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The evolution of the use of big data to serve Moroccan territorial economic intelligence

L'évolution de l'utilisation des BIG DATA au service de l'intelligence économique territoriale marocaine

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Abstract:

The issue of the sustainable economic and social development of a territory, and its attractiveness, is considered as a major concern of the Moroccan governmental institutions within the new economic development models. In fact, the strategic reforms undertaken as a part of the advanced regionalization system support the ambition to provide each territory the necessary tools and information to respond effectively to the continuous economic, environmental and social challenges. The practice of economic intelligence is based on the control of the information that must be protected, the understanding of opportunities and threats and the coordination between actors and activities. Thus, Big Data supports all these fundamentals targets. The development of new technologies as machine learnings, cloud computing, social networks, internet of things … provides reliable and real-time information about the existing resources and expand operational mechanisms of steering, coordination and evaluation. Successful territories are those built through a continuous exchange network that integrate all the common values, issues and geo-economics strategies of a country. We analyze in this paper, the contribution of Big Data on the development of a territorial economic intelligence by providing the ability to transform a basic "Information" to an 'InfoAction' and an 'OPEN DATA' connecting the real-time information with the action to execute. Moreover, we conduct a qualitative study about the evolution of the use of Big Data by Moroccan public administrations and its impact on the territorial economic intelligence.

Keywords: BIG Data; Economic intelligence; Territory; Territorial economic intelligence; InfoAction

Résumé :

La problématique de développement économique et durable des territoires, et leur attractivité, représente une préoccupation majeure des institutions gouvernementales marocaines eu égard des nouveaux modèles de développement économique. En effet, toutes les nouvelles réformes misent en place dans le cadre du projet de régionalisation avancée soutiennent l'ambition de doter chaque territoire des outils nécessaires (technologiques, humains et financiers) pour faire face aux défis économiques, environnementaux et sociaux continus. La pratique de l'intelligence économique repose sur la maîtrise de l'information ainsi qu'une bonne analyse des opportunités et des menaces de l'environnement interne et externe. Pour ce faire, les BIG DATA supportent les fondamentaux du concept d'intelligence économique. Le développement des nouvelles technologies d'information comme le cloud computing, réseaux sociaux, internet

des objets… permettent d'obtenir et de traiter des informations fiables et en temps réel dans le cadre d'un système de traitement des donnés. D'autant plus, qu'ils permettent d'identifier l'ensemble des ressources potentiel d'un territoire et d'étendre, en conséquent, les mécanismes existants de pilotage, de coordination et d'évaluation. Les territoires développés, seront certainement ceux qui se construisent à travers un réseau d'échange qui prend en considération toutes les valeurs sociales communes du territoire, les enjeux et les stratégies économique et sociétale du pays. A travers cet article, nous analysons l'importance des BIG DATA dans le développement d'une intelligence économique territoriale en fournissant la capacité de transformer une simple ' information ' en une 'InfoAction' et une OPEN DATA qui permet de transformer, en temps réel, une information reçue en une action à exécuter. Nous menons ainsi, une étude qualitative sur l'évolution de l'utilisation des BIG DATA par les administrations publiques marocaines et son impact sur le développement d'une intelligence économique territoriale.

Mots clés : BIG Data ; Intelligence économique ; Intelligence économique territoriale ; Territoires ; InfoAction.

Introduction

The knowledge economy has balanced the conditions of productive activity and territorial organization. We went form predictable and stable environment to uncertain and continuous changing contexts that requires quickness, adaptability and appropriate competency. In this new reconfiguration, the instant access and the right use of information is one of the key enablers for the competitiveness of any state towards the rest of the world. In a globalized economy, territories must take on the challenges of data and make it a source of opportunities and competitiveness for its stakeholders. Among the various challenges, we emphasize the implementation of a Territorial Economic Intelligence approach that considers data as its midst and BIG Data as the key lever of the process and the support tool for real-time and reliable information.

