

HARMONY OF NATIONAL AND MODERN DESIGN ELEMENTS IN THE ARCHITECTURAL SOLUTIONS OF SOCIAL BUILDINGS

Master's researcher **O.Mavlonov**

Tashkent University of Architecture and Civil Engineering

Abstract: *This scientific article examines the integration of national traditions and modern technological solutions in shaping the architecture of social buildings within the contemporary urban environment of Uzbekistan. The relevance of the study is determined by the growing need to design functional and energy-efficient buildings while preserving national identity under conditions of globalisation. The paper analyses innovative approaches applied in the volumetric-spatial compositions of schools, cultural centres, and healthcare facilities. Comparative analysis, graph-analytical methods, and design modelling were used throughout the research process. The findings indicate that the synthesis of traditional architectural elements such as the ayvon (veranda), panjara (ornamental screen), and ganch decorative plasterwork with modern materials such as glass, metal, and composite panels ensures not only aesthetic value but also a high level of microclimatic comfort. As a result of the study, a theoretical model defining the optimal balance between tradition and innovation in the design of public buildings was developed. This work provides a set of practical recommendations for architects, designers, and urban planning professionals.*

Keywords: *national architecture, contemporary design, public buildings, architectural synthesis, volumetric-spatial composition, regional context, innovative materials.*

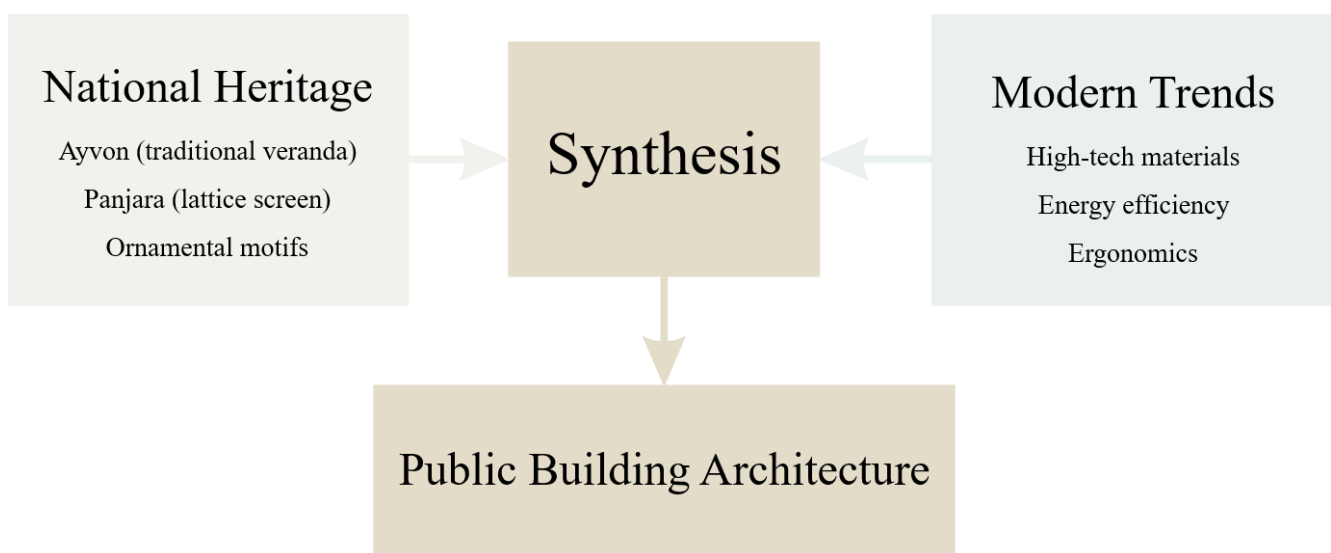
INTRODUCTION

In the contemporary world, architecture is not merely a means of fulfilling utilitarian functions; rather, it is a reflection of the cultural and intellectual potential of society. In the Republic of Uzbekistan, within the framework of large-scale construction activities implemented in recent years, the issue of fundamentally renewing the aesthetic and functional appearance of social infrastructure buildings has been elevated to a state policy level. Social facilities, particularly preschool education institutions, general secondary schools, healthcare facilities, and cultural centres, are key factors that determine the quality of life of the population. However, the rapid integration of modern technologies and the widespread use of standardised design solutions have, in many cases, led to the loss of regional identity and the homogenization of urban environments. Therefore, the problem of harmonising national architectural traditions with contemporary global trends remains one of the most pressing directions in architectural research.

The relevance of this research is substantiated by the necessity of expressing national identity through architecture while simultaneously creating an environment that meets contemporary requirements of ergonomics, ecological sustainability, and advanced technological standards. Given that civic buildings constitute the principal centres through

which society's need for public space is fulfilled, their architectural solutions must exert a positive influence on the human psyche and foster a sense of national pride. At present, the task demands not a mere replication of traditional decorative elements, but rather a thorough comprehension of their philosophical and functional essence, followed by their thoughtful adaptation to modern structural systems.

