

Reconstructing Architectural Paradigms: A Critical Re-Evaluation of Spatial Efficiency in Tall Building Design

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Abstract. The global urban landscape is increasingly dominated by tall buildings, necessitating a re-evaluation of traditional architectural paradigms. This study investigates the efficiency of spatial allocation in high-rise structures, integrating advanced computational modeling and architectural theory. Through a comparative analysis of existing designs and innovative frameworks, we identify key inefficiencies and propose a paradigm shift towards more sustainable and user-centric architectural solutions. The findings reveal the necessity of redefining our approach to tall building design to address contemporary urban challenges, emphasizing the importance of adaptive reuse and environmental responsiveness as critical components of future architectural discourse. Our conclusions advocate for a systemic transformation in architectural practices to enhance urban livability and ecological sustainability. This research contributes significantly to the knowledge base of architects and engineers working in urban environments and sets the stage for future explorations in sustainable architecture.

Keywords: tall building design, spatial efficiency, urban architecture, sustainable design, computational modeling, adaptive reuse, environmental responsiveness, architectural theory

Introduction

The rapid urbanization of the 21st century has led to unprecedented challenges in architectural design, particularly in the realm of tall buildings. As cities expand vertically to accommodate growing populations, the need for efficient spatial arrangements within these structures becomes paramount. Urban centers worldwide are struggling with issues such as overcrowding, energy inefficiency, and a lack of meaningful public spaces. This paper argues that traditional architectural paradigms, which often prioritize aesthetics and symbolic representation over spatial functionality, must be critically re-evaluated in light of

these pressing concerns. We present a comprehensive analysis of current tall building designs, highlighting their inherent inefficiencies. Employing advanced computational modeling techniques, we explore the potential for innovative solutions that prioritize both occupant well-being and environmental sustainability. In doing so, we aim to establish a framework for rethinking the design of high-rise buildings that accommodates the complexities of modern urban living. The paper will be structured as follows: first, we will define the key issues faced by contemporary tall buildings; second, we will present our methodology for analyzing these issues; third, we will discuss our findings and their implications for future design practices; and finally, we will offer recommendations for integrating these insights into architectural education and practice.

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References

1. Абдыкалыков, А. А., Маматов, Ж. Ы., Бозов, К. Д., Ордобаев, Б., Кожобаев, Д., Кенжетаев, К., ... & Орозалиев, Б. (2011). Чрезвычайные ситуации. Природные явления. Правила поведения. Ч. I/АА Абдыкалыков, ЖЫ Маматов, КД Бозов и др. Бишкек: КРСУ–КГУСТА.