

## "The tale of two smart cities"

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### Abstract

*Ante Scriptum: Every leap of development or revolution in the history of human civilization had as its preamble a period of theoretical searches and confrontations, which were the catalysts of the respective shifts in the historical paradigm. Theorizing has its purpose, and the aim of this paper is to pave the way for an adaptation of architectural theory to new concepts related to the smart city model. We also investigate the predictability of the destiny of the smart city organism and the possible directions of morphogenesis. This article was translated from Romanian by the author.*

*The study is based on revisiting the concepts of place and limit with new connotations developed by technology that has a mediating role vis-à-vis the individual and communities. By redefining them, the concepts acquire characteristics of variables or mathematical functions, which can effectively study or generate future behavior patterns of smart cities, these dual territorial entities, with body and, here, an artificial intelligence AI (IoT, applications, cloud, software). One of these models is the theory of catastrophe, which can predict the limits of acceptance of phenomenological saturation (in the philosophical sense of Jean-luc Marion) by the individual, or in extremes, by society. We will describe how the theory of catastrophe can be applied using notions of quantum architecture theory, and how the philosophical system of donation described by Marion can help draw the boundaries of the existence of the smart city.*

*The approach is theoretical using inference, observation and exemplification through case studies. The research methods can only be of an eclectic and interdisciplinary nature, linking the theories of architectural atmospheres, of the donation of phenomenological philosophy and of applied mathematics. The method of translating into quantifiable variables the values of place and limit, is based on the loading of the notion of place of Christian Norberg-Schulz, with valences connected to the specificity given by the mediation of technology between individual and place.*

*The results are models of behavior of a bivalent nature, philosophical and mathematical, to describe a new theory of architecture, a theory of the smart place. This type of architectural place with its set of parameters, is a*

*new element of study, in continuation of research in the field of architecture aimed at reducing risk and preventing losses from hazards that threaten this smart city, either anthropogenic or natural.*

**Keywords:** *smart place, smart limit, saturated phenomenon, catastrophe theory, smart atmosphere.*

## **1. About places**

A new association of forces between the theory of architecture, with its predominantly phenomenological approach, and the study of the development of smart cities with the issue oscillating between performance and ethics, is likely to create a new research space, that of smart place and limit with a dual methodology, humanities and mathematics.

The theory of architecture offers us some famous examples of defining the place, coming from various fields of interest. At first sight, the word "place" –" loc (Romanian)" seems easy to understand and is frequently used, being part of the main vocabulary of the Romanian language, having here a clear etymology from Latin, respectively "platea-plateae" or "locus-loci" [1]. The first definition on-line appears to us unequivocally: "a place is a particular position, point or area in space; a location". Here is the fountainhead of the search for meaning: a first critical question arises, namely, "determined by whom, in what way, for whom?". Another, more provocative question: "which space?". The hermeneutic adventure begins here, because place and space are basic concepts of architecture.

A simple exercise would be to try to offer this so familiar word some definitions of equivalence: place is a physically and theoretically delimited space; the place is a uniquely identifiable area; the place is a unit of measurement of perception in architecture. As we get closer to the essence of its definition, we introduce new concepts that take us even further away from it, in a pattern of a "strange loop" [8]. If we were to choose a poetic definition, the place could be seen in the manner of the American writer Robert Pogue Harrison, in the tradition of the same strange loop. "*In the fusion between place and soul, the soul is a recipient of the place to the same extent that the place is a recipient of the soul*" [4]. Can we find satisfactory definitions for this concept? Like any concept, it evades us, and all we can grasp, as a continuous or serendipitous feature of the place-thing, is its identity. "*If we think of belonging together in the customary way, the meaning of belonging is determined by the word together, that is, by its unity. In that case, "to belong" means as much as : to be assigned and put into the order of a "together", established in the unity of a manifold, combined into the unity of a system, mediated by the unifying center of an authoritative synthesis*" [7] - if we are willing to link the concepts of identity and place, we find the first in Heidegger assimilated with the previously cited notion of "belonging-together" [6] and the second extended to the broader idea of topology by the same thinker. We thus remain prisoners of a hermeneutic circle.

In order to befriend this abstract "place," we can bring it closer or appropriate it by adorning it with limits. The previous statement may seem out of place, but just

as we can only describe an unknown person through attributes that limit the degree of ambiguity for a third party, so we can define a place by fixing it within its limits. We can explain spatial limits (neighborhood, park), cultural limits (areas loaded with a unifying tradition), exhaustive limits (coordinates of the nature of longitude and latitude to define an exact geographical position) or atmospheres (places of street events, occult or deification gatherings). Another kind of limitation is the concept of Christian Norberg-Schulz, so well-known to the world of architectural theorists, *genius loci*. Originally, a Latin term that translates as a spirit of those spaces that are inhabited or dedicated to human activities, being a supernatural entity adored in the Roman religion: "nullus locus sine Genio" (*Vergilii Aeneidos Commentarius*). The Norwegian theorist nostalgically redefines this *genius loci* for the theory of architecture. A concept very adaptable to cultural entities, which draws its juice from the eloquence of tradition and is invoked to justify and imagine architectural atmospheres, helping to identify a place in relation to another, thus limiting it, but retaining its ephemeral and immaterial character [15]: "*Architecture means to visualize the genius loci, and the task of the architect is to create meaningful places, whereby he helps man to dwell.*" [16]

Here is how we managed to highlight a symbiosis between place and limit, in which the first has the role of introducing the limit in space so that space can be appropriated, lived through *Ereignis*; "*A space is something arranged, ceded, liberated, namely in view of a limit, in Greek peras...Space is, by its essence, what is arranged, what is introduced into its limit.*" [5] The way in which this appropriation happens as a phenomenon is in architecture by edification. We see edification as more than mere construction, namely as construction augmented through representation. We can even see an interesting solution to the problem of the birth of architecture as follows: architecture appeared with the first construction bearing the intention of representation. (We can thus bravely frame the cave of Lascaux in the field of architecture arguing its character of representation, of edification through art, and we can exclude bold constructions like Emley Moor Tower for the lack of this representative character).

