THE IMPACT OF NEW TECHNOLOGIES ON ARCHITECTURE
"RESPONSIVE ARCHITECTURE"

A THESIS

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ABSTRACT

Responsive architecture is a new trend of architecture influenced by new technologies such as nanotechnologies and computer aided manufacturing and robotics, this trend is concerned with the ability of architecture to change in response to external factors as well as the internal human needs, in this part the concepts of responsive architecture will be discussed such as flexibility, mobility , learn ability, and time factor , as well as the initiatives and motivation for such a trend of architecture.

The process through which the system responds to stimuli, whether it is environmental "external factors" or human needs "internal factors", is discussed in three main axes, the first is concerning the embedded computation and how the responsive system is detecting the changes in the context and in the inside as well, and taking the decision how to respond, which takes the research to the second axis concerning the response and the form of motion and its prototyping and typology, and after the response what is the impact of that response - represented in kinetic architecture – on the environment , the human behavior and the economic feasibility of such a technology .

When mentioning the term "responsive architecture", a lot of architectural functionalities are described as such. Each one of them seems to correspond to different parts of a construction, to the inner part, the outer, specific elements like shades or even appliances and therefore terminology can only be different for every case.

In architecture of time-based transformation, Projects vary from speculations about large long-term landscape transformations to the construction of 1:1 responsive and interactive installations.

Accordingly in this research, Responsive architecture will be discussed on the scale of the whole building whether it's portable or rotating, and the scale of the structure including movable bridges and retractable roofs, and the scale of the façade; including mechanical units and illuminating facades, to the scale of the responsive and smart materials.