

**TERRITORIAL BIG DATA, DIGITAL ATTRACTIVENESS, LIVING  
LAB AND AUGMENTED METROPOLIS:**

**NEW AVENUES OF TERRITORIAL RESEARCH AND PRACTICE**

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**Abstract:**

The objective of this paper is both to present new scientific concepts of the territory, as well as to call for the resumption of an actualist territorial research. To do this, we have come together around a collective reflection, as researchers of the territory, to present, each from its own field of research, the most new territorial concepts. In this sense, we successively present in this article 4 new concepts: (C1) Territorial Big Data, (C2) Attractiveness and Territorial Digital Marketing, (C3) Territorial Living Lab and (C4) Augmented Metropolis.

**Key words:** Territorial Big Data, Attractiveness and Territorial Digital Marketing, Territorial Living Lab, Augmented Metropolis.

**Résumé :**

L'objectif de cet article est à la fois de présenter de nouveaux concepts scientifiques du territoire, aussi bien que d'appeler à la reprise d'une recherche territoriale actualiste. Pour ce faire, nous nous sommes réunis autour d'une réflexion collective, en tant que chercheurs du territoire, pour présenter, chacun de son domaine de recherche, les concepts territoriaux les

plus nouveaux. Dans ce sens, nous présentons successivement dans cet article 4 concepts nouveaux : (C1) Le Big Data Territorial, (C2) l'Attractivité et le Marketing Digital Territorial, (C3) le Living Lab Territorial et (C4) la Métropole Augmentée.

**Mots-clés:** Big Data Territorial, Attractivité et Marketing Digital Territorial, Living Lab et Métropole Augmentée.

## 1. INTRODUCTION

The social sciences today define the territory essentially as a construction by its actors. However, territorial concepts advance over time out of necessity. Today's world has become a world of sudden crises, general revolutions and global challenges. This is why the territory has a regular relationship with change. And of course, changing the context requires changing concepts.

We live within the global covid-19 crisis today. Not yet completed, and bearing serious socio-economic consequences and successive crises, it forces the territory to seek new concepts, new strategies and new practices in order to consider unprecedented problems. In other words, the emergence of post-covid territory.

Our scientific article forms part of a new paradigm of territorial research. It starts of course from the main theoretical and conceptual foundations of the territory, but it tries to move out from the narrow classical framework towards a current, new framework that opens up to the realities and needs of today. Whether for researchers or practitioners, the territory is an evolving and constructivist concept.

This problem being underlined, the objective of this work is therefore both to present new scientific concepts of the territory, as well as to call for the resumption of an actualist territorial research. To do this, we have come together around a collective reflection, as researchers of the territory, to present, each from its own field of research, the most new territorial concepts. In this sense, we successively<sup>1</sup> present in this article 4 new concepts: (C1) Territorial Big Data, (C2) Attractiveness and Territorial Digital Marketing, (C3) Territorial Living Lab and (C4) Augmented Metropolis.

The objective as we have stressed is to attract the attention of researchers to this new paradigm of territorial research as well as to inspire practitioners, especially in Morocco, for new development practices.

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<sup>1</sup>According to the order of the authors.

## 2. TERRITORIAL BIG DATA

Our constructive research on the original concept of Territorial Big Data “TBD” (LAMRABET Mouad and BENKERAACHE Taoufik) began in 2018 within the Strategic Intelligence Research Laboratory (LRIS) of the Faculty of Economic and Social Legal Sciences (FESLS) Mohammed VI, Hassan II University. Publicly, it was in 2019 during the Fez International Colloquium on Digital Transformation that we presented “*Territorial Big Data: The elements of a new approach at the service of Territorial Economic Intelligence*”.