Territorial economic intelligence is a practice dedicated to obtain, treat and upgrading information and strategic territorial knowledge about a territory and its surrounding environment and actors. The objective is to implement adapted territorial plan of actions and to reconfigure the existing structures. This article aims to provide an overview about the meaning and perspectives of "The territorial economic intelligence" in academic literature covering facts and actual context related to the Moroccan context. Then, it is about to understand to what extend BIG Data would have an impact on the development of a territorial economic intelligence? And what are the data that must be supported to attend this efficiency?

In order to respond to those following questions, we will first define the importance of strategic information and economic intelligence in the development of a territorial economic intelligence. Then, we will analyze the different existing BIG DATA in Morocco and their impact on the development of a Moroccan territorial economic intelligence.

1. Strategic information and economic intelligence in the heart of the territorial economic intelligence

Territories are dynamic systems that should be observed in real-time to execute effectively local policies and appropriate public management established by the government. In a context of uncertainties and continuous changing, territorial intelligence is the solution, in the same way as the economic recovery policies, to forge a common attitude and a mode of public management. It will increase the control of the strategic information and its management by the

concerned actors and improve, consequently, the performance of the territory in terms of investments, industrial activities and social development.

Territorial intelligence can be analyzed along two logics (Pelissier, 2009): a bottom-up approach or a downward approach.

An ascending logic (bottom-up): This logic put people and citizens on the center of the territorial development. It is about to advocate territorial intelligence in the form of an entity within the meaning of a socio-economic organization built on the basis of the various interactions between heterogeneous actors that composes a territory and produce constructed resources. The bottom-up trajectory is part of a vision of local development that considers a territory as an endogenous actor of its own development and a space for promoting its constructed resources that forge its identity.

Girardot (2004) defines the constructed resources as the specific resources constructed by actors from localized objects, mastered know-how in response to production problems. They necessitate cooperation and coordination between the various local actors (firms, citizen, public institutions, banks…) and their capacities to share information resource, their know-how, their skills so as to manage their own development model. As a matter of fact, the ascending logic related to territorial intelligence forges the concept of learning territories (Pelissier, 2009). We consider that communication and using a system of territorial information is in the heart of the development of territories because it allows the collection of the strategic information to use and to formalize in order to facilitate its understanding and treatment.

A downward logic (Top-down): It is about to decline the strategic plans of action and pubic policies at the level of territories to improve national competitiveness. Within the top-down logic, territories are obliged to take into consideration the decisions of the government and implement its public management policies. Specificities of each territory is not taken into consideration; all the territories are put on an equal footing. Therefore, a territory is apprehended as a simple receptacle of localization decided elsewhere (Courlet, et al., 2013)

The phenomenal development of concepts, tools and methods related to the distribution of information, under any type of approach, has made the need to effectively master this new strategic resource in order to use it as a weapon to face the external and unpredictable challenges.

The objective is to provide the right information, at the right time, to the right person and at the least possible cost. For territories, it is about to deploy activities devoted to strategic information

management by focusing on the right use of the supporting BIG Data that will insures strategic intelligence processes, knowledge management and economic intelligence.

1.1.Strategic Intelligence:

The first concept of strategic intelligence is based on supervising continuously internal and external environment. It is the provision of various information that are vital for the decision-makers, mostly investors and government. The objective is to ensure real-time diffusion of information that can serve the priorities of an institution or a territory. According to Sewdass (2012), institutions that are able to turn information into intelligence are those who success. Strategic intelligence is a continuous process of producing needed intelligence to facilitate decision-making process and provide a baseline of information on which to build projects and plans. (GIA, 2004).

Regarding the continuous changing of social, economic and environmental contexts, territories and both their administration and companies, are challenged to understand the dynamics of their surrounding environment. A study conducted by the Global Intelligence Alliance in 2005, exposed the resulting benefits behind developing a competitive strategic intelligence:

- Improve a systematic understanding of internal and external environment
- Increase effectiveness in decision making processes
- Time and cost saving
- Enhance the quality of collected information and their interpretations
- Identify threats and opportunities through intelligent systems that support, treat and store information timely.

