) IN BIM TECHNOLOGY**

Collecting progress information of a construction project could be expensive and complicated. The requirements on-site progress data collection normally is one of the responsibilities for the contractor's engineers on the site., and the site works progress is recorded by the updating of the project program which is manually attached with photographs, the site's notes, progress meetings minutes and correspondence [1]. The integrated between UAV (Unmanned Aerial Vehicle) and BIM technologies could be used so contractors can efficiently obtain and manage as-built data more effectively and efficiently. BIM technology, with the particularly useful 3D illustrations can provide it; can support the monitoring and management of the progress of the project. UAV technology can be added to this tool in order to provide more accurate and efficient collection of all data needed in any process in the project. BIM technology can be used to illustrate a project's as-built information in 3D and enable all the involved parties appreciate the actual works progress and identify possible causes of delay. The project managers can also use the collected information from UAV to take the suitable and correct decisions in order to avoid or reduce the effect of such delay events and to achieve the low cost target. Furthermore, even in the event of delay if the reasons and effect is well known in a clear point of view, the parties will accept their responsibilities and disputes will be avoided [2].

UAVs have undergone has reached a high level of advances in equipment capabilities and now have the capacity to acquire high resolution imagery from many angles in a cost effective, efficient manner. By using Metric Photogrammetry and Structure for Motion, the science of determining object characteristics from rectified stereo-photographs, someone can extract information from imagery. Distances, angles, areas, volumes, elevations, object sizes, and object shape within

overlapping images are some of the many characteristics that can be determined using photogrammetry (Adams et al 2010).

The UAV should know the location and the spatial extent of a construction site in order to automatically survey building structures and avoid damages. These data should be extracted from building information models, which are described according to the Industry Foundation Classes (IFC) data model. IFC models include optional georeferenced and thus any building element can be related to a geolocation. In order to be able to relate any related requirements for the structure of a building with the geo-reference, it is necessary to understand the representation of geometry in IFC [3].

The potential existed in the use of UAV – BIM integration from production of design and plans, monitoring materials on site and measuring accurate work done on the site. Integration of UAV and BIM technology leverages the capabilities and chances that the fourth industrial revolution (4IR) has provided. We can now digitalize and automate most of processes and outputs in the construction process for the benefit for industry achieving low time and cost. Therefore, the benefits of UAVs (Drones) and BIM technology will allow us to reach the effectiveness, as well as reduce the many aberrations that occur in construction projects [4].

Tools for generating topographies described by means of UAVs have made it possible to give us detailed information about any specific area where the building is planned to be constructed. These data are handled by 2D and 3D software tools; they work on both the X–Y and Z axis. This is also related on the type of program used by BIM for the interconnection of all parts of the constructions in the project. Nowadays, the accuracy of 3D photo surveying has the ability information to be quickly transferred and recorded and loaded into BIM programs. The technological advances in data collection and its transferring the data into BIM makes a revolutionary change before and after in the cooperation and design of a building is currently an objective reality. However, it is necessary to go further and deeper into the relationship between the environment in which the building is located and with the application of these technologies to select the ideal execution on site. [5].

Cooperation between BIM (Building Information Modelling) and the points taken by UAV (Unmanned Aerial Vehicle) provide an ideal method which is: that point cloud directly loaded in BIM program. BIM application solutions support the most of basic points cloud data formats and point clouds can be loaded directly in the load menu. A 3D model in the demand format then could be created uprightly using BIM software tools. This step fix the transferring data problem and level of the detail can be chosen accurately according the BIM designer requirements. If there is any additional requirement in any level of detail, the original point cloud is still available and accessible for any steps in the project need this point.

## REFERENCE

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