Big Data is a revolution. We have presented this well in our researches: the communication cited above, “*Economic Intelligence after the Big Data revolution*”, “*Big Data and decision-making systems in Morocco: State of play*” and “*The Territorial Big Data: An innovative concept of Territorial Economic Intelligence*”. Big Data means first of all a phenomenon of data explosion. The International Data Consulting Institute (IDC, 2018, p.3) predicts that we will reach 175 Zettabytes of data globally in 2025. During the 2020 coronavirus crisis, we hit a record high of 64.2 Zettabytes!<sup>2</sup> This exponential growth of the global datasphere is due to the metamorphosis of individuals and economic agents who have become “homo numericusconnectus”. The almost permanent online activity and the use of smartphones and connected objects in everyday life generate immense amounts of data. The presence on the net and on social networks has greatly increased with the coronavirus crisis, and has even become the alternative of directly social contact.

So, and this is what is beneficial, Big Data practically means technological and strategic concepts for processing and making useful the Big Data that we have. The basic concept of Big Data revolves around the 3 V of Gartner (Lamrabet and Benkeraache, 2019). That is to say that we can only speak of Big Data if we have a Volume of data exceeding one terabyte, and therefore requiring an appropriate computer device, a Variety of structured and unstructured data and data Velocity or real-time management. However, ArockiaPanimalaret al (2017) identify more than 17 V and UC Berkeley School of Information verifies more than

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<sup>2</sup><https://www.idc.com/getdoc.jsp?containerId=prUS47560321> consulted on 10/14/2021

40 definitions of Big Data<sup>3</sup>. “The Big Data product takes the form of patterns, explanatory and predictive models that help decision-making” (Lamrabet and Benkeraache 2019). That is, deep, intelligent information and a source of strategic knowledge that is not possible with traditional data analysis.

Now, how is Big Data a new territorial concept? Basically, we define TBD as “a concept of Territorial Intelligence (TI)”. The latter has 6 important landmarks in its history. TI was first defined by Denis Raison in 1997 as a concept of mastery of knowledge and management of complexity, with a view to the planning and development of the territory of the Poitou Charente region in France. In 2002, Jean Jaques Girardot specifies that “The concept of TI designates all the multidisciplinary knowledge which, on the one hand, contributes to the understanding of territorial structures and dynamics and, on the other hand, claims to be an instrument at the service of the actors of the sustainable development of the territories”. In 2003, the Carayon report spoke more of the Territorial Economic Intelligence (TEI). He sees it as an application of Economic Intelligence (EI) at the territorial level, in favor of SMEs / SMIs and in a combination of competitiveness and attractiveness. The region is the optimal scale in this sense, with a public-private partnership approach. In 2004, Yann Bertacchini defined TI as “an informational and anthropological process, regular and continuous, initiated by local actors physically present and / or distant who appropriate the resources of a space by mobilizing and then transforming the energy of the territorial system in project capacity. As a result, TI can be assimilated to the territoriality that results from the phenomenon of appropriation of a territory's resources and then to the transfer of skills between categories of local actors from different cultures. The objective of this approach is to ensure, both literally and figuratively, to endow the territorial level to be developed with what we have called the Formal Territorial Capital”.

In 2012, the International Network of Territorial Intelligence (INTI) states that “TI is a polydisciplinary scientific project whose object is the sustainable development of territories

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<sup>3</sup><https://datascience.berkeley.edu/what-is-big-data/> consulted on 10/14/2021