### 1.1. *The smart place*

We see that the place is neither obsolete nor negligible a notion in the field of architecture or urbanism, therefore it must be of interest and in connection with the study of smart cities. After all, the smart city starts from a material structured framework dominated by the laws of architecture and construction engineering, invaded then by the overlapped, complex and interdependent systems of urban life: transport, infrastructure, administration, education, health, recreational activities, representing the vegetative nervous system of the urban body. But the smart city has a new feature, which we can assimilate with its own central nervous system. It is about the ability to synthesize large volumes of data collected from various sources using advanced technologies (IoT, applications, sensor systems, video camera systems), by processing them, in order to generate solutions and adapt real-time urban functions. The premises for defining a concept are met: the *smart places*,

which unite the field of interest of the place as an essential working concept of architecture, with the database generated by it in real time and with the effects of analyzing this amount of data, respectively self-regulation capacity.

Such an intelligent place has three main characteristics:

- **The architectural origin**, i.e. the geographical location and the built ensemble (together with physical infrastructure necessary for their functions) dominated by one or more defining landmarks (here is an example: Piata Victoriei in Bucharest, with its iconic landmark Victoria Palace of the architect Duiliu Marcu-1937);
- **The architectural atmosphere** that gives it *meaning or heading*, this meaning can be one of attraction or rejection with all intermediate degrees, including that of indifference, depending on individual perception or public opinion at a given time; this intuitive assessment of the local atmosphere was linked both to peripheral perception [16] and to the relationship with political power [2]; we might justify the association of an atmosphere with the place of the smart city by the common character of novelty of the two concepts; the study of architectural atmospheres is a relatively new field of interest that emerged as a reaction to a modernity dominated by geometry, technology and industrial standardization.
- **The patrimonial value** or the prediction towards a certain type of patrimonial value in the future; patrimonial value is no longer an uncertain and unfocused concept; it has been subjected to an evaluation system (such as the one proposed by Prof. Dr. Arch. Hanna Derer et alii) that generates a certain numerical quantification, by summing up the specific values of the various aspects related to patrimony. In our view this value should have two components, one with roots in the past, and one with expectations for the future. We propose to follow a criterion of aesthetic resilience in the design of new buildings.
- **The volume of data** generated, received and inferred together with the variation of this volume over time, a matrix characteristic of quantitative type, with its value dependent on its own factors: population fluctuation, temporal / historical evolution, state of operation of the system, physical or ethical availability for data transmission (use of LPWAN, Bluetooth, Lora WAN, LTE, NB IoT, Cat M and anticipated 5G technologies).

From the point of view of these three components, we can assimilate an intelligent place with the concept of Euclidean mathematical vector, with its four components respectively origin or tail, direction, head and magnitude. The concept of the smart city together with its areas of influence can be defined as a vector space for the existence of smart places.

### 1.2. The intelligent limit

Urbanization is a large-scale phenomenon with a permanent character; 54% of the world's population lives in urban areas, with chances that by 2050 this percentage will evolve to 66%. According to these calculations related to the growth

of the world's population, urbanization will add another 2.5 billion inhabitants of the cities in the next three decades [9]. These data force us to visualize the types of behavior of smart places, one in relation to another or in relation to the smart city, their vector space.

The defining element of the place as seen in the theory of architecture, is the limit, the boundary. *"Something is insofar as it has borders. The act of enclosing is the supreme ontological act. (...) The appearance of the border (...) is equivalent to the act of birth of the being. One thing is, absolutely, as long as it persists within its boundary, and it ceases to be with its disintegration"* [10]. We therefore justify the existence of the place-thing by the existence of the limits that separate it and identify it from other places. But how can we explain a limit to the *smart place*? It is not limited to the geographical place or its construction, but to an entire ephemeral and permeable virtual structure, through its ability to influence other places and other systems, or to influence itself, to self-generate. This structure is based on the head, direction and magnitude of the intelligent place. Influencing other intelligent places and influencing oneself, we find here the bases of visualizing a model that connects by inferential determinations, all intelligent places globally, recurrently, and based on technologically generated algorithms.

Through these characteristics, namely:

- A simple and recursive definition - cause-effect determination.
- Irregularity given by the atmospheric character but also by the wide range of influences in the system, from the minor ones (lighting of the street lighting according to the natural light intensity sensors) to the major ones (modeling the post-hazard administrative response).
- A fine structure at arbitrarily small scales, given by the capacity for self-regulation through subtle mechanisms (information transmitted - analysis - self-regulation) down to initial informational levels.
- It is stochastically similar.
- We assume the Hausdorff dimension to be larger than the topological dimension (we can predict the Hausdorff dimension to be similar with that of the Brownian motion, which tends to 2).

We find a starting point in beginning the research of the intelligent limit by applying fractal theory. Smart limits can be researched and understood as fractals.

