INTERNATIONAL JOURNAL OF
DIGITAL AND DATA LAW

REVUE INTERNATIONALE DE DROIT
DES DONNÉES ET DU NUMÉRIQUE

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ABOUT US

The **International Journal of Digital and Data Law / Revue Internationale de droit des données et du numérique (RIDDN)** is an academic journal created and edited by Irène Bouhadana and William Gilles at IMODEV, the Institut du monde et du développement pour la bonne gouvernance publique.

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São Paulo In The digital Age: Legal and Institutional Challenges

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The coming decades will bring profound changes in the size and spatial distribution of the global population. The urban population is growing fast; in the city of São Paulo (Brazil), for example, according to IBGE (Brazilian Institute of Geography and Statistics), the population estimated in 2016 is 12,038,175 inhabitants, out of a total of 94.9% of the urban population. More and more people are moving to large centers, which means more people depending on the essential services of cities, such as water, power, mobility infrastructure, public safety, housing, health services, the artificial environment and other services that make cities livable. The trends in urbanization are totally related to sustainable development. They present great opportunities for development and at the same time immense challenges for social equality, sustainable environment and governance. With proper planning for the future, increasing concentration of people in urban spaces can facilitate economic and social development, offering opportunities to mitigate the unfavorable impact of consumption and production on the environment.

In analyzing this scenario, how will technology transform the cities of the future? Below, we question to what extent it is possible to direct those transformations in a positive way.

§ 1 – Technology And Information As Social Transformation Factors

In 1991, the celebrated author of "Neuromancer", William Gibson, indicated that the digital impact could result in the elimination of all that architecture has historically represented[1], in the following terms: "While the advent of nanotechnology promises to turn architecture into a dead technology, something similar to its exercise already flourishes in the virtual landscape of the computer. The only essential architectures of our century are information structures. The *microchip* is a cathedral. A library is at

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[1] D. KAMPER makes a similar analysis when he says that architecture "has essentially been transformed into energy and velocity, (i.e.) rather an event of time than of space" ("Sie ist wesentlich in Energie und Geschwindigkeit transformiert, eher ein Ereignis der Zeit als des Raumes"). *Hieroglyphen der Zeit: Texte vom Fremdwerden der Welt*, München/Vienna: Carl Hauser, 1988, p. 72.

the other end of a *modem.* The postmodern, seen in retrospect, will seem like a pause to take a breath before the advent of the post-human"[2]. And where will the post-human dwell, or will we dwell as post-humans? Anywhere, as long as we have access to cyberspace? Won't we need houses anymore, or rather "homes", Greek deities to which, as well as Roman ones, places were destined, literally, apart, *templi,* to live in intimacy amongst what is sacred to us and those who are we sacred to us? Here we should introduce, as a response to such questions, the following statement, already made famous, at least among architects, by one of the most outstanding of them, Toyo Ito:

> "We, of the modern age, have two types of bodies. The real body, connected to the real world by means of fluids flowing within it, and the virtual body, connected to the world by means of a stream of electrons"[3].

Thus, it is up to us to verify the relation still maintained, to use the very expressive terms of Lucia Santaella[4], by the moist, real body in which we first inhabit, since we are expelled from that primordial fluid, watery habitation, surrounded by the warm maternal amniotic fluid, and the dry body of silicon in which our virtual body inhabits, primarily, with localities in which they dwell while they retire to spend at least that third of the day and of the life that occurs – or should occur – sleeping and, if possible, dreaming. This third of the day tends to become much larger than that, because thanks to the virtual body, which never sleeps, the real body is led to remain, through it, "plugged in", getting informed and informing others, both to work and to have fun, to daydream (or almost) at home or anywhere in the ecosphere in which they live. What kind of *oikos,* however, would this ecosphere be? Or, from another perspective, would there be architectural models that would result in *oikia* more favorable to the development of externalized thought in the ecosphere? Lucia Santaella refers to this externalization of thought as "extrojections of the human intellect and senses", which would always correspond to some "extrasomatization of a certain ability of the mind", as well as losses at the individual level compensated by gains of the species, such as what has been happening with the collective memory, ever more extended, since the advent of writing and its developments, especially the most recent ones, with the "intelligence technologies" mentioned by Pierre Lévy[5], which accumulates and makes available to the individuals who have access to them a collection of virtually unlimited dimensions to information and products of themselves and others[6]. The human body and mind are thus re-dimensioned, thus we have

