

# The Effect of Technology to Integrate Aesthetic Desire of Contemporary Architecture with Environmental Principles in Façade Design\*

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**Abstract**— As architecture continues to express itself in the way form is created, the application of a building's skin has shifted from pre-Modern ideas of applied Ornamentation, to the intentional abolition of ornamentation in Modernism (~1920s), and has reappeared in Postmodernism (~1960) and present day Architecture. The advent of the digital era has introduced new tools that provide parametric design of building skins. These skins however, largely tend to be an aesthetic expression of form (or ornament), and rarely meet environmental conditions such as effective radiation control, day lighting or thermal comfort. On the other hand, environmental crisis and interior air quality of buildings has provoked the criticism of the buildings since 1970. In current era, human beings are still in a critical condition in terms of energy consumption, so designing a building that incorporates economy of energy consumption and building environmental protection, is one of the main responsibilities of architects. Façade as a building skin, that is an interface between interior and exterior condition, play an important role in building energy consumption and its interior comfort. Historically, there have been different solutions such as reflective glasses, shading devices and..., applied to building's façade, to address environmental issues but none of them can meet aesthetic desire of contemporary architects. The building skin, as both the building's interior and exterior interface and as the Architect's statement, must be designed in such a way that could address different set of needs. Accordingly, in this study, It is aimed to determine how new technologies can contribute to a synthesis of formal and environmental needs in the contemporary architecture. This research focuses on some case studies and uses analytical descriptions techniques and library documents to determine the impact of technology on environmental and aesthetic needs of contemporary architecture. Results show that new digital tools and technologies have introduced new tools to architects that smooth their design process and allow them to think of different complex forms modeling, their environmental optimization and even their fabrication after design process. Therefore, Architects can implement their formal ideas while complying with the environmental principles, using new technologies.

**Keywords**—Façade; Environmental design; Aesthetics; Digital age; Parametric design