### *1.3. Beyond place and limit*

Architecture must be approached as a scientific discipline, because talking about architecture no longer means talking only about buildings, but about complex systems and processes within or between them. The high artistic side of architecture, which enhances its cultural value, overlaps a core dominated by the exact sciences, subject not only in a limited sense, but in an exhaustive one, to a way of thinking based on inference and experimental or theoretical demonstration. This artistic side has a lead role in defining architectural identity, which makes it for the scientific side of the approach what quantum theory is for the theory of relativity. The challenge resides in finding a unifying theory.

Its place and limit, as essential concepts of architecture, would be interesting to study with methods that belong to science, especially when seen through the prism of cybernetics and state-of-the-art technologies pioneered in the smart cities implementation.

The functioning of an *intelligent place* can be seen by analogy with that of a living organism: it generates data and information, even having the ability to synthesize them, while it can be experienced both physically and digitally; at the same time, it gathers information, it metabolizes the data and can self-regulate accordingly. We can not talk about reproductive capabilities, but an interesting phenomenon is observed, especially in recent months dominated by the effects of the pandemic: an intelligent place can be projected outside its physical boundaries, in countless replicas, and can be partially perceived or experienced visually, audibly and informational from any distance, through technological interfaces and with the help of the common will of the members of society. We can talk about places that already virtually circumscribe multiple other places, with a globalizing tendency of the *smart place*.

The role of *the intelligent limit* is even more interesting, somehow resulting from this virtual generalization of the place it brings into existence. Permeable or perhaps repressive, discretionary or imposed, *the intelligent limit*, by its fractal character, could in itself be an object of study. The phenomena of information exchange make it possible for the collected data to be used in any other intelligent places that depend on this data. We can adjust the level of street lighting according to sensors that measure the intensity of natural light, but the data provided by these light sensors can be used at the territorial level in conducting studies on the evolution of alternative energy systems, or global studies on the qualities of the atmosphere or the effects of climate change. These studies will return data to other smart place systems, or back to the first system, the original smart place. *The limits of the intelligent place* are, in the extreme, subject to disintegration, paradoxically, for the benefit of the smart place's prosperity.

The globalization of the intelligent place in parallel with the disintegration of the intelligent limit, here is a phenomenon bearing the potential of ideological anthropic hazard.

## **2. The atmosphere of the smart city**

The visual seems to have supremacy in the perception of the architectural place, even if the origin of all the senses, including the visual, is biologically in the tactile sense. [14] At least that's what was said about the visual and tectonic aspects in recent architectural theory. But surprisingly, if we try to remember a place of our childhood, we will be surprised to discover that the evocation of that place contains very few visual details, and that it is characterized more by emotions, scents, textures, intuitions, cultures, of a way of presence in the world that we can comprehend in one word: the atmosphere of the place. This atmosphere is currently being researched, yet not enough theorized or quantified, but intuitively understood

by many as a New World that architects must conquer in order to create meaningful spaces.

We can take steps to understand it, even to anticipate it, when we study its relationship with the social, within the ecosystem of the smart city, as a smart atmosphere.

### 2.1. The identity of the smart place

Let's detail. The existential space of architecture, made up of patterns, centers, directions, roads and domains, is enriched with this genius loci. This existential space manifests itself phenomenologically on four concentric hierarchical levels: the geographical one, the urban one, the one of the dwelling (house) and the last one, of the work [5]. The next level, which we can place either before the geographical (meta geographic), or after the work (ueber - Ding), is the level of information, a kind of alpha and omega that transforms the former hierarchy into a circle. A circle that must have human life at its center, as said by architect Tina Saaby, who until 2019 held the position of chief architect of the city of Copenhagen. It stated in its presentation in 2013 that *"we must consider life before the urban space, and urban space before buildings."* [18]

A place is such an existential space, defined by the limit of the corresponding space experienced over a time limit. A smart place is similarly delimited, and in addition digitally enhanced. The value of any place in architecture is given by identity, in the case of the smart place, this identity is both architectural and intelligent, the value of the place being a variable position in a Cartesian control field.

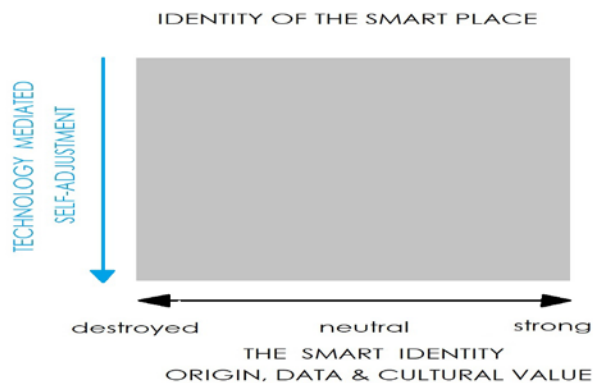


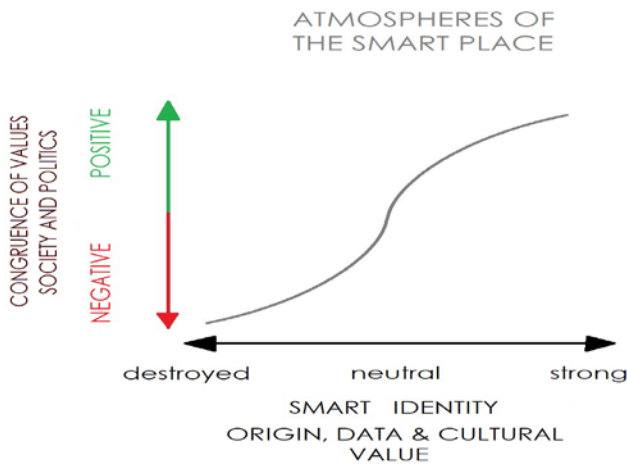
Fig. 1. The identity of the smart place

### 2.2. The relationship with the governance

Obviously, when the political power has in view democratic and sustainable urban development objectives, and should these objectives be pursued in an ethically way, the architectural identity of the place will be preserved or refined; the identity will not be reduced to the picturesque elements of heritage, but will be

extended to the new constructions that house functions endorsed by means of technology, resulting in a certain quality of the smart atmosphere of the place.