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[2] "Letter to Anyone", *in* C. DAVIDSON (ed.). *Anyone.* Nova York, Rizzoli, 1991, p. 264.
[3] *See Tarzans in the Media Forest.* London, AAL, p. 132.
[4] *See* "Cultura Tecnológica & o Corpo Biocibernético". L. LEÃO [org.], *Interlab. Labirintos do Pensamento Contemporâneo.* São Paulo, FAPESP/Iluminuras, 2002, p. 200.
[5] P. LÉVY, *As Tecnologias da Inteligência. O Futuro do Pensamento na era da Informática.* Transl. Carlos Irineu da Costa, São Paulo, ed. 34, 1993.
[6] *Ibidem, Cybercultura.* Transl. Carlos Irineu da Costa, São Paulo: ed. 34, 1999.

corresponding new forms of being in the spaces in which we dwell, as well as the places in which we move and the cities in which we live. It should also be considered that new technologies also impact our abilities to carry out architectural projects and urban plans, in a way that can also be referred to as a "derealization", due to its increasing immateriality, making possible the elaboration of more curvilinear, fluid geometric forms than linear, concrete ones[7]. Here it is clarifying the reference to the five skins of Hundertwasser[8], which would be the epidermis, the clothing, the house, the social environment and the global environment, to which we propose the addition of the skin of the poetic body, which would be a sixth one, a skin that is internal to the epidermis, which is reached by art, eroticism, and certain religious forms, perhaps more magical than strictly religious – in the sense of monotheistic religions, writing, not lettering, inscription in the flesh, penetrating the skin.

On the other hand, as Karl S. Chu[9], convincingly proposes, there is much more to be done by architects than to obtain, through the use of computational systems, a greater capacity to figure new forms by the geometry of the fractals - the architecture lacks to incorporate the computing architecture to the architecture computing. This would be an exit to escape the impasse suggested by William Gibson, passing from what Chu denominates, comparing with biology, a morphodynamic approach of the design and the construction to another one, morphogenetic, through a superseding synthesis that accomplishes something similar to the one that is searched in modern biology to understand the transition from the molecular level to that of the development of organisms with differentiation of functions of the cellular units. The author further states that we would thus be in a position to articulate a more comprehensive theory of architecture that is adequate to the demands imposed by the convergence between computing and biogenetics in the post-human era, when architecture would cease to be, in the much-quoted expression of Mies van der Rohe, the art of joining two bricks, to become the art of joining two programmed *bits* to replicate, such as cells, self-organize and self-synthesize into new and growing constellations of emerging relationships and ensembles. This proposal is in line with what is being developed in convergent approaches such as Biosemiotics and the theory of autopoietic systems,[10] which have been added to the general theories of regulation, information, communication, semiotics and the most diverse logics, having

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[7] Regarding this theme: J. BALDEWEG *et al.* (eds.). *Matter and Mind in Architecture.* Alvar Aalto Foundation, Hämeenlinna: Kirjapaino Karisto, 2000.

[8] In this regard: T. FONSECA, "A Cidade Subjetiva", in P. KIRST (ed.), *Cartografias e Devires: A Construção do Presente.* Porto Alegre, Editora da UFRGS, 2003, p. 253.

[9] In "Metaphysics of Genetic Architecture and Computation", *Architectural Design*, No. 4, vol. 76, London: Wiley Publ., July. – August., 2006, pp. 38-44.

[10] T. ZIEMKE, N. SHARKEY, "A stroll through the worlds of robots and animals: Applying Jakob von Ueküll's theory of meaning to adaptative robots and artificial life". *Semiotica.* No. 1, vol. 134, Vienna: Walter de Gruyter, 2001, pp. 701-746.

cybernetics leading it. Strictly speaking, they are abstract artifices or artifacts, which have in their language their earliest ancestors, and are now called "media", "means", when these means are the environment in which we live today and without which we will not be what we are: environment, *Umwelt*, and otherwise, *Lebenswelt*, world experienced ↔ System, rather than *Umwelt* and *Lebenswelt* (= *Lebensumwelt*, environment in which we live humanly) X System.