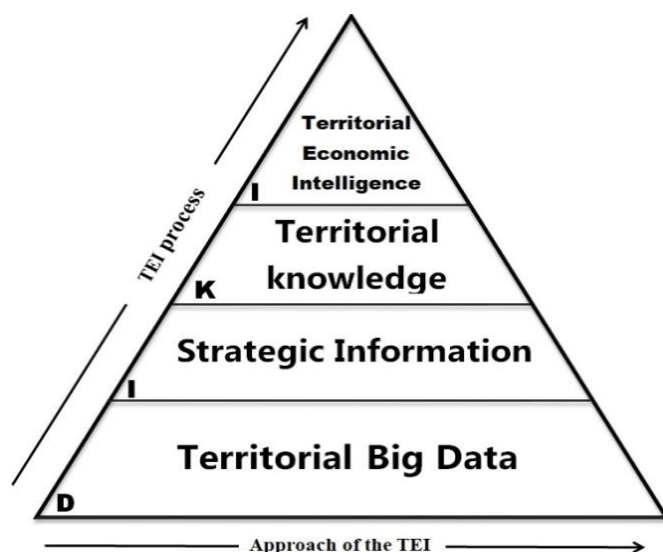
and of which the territorial communities are the subjects. It is based on a systemic vision of the territory, integrating a geographical space, a community, its representations and its behaviors” (cited in Neffati & Girardot, 2014, p.5). In 2021, Jean Jaques Girardot explains that the coronavirus crisis paves the way for a new way of seeing IT. It is henceforth defined as “a research and action project, polydisciplinary and multisectoral, the object of which is the evolution of the human species ... Its current stake is the socio-ecological transition towards a harmonious combination of ecological dimensions, social, health, economic, cultural, and moral development. This transition supposes a global taking into account of the risks that the current evolution of the human species poses to the planet but first of all to itself ... This issue certainly involves the criticism of worn-out concepts (state, progress, growth, profit, etc.) which cause repeated crises ...”(cited in El Hajri, 2021, Afterword of the book).

The first definition we then gave to the TBD in 2019 (Lamrabet and Benkaraache) is that it is a concept of TEI whose raw material is “strategic” data. We have considered it as a concept of strategic information at the service of territorial economic actors in particular. We imaged our concept by borrowing from the DICI model “Data, Information, Knowledge, and Intelligence” (Brouard 1997). We indicate in our BDT model that “the TEI process corresponds to the territory as a whole (vertical axis). Each higher level relies on the lower one to define itself. However, the TEI approach focuses much more on territorial economic actors (horizontal axis), through their dynamic of sharing and exchanging data, information and knowledge. Though, the levels are cross-cutting, hence the complexity of TEI”(Lamrabet and Benkaraache, 2019, p.15).

**Figure1:** the TBD model.

In addition, we have provided 6 conceptual elements for TBD as a new scientific and strategic approach:

- Data at the heart of the TEI.
- The territorial and territorialized approach.
- The Big Data system.
- Territorial Open Data.
- BD-IE hybrid skills.



Source : Lamrabet and Benkeraache, 2019.

Today we have a more developed version of our TBD concept. We consider it not only at the service of economic actors, but in favor of the sustainable development of the territory in all its dimensions. It is therefore a concept of TI and not just of TEI. Its originality comes from the change of the raw material of the concept of TI which was mainly information. Big Data is today an emerging resource for information and strategic knowledge. So this is a change at the heart of the concept of TI that is reorganizing itself around data. TI acts of dissemination of strategic information on web portals, exchanges between actors in territorial meetings, manual monitoring of reports, websites and net data sources ... have become classic. TBD is based on the voluminous raw data produced daily by the actors and which remains unexploited. The valuation and management of Big Data offers unprecedented possibilities for predictive analysis and territorial information.

Thus, the TBD aims at the sustainable development of the territory. That is to say, it targets large territorial projects amalgamating, economic, social, environmental, cultural dimensions etc. A territory that has a strategic project to promote sustainable employment, for example, naturally requires the concept of TBD. The main challenge of the collective intelligence of the



actors in the employment ecosystem is the management of the large, varied and multidimensional data of the actors. It is a fatal resource for the success of the project.

### **3. ATTRACTIVENESS AND DIGITAL TERRITORIAL MARKETING**

Big data, internet of things, industry 4.0, 3D printing... are all fundamental concepts of the digital transformation that the world is currently experiencing, this “digital revolution” has upset the thinking (and consequently the way of working) around several socio-economic phenomena.

In this wake, the notion of territorial attractiveness, which was absent from the vocabulary of economists at the end of the 1980s, has aroused increasing interest in recent years, to the point of constituting one of the central themes of economic policy discussions (Hatem, 2004).

In parallel with this concept of attractiveness, the notion of territorial marketing is emerging, which aims to strengthen the attractiveness of a territory based on marketing techniques and tools.