A strategic intelligence consolidates the terms of a social intelligence and competitive technical intelligence. The social intelligence refers to all the information that improve the ability of an organization to adapt changing circumstances in order to achieve agreed social development goals. (Clerc,2008). It is based on the dynamism of the territorial knowledge, as well as the volume and quality of information networks. Competitive technical intelligence is the process of collecting actionable information about new technology developments that could impact a territory competitiveness.

1.2. Knowledge management:

Concerning the second concept of knowledge management, it targets the creation of a new knowledge by pooling the internal know-how and operational practices within the different

administrative departments. It is the process that facilitates knowledge sharing by insuring a continuous learning process within the different actors of a territory.

According to Bounfour (2003), knowledge management is a set of procedures, technical and managerial tools that aim to create, share and upgrade information and knowledge within an organization or a state. There is not a fixed and defined number of knowledge management processes because of their different interpretation that depends on the contexts and circumstances of their implementation. Globally, the process of knowledge management can be defined at three main stages: Knowledge generation, Knowledge codification and knowledge transfer (Costa & Monterio,2016).

Therefore, it must be completed by the economic intelligence that will protect the intellectual heritage as well as strategies for an economic performance support. Klaus Knorr was the first to advocate a wide distribution of the concept of economic intelligence. According to h
im, it is the operation that allows to obtain and treat information related to external environment by which an organization tends to maximize its strategic objectives.

1.3. Territorial Economic intelligence:

Territorial Economic intelligence is recognized as an efficient management tool to increase the competitiveness of a territory in a globalized world. Its implantation involves, firstly, the mastering of strategic information that must be collected, analyzed and treated so as to anticipate external and internal issues.

This first step necessitates appropriate immaterial and material resources such as BIG Data to support the information and organize it. Then, it is about to store the information and secure this strategic information through the creation of national institutions that will protect the data collected and make it accessible to different stakeholders.

Finally, it is about to release the appropriate strategy, influence or action to seek the opportunities and to be able to take advantages of current internal and external environment and not to be passively dependent on it.

In Morocco, we distinguish various institutions that support the economic intelligence:

-Moroccan Institute of Scientific and Technical information: It is a public institution that enhance scientific research and technology transfer activities according to the social, economic and environmental needs of a territory. It allows Moroccan scientists, in public and private sectors, to access to scientific and technical information. It enables a dynamic and continuous learning process that provide relevant information in all economic sectors.

-Moroccan Office of Industrial and Commercial Property: The main function of the institution is to maintain a national register of industrial property and registration of the acts that affect the ownerships of industrial property right and to protect them.

-Royal Institute of Strategic Studies: The vocation of the institute is to carry out strategic analysis at a large scale in order to be able to deal with the territory's multiple issues. It studies domestic structural issues as political, economic, environmental and social challenges by developing multidimensional approaches.

-National Center of Documentation: The center affords observation about the evolution of the different sectors of a territory and provides real-time information about the issues and evolutions.

-Moroccan institute of Strategic Intelligence: It is a generalist think thank that develop studies on the strategic challenges of Morocco and produce knowledge by clarifying and recommending strategies.

-Leadership Development association: The objective of the association is to share know how between Moroccan leaders and those from other countries by organizing training sessions and seminars.

2. Big data to serve Moroccan territorial economic intelligence

Big Data insures quick and permanent linkages between firms, public administration and other involved actors in the vast 'non-market' space that must attend the same common general interests. It is important to understand that in the heart of the BIG Data systems are algorithms. Those algorithms identify the possible links between the mass of data that is varied, voluminous and fast. As a matter of fact, BIG Data is characterized by the volume, variety and an exponential rate of data.

A territory can be assimilated to a network since the inter-organizational relationships between firms, local authorities and citizens are not hierarchical by more cooperative (Josserand, 2007). A territorial economic intelligence process requires a clear methodology and appropriate tools that will, firstly, facilitate networking between stakeholders and citizens, then, forge a culture of sharing and cooperation to, finally, produce a territorial knowledge. *Strategic information is the key element in the implementation of a territorial economic intelligence process. In effect, its compilation, interpretation and communication contribute to a better mastered development of territories and the increase of its competitiveness. (Marek, and al., 2011).