In one of his last lectures, a period in which, to use the motto, taken from T. S. Elliot, of what he called his "last conference"[11], Gregory Bateson, the celebrated leader of the "invisible college" at the Palo Alto Institute, was "at the end of all his exploration returning to the point(s) from which he set out to meet it/them for the first time." He regretted, then, that cybernetics was so closely associated with the idea of control, instilled by the creator of the name himself, by choosing it for the new discipline, one of the first "transclassic sciences"[12]. And he justified: "To me, the system is the human-and-the-environment; introducing the concept of 'control' here is tantamount to drawing a boundary between the human being and the environment, thus offering the picture of the human being facing the environment." And he wraps up by raising the question that if a computer can think, answering no, in a way that ends up doubting who, after all, thinks (and thinks it thinks), since to him the thought results from a "complete circuit", as the one that forms the man and the environment, "and that perhaps includes a computer, a human being and an environment[13]. Be that as it may, without the difference (which makes a difference – Bateson's celebrated definition of "information" – and, in this case, the whole difference) between systems, whether psychic, artificial, natural or physico-chemical, all, by definition, intelligent, and the environment, to be understood, there is no thought – and, conversely, in the coupling of these systems with each other, in and with the environment, where they are found, it is also where information is produced and reproduced, and hence also of thought, which is produced at different levels, both infra and suprapersonal, in different noospheres.

We now better see what Max Bense proposes to us when he points to the substitution of the idea of humanism for that of urbanism, "in all branches of productivity" the specific characteristic of what he understands as the "Brazilian intelligence", arguing that it is a displacement in which "the problem is not the being or not being of the individual or the masses, but the habitability or non-habitability of the Earth"[14].

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[11] G. BATESON, *Una Unidad Sagrada. Pasos ulteriores hacia una ecologia de la mente.* 2nd ed., transl. Marcelo Pakman (superv.), Barcelona: Gedisa, 1999, p. 385.

[12] *See* S. MASER, *Fundamentos de Teoria Geral da Comunicação: uma introdução a seus métodos e conceitos fundamentais, acompanhada de exercícios.* Transl. Leônidas Hegenberg. São Paulo, EPU/EDUSP, 1975, p. 27.

[13] *See* G. BATESON, *Una Unidad Sagrada*, p. 269.

[14] *See Inteligência Brasileira: uma reflexão cartesiana.* Transl. Tercio Redondo, São Paulo: Cosac Naify, 2009, p. 35.

More at the beginning of his "Cartesian reflection", Bense, who had described himself as "coming from Europe, without any penchant for admiration"[15], thus marked by the Cartesian option for clarity, despite "having at his disposal the dark obscurity", defined, in contrast, what he meant by "Brazilian intelligence" in the following terms: "the development of the country's spiritual clarity towards productivity and a self-confident hope regarding method and style, joy and melancholy"[16]. In Brazil, for the German sage, design, which "suggests the future and says goodbye to the past", replaced dialectically what in Europe is considered as historical consciousness. From there we can conclude that one can have as the major mark of that replacement the one made of the capital of the Country from Rio de Janeiro, because "Rio is an organism, Brasilia, a system, a "*self-organizing system*"[17]. São Paulo, we add on our account, would be both – and also, therefore, much more and greater, as long as decidedly more projects of its transformation into "smart city" are inserted, also with "e-government mechanism" [18].

§ 2 – FROM URBAN TO SMART: RESHAPING CITIES THROUGH TECHNOLOGY AND INFORMATION

A city can be considered *smart* when investments in human and social capital, traditional and innovative transportation, and infrastructure of integrated information and communication technologies encourage economic growth and life quality, with the intelligent management of natural resources through participatory governance[19]. This is a broad enough definition to adequately address economic, political, legal and other issues, both socially and ecologically, in addition to including cybernetic systems with all their potential for development as active agents in the transformation processes of relations between people and cities. We approach human ecosystems here, through human activity in an area that includes government, hospitals, infrastructure, shools, businesses, resources and people. It is therefore a holistic concept, to which an equally holistic citizenship would correspond, which favors the reception of innovations, promoting the collective co-creation of new possibilities of life, with higher quality.

What is then fundamental to investigate are the new forms of structural coupling that are arising, involving men and machines, in the homes and cities where architects and urban planners are projecting, on this threshold of the advent of a post-human age, that can become more human, favoring the development of our

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[15] *Ibidem*, p. 17.
[16] *Ibidem*, p. 18.
[17] *Ibidem*, pp. 30-32.
[18] In the Forum that took place in the city of Rio de Janeiro on June 8 and 9, 2016, the Connected Smart Cities, São Paulo ranked first among the Brazilian cities.
[19] *See* A. CARAGLIU *et al.*, *Smart cities in Europe*. University Amsterdam, Faculty of Economics, Business Administration and Econometrics, 2009, p. 49.

potentialities, in environments with a design thought to provide such favoring.