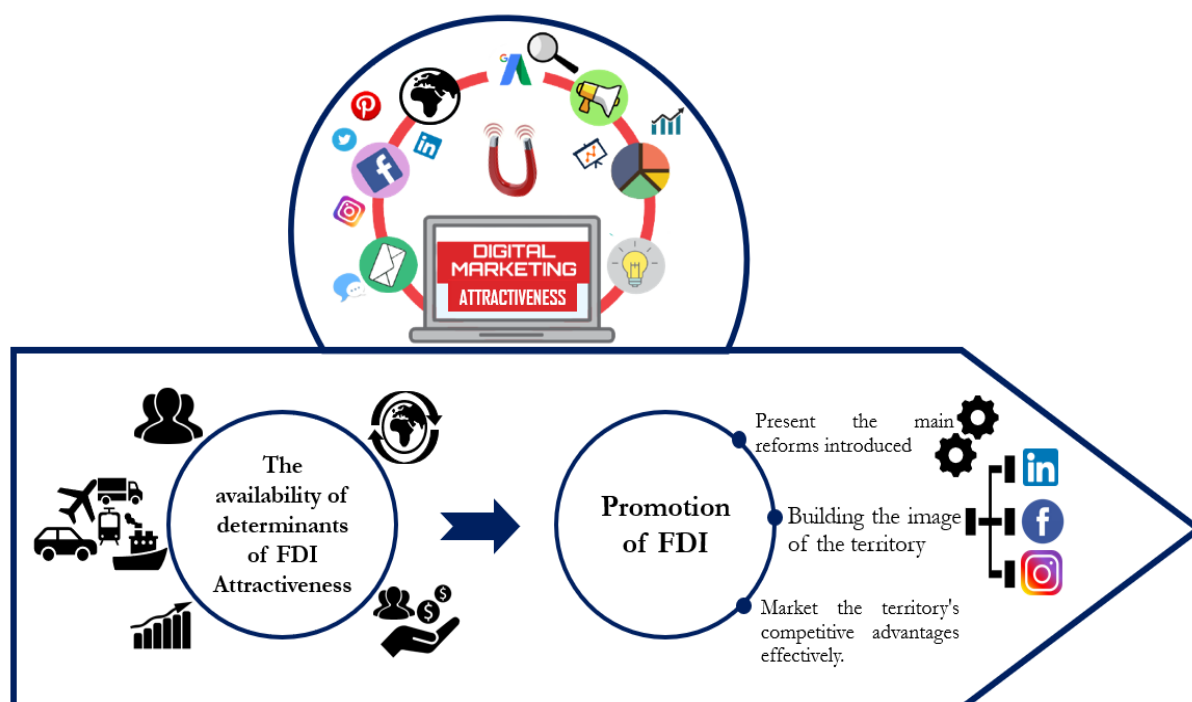
To this end, in order to take into consideration these digital mutations, based on the traditional definitions of the notion of attractiveness of a territory, and taking into consideration the digital aspect, we define Digital Territorial Attractiveness (DTA) or e-attractiveness as “The ability of a territory (country, region, city, town...) to attract and keep (preserve) investments, to encourage other investors to invest there, and to use available digital resources to attract them”.

In other words, it is a concept that designates the use of digital (especially digital marketing techniques) as an inevitable tool to the determinants of territorial attractiveness (it is a marketing and promotion tool of the attractiveness factors of a country (example: promote the political stability, infrastructure, human capital ... of a country on social media). Thus, we can use digital information and communication tools and resources to learn about the investors to attract.

To this effect, in addition to the availability of territories of several factors that are determinant in their attractiveness as: Political and socio-economic stability, market size, infrastructure development, trade openness, human capital, inflation rate, labor cost, communications and telecommunications system, growth rate ... the implementation of a promotion strategy is a sine qua non condition for the development of these factors, hence the growing interest in the use of new technologies, including a strong presence in social media, the latter are currently an indispensable tool for any act of promotion, and marketing of a product, and possibly for a territory. It should be noted that this approach to DTA is necessary today for the promotion of attractiveness.