Ethical policies are those with a congruence between the values of society (prosperity, culture, quality of life, quality of environment and the transmitting of a range of traditions) and the values pursued or obtained through the control and self-regulation programs of the smart city. Ethical urban development policies will aim at preserving the identity of the place, in order to generate, in society, the feeling of belonging-together; another aspect of ethical policies is that they approach the place with its architectural identity, as a reference system for future generations, predicting and preparing the atmospheres of the future.



**Fig. 2.** The atmosphere of the smart place.

The architecture of the smart city must focus on the quality of these atmospheres and of urban life. [18] The mission is all the more complicated as beyond this quality desideratum, it superimposes on the design with distant future objectives, ensuring the flexibility in time of the architectural functions, together with the fulfillment of other special criteria such as the use of construction materials permeable to LPWAN or adapted to future data transmission technologies; these architectural functions already have and will develop over time their own technological infrastructure (for example we can assume that CAD design in BIM will create models of whole cities, in order to study their reactions to various internal and external factors) that will make accurate predictions of immediate or future needs, prediction based on ceded and inferred data.

But if we look at history, we see that governments, companies and individuals have placed great value on the information they hold, always treating third-party access to it with great caution. The exchange of information has an inestimable value in the existence of the smart city, and the concern for security threats and privacy can only erode this foundation on which the smart city is based: the identity of the

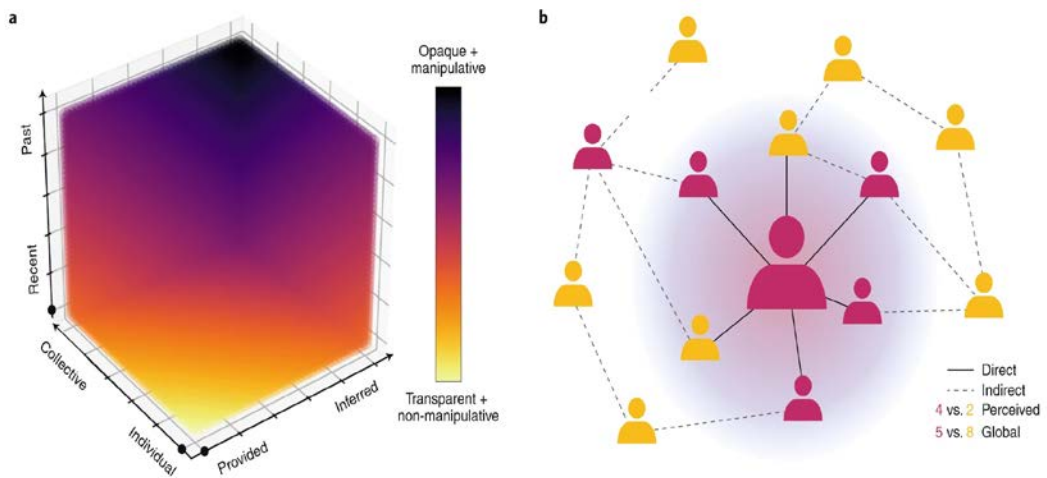


smart place. Is the increase in the exchange of information for the purpose of self-regulation a risk factor? This remains to the date an open question.

### 2.3. The saturated phenomenon and the smart city

In order to introduce the method of this investigation, we first propose to find, in the spirit of architectural theory, a phenomenological justification of the type of relationship between society and technological development.

Of course, when asked at one point, no one will oppose or see a danger in interpreting the data related to a specific place, as long as it is assumed that the goal is an improved quality of life. Sometimes even those data related to the individual privacy are transferred for collection to third parties without the owners intuiting the overall value of the models influenced by them. [9]



**Fig. 3.** „Challenges in technologically curated environments and on social media platforms.

a. Dimensions of knowledge reached by information technology, which makes their recommendations opaque and manipulative. b. The size of the perceived group in relation to the real global dimension, from the point of view of the user (center) in a social homophile network”

**Source:** <https://www.nature.com/articles/s41562-020-0889-7/figures/1>

The smart place will generate far more information exchanges than individuals taken separately. And, as with individual users, previous selections of self-regulation as a whole make the phenomenon of nudging possible. They make manipulation possible in the smart place.

The governance of the smart place can use these technologies for purposes that serve the community, or for manipulative purposes, at all levels of interest, local, regional, national, global. Or it may itself be the subject of this manipulation. *“There are at least three areas where these technology platforms go far beyond human cognitive abilities: data that refer to periods from the recent to the distant past, (for example, years of history of a physical place on Google Maps), information about*

human behavior at the collective level, compared to the individual level (for example, the analysis of the preferences of millions of Amazon customers that may be the basis for recommending a particular product or software) and knowledge gained through technology-specific deduction methods, based on existing data collected (for example, learning gastronomic preferences according to the pattern of travel related to the restaurants of a certain place). "[9] What if the local historical data interpreted were those related to political protests? Imagine them correlated with behavioral patterns given by Big Data. Can we witness the manipulation of decisions to accept certain technologies, certain smart places, in taking advantage of the dissipative approach to smart limits, in order to create unethical gaps?