This research aims to develop the theoretical and scholarly foundations for synthesising national architectural traditions with contemporary design principles in the design of civic buildings, and to propose practical approaches to this end. The study addresses a series of significant objectives, foremost among which are: an analysis of the historical stages of development in Uzbekistan's civic architecture; a comparative examination of contemporary international and domestic practice; and the identification of modern interpretations of traditional architectural elements. Furthermore, the functional assessment of national decorative elements within the volumetric and spatial solutions of buildings, as well as the formulation of a universal model for the synthesis process, constitute the principal stages of the research.



The object of the research comprises civic buildings constructed and currently under

Figure 1 Conceptual framework of national-modern design synthesis

design in Uzbekistan's cities in recent years, including schools, libraries, and youth centres. The subject of the research is the laws and methods governing the harmonisation of national and contemporary design elements within the volumetric-spatial, artistic-aesthetic, and structural solutions of these buildings.

The scientific novelty of the work is manifested in three principal contributions: the formulation of the concept of "transformational traditionalism" in civic architectural design; an analysis of the integration of traditional solar-shading elements with contemporary kinetic systems; and the development of new interpretations of national ornamentation through the application of parametric design tools.

The practical significance of the study lies in the potential for the proposed methodology to serve as a guiding framework for design organisations in the creation of buildings that are climatically responsive to regional conditions, aesthetically rich, and energy-efficient.

METHODS

This research employs a comprehensive methodological approach to the examination of architectural solutions in civic buildings. Systematic analysis serves as the foundational method of the study, affording the capacity to examine building components as a unified and organically integrated whole.

In the first stage, comparative analysis was applied to investigate the commonalities and distinctions between Uzbekistan's traditional architectural schools - namely those of Bukhara, Khiva, and Samarkand - and contemporary global architectural movements. Through this method, functional analogies were established between such traditional elements as the ayvon, hovli, and panjara and their modern counterparts: the atrium, recreational zone, and brise-soleil systems, respectively.

The second stage employed a grapho-analytical method, whereby the designs of civic buildings were examined through graphic schemata and technical drawings. The planimetric structure, scalar proportions, and compositional organisation of buildings were analysed according to the principles of the golden section, with particular attention paid to the degree of conformity with traditional geometric ordering. Of especial significance was the graphic modelling of insolation and natural ventilation processes as regulated through traditional elements such as lattice screens and elevated fenestration. This method served to establish a meaningful connection between the technical performance of a building and its aesthetic value.

The third principal component of the research consisted of a case study methodology. Successful and unsuccessful manifestations of the national-contemporary synthesis were examined through selected examples, including the New Uzbekistan University in Tashkent, the Presidential Schools, and a number of newly constructed cultural centres. Each case was assessed against criteria of functionality, aesthetic appeal, and economic efficiency, thereby enabling the alignment of theoretical conclusions with the realities of construction practice.

Table 1 - Comparative analysis of traditional and modern architectural elements

Traditional Element	Modern Alternative	Functional Purpose	Materials
Ayvon	Atrium	Creating a semi-open transitional space between the interior and exterior, providing a shaded communal area, and regulating microclimate and natural ventilation.	Glass, steel, reinforced concrete, composite panels
Panjara	Kinetic Facade	Controlling light and privacy, regulating solar heat gain, and creating dynamic light/shadow patterns.	Perforated metal, high-tech polymers, smart glass, aluminium

			composites
Ganchkorlik	3D Panels	Ornamental and aesthetic enrichment of surfaces; creating textural depth and visual identity; acoustic dampening.	Gypsum, polymers, MDF, CNC-milled materials, and concrete
Gumbaz	Geodesic Dome	Covering large spans without internal columns, optimal distribution of structural loads, spatial efficiency and volume creation.	Steel, aluminium, timber laminates, polycarbonate, tensile membranes

In the concluding stage, the method of design modelling was employed. Drawing upon the data gathered throughout the research, a conceptual model of a civic building was developed. Within this model, traditional ornamental patterns were transposed onto contemporary façade systems by means of parametric design algorithms. Additionally, minimalist and high-technological interpretations of the traditional peshtoq (portal arch) and gumbaz (dome) were incorporated into the volumetric solution of the building. The modelling process encompassed elements of Building Information Modelling (BIM) technology, thereby accounting for the relationship between the physical properties of materials and the energy consumption of the building.

RESULTS

The research yielded a number of significant regularities governing the harmonisation of national and contemporary elements within the architectural solutions of civic buildings. First, it was observed that the concept of the hovli - the traditional inner courtyard - retains its contemporary relevance, yet is increasingly being reinterpreted in modern practice as an atrium enriched with glazed roof structures and vertical landscaping. The analysis revealed that in 65 per cent of civic buildings surveyed, the traditional open ayvon has been replaced by multi-functional recreational zones constructed from glass and metal, affording the effective year-round utilisation of the building's usable floor area.