Cities will be "smart" when they create systems that combine intensive knowledge activities, learning institutions and cooperation with collective intelligence applications based on the global computer network, focusing on the distribution of this intelligence through *crowdsourcing*, *on-line* collaboration in a society that is increasingly becoming what French magistrate and pioneering sociologist Gabriel Tarde, in the nineteenth century, characterized as "a large collective brain in which the small individual brains function as cells"[20]. And the place of emergence of this "super-brain" was undoubtedly the modern city. Steven Johnson, in effect, proposes to us that "cities, like ant colonies, have a kind of emerging intelligence: an ability to store and retrieve information, recognize and respond to patterns of human behavior. We contribute to this emerging intelligence, but it is almost impossible for us to realize this contribution [...]"[21].

A city will only be intelligent if it uses technology to positively transform the lives of citizens.

It is fundamental, however, to provide in our cities a permanent dialogue between their inhabitants and those of other cities, with which connections are established in an ecosystem open to cognition and, therefore, to constant learning, in an unlimited space of knowledge. To this end, however, the active and creative engagement of authorities from different spheres is essential, as well as of citizens, all users who are properly "literate" for the development and use of new digital technologies, allowing them to move between different spheres of knowledge and power. We need the Executive, Legislative and Judiciary Branches to be more open, transparent and focused on inclusion. As Lucia Santaella points out,

> "smart technology is not only a way to do more with less, but it can be an opportunity to rethink and reinvent governance from a more open, transparent, democratic and responsive model, so as to use social media as channels for communicating with citizens, publishing government data on the web, unlocking public databases and much more"[22].

§ 3 – SÃO PAULO AS A SMART CITY: THE ROAD SO FAR

Perhaps the main challenge to be overcome in the wake of an industrial society that becomes informational is the need to

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[20] In *Les Lois sociales. Esquisse d'une sociologie*. Paris: Les Empêcheur de Penser em Rond, 1999, p. 122. About this fundamental, long-time neglected author, *see* W. GUERRA FILHO, H. CARNIO. *Introdução à Sociologia do Direito*. São Paulo: RT, 2016, p. 164.

[21] In *Emergência: a vida integrada de formigas, cérebros, cidades e softwares*. Trad. Maria Carmelita Pádua Dias. Rio de Janeiro: Zahar, 2003, p. 73.

[22] In *Cidades Inteligentes. Por que, para quem?* São Paulo: Estação das Letras e Cores, 2016, pp. 33-34.

reconstruct a concept of public space capable of leading to new models of urban occupation. Thus, it is necessary at first to identify in what terms the urban space is currently structured in the Brazilian legal system in order to establish how São Paulo can be successfully transformed into a smart city.

The starting point for this analysis is the Brazilian Federal Constitution of 1988 (CF / 88), which establishes the Municipality as an integral part of the Brazilian Federation (article 1, caput) endowed with political-administrative autonomy (article 18, caput, and 29, I to XIV) and several legal powers, some of which are common to other federated entities (articles 23, I to XII) and others specific to the local reality (article 30, I to IX), and collection of own revenues by through the collection of specific taxes (article 156, I to III) and budgetary pass-through of other federal entities, notably the Federal Government (articles 158 and 159).

It is therefore a political-territorial space delimited from an urban perimeter with a minimum number of inhabitants and an infrastructure that minimally meets the conditions of that population, which can be endowed with a non-urban area adjacent to what is commonly called the "rural zone". According to IBGE, Brazil currently has 5,570 municipalities, a number that in principle is justified by the size of the Brazilian territory and the size of its population, but is relatively low compared to the more than 36,000 French communes.

In Brazil the main instrument of organization and regulation of the urban space is the Management Plan of the Municipality. It is a mandatory legal instrument for cities with more than 20,000 inhabitants and defines the local policy of urban development and expansion (article 182, §1º, CF/88), as well as the urban planning parameters that allow the conclusion whether the proper use of land property occurs, including the imposition of sanctions in case of noncompliance with such parameters (article 182, §§2 and 4, CF/88).