A branch of philosophy concerned with donation (in the sense of giving) that has in the center the figure of Jean-Luc Marion, with a particular theory about a certain type of phenomenon called saturated, will provide us with the framework for the type of perception of technology we have in mind. By comparing it with the act of contemplating an art object, more precisely a painting signed by Mark Rothko, as a particular case suggested by Marion. A work of art looks at us with intensity, creating an exclusive and enslaving connection, capturing our full attention in such a way that nothing will escape the admiration seeking vortex, uniquely directed towards its essence. This is an essence that radiates so intensely that it melts the artist's personality and any resemblance to the immediate reality. The essence removes from the ambience any rival who would compete for attention, reaching "*such an intensity that often saturates the capacity of (...) sight, and even exceeds this capacity.*" [12] Marion calls this type of essence - the idol.

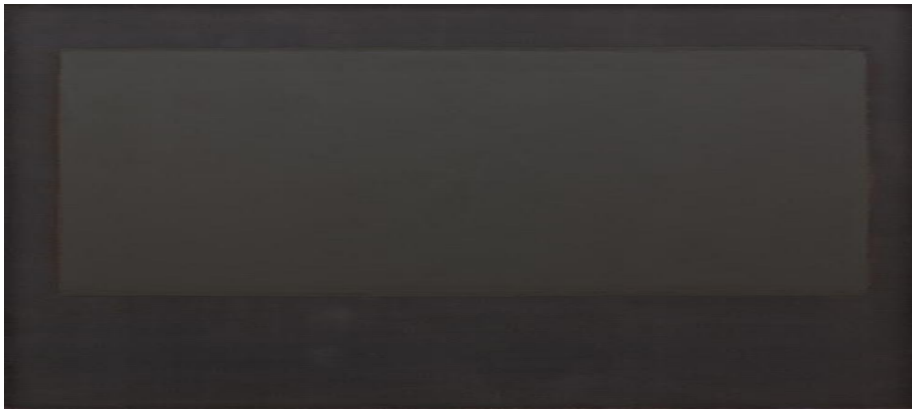


**Fig. 4.** Vladimir Rothko - Black Canvas at NGA 2010 - In the Tower

*Source:* Courtesy of Author Matthew Langley

[https://i1.wp.com/www.matthewlangley.com/blog/uploaded\\_images/rothko\\_front-769229.jpg](https://i1.wp.com/www.matthewlangley.com/blog/uploaded_images/rothko_front-769229.jpg) [9]

„Name your idol and you will know who you are.” [14, p.61] The theory of architecture with its recent phenomenological aura, gives us the chance to study intelligent places and their limits as a support area for the manifestation of the idol generated by this technology that exceeds by far our intellectual abilities. I would like to paraphrase a statement by the same Jean-Luc Marion, whose theory of donation and the saturated phenomenon we consider adaptable to the study of behaviors generated by technological domination. For intellectual pleasure, I replaced "art" with "technology", obtaining defining statements at the extreme limit for a new religion, the one that deifies technology. (The artist chosen by Marion in explaining his thinking, Mark Rothko, is also a visionary, we can formally assimilate the image of the painting with the appearance of a closed iPad. Fig.5)



**Fig. 5.** No. 2, 1964, mixed media on canvas, 266.5 x 203.2 cm (105 x 80 in.),  
Collection of Robert and Jane Meyerhoff,  
**Source:** [www.nga.gov](http://www.nga.gov)

*"Raising information to the level of the original, in fact to nothing more and nothing less than the imperative origin of phenomenality, that is, the position and place of work in the world."* [14, p.63-64], here is the premise of the saturated phenomenon related to the adoption, contemplation and blind pursuit of technology. *"In this way the idol is realized: the visible interface, which the eye cannot pierce and abandon, because it saturates it for the first time, capturing all the admiration."* [14, p.60]. Or really simply put: abundance of information will lead to sabotage of attention.

Contemplating technology and completely abandoning it takes the form of a saturated phenomenon. But how does this happen in the smart place? Is this idol benevolent or unpredictable? How does the worship happen?

#### *2.4. The idol of the smart city*

, *"Logic is a poor guide compared to custom."* said Churchill in a famous speech back in 1943 [23]. The sentence was designed to convince the audience that the destroyed room of the House of Commons must be restored exactly to its previous

shape after being bombed during the war, not enlarged and transformed from an oblong plan to a more modern circular plan oriented towards a center of interest. Churchill was an advocate of a tradition based on a sine qua non habit of the human essence - direct (sometimes even verbal aggressive) confrontation - and on embracing diversity of opinion as the fundamental of democracy.

However, for the time being, pure logic seems to be the principle of the existence and development of technologies in relation to the intelligent place. The logical non-debatable inference, manifested in a fractal way, up to the fine lacework of the structure of human behavior. Where can this logic fail? Is there an existential space that will escape the control of logic and thus become unpredictable?

