

## Using digital modeling to simulate heritage furniture and manufacturing it digitally

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### **Abstract:**

With the passage of time, the problems of preserving the archaeological heritage are increasing, so scientists have begun to search for new, unconventional methods of simulation, reproduction, and preservation of it, and furniture is one of the most important examples included in cultural heritage.

In recent years, interest in digital manufacturing has increased, which depends mainly on the presence of computers, and many digital mechanisms have been deployed that serve design in general and interior design in particular, and from here the idea of research emerged that discusses the possibility of adopting design models that simulate heritage furniture through a computer, It is digitally produced and re-manufactured again. The research was conducted in three stages as follows:

**First:** theoretical study in which an extensive theoretical study was conducted for scientific research and messages in the period from 2009 to 2019 within the constituent environments of the research elements, then a theoretical study of digital modeling was conducted as one of the axes of the research topic, then how to simulate the work of existing furniture, and also discuss simulation methods and choose the method Optimal among them, and finally discussing digital manufacturing and knowing the digital technologies used in manufacturing, so we finally get a set of mechanisms and tools that can be used in preparing a standard model for use in analytical study.

**Second:** An analytical study in which a number of samples were selected for pieces of historical furniture in which the method of digital modeling was applied to them taking into account the diversity of those samples in terms of the historical period between the ancient and classic Egyptian, and also in terms of function, then researching the possibility of digital manufacturing of those samples.

**Third:** The applied study and the results in which the researcher presents the most important results related to the effect of using digital modeling on simulating classic furniture and digitally recycling it.

### **key words:**

Simulation - Modeling - Historic Furniture - Digital Manufacturing - 3D Printing.