COVID-19 and digital transformation: developing an open experimental testbed for sustainable and innovative environments using Fuzzy Cognitive Maps

Climate Action Solution Category	**Nature 4 Cities**
Sustainable Development Goals	**Goal 13 - Take urgent action to combat climate change and its impacts**

Summary

This paper sketches a new approach using Fuzzy Cognitive Maps (FCMs) to operably map and simulate digital transformation in architecture and urban planning. Today these processes are poorly understood.

Background and Objective

Today these processes are poorly understood. Many current studies on digital transformation are only treating questions of economic efficiency. Sustainability and social impact only play a minor role. Decisive definitions, concepts and terms stay unclear. Therefore this paper develops an open experimental testbed for sustainable and innovative environments (ETSIE) for three different digital transformation scenarios using FCMs. A traditional growth-oriented scenario, a COVID-19 scenario and an innovative and sustainable COVID-19 scenario are modeled and tested. All three scenarios have the same number of components, connections and the same driver components. Only the initial state vectors are different and the internal correlations are weighted differently. This allows for comparing all three scenarios on an equal basis. The Mental Modeler software is used. This paper presents one of the first applications of FCMs in the context of digital transformation. It is shown that the traditional growth-oriented scenario is structurally very similar to the current COVID-19 scenario. The current pandemic is able to accelerate digital transformation to a certain extent. But the pandemic does not guarantee for a distinct sustainable and innovative future development. Only by changing the initial state vectors and the weights of the connections an innovative and sustainable turnaround in a third scenario becomes possible. Read more: https://www.scienceviz.com/