Catastrophe theory (TC) is a method of modeling the discontinuous phenomena of dynamical systems. It is the one that studies the sudden change of the defining essence of a system, in the conditions in which the applied forces have a fine and constant increase. A dam, for example, under constant increasing pressure, will retain its original shape until a certain moment when its conformation will be suddenly and completely changed when it breaks. A society that keeps its balance in difficult conditions until all the frustrations repressed by a revolution spill over. This mathematical theory also explains natural phenomena, such as the particular perception of the moon's twinkles on the waves of a lake at night, always in pairs of bright spots. [3]

When we apply continuous forces, we expect continuous effects. But when discontinuous phenomena occur, when they have an impressive magnitude or are devastating, we call them catastrophes, hence the disturbing name of catastrophe theory. [3] Discontinuous behavior of dynamical systems was started by mathematician Rene Thom, and the theory already has behavioral or ecological applications. We will model the dynamic system of intelligent atmospheres according to this theory.

### **3. The story of the two smart cities**

We saw in section 2.2 how the atmosphere depends directly on preserving the identity of the place and the political ethics reflected upon society. In section 2.1. we identified a field of variation of the identity of the intelligent place, by coordinating characteristics related to the volume of information generated, collected and deduced (a volume of information exchange) with the architecture (site, cultural value, quality of life).

Catastrophe Theory (TC) has the quality of providing us with support for our intuition and describes, in a convincing way, how the concomitant meeting of certain conditions will generate a possible, quantifiable and predictable bifurcation of social behavior. In the complex context of the smart city, the future of collaboration between technology and society is of interest, this collaboration can take several forms: rejection (from moderate to vehement or revolutionary), harmony, manipulation. The word collaboration is used to emphasize the significance of personifying technology in context, alluding to the latest research related to AI).

This mathematical theory helps us to analyze how allowing the increase of control exercised by technology (this indisputable idol (even mediated by socially

sustained political moderation) can affect the evolution of smart city atmospheres, by creating conditions for jumping (negative or positive) in the degree of social acceptance of this control.

The identity of a smart place (city) can vary freely between two opposite boundaries. We assimilate the positive value with a strong identity, sustained over time by the continuity of collective memory, a real cultural importance and the authenticity and multitude of data in local and foreign exchanges. These cumulative characteristics can be visualized in the form of a three-dimensional urban mandala, the three dimensions being geography, culture and information. The negative value is given by the dismantling of the feeling of belonging, by the loss or destruction of cultural values and by the nonexistence or lack of credibility correlated with the manipulative intentions of the information exchange. Between these two extremes, identity passes through a value range of the *no man's land* type which in our conception does not constitute a minimum of identity, but a neutrality specific to new places artificially implanted or born from tradition but inorganically rehabilitated, without authentic cultural landmarks or that can be appropriated in time, governed and administered by scientific methods and technology.

The stronger the place has an identity, the higher the degree of coordination of social aspirations with the ethics of local policies. The more the identity of the intelligent place is lost even to the point of annulment, the more frustratedly the place will be dwelled (in the sense of experienced), the more rejected and left to decay it will be (disintegration, depopulation, crime) through unethical policies.

We will add a new variable, in this dynamic ensemble, namely the growth of self-controlling capacity of the technological system, the degree to which the regulation of the urban system is ceded to it, and, at the same time, the number of freedoms given up in order to fulfill an atmosphere of perfect harmony and functioning, which is the goal of any administration.

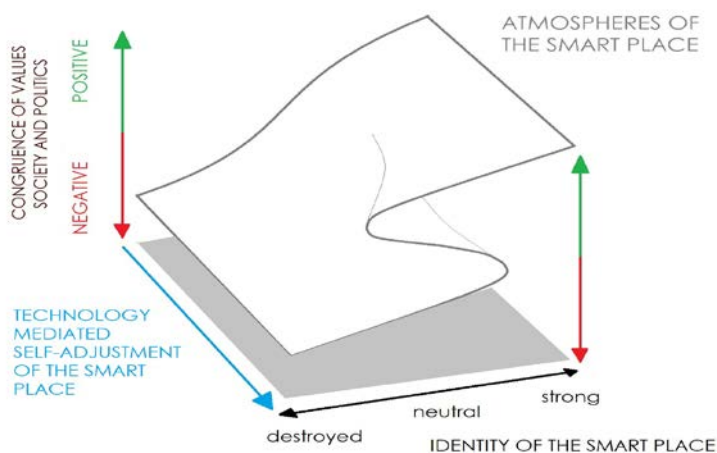


Fig. 6. Possible behaviors in the intelligent atmospheres.

We view this control as a continuously increasing, fine force, which in the mathematical theory of TC catastrophe is a factor that at some point will generate a bifurcation, in the sense that as self-regulation through technology increases in scope, the more it influences much the atmosphere of the intelligent place, the social acceptance of the paradigm is a binom of possible values: either/or. The variation of the three types of values, two control and one generating the bifurcation, will result graphically in a surface with double curvature, a three-dimensional surface of solutions, with a special folding characteristic, called "the cusp".

We interpret that from a certain value of technologically mediated control, the value of social acceptance of policies related to the smart place is no longer singular, but is found on two levels, one in the positive space of the three-dimensional graph, one in the negative space. The area of values between the two levels is in TC so unlikely to be reached that we consider it negligible. For more clarity, the graph above represents the range of variations in the atmosphere of the intelligent place, corresponding to the social response to the fine increment of technological self-control.

For a point characterized by an identity in the neutral zone, with a strong technologically mediated control vector and a state of social equilibrium, this equilibrium will be sharply disturbed, after a certain limit of ceding autonomy in favor of technology: the equilibrium will become so unlikely that it is negligible, the state of congruence between social and politico-administrative values will be able to jump between two states of grace both subject to anthropic risk: one of the two possible smart cities.

