Abstract

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Resilient Rules - Culture and Computation in Traditional Built Environments

This study explores the influence of the socio-cultural rules, based upon Islamic jurisprudence (fiqh), on the complexity of the traditional built environment. This system of rules organized the societal activities, including decisions and activities related to design and construction in the Arab-Islamic city. Considering the city as a complex system, the study will try to show how this rules system made the Arab-Islamic city resilient and adaptive. Complex Adaptive Systems (CAS) are nonlinear, self-organizing systems that have the ability to adapt to changing conditions through changing the rules that organize the random autonomous interactions between agents in the environment. This adaptation takes place through gradual gained experience that is reflected in the behavior of agents. This study attempts to interrelate different bodies of literature (resilience theory, complexity theory and urban sociology) in a single framework that aims to show that the socio-cultural rules system based on fiqh was a major factor in the resilience of the traditional built environment. These interrelations are illustrated using a graph called Computational Rules Graph (CRG). The CRG relates the traditional rules system to attributes of complex and resilient systems in a graph that can be modeled computationally. Traditional rules (codes of conduct) are of a proscriptive (non-deterministic), defining what is prohibited, thereby producing autonomous environments where agents had control over their immediate environment. In comparison, contemporary rules of the built environment (building codes) tend to be prescriptive (deterministic), subscribing definite actions that need to take place by the stake-holder (agent) neglecting user needs and preferences. The application of these traditional rules system increased the agent's autonomy and freedom of action. It also helped establish stronger social networks among agents, which resulted in a resilient environment.