The diagram below summarizes the idea of the DTA concept, putting the determinants of Foreign Direct Investments (FDI) as the basis of the attractiveness of the territory and the tools of digital marketing as a lever for the promotion of these factors.

**Figure2:** Attractiveness and Digital Territorial Marketing



Source: The authors.

On the basis of all the above, we propose a strategic plan for the establishment of the DTA, which is articulated around the following focal points:

- First, identify the key factors of the country's attractiveness, so that a good knowledge of its strengths will lead to a good presentation of these factors.
- Present these factors, plus the main reforms introduced (legal, economic and institutional) in the country in order to improve the general business environment and therefore the attractiveness of FDI.
- Transform the above elements into digital schematic content (digital documents, video clips, digital presentations...).
- Instead of relying on costly promotional activities using traditional advertising channels, with the objective of building the image of the territory through advertisements, participation in fairs and conferences. Social media offer this possibility and at a lower cost. The construction of a quality digital content (a knowledge of digital marketing is necessary) with a strategy of targeting (via Facebook Ads or Instagram Ads for example) the main multinational companies<sup>4</sup> (either the official accounts of these companies themselves on social media or targeting the account of the CEOs of these companies, members of the board of directors ... or any person likely to influence the decisions of implementation of these MNFs) will allow to achieve the objectives of promotion of the territory by saving time, cost, and reaching the maximum number of investors in different corners of the globe.
- Enable investors interested in the host territory (potential investors) to make 3D virtual visits to the various sites likely to be involved in the investment process (free zone, administrations, one-stop offices).

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<sup>4</sup>The choice of target MNFs should be preceded by the identification of MNFs that are not located in the country, and that may locate in the future if it is demonstrated that such an (investment) decision could enhance their competitiveness.

- Translate the different codes and laws related to trade and investment into several world languages (including English, Chinese, Spanish ...) and put them online (in the sites of promotion agencies, pages of social media ...) and this, to provide potential investors all the information they need to form their judgment.
- Currently, influencers on social media have become advertising supports that are increasingly searched by companies<sup>5</sup>. In the same way, territories can use the influence of these influencers on social medias to promote the territory by making visits to places identified as a location for investors by presenting the potential of these sites (especially in the tourism field, to attract large international hotels to set up there).

#### **4. TERRITORIAL LIVING LAB**

##### **4.1. General model of the Livings Labs: Theoretical retrospective and elements of definition**

Living Labs are a new approach to open and collaborative innovation, mainly focused on the user. The North Americans are the precursors; in fact, a group of researchers (William J. Mitchell, Kent Larson and Alex Pentland) founded, in the early 2000s, the first living lab, managed by a research consortium: the Massachusetts Institute of Technology (Voilmy, 2016, p.75). The functioning of this LL is identified as an approach that enables the design of complex solutions in real-life contexts (Pecqueur and Klein, 2020, p.27). Proving its effectiveness, this innovation approach spread in Europe from 2005 and pilot projects multiplied. To support and encourage the adoption of LLs, the European Union officially launched the European Network of Living Labs (ENoLL) in 2006 (in Helsinki) in order to label LLs throughout the world. Currently, this network has more than 440 Living Labs (Pecqueur and Klein, 2020, p.27) distributed throughout the world, but the majority of which are concentrated in Europe. At the national level, Morocco has six LLs launched by the OCP group in partner ship with the Mohammed VI Polytechnic University.

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<sup>5</sup>The global market for influencer marketing has experienced very strong growth in recent years. According to estimates (Statista, 2020, p. 7), the global sales figure for 2020 is 9.7 billion dollars.