The bifurcation has as causes a mathematical behavioral model, but also a philosophical model with roots in the saturated phenomenon presented above. The technological idol, paved with intuitive software and infinite inferences, fed with direct information but also with predictions generated by this software; he is adored and immediately captures the attention on the control area with predictable conditions of behavior, generating a stable and appropriate atmosphere.

This control area is shown again in figure 7, which represents the design of the graphic surface given by the variation of the atmospheres, in terms of the identity of the intelligent place. The surface marked in gray represents the projection of the repertoire of atmospheres that generate the stability and congruence of values between political and social. It is the surface with conditions of acceptance of living, of living space in a given form (in Marion's sense). On this surface is identified a shaded area as a projection of the atmospheres in which the behavior can turn from positive to negative and vice versa - a "cusp" of values. By quantification, TC can give us a limit value of the technological self-regulation from which this discontinuous behavior will manifest itself, and a cumulation of conditions that will generate the discontinuity, this intervening irrationally and unexpectedly.

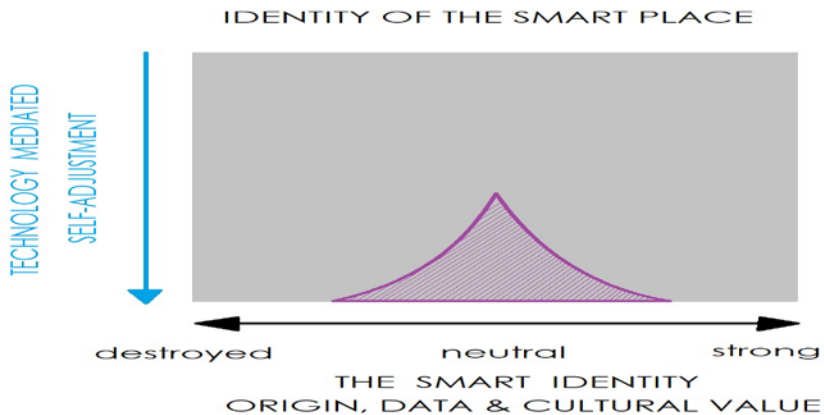


Fig. 7. The cusp projected on the identity of the smart place

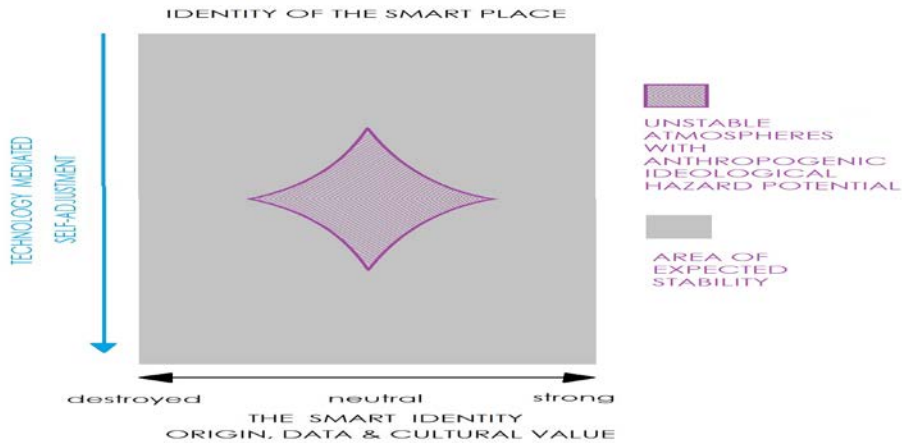
We interpret that, applying TC, we will identify certain types of smart places that will be socially rejected or will generate dissatisfaction to serious dissensions with the governance, namely those characterized by the nullity of identity combined with a constantly increasing technological control. These particular places evade the domination of the technological idol, and create the conditions for a story with a difficult ending.

In the absence of the saturated phenomenon generated by technology, this expression of intelligence and human spirit that curls and provokes divinity, society can manifest its free will, through a revelation that is not divine in nature, but is based on the values of humanity. The demolition of the idol puts in front of the society of the smart city two options, a fork in the road, just equally possible.

The atmosphere can be corrected for the negative value of social acceptance, and then we will witness phenomena corresponding to an anthropological hazard of an ideological type of greater or lesser magnitude, until the total uninstallation of technological control or complete depopulation of the smart city. A smart city stormed by revolution. Or it can move towards a highly positive value of social acceptance, which superimposed on the nullity of the identity of the place and the progressive establishment of technological control, will create the conditions of anthropogenic ideological hazard through social manipulation of the purest dystopian story. These discontinuous behaviors are the two faces of a smart city headed to a grim scenario of failure.

Pushing the limit, we will continue the cusp graph of the TC, with the observation that this duality is maintained on a diamond-shaped surface, which looks at us provocatively from the center of the idol dominated kingdom of values. [3] It is suggested to us by mathematical theory that the field of bifurcation is limited, once a certain threshold of ceding control to technology is exceeded, the atmospheres stabilize, perhaps by reaching a new level of social consciousness that embraces technology as a new form of existence, a new given. This new stage of civilization can be seen as a migration of the concept of smart city to the concept of

smart me, involving at some point the neurological sciences in the process of self-regulation of the urban ecosystem. The other ever resilient smart city.



