
How to Model Our Future Cities?



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The representation of the city we need is a mystery to us; now, without that vision, we "mutilate" urban value.

The novel *Frankenstein* written by the English author Mary Wollstonecraft Shelley describes the creation of a poor wretch. The premise is that a sum of organs could create a human being. Shelley wanted to write the best horror story and she succeeded.

“Smart” buildings, “intelligent” transportation systems and “smart” airports are all isolated projects (managed by independent departments) which leverage the use of technology to create new urban value in a city being modernised and often called a “smart city”. Like Frankenstein, the sum of isolated “smart” urban projects creates a so-called “smart city”!

A city is not a sum of things. Vibrant cities are a complex system of systems (and not a set of sets) which rely on economic, social and environmental interconnected values with the **goal** to support urban sustainability.

In the history of ideas, Aristotle was probably the first to point out that the whole is more than the sum of its parts. Blaise Pascal wrote in *Pensées* 72,

“since everything then is cause and effect, dependent and supporting, mediate and immediate, and all is held together by a natural though imperceptible chain, which binds together things most distant and most different, I hold it equally impossible to know the parts without knowing the whole, and to know the whole without knowing the parts in detail.”

Our traditional urban management fails (congestion, pollution, waste of energy) and urban governance struggles (siloes urban organisations and operations, economic pressures) because they rely on an incorrect model of representation of a “city”. Urban leaders ask the wrong question, “What is a city?” when no unequivocal answer exists and then design their city as a set of independent organisations. To find the next model for our future cities, we need to answer different questions.

A better approach to designing and creating value in future cities should consider: 1) What does a city do? 2) How is the city organised? 3) What will the city become?

1. What does the city do?

Cities are characterised by activities, including the planning of new districts to face growing urbanisation, the reorganisation of the transport network to ease congestion, the distribution of public water and electricity to all inhabitants, environment management and providing law enforcement. These examples show that goal-directed collective actions in a city (or an urban area) cannot be managed by a single department or agency. It is a **collaborative work between silos** such as security and safety, transport, utilities, city mayor’s administration, government agencies and ministries, involving non-governmental organisations (NGOs), citizens, businesses, tourists, etc.

As such, the modelling, design and implementation of a collective effort in a city can be perceived as a complex process. **Le Moigne** says, “a phenomenon is said to be perceived as being complex when it has the following property: no single finite model, no matter how large, how complicated, how stochastic, etc., it may be built, seems capable of representing exhaustively that phenomenon.” **Edgar Morin**, in his work on complexity, explains that reducing the complexity of a situation (as we do when applying a Cartesian approach to solve urban challenges) will mutilate its understanding and make it even more complex (so that it will no longer be possible to understand the situation and solve a challenge).

2. How is the city organised?

Experience shows that if the context in which the action takes place is not properly considered during the design process, its implementation will fail (such as satellite cities and many Greenfield cities launched since 2007 in Asia and Middle East). For example, when designing a city platform (like a few cities are currently planning) only the selection of an appropriate methodology adapted to complex system modelling will provide the conceptual tools for modelling in the context of the environment of the city. For cities, the holistic approach needs to be replaced by a systemic approach. Such new approach in the urban environment reveals that the governance of the city of the future needs to change to include co-operation and collaboration between departments and so, the design of a systemic urban management system. Cities need to innovate their governance (the Leipzig Charter on Sustainable European Cities recommended in 2007 to develop integrated urban development) or they will stagnate (cities continuing with a silo approach).

3. What will the city become?

Each city needs to do its own analysis and modelling. All the axioms defined along this analysis will constitute the new paradigm of the systemic urban governance of the city. It will show that the current organisation is based on segmented decision centres and a more efficient one should rely on a collaborative and systemic governance to support urban sustainability. Because you cannot manage what you cannot measure, thanks to forthcoming technologies, the management of cities can be improved using ICT solutions and an urban digital transformation strategy.

China wants to find its typical future Chinese city. Each city has its own culture and heritage, and is shaped by international trends and local challenges. When defining its strategy to create future urban value, the city shall consider what it wants to become. Cities are unique and need a unique vision based on national strategies like the 2020 plans in Europe, India and China, or the 2030 plan in the Kingdom of Saudi Arabia.

Industry has business objectives and the way the industry models the city will determine its ability to design and develop urban value solutions and products. For example, the ICT industry has its proprietary models of a city (based on set of sets, puzzles of IoT trees and layers like fog, cloud, applications), so the manufacturers have designed different types of city

management platform. We understand that if the manufacturers used a holistic approach or a Cartesian approach they have mutilated the representation of the city: like Frankenstein “seeing” the human body as a sum of parts and not as a person with interconnected parts. In “smart” models, the city is represented as a sum of departments and not understood as a whole. The “smart” cities as designed nowadays are like a “Frankenstein city” where networks of networks are forgotten, where happy citizens are replaced by “happy sensors”. The model of the “city of the future” is not yet defined and will not be unique like “one fits all”.

To become sustainable and **human centred**, the model of our future city should be analysed from a systemic perspective and not built from as a sum of siloed projects and departments.

Just ask yourself in which city you would like to live and why, considering these three questions.

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