# A Comparative Study of the Use of Drones versus Traditional Surveying Techniques in Construction Projects

## Topic Consultation



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## Background

In order to complete construction projects successfully, precise and accurate surveying is of high significance. There are multiple traditional techniques available to the project teams in this regard, among which the most common ones include theodolites, total stations, and others. These techniques have been used for centuries and come with their limitations related to safety and accessibility (Elghaish et al., 2021). On the other hand, drones are the new technology introduced in the market for surveying construction sites. Drones, also known as uncrewed aerial vehicles, come with sensors and a high-resolution camera, allowing the construction project teams to gain an aerial image of the site and develop 3D models for better understanding (Carrera-Hernández et al., 2020). However, there is a lack of research to determine whether or not drone technology is effective enough to replace traditional surveying techniques in construction projects.



## Research Rationale

The rationale for conducting this research comes from the efficiency and effectiveness requirements in the case of construction projects to complete them successfully within the limitations of time, quality, and cost. Drone technology has gained great attention recently for multiple purposes like food delivery, event management, cinematography, and others (Anwar et al., 2018). However, there is a lack of research to validate whether the construction project teams should prefer this over traditional surveying techniques (Elghaish et al., 2021). For this reason, this research study tends to offer great support by comparing drone technology and traditional surveying techniques for construction site surveying, considering the key aspects of cost, data accuracy, and reliability (Carrera-Hernández et al., 2020). The study findings tend to carry high importance for the construction industry to either continue using traditional surveying techniques or switch to the latest ones, such as drones, for maximising the success chances of the construction projects.

## Key Aims and Objectives

The key aim of the research is

*To compare and contrast the use of drones versus traditional surveying techniques in construction projects*

The related study objectives are as follows:

- To compare the accuracy of drones versus traditional surveying techniques for site surveying
- To analyse the effectiveness of drones versus traditional surveying techniques considering time and labour requirements
- To determine the cost implications of drones versus traditional surveying techniques related to the construction projects
- To determine the benefits and drawbacks of drones versus traditional surveying techniques for construction project management



## Literature Review

The researcher shall use the Technology Acceptance Model to compare the effectiveness of drones versus traditional surveying techniques for site surveying and construction projects, as shown in Figure 1. The TAM model comprises different elements, such as perceived usefulness and ease of use, which shall be evaluated in the light of drones versus traditional surveying techniques to prioritise one technique over the other (Maranguni and Grani, 2015).

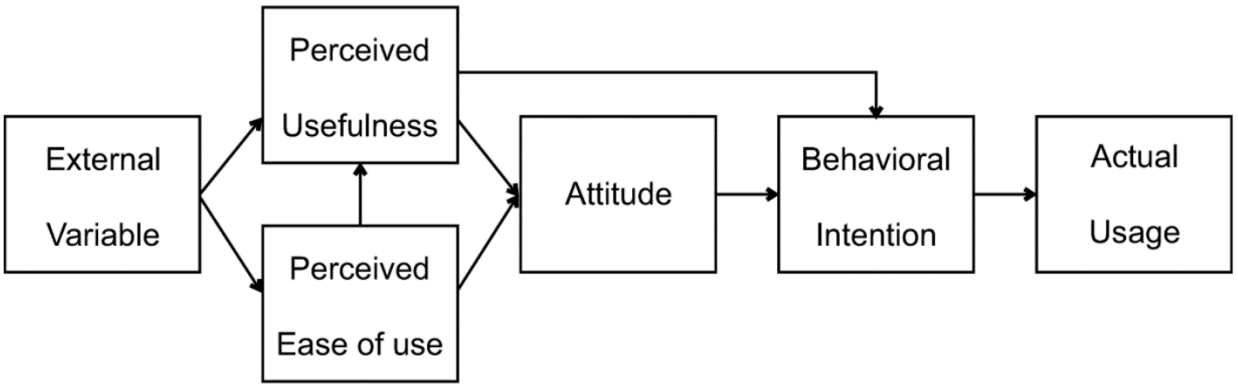


***Figure 1: Technology Acceptance Model (Maranguni and Grani, 2015)***



## Research Methodology

The research study shall be completed using a mixed research methodology approach. Primary or quantitative data related to drones' labour, cost, time, and accuracy versus traditional surveying techniques shall be completed (Snyder, 2019). At the same time, qualitative research or secondary data shall be collected to explore the pros and cons of both techniques to gain a holistic understanding and offer viable recommendations for the construction project techniques (Ørngreen and Levinsen, 2017). Snyder (2019) appraises mixed research methodology for the research as it offers a triangulation advantage by which the results from each methodology shall be verified by the other to improve the overall reliability and validity of the research.

**References**

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