Since its emergence, the LL has been the subject of several research works trying to define and delimit the semantic field of its new concept. The literature review of these works shows that this concept does not have a consensual definition, but several definitions which, despite their diversity, converge on the main characteristics:

**Figure 3:** Definitions of the Living Lab

Authors	Date	Definition of the LL
<b>ENoll Network</b>	<b>2011</b>	“User-driven open ecosystem that engages and motivates all stakeholders, stimulates co-design and co-creation of technologies, products, services, social innovations, creates new markets and enables behavioral transformation”
<b>European Union</b>	<b>2006</b>	“An open environment for full-scale innovation, where users participate in the creation of new services, products and societal infrastructures”
<b>Dube &amp; al</b>	<b>2014</b>	“An open innovation research method that aims to develop new products and services. The approach promotes a co-creation process with end-users in real-life conditions and relies on an ecosystem of public-private-citizen partnerships”
<b>Eriksson &amp; al</b>	<b>2005</b>	“The Living Labs Concept refers to an R&D methodology where innovations, such as services, products or application enhancements, are created and validated in collaborative multi-contextual empirical real-world environments”
<b>Living Labs Roadmap Work Group</b>	<b>2010</b>	“A system enabling people, users/consumers of services and products, to take active roles as contributors and cocreators in the research, development, and innovation process”

**Source:** All cited in Dube & al (p.22) except Eriksson & al definition (p.5)

In summary of these definitions, we underline the multidimensional representation of the LL, it is considered at the same time as an approach, an innovation process, and a research and innovation environment. Nevertheless, all the definitions agree on the structure of the LL

manifested by a network of actors, and insist on the importance of the user in all phases of the innovation project. Therefore, the LL is presented as a crucible of collaborative practices, knowledge sharing and socialization of actors.

Moreover, we underline the innovative contribution of the LL approach, which consists in placing the user as the main actor in all the stages of innovation and entrusting him with prototypes in real conditions in order to observe acceptability and use, and eventually facilitate the appropriation of the innovations.

#### **4.2. The territorial Living Lab: A potential vector for the recomposition of territories**

The first wave of LLs, oriented towards technologies, was not territorialized at all. With the popularization of this practice, the LL approach diversified and moved closer to environmental and social development processes, giving rise to territorial LLs. For Janin and Pecqueur (2013) a LL is characterized as territorial insofar as the problem that cements the actors is geographically contextualized. The configuration of a territorialized LL is not only based on a network of actors (private, public, users...) who collaborate for the realization of a product or a service, but it differs from the standard configuration by an additional dimension: the capacity of specification of resources by the actors, i.e. the capacity to bring together a network of actors in a particular space in order to produce solutions adapted to their territory.

In one of the studies conducted by CEFRI (2013), the territorial LL approach is considered an innovative solution for knowledge production and sharing and collective learning. According to the same study, the LL approach holds the following characteristics:

- It focuses on increasing the knowledge of the actors involved in a non-linear, participatory and iterative innovation process;
- It focuses on the sharing and integration of knowledge and experience;
- It provided the observation of experiments in a real context and theme asurement of the value of activities and innovations for users, humans and citizens;

- It includes activities of exchange or transfer of knowledge related to innovation;
- It based on taking into account space (or territory, physical or not, of experimentation and innovation) and time (process, cycle, duration, sustainability) (CEFRIIO, 2013, p.7).

Because of its approach and its capacity to network social actors, the territorial LL is no longer identified as a simple variant of the standard LL model; it is in fact presented as a renewed form of territorialization of innovations, going beyond the classic and outdated forms of territorialization, which are: innovative communities, clusters, districts, productive systems and learning regions.

When the Living Lab is territorialized, under the conditions described above, it participates in:

- The production of socio-territorialized innovation, i.e. innovations that provide local stakeholders with a response to social and environmental problems that are not resolved by the market model.
- Collective learning: the collaborative dynamics of innovation in the LL contribute to the co-construction and dissemination of scientific knowledge and hybrid knowledge that nourish the territory.

Therefore, the territorial LL could be a real vector of recomposition and regeneration of territories.

## 5. AUGMENTED METROPOLIS

Since the beginning of this century, the concept of the metropolis has experienced effervescence in literature as well as in practice. Associated with the process of metropolization which is characterized by a demographic increase accompanied by a double process of concentration (polarization of activities and people) and deconcentration (urban sprawl structured by the development of new secondary centralities), registering the city as a system in new forms of economic and social action.

