

Territorial Intelligence through the application of Business and Competitive intelligence: The case of Guadalupe, Zacatecas (Mexico)

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Abstract - The competitiveness it is a quality demanded by organizations, independently of its nature, size, or position in the value chain, public administrations also do this. Public administrations, on its side, have decided to bet for the development of initiatives that prompt the development of a single knowledge, which allows improving the activities between agents installed in its action zones and, thus, enhancing its competitiveness in a coordinated manner, fulfilling its most immediate needs, and building a trustful environment. With this intention, public administrations require formal studies that identify and measure each one of the elements that compose competitiveness of the organizations, and allow each person involved to analyze and make decisions for adequate economic planning, sustainable development of the region, the enhancement of the life quality, and the perception of an environment of opportunities. For this reason, the city council of the municipality of Guadalupe, Zacatecas (Mexico) in collaboration with the National Institute of Geography and Statistics (INEGI, by its acronym in Spanish) have launched an initiative for identifying, finding, and cataloging, 100% of the active businesses in the territory comprised in an intelligence and geolocalization system, that was named “Inteligencia Competitiva del Comercio, Guadalupe, Zacatecas (ICCGZ)” that roughly translates to “Competitive Commerce Intelligence, Guadalupe, Zacatecas”. This initiative allows knowing rapidly the current status of the local commerce and establishes strategies for strengthening and growing up it, through the intelligent use of the data and information.

Keyword - Business Intelligence; Competitive Intelligence; Strategic Intelligence; Territorial intelligence; Entrepreneurship; Public policies; Regional Specialization; Competitiveness; Zacatecas.

I. INTRODUCTION

Today, the use of information enables to define strategies that allow both the public administrations and the organizations, to have a better knowledge of its background and hence of its competitiveness [1; 2].

From the optics of the public administration and the local commerce, we will find a wide range of opportunities, because the local commerce is becoming as a strategic sector, for being a source of income, jobs, and contribution, to the community. The Statistics shows that of the one hundred percent of the income generated by this type of business, 45% stays in the local economy, unlike big commerce, that only leaves about 15% of its revenue. In addition, local commerce tends to use the services that other local businesses provide, creating a synergic and dynamic environment [3].

Becoming aware of this, administrations and business associations have taken the stake of generating capacities of Competitive and Business Intelligence, thus, searching for developing strategies that allow them to grow and strengthen the local commerce [4-7]. An existing case is the municipality of Guadalupe in the state of Zacatecas (Mexico), where a work team of the city council, in collaboration with the National Institute of Geography and Statistics (INEGI), have created a methodology for identifying, finding and cataloging the 100% of the active businesses in the territory that includes an intelligence and geolocalization system [8-10]. This methodology not only brings us the possibility to know rapidly the current configuration of the commerce, but also eases the establishment of strategies to increase and strengthen local business through the intelligent use of information [11-13].

Derived from the above can be determined that the Coordination action of the European Network of Territorial Intelligence (CAENTI) defines as Territorial Intelligence, that makes reference on what knowledge is needed for understanding territorial structures and dynamics, and also the tools used for the generation and use of that knowledge [14]. Everything on behalf of pushing forward a sustainable territorial development.

On the following section is presented the case of Guadalupe, Zacatecas (Mexico), as a success case in the application of Competitive and Business Intelligence through Territorial Intelligence [15; 16].

II. MEXICO, A GENERAL VISION

Mexico is a key nation in the application of territorial intelligence in America, the exigence of the nation, force it

into growing at the phase of its neighbors through its trade treaties, among other things [17].

Also, it is important to acknowledge that Mexico sustains a great number of commercial treaties, and this asks for this nation to be more organized and competitive in the fulfillment of the international agreements, without being affected by it.

If we take the case of Guadalupe, Zacatecas (Mexico), we can define this municipality as one of the three most important municipalities in the state. This municipality conforms part of the metropolitan area of the cities of Zacatecas and Guadalupe, and its featured in the list of the 50 cities with the most population growth in the nation, taking the fourth place. It has a population of 200.000 inhabitants, where 47 commercial establishments of each 100 are retail businesses, 97 of 100 are small businesses, of each 100 employments, 57 take places in commerce and services, while 65 of 100 employees are paid subordinates and 37 are employed in small businesses.

In this way, the municipality of Guadalupe is distinguished for being reference in the development of and application of the concept of territorial intelligence in the state, mainly because of its close collaboration with the National Institute of Geography, Statistics and Informatics (INEGI) and the Government of the State of Zacatecas, which also translates in a generalized interest on its new advancements and the application of it in other municipalities.

The INEGI plays a relevant part for being a driving agent in this initiative. With its creation, on 1983, INEGI modernized the worthy tradition of our country in the means of compilation, processing and diffusion of information about the territory, population and economics. It consolidated in one institution, the responsibility of generating geographical and statistical information [18].

INEGI is an autonomous public organization, responsible of the norms and coordination of the national system of Statistical and Geographical Information, and the compilation and diffusion of information about Mexico's, territory, resources, population, and economics, that, allows the release of the characteristics of the country, and aids the decision making.

In this manner, it is proposed the presentation of the case of Guadalupe, Zacatecas (Mexico) as a success case in the application of Business and Competitive Intelligence models [19-21].

III. COMPETITIVE INTELLIGENCE OF COMMERCE, GUADALUPE, ZACATECAS (ICCGZ)

Taking as a premise that the municipality has the obligation of providing the best conditions for motivating the investment in its territory, and thus driving forward the economic development of the municipality, and by doing so, enhancing the life quality of its inhabitants by receiving the best services from the city.

The previous idea, caused in the city council the need of generating the adequate information to create a digital database that allows the measurement/analysis of the economic situation of the municipality, and start seeing the economic changes that take place in it, and then developing new strategies to help enhance the distribution of commerce in the territory of new business.

In this way, the project “Competitive Intelligence of Commerce, Guadalupe, Zacatecas (ICCGZ)” was born, this project has as objective the improvement of the economic and social wellbeing of the region, increasing the regional economic activity by the identification and development of economic, social and cultural policies that favor the