ПРОЕКТИРОВАНИЕ И МОДЕЛИРОВАНИЕ ПРЕДМЕТНО-ПРОСТРАНСТВЕННОЙ СРЕДЫ СРЕДСТВАМИ ДИЗАЙНА, ИЗОБРАЗИТЕЛЬНОГО И ДЕКОРАТИВНОГО ИСКУССТВ

THE CURRENT STATE OF SCIENTIFIC THOUGHT AND ACHIEVEMENTS OF 3D PRINTING TECHNOLOGY IN DESIGN

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When stereo lithography was invented and patented for the first time in the 1980s of the 20th century, in all developed countries of the world and in Ukraine growing interest in innovative technology of three-dimensional virtual 3D-printed models has been observed. Unique products in a single copy (art objects, musical instruments, houses, cars, furniture, clothing) appeared, they were wholly or partly made using 3D-printer and they have the shape that was previously impossible and extremely difficult to perform in conditions of existing modern equipment. Due to 3D-printing technology fast and qualitative way from idea to final product is implemented, namely, the duration of the production process of prototypes is reduced and the number of employed workers (and therefore cost) is also reduced; But complexity of form parts and product quality is increasing; the ecological production (waste-free production and production of secondary raw materials) is improving; variability of design concepts (the ability to create prototypes and small series of high quality without the involvement of industrial production) is increasing. Modern 3D-printers offer product developers the ability to print parts and mechanisms of several materials with different mechanical and physical properties at a time of drafting process. According to the analytical company, volume of 3D-printing market in 2020 will exceed 20 billion dollars.

3D-printing technology and 3D-printer types used in the creation of experimental design objects are poorly understood aspect in the areas of theory and practice of architecture and design. The retrospective review of printed and electronic sources proved the uncertainty of systematic approaches and methods of 3D-technologies usage in design, fragmentation of research and practical developments on this topical issue.

The purpose of this study is to generalize and systematize practical and theoretical foreign and domestic experience, to define characteristics, study prospects of innovative 3D-printing technology in shaping of design objects and living environment.

Material and methods. The following methods were used in interdisciplinary study: a monitoring method, a method of expert and subjective assessments, visual-analytic method. Retrospective application of 3D-printing technology was established using historical and comparative method, a chronology of its development in a certain time interval was compiled, some creative ways of artists on the application of 3D-printing technology in shaping the design of products were found. Formal typological method was used in the preparation of classification of materials and objects for 3D-printing technology. Method of compositional analysis helped to identify artistic and aesthetic features of objects and spaces formed by using 3D-printing technology.

Results and their discussions. The authors defined the main directions and prospects of 3D-printing technology as more sophisticated, which eventually will replace the main types of industrial production. In particular, in the field of design it is a new attitude to the material, it gives more artistic capabilities while reducing the cost and time for production; in the social sphere it is a creation of affordable and high-quality products; in the environmental field it is waste-free production and recycling materials.

The classification technology of 3D-printing was established as a result of the analysis of a large number of competing technologies that give the possibility to make a 3D-model. There are stereo lithography (SLA); selective laser sintering (SLS); Fused Deposition Modeling (FDM); Laminated Object Manufacturing (LOM); Multi Jet modeling, (MJM).

Design concept of artistic and imaginative environment of "Kharkiv Palace Premier Hotel" (Principles of complex formation of open spaces, interiors, lighting fittings, furniture, by means of 3D-printing) was developed on the basis of 3D-technology. The article shows 3D-designs made by students studying at "Furniture Design" specialization at 3D-printers installed in enterprises of Kharkov.

Scientific novelty lies in the fact that innovative 3D-printing technology in design of object-spatial environment was systematized for the first time and the main types of design objects made by 3D-printing technology were classified. The definition of artistic and aesthetic functions and uses of 3D printing technology in the shaping of object-spatial environment became important for further development. The list of technologies was enhanced and new features of technologies and devices of 3D-printing were added.

In 15-16 May 2018 Alnikov Y.M. became a finalist all-ukrainian innovation festival and presented his project «Inclusive furniture design using 3D printing technology» in Kiev, Ukraine in the Ministry of Education of Ukraine.

Conclusions. Key findings and results can be used by designers practicing in project activities. Scientific research and theoretical principles can be applied in higher architectural and design education and as a basis for writing textbooks, monographs and user's guidelines.

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ВЛИЯНИЕ ЭКОЛОГИЧЕСКИХ ТЕХНОЛОГИЙ И МАТЕРИАЛОВ НА ЭСТЕТИЧЕСКИЙ ОБЛИК В ДИЗАЙНЕ ЭКОАРХИТЕКТУРЫ

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Современную архитектуру можно определить, как искусственно организованное пространство, обеспечивающее комфортное и гармоничное развитие человека, общества и окружающей среды. Важным и актуальным в архитектурно-дизайнерском мышлении и проектировании экологической среды является самоощущения проектировщика во времени, его отношения к традицией и современностью. Современные и традиционные экотехнологии разнообразны и существенно влияют на эстетику, внешнего облика в дизайне архитектуры.

Цель данного исследования - рассмотреть влияние различных экотехнологий на формообразование экоархитектуры и выявить их взаимосвязь.