

Digital Fabrication Systems between Theory and Practice, with Applications in Metal Roofing Systems

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Abstract:

The tremendous development in computer technology, communication technology and information circulation is an inspiring and influential source in modern design trends, which led to the expansion of design capabilities and facilitated the preparation of designs for complex shapes quickly and accurately. The design and manufacturing process is always closely linked, starting from the stage of generating the initial ideas to the final products, especially in curved and complex shapes that are difficult to implement in traditional ways, which led to the search for new ways and methods that help in preparing and implementing their designs. The widespread spread, along with the low cost of computers, has led to its increasing use in design instead of manual means, and the computer with its superior ability to deal with many, multiple and overlapping data quickly using mathematical algorithms, which in turn facilitated the architects to use Multiple methods and programs helped to prepare and develop many different types of designs and to show problems in them before starting implementation, which helped to save time, effort and money. With the help of the computer, it was possible to design and produce virtual models from ready-made full-size molds from aluminum, iron and plastic ores. The diversity in design and manufacturing programs made possible by modern technological progress has opened the way for designers and manufacturers to prepare highly innovative and quality geometric shapes and designs, and by using these programs it has been possible to translate those shapes and designs into three-dimensional models. Hence the concept and importance of digital manufacturing systems as a link between the design process and the manufacturing process, and this is what gives the current research its importance. **Statement of the problem:** problem of the current research emerged from the need To keep pace with the technical development in the design and manufacturing processes of metal systems to achieve effective performance and quality, which can be achieved by taking advantage of the advantages of digital manufacturing systems. **Objective:** exploring the role of digital manufacturing systems in the design, manufacture and production of metal systems with application to glass metal ceiling systems. **Methodology:** The research used the descriptive approach in theoretical studies and the experimental approach in applied studies.

Keywords:

Digital Fabrication, 4th Industrial Revolution, Metal Roofing Systems

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