

# Investigating the Use of 3D Printing and the Integration of BIM in Manufacturing Furniture Units

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**Abstract.** 3D printing is an emerging technology and one of the main aspects that can help in its success is BIM (Building Information Modelling). Despite recent interest in this topic, research indicates that to date no framework is in place that highlights the integration of BIM with 3D printing technology in the furniture design and production industry. This research delves deep into the use of 3D printing with the aid of BIM tools to produce furniture units. Through an analytical and experimental approach, this study aims to develop a conceptual framework that integrates BIM within the 3D printing process of small-scale furniture units. To gather data, the existing literature has been reviewed thoroughly and a framework was developed and adopted in the experimental study; where a BIM software was used to simulate a piece of furniture and measure the printing process against a set of criteria such as cost, material, and energy consumption. Results of the experiment were analysed and validated by applying comparative analysis between the interview with an expert in the interior 3D printing field and the results of the simulation. The research provided key aspects to be considered in the 3D printing of interior furniture pieces in addition to outlining the relevant limitations as well as the possible opportunities for further research.