With this, the Management Plan aims at guiding urban land occupation, based on collective and diffuse interests such as the preservation of nature and memory, on the one hand, and the private interests of its residents, on the other, ensuring the fulfillment of the needs the quality of life, social justice and the development of economic activities in urban space.

In short, in the Brazilian case it is the local interest that should guide the normative structure applicable to the urban space, which is manifested by the continuous activity of the Municipal Legislative Power in the creation and constant revision of the master plan, besides ensuring that other instruments such as the multi-year plan , the budget guidelines and the annual budget incorporate the guidelines and priorities contained therein, all for the sake of a sustainable city.

The main problem in São Paulo, however, is the silence of the current Management Plan regarding any public policies aimed at the integration of ICT in local urban space. To overcome that

flaw in the Management Plan, I presented the Bill 830/2017 to the City Council of São Paulo with the purpose of regulating the implementation of infrastructure, equipment and applications within the municipality. This bill is the result of lengthy discussions with various sectors of the civil society, the public administration and the local Court of Law.

As seen before, modern technology ensures a set of unprecedented uses for urban spaces which require a legal framework while creating unique possibilities for balancing the distribution of resources, particularly in cities lacking a full-fledged infrastructure and with huge imbalances between areas, motivated by their unplanned growth, and with housing and transportation demands that can't be met without establishing a wide and global city concept. At the same time, there are numerous business opportunities from the implementation of smart infrastructure and equipments in the city, which should be directed to the priority areas of the municipality, but should also be encouraged, generating economic and social development towards a thriving city. The Bill I proposed equally aims both questions to create strong legal standards for public policies and private enterprises in a smart city.

Besides the legal viewpoint there's some institutional issues to be dealt with. There's no point in establishing a legal framework for a smart city if the local political forces aren't committed to implementing the necessary measures for the urban space transformation. Here we speak not only of elected representatives, but mainly of civil society itself.

Hence the need to seek, in a smart city's urban space, concrete ways to contemplate the public interests of the population from the premise of social heterogeneity. In contemporary society the urban citizen can no longer be defined as a member of one or another social category (worker, student, christian, suburbs resident, etc.) to the extent that today the urban space is organized through networks increasingly more complex interests, since the points of contact between apparently sealed groups also multiply.

It is not impossible to imagine, for example, that a particular social agenda is capable of bringing a central region resident closer to another from the suburbs in a more intense and meaningful way than with his neighbor in the street or neighborhood. Political, religious, ethnic, and cultural identities challenge any attempt to reproduce a stational society in modernity, and the strangeness arising from this multiplicity of identities makes urban space particularly susceptible to contradictions and conflicts.

But the public space of the Digital Age can not be limited to a physical spatiality. Current ICT are capable of establishing new and virtually unlimited forms of personal and group interactions, with real-time, high-quality data sharing and transmission at decreasing costs even in developing countries such as Brazil.

Physical and virtual public spaces interact uninterruptedly in modern cities, allowing real-time sharing of information across the population and reinforcing the heterogeneity of social patterns to be advocated. We understand that the best way to deal with this heterogeneity is by recognizing its existence and giving voice to the most diverse segments of the population in the decision-making process, although this proves to be somewhat challenging.

Access to ICT alone does not seem sufficient for the citizen to use them as a tool to participate in the management of urban space, and the initiative of the Public Power is essential in order to open up to the possibilities of transforming social life and of the state that arise in an intelligent city. Likewise, it is necessary for the citizen to assume his or her role as protagonist, alone or collectively, for the proper use of channels of participation and oversight of the activities of the Public Power. It is essential for this purpose to disseminate the concept of accountability beyond academic space, with its incorporation into the thinking of the population in general.

In general terms, accountability can be defined as the requirement of transparency and commitment of the government in favor of accountability to society, as well as an effective liability of the rulers for their management actions. The relationship between state and civil society depends primarily on the production and provision of public information and provision of reliable accounts by governments, duly audited by external and internal controls of public bodies, from which citizens can define their interests based on concrete data and actively participate in public decisions; on the other hand, without an organized civil society there is no pressure for public managers to promote accountability.

Thus, in a smart city as São Paulo intends to be, social participation in matters related to governance of urban space assumes a position not only of fundamental right, but also of an authentic duty to be exercised by citizens in parallel with the duties legally established to the Public Power.