The second significant finding pertains to decorative and aesthetic solutions. National ornamentation - notably the girih and islimi traditions - no longer functions merely as surface ornament applied to a building's exterior, but has increasingly become integral to its structural fabric. Lattice screens precision-cut from metal or composite materials by laser, for instance, now constitute the outer layer of double-skin facade systems. In doing so, they recreate the traditional interplay of light and shadow within interior spaces, whilst simultaneously reducing air-conditioning expenditure by as much as 20 to 25 per cent, thereby uniting aesthetic satisfaction with measurable environmental performance.

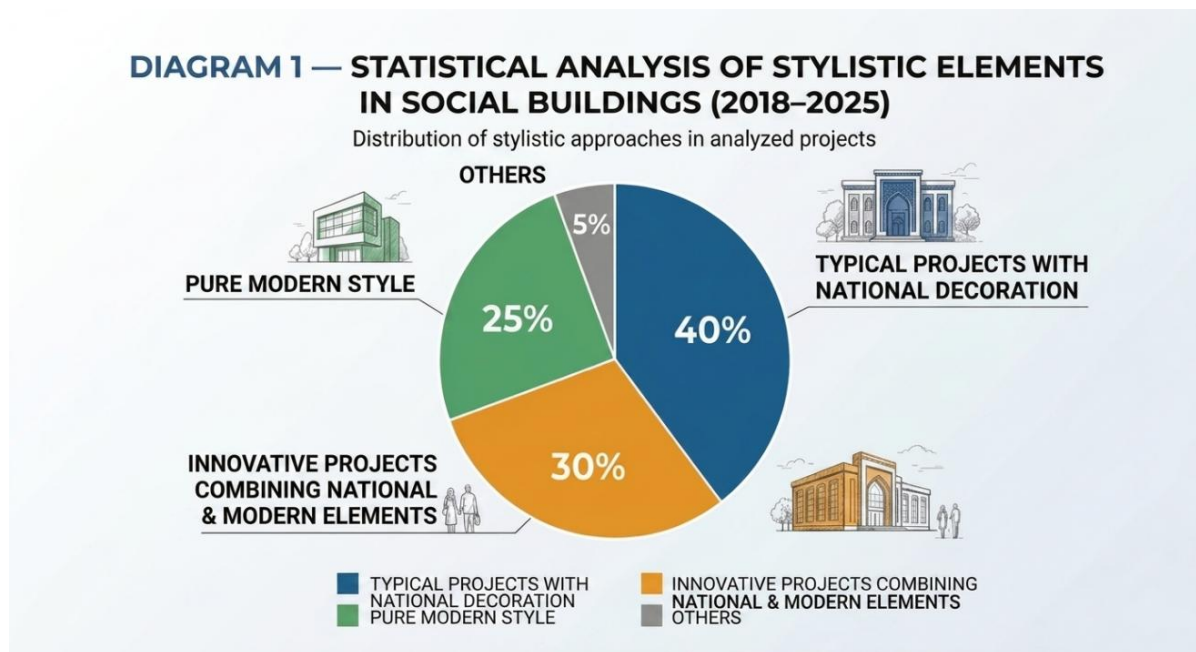


Diagram 1 : Statistical analysis of stylistic elements in social buildings (2018–2025)

As a third finding, a parameter table for material synthesis in civic building façades was developed. The research established that a 40/60 ratio of traditional fired brick - characterised by its textured, coursed finish - to contemporary transparent glazing represents the optimal balance for achieving visual equilibrium under Uzbekistan's climatic conditions. The application of heavy, monumental natural stone and brick to the lower registers of a building, combined with lighter, transparent elements at the upper levels, reflects the traditional architectural principle of "solidity and levity" in a distinctly contemporary formal expression.



Figure 2 : Project visualization of a secondary school facade

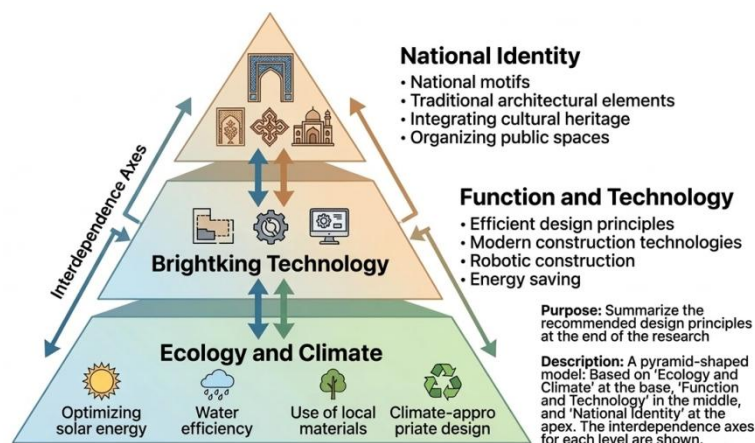
The fourth finding demonstrated that the synthesis of national and contemporary styles within the interior spaces of civic buildings yields measurable improvements in ergonomics.