If we consider metropolization as a typically urban form of modernity, we could be interested in a new emerging concept that combines other concepts that have become increasingly apparent such as the smart city, the green city, the creative metropolis, etc. It is the “Augmented Metropolis” which can easily refer to the concept of augmented reality. Jean Viard in his last book published in 2021 “The revolution we expected has arrived” published by Aube, wonders about the fate of our cities “after industrial society, after the class struggle, we were witnessing to the great return of territories and places, of the uniqueness of individuals and the meaning of life? What if we had switched to a new civilization, digital and ecological? What if the expected revolution had finally arrived?” (Viard, 2021).

This issue questions both the actors but also the paradigms and concepts mobilizing a new reality of the territories. Talking about an Augmented Metropolis also means getting ready to understand the changes and upheavals regarding the understanding of the reality of individuals living in metropolises or metropolitan areas and who find themselves faced with managing the city's time. Mobility time, sociability time and finally accessibility time.

To ensure these three ambitions, we must use a collective intelligence starting first from the observation of a connected metropolis, to consider the intensity of exchanges, the interdependence of the living areas and the institutional representations that form the logics of building a citizen-world. This vision must be accompanied by a strong involvement of stakeholders in a digital revolution allowing the entire metropolitan population to have large-scale access to all connection networks and an ability to suitably attract the citizen consumer of soft, sober mobility that generates a flow of exchange in high-quality technological services, the objective of which is to optimize the time spent by citizens in their city.

This conception of the augmented city is not only an urban planning tool but a state of mind referring to a break with traditional planning methods. As a result, to implement this new city model, “we have to use a *laboratory metropolis* where a new city model can be experienced, obviously requires voluntarist public policies, investments in equipment or new services, but



also to structure its image as much as its destiny by drawing on and reaffirming the character traits that differentiate it”(Grand Lyon, 2007, p.8).

That being said, this vision must be accompanied by a true digital strategy. It is about preparing the metropolis for a new breakthrough in terms of access to information, particularly in public spaces, to a digital transformation model in municipalities, to integration of capability approaches in the pooling of resources and to local economy and attractive use of territorial data.

It is therefore essential to develop a “digital culture” (Strasbourg eurométropole, 2019), carrying a new perspective on the use of spaces and on creativity, but also innovation in the city by including this approach in this which is now called “the right to the city”. As soon as we want to make a metropolis and include it in an augmented reality, it goes without saying to base this metropolization on a new perspective that inscribes the territory in a negotiated performance, horizontal and local governance and to reason in a territorial alliance approach.

To do this, the metropolis must first be prepared for governance of the means necessary to mobilize all local actors to a boom in digital uses and practices. The aim is to focus on building a local digital ecosystem (France Urbaine, 2019). Indeed, the way in which this entry into an augmented reality is planned - new technologies, data, artificial intelligence, etc. - must be linked to the realities of the territories of experience. To do this, and lastly, we need reciprocity contracts within the metropolises themselves to ensure this convergence and prepare for digital inclusion which must be thought of in a systemic way in order to go beyond the geographic constraints and the center-periphery, couple largely overwhelmed by the new proximities generated by the changes made in the territories.

To conclude, the concept of an augmented metropolis attempts to anticipate the realities of metropolitan territories. Like augmented reality, the augmented metropolis can be defined as this temptation to connect spaces with each other with new forms of technology making it possible to make the metropolitan quality of life sober, optimal and sustainable by

dematerializing objects in the metropolis. It is therefore a question of making a metropolitan reality an augmented action to develop mobility flows capable of living better in these metropolises.

## 6. CONCLUSION

We see that the new territorial concepts are innovative concepts, insofar as they are part of the modern technological and digital sphere, thus they present a new approach of organization and thought of the territory. These new ways of approaching territorial research invite researchers to advance their research and practitioners to improve their way of doing things, nothing other than for the development of the territory, which is henceforth inaugurating “the era of intelligent territorial development”.

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