**Fig. 8.** The area corresponding to the cusp to the continuous increase of the technological control

These are the two possible smart cities in the title with their story. The first idea of representing these variants started from the Dickensian narrative which is the best-selling book of all time. Especially from the famous opening paragraph (please see our *Post Scriptum*). But more recently, a steampunk story written by the terrible child of contemporary fantasy literature, Neil Gaiman, playfully opened the same perspective on the coexistence of two possible cities, with opposing views on the technological idol, denying each other (*Neverwhere*, 2008).

Behavior prediction will be verified as smart cities become more and more impressive in their performance. We can already find examples where predictions can be tested, but we are still at the beginning of their implementation. An example is Songdo, the first smart city in South Korea, and the world's largest, built with the help of IT company Cisco [13] at a relatively short distance from Seoul, only 60 kilometers, an hour and a half drive for the inhabitants attracted by the novelty of the ambitious project. Launched in 2003 and implemented in 2015 on an area of 600 hectares recovered from the Yellow Sea. Designed as a major economic center helped by an attractive luxury residential area in terms of prices that offer a quality of life that becomes a standard to be achieved and a model to follow. And yet the press declares it "an impersonal project" which "is not a great success." [13] The project consists of volumes of metal and glass, gathered around a 305-meter-high landmark, North East Asia Tower, and does not contain museums or cinemas. It is populated only halfway to expectations, the inhabitants being attracted by the novelty of the project and the facilities offered: generous green spaces, 25-kilometer bicycle route, a quality educational offer, but the employees of the (only) 58 companies based in Songdo say they can't live there. The city is impressively developed technologically, there are 500 surveillance video cameras in constant contact with the police, there is internet everywhere and an IoT innovation project



is under development. Electricity networks operate according to an efficiency program, there are garbage collection systems that achieve a recycling rate of 76%. And yet, what is the cause of the lack of attachment of employees and residents of Songdo? On the graph above, the point corresponding to the atmosphere of the projected place is in the range of dual ones, and because the technological control is not forced (although we can say that the city is under continuous surveillance) the reaction is not very violent. Songdo's identity as a smart place tends towards values of neutrality, due to the complete neglect of arranging and offering the stage for a complex social life, making Songdo a "ghetto for the rich" [13], as Le Monde calls it.



The Tale Of Two Smart Cities

Fig. 9. The Tale of Two Smart Cities - a possible skyline.

#### 4. Conclusions

*"What I look at that is visible decides who I am. I am what I can look at. What I admire judges me."* - Jean-Luc Marion [12]

Our application is a starting point for a possible investigation of the potential of future projects, in complex feasibility studies. This is a demonstration of a possible end of smart cities, looking defiantly at us from the eye of this tornado of artificial intelligence development. At the same time, it is a plea in favor of the contemporary current of architecture, with as avant-garde supporters Peter Zumthor and Juhani Pallasmaa, a new approach to living space with the contribution of all the senses, overcoming the absolute supremacy of sight, and putting in a new light intuition that gathers its subtle and subliminal information from all sources of sensory reception: hearing, smell, haptic interaction, atmosphere of places. This atmosphere, intelligent or not, is what gives the strength and resilience of the smart place, it is that quality that an individual or a team can evaluate instantly, without even distinguishing all the constructive or visual details of this place. The intuition of the local atmosphere is probably related to the evolution of our species, to the survival instinct put in front of an opponent endowed with the same weapon of intelligence, the other man. This intuition can also be manipulated, but this is the subject of another discussion.

In the absence of an awareness of the importance of the identity of the place, in the absence of concerns related to the evaluation, conservation and prediction of this identity which has an organic nature thus being mortal but can reproduce

indefinitely through rehabilitation, conservation, restoration and instating as a sine qua non condition of sustainable development, we will witness surprising phenomena, such as the Songdo phenomenon, or its predecessor, the phenomenon Pruitt-Igoe. In the latter case, the idol was not, in our opinion, technology, but modernity-at-all-price, another side of the vanity of our civilization, which is beginning to understand the true meaning of that the perception of space and our mental maps find their place in the brain in hippocampi, the longest tested formation, which is part of the system pejoratively called to this day "reptilian complex" [11]. We will be able to anticipate the future of the city regulated by technology after we understand more clearly the connections between the specific neurons representing the space, intuition and the atmosphere of the place. Until then, we must be aware of a possible anthropogenic hazard due to an ideology related to the indiscriminate implementation of technology on a large scale, with its two extreme disaster models.

In anticipation of the losses caused by this type of risk for the development of smart cities, we see as a solution the creation of strategies to remove smart cities from the neutral zone of architectural identity, to promote the aesthetic-atmospheric resilience of architectural projects, and to research and define methods by that intelligent places can be or become "palaces for humanity" [20].

It is this mathematical application equally an exhortation to balance, because it confirms our intuition that this idol of technology can be worshiped, but not in a monotheistic cult, but in a phenomenological construction of polytheism, in which to dialogue with other idols, as well; idols just as imperfect but just as strong, such as tradition or beauty (created by mathematics, art, or nature). This tragic and fruitful confrontation between two or more idols is the basis of the morphogenesis of the authentic and living atmosphere we will feel flooding a world, that world which is born of the great work researched by Heidegger, or which is given by the painting of genius described by Marion. A possible world of this rank is that of the smart city of a humanitarian future.



**Fig. 10.** A corner of Mark Rhotko's exhibition at NGA  
*Source:* <http://matthewlanglely.com/blog/?p=6>

*Post Scriptum: "It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to Heaven, we were all going direct the other way – in short, the period was so far like the present period, that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only."*[3]

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