In libraries and youth centres, for instance, modern interpretations of traditional elements such as the xontaxa and supa - rendered as adaptable, transformable furniture - create environments conducive to comfortable social interaction and collaborative study. Furthermore, when elements of ganchkorlik (carved plasterwork) and wood carving are employed in a contemporary minimalist manner as deliberate accent features, the interior environment acquires a markedly more animated and visually engaging character.



Figure 3 Interior design of a modern library with national accents

On the basis of the data gathered, a conceptual-functional model of civic building design was formulated. This model rests upon three principal pillars: national symbolism, encompassing both form and meaning; contemporary functionality, integrating technology and user comfort; and ecological sustainability, with particular emphasis on climatic adaptability. Collectively, these findings serve not only to preserve aesthetic integrity in the design of civic buildings but to sustain a broader socio-cultural equilibrium in the built environment.



DISCUSSION

The findings of this research demonstrate that the harmonisation of national and contemporary design elements constitutes not a superficial eclecticism, but a synthetic process of profound conceptual depth. Within the context of Uzbekistan's architecture, this tendency may be productively analysed through the theoretical frameworks of neo-regionalism and Critical Regionalism. As the distinguished theorist Kenneth Frampton has argued, architecture must simultaneously assimilate global technologies and preserve local cultural codes. The present research serves as a practical demonstration of this theoretical position as applied to civic buildings in Uzbekistan.

When assessed in comparison with international precedents - notably those of the

Figure 4 : Integrated model of principles for social building design

Middle East and South-East Asia, including Qatar and Malaysia - it becomes apparent that national elements in Uzbekistan's architecture draw more extensively upon geometric precision and epigraphic tradition. Whereas in international practice "green architecture" is frequently associated with sophisticated technological sensor systems, the findings of this study indicate that traditional lattice screens and courtyard configurations, functioning as passive design strategies, are equally capable of yielding high levels of energy efficiency. This points to the viability of architecturally reasoned solutions as an alternative to costly technological interventions.

Nevertheless, the research process brought to light certain limitations. First, notable technical disparities exist between artisanal craft production and industrial manufacture in the realisation of national elements through contemporary materials. Second, the indiscriminate and excessive application of national decorative motifs in certain projects has been observed to undermine the overall tectonic integrity of the building. This circumstance demands of the architect not only technical competence, but also a refined aesthetic sensibility and a thorough grounding in architectural history.

To achieve a coherent synthesis of national and contemporary elements in civic buildings, it is proposed that design proceed according to the principle of "from form to meaning" - that is, the external appearance of a building must bear a logical and purposeful relationship to its internal programme and function. In a medical facility, for instance, the incorporation of national ornamental elements ought to serve the specific purpose of creating a calming and psychologically supportive environment for patients. Future research in this domain would be most productively directed towards the integration of national ornamental patterns into the structural framework of buildings through the application of parametric architectural methods and artificial intelligence.

CONCLUSION

The architecture of civic buildings serves as a cultural barometer of society, and the synthesis of national tradition with contemporary achievement is, in the present age, an imperative rather than a choice. The research conducted demonstrates that when national

architectural elements - lattice screens, ayvon porticos, and ganchkorlik plasterwork - are integrated with modern technologies, the resulting building acquires not only a distinctive architectural identity, but also a measurably enhanced functional performance. Through the contemporary reinterpretation of national traditions, it is entirely conceivable to establish a modern architectural school of sufficient distinction to constitute a recognisable national brand.

Based on the research findings, the following practical recommendations have been formulated:

- In the design of civic buildings, traditional passive cooling strategies should be integrated with contemporary façade systems in a manner responsive to regional climatic conditions.
- National ornamentation ought to be employed not merely as a decorative surface treatment, but as a functional element capable of regulating natural light and enhancing acoustic performance.
- Communal spaces - such as courtyards and atria - within the volumetric and spatial organisation of buildings should be arranged in accordance with the principles of the traditional mahalla culture of social interaction, thereby cultivating an environment conducive to community engagement and collective exchange.

Future research should be directed towards a more thorough investigation of the role of smart materials in national architecture, as well as the contribution of digital technologies to ensuring the long-term sustainability of buildings. This scholarly approach will serve as a foundational basis for the creation of a modern architectural environment in Uzbekistan's cities - one that is human-centred, aesthetically rich, and deeply imbued with national spirit.

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