DIGITAL ARCHITECTURE AND TECHNOLOGIES

https://doi.org/10.5281/zenodo.19536916

Bobobekov Bekzod Bahodirovich
trainee teacher of the Architecture Department of Samarkand State Architecture and Construction University named after Mirzo Ulugbek
Bobobekov Bahodir Qudratovich
associate professor of the Architectural Design Department of Jizzakh Polytechnic Institute bekzod.ru93@mail.ru

Abstract: *This article highlights the concept of digital architecture, its stages of development, its integration with modern technologies, and its importance in the field of architecture. It also analyzes the application of innovative approaches such as BIM technology, parametric design, artificial intelligence, and virtual reality.*

Keywords*: Digital architecture, BIM, 3D modeling, parametric design, artificial intelligence, VR/AR, innovation.*

INTRODUCTION

In the 21st century, the rapid development of technologies has also had a significant impact on the field of architecture. Traditional design methods are being replaced by digital technologies. Digital architecture is not only a design tool, but also a system that optimizes the entire construction process.

Main part. Concept of digital architecture. Digital architecture is the process of designing, modeling, and managing buildings and structures using computer technologies. Through this approach, it is possible to achieve complex forms, high accuracy, and efficiency.Modern technologies. BIM (Building Information Modeling). BIM technology integrates all information of a building into a single digital model. This ensures effective collaboration among project participants. For example, Autodesk Revit software is widely used.

3D modeling. With the help of 3D modeling, a project is developed in a visual form. This allows for evaluating and improving the design. Popular software includes SketchUp and 3ds Max.Parametric design allows the creation of forms based on algorithms. This method is used in creating innovative and complex architectural forms. For example, Grasshopper.

Artificial intelligence (AI). With the help of AI, energy efficiency, material selection, and project optimization are carried out. This accelerates the decision-making process.

Virtual and augmented reality (VR/AR). Through VR/AR technologies, the project is presented in a state close to a real environment. This is a convenient and understandable solution for clients.

Digital architecture and technology is a field based on the digitalization of architectural design, construction, and management processes using modern information technologies. This field enriches traditional architectural methods with innovative solutions and increases efficiency.

Advantages of digital architecture

- Design accuracy increases
- Construction costs decrease
- Time is saved
- Errors are minimized
- Environmental sustainability is ensured

Practical application

Digital architecture is widely used in the following areas:

- Urban planning and urban design
- Conservation of historical monuments
- Creation of Smart Cities
- Design of energy-efficient buildings

Conclusion. Digital architecture and technologies have become an integral part of the modern construction and design field. Through them, it is possible to implement not only efficient, but also innovative and environmentally sustainable projects. In the future, this direction is expected to further develop and fundamentally transform the field of architecture.

REFERENCES:

1. Eastman C. et al. BIM Handbook
2. Autodesk rasmiy manbalari
3. Smith P. “Introduction to Digital Architecture”
4. Zamonaviy arxitektura va IT texnologiyalar bo‘yicha ilmiy maqolalar
5. ekomaktab.uz — образовательный ресурс по экологическим вопросам. zoinet.org
6. uzspb.uz — Общество охраны птиц Узбекистана (раздел биоразнообразие).
7. Abdullayev, A. (2022). PRINCIPLES OF USE OF WALL PICTURES IN THE INTERIOR OF ARCHITECTURE OF UZBEKISTAN AND HISTORY OF DEVELOPMENT. Spectrum Journal of Innovation, Reforms and Development, 9, 141-143.
8. Yerjanovich, Y. B., & Mamadiyoroglu, A. A. (2021). Principles of Using Ornamental Plants in the Interior. EUROPEAN JOURNAL OF INNOVATION IN NONFORMAL EDUCATION, 1(2), 79-81.

9. Khudoyarova, M. B., Masaritdinova, N. A., & Makhmudova, S. A. (2024). ARCHITECTURAL TRENDS OF UZBEKISTAN IN THE PERIOD 1932 1990. Экономика и социум, (9 (124)), 201-206.

10. Gazizov, R. K., & Ibragimov, N. H. (2014). Kompaneets tenglamasining taxminiy simmetriyalari va yechimlari. Amaliy mexanika va texnik fizika , 55 (2), 38–42.

11. Xasanovich, I. N. (2023). SUV HO'JALARIDA SPA (SANUS PER AQUAM) ZONALARINI RIVOJLANISH. CENTRAL ASIAN JOURNAL OF SANAT VA DIZAYN , 366-368.

12. Gazizov, R. K., & Ibragimov, N. K. (2014). Kompaneets tenglamasining taxminiy simmetriyalari va yechimlari. Amaliy mexanika va texnik fizika jurnali , 55 (2), 220-224.

13. Sultanov, D. U. (2026). ARCHITECTURAL AND LANDSCAPE PRINCIPLES FOR THE FORMATION OF TOURIST ROUTES IN HISTORIC CITIES. AMERICAN JOURNAL OF MULTIDISCIPLINARY BULLETIN, 4(3), 198-204.

14. РАХИМОВ, Ш. К., & СУЛТАНОВ, Д. У. (2022). Модернизация и совершенствование старых туристических маршрутов Самарканда и разработка на их основе новых. МОЛОДОЙ УЧЕНЫЙ Учредители: ООО" Издательство Молодой ученый", (12), 107-111.

15. Bobobekov, B. K., & Bobobekov, B. B. (2023). Issues of Architectural and Landscape Organization of Pedestrian Tourist Routes (PTM) in the Historical Cities of Uzbekistan. Web Semantic Univers. J. Innov. Educ, 2(3), 97-101.

16. Tursunov, S., Tursunova, D., Vakhidov, A., Khojamov, Z., Makhmudova, F., Masaridinova, N., & Bobobekov, B. (2024). Experimental studies on shear stiffness of soil under external loading conditions. In BIO Web of Conferences (Vol. 149, p. 01072). EDP Sciences.