2.1.Internet data

According to Datareportal reports[1], there were over 31 million Moroccan internet users in January 2022 . In that way, Moroccan internet users have increased by 1,2% between 2021 and 2022. The internet Data is the information that is accessed and collected from the Web. It can be information related to online practices of the users after they leave traces at the time of their connection to a website or application (Reis, et al., 2015). It can also be related to the localization of shops, centers, professionals and firms… or a statistical year book and a professional directory that contain various information from different users.

This source of information helps companies to track the habits and licking of customers for the development of their products and services. It also provides the government about the consumption's preferences of their citizens and their everyday habits.

2.2.Data produced by organizations

It concerns the DATA produced by the public administration, local authorities, companies, financial institutions and associations taking part on the development of a territory. They contain useful and relevant information about the business activities, budgets, productivity and details about the clients, potential investors and orders. Decisions-makers and scientific researchers use this type of Data to analyze markets tendencies and needs. Thanks to BIG Data, all this important information is stored on servers of the concerned organization to manage them and protect them.). According to Act No210,211 and 150-II of the Moroccan General Tax Code, organizations are constrained to archive their supporting documents related to their accounting transactions for a period of 10 years in an electronic format. Indeed, Moroccan legislation obliges firms to archive duplicate of invoices, customer files, legal books, cash receipts and investment receipts…

2.3.Open government data (or OPEN DATA):

It concerned Data that are deliberately made available to the public. It represents raw data produced and collected by the administration in order to make it available to any interested actor.

For a territorial economic intelligence, it is necessary to ensures a harmonious implementation of a territorial knowledge that involves all its actors through their contribution to the production

[1] Founded by Kepios, an advisory firm that publish online collection of resources that explore evolving digital behaviors all over the word.

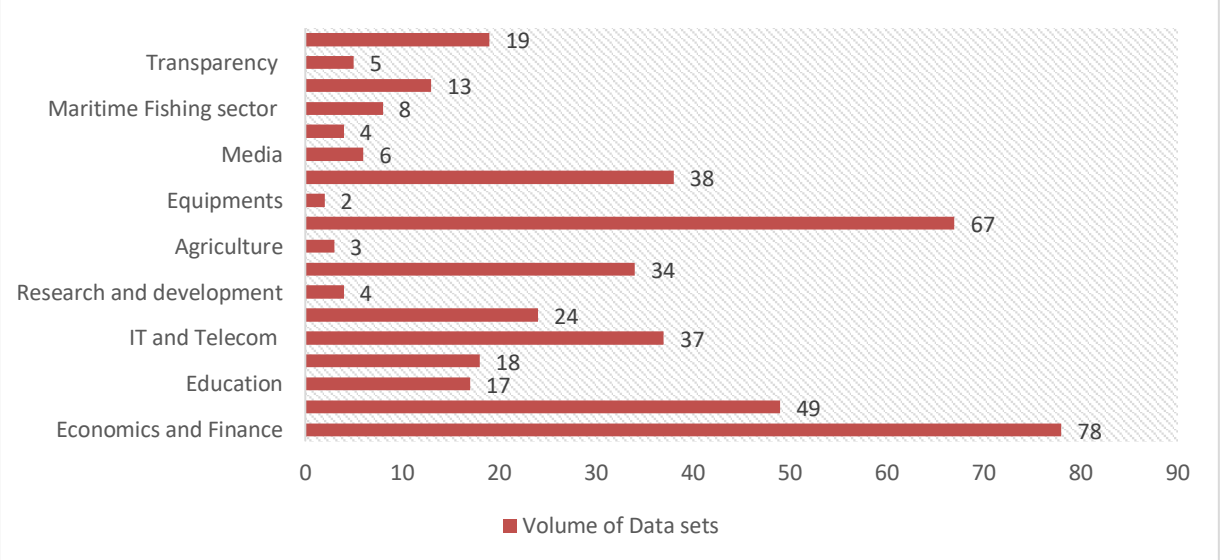
of strategic information. The objectives behind the creation of a platform of OPEN DATA are various:

- First, to provide citizens with practical information about their territorial ecosystem;
- To dematerialize the public procedures and services;
- To improve public participation to the development of the territory;
- To stimulate economic development of a territory through a better access to relevant information;
- Finally, to develop "information technologies and communications" that promote a digital economy.

In Morocco, an e-government program has been implemented by the ministry of industry, commerce and new technologies in March 2011, whereby a first version of an OPEN DATA platform was created 'data.gov.ma'(CESE).

The platform explores various public data available on different websites and public reports, to produce easily exploitable documents that contains all this collected information. By the end of September 2022, the Open data platform contains 426 data sets that concern 18 different fields.[2]

Figure n°1: Open DATA produced by public organization until September 2022.



Source : www.opendata.gov.ma

2.4.DATA from IoT (Internet of Things):

Important volume of information is generated from machines and devices that are connected to internet. Nowadays, we use devices that can provide real-time information about the

[2] According to the statistical information reported in Digital Development Agency in www.data.gov.ma

surrounding environment (e.g.: motion sensors, temperature sensors…). In doing so, data can be sourced from vehicular processes, cameras, household machines and medical devices…. An IoT system collect data from the environment they are in and leans on sensors devices, data processing and internet connectivity. Although data is stored by IoT devices, information are not structured and analyzed. It needs the use of BIG Data to collect information timely, to store them using storage technologies and finally, to analyze them using analytical tools. The purpose is to develop a territorial intelligence economy based on information from real-time reports that analyzes environmental and social conditions of a territory.

In May 2021, a cooperation agreement had been signed between Millennium Challenge Account-Morocco and the consortium "UM6P-OCP Solutions-Atlas Cloud Services, to implement a digital platform of information on the labor market based on IoT and BIG Data. The objective of this digital platform is to exploit the collected information about the situation of job supply and demand, required competencies and job trends. It integrates data from national, regional and local levels.

2.5.DATA from archived documents converted to numeric format:

It is the documents that are scanned or transcribed digitally in order to make them available to large public and that contain important information about economic, social and environmental development of an organization or a territory. Thanks to Optical character recognition [3], archived physical documents are converted into pdf documents so that concerned users can edit, reconfigure and use the contained information. This technology can benefit from IoT to implement advanced methods based on Intelligent Character Recognition. Il will provide a capacity to convert the documents by identifying languages or styles of handwriting.

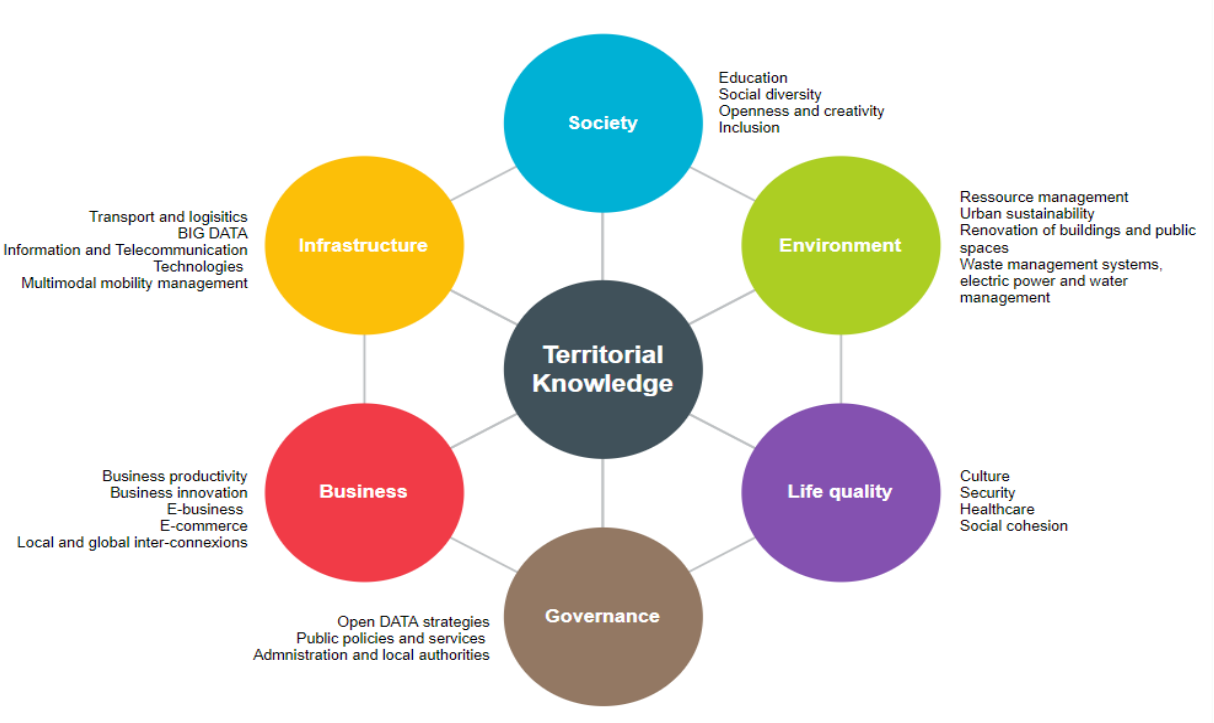
2.6.DATA from interactive platforms:

This source of data includes social media platforms like WhatsApp, Facebook, Twitter, Instagram, YouTube… as well as generic media, audios, videos, images and podcasts. This interactive platform provides qualitative and quantitative overview on the aspects and characteristics of the user. It gives relevant information about his consumption behavior and his state of mind. Ferreira (2015) developed a dynamic factor model to extract a latent variable from Google Trends, that provides good indicators about unemployment.

[3] It is a system that was developed by Kurzweil in 1974 and became popular in the early 1990s. It uses a combination of hardware and software to convert printed converted into machine-readable text.

Every Moroccan geographic region has its own Datasphere size 'Territorial knowledge' that is impacted by population, business productivity of the firms, consumptions habits of its citizen and existing natural resources.

Figure n° 2: Territorial economic intelligence produced by BIG Data.



Source: Author

For the development of a Moroccan territorial intelligence economy, we suggest the following measures to be undertaken:

- To implement a mutualized Open Data platform where administrations; local authorities, firms… integrate their financial reports, statistics and public services.
- To identify the relevant socio-economic data sets to be disseminated.
- To develop a supportive ecosystem for the use of BIG Data
- To promote the use of public data within universities and research organizations, from reports and statistics published by public organizations in various fields such as education, environment, economy, business…
- To develop regional service applications that will make life easier for citizens and cover the everyday life areas such as administrative procedures, healthcare, employment, education…

CONCLUSION

Territorial economic intelligence is a set of coordinated actions of research, processing and disseminations of relevant information to economic actors that take part to the development of a territory. Hence, the development of a territorial economic intelligence necessitates to develop adapted tools that will enhance its competitiveness and extension. It involves a deep environment scanning that take into consideration all the sectors and issues so as to adapt the strategies and the functioning with the new challenges and needs. Big Data it the enabler that provides quick and permanent linkages between firms, public administration and other involved actors in the vast 'non-market' space that must attend the same common general interests. It aims to develop a territorial knowledge that provides strategic information, accessible to various concerned actors. Then, the knowledge is analyzed, communicated and protected by institutions that aim to support territorial economic intelligence within Moroccan territories, as developed in our paper. We have distinguished different source of information, in our Moroccan context, such as Open Data, IoT, archived documents, internet… They are aligned with the developed strategies and national programs that promote the development of a territorial economic intelligence. BIG Data is considered as the essential system to support the development of a strategic information and a global knowledge to attend competitiveness within a territory. Which leads us to wonder, for future potential researches, whether if we can develop a new concept of "competitive territorial economic intelligence" regarding the exponential evolution of BIG Data and its capacity to treat and reconfigure the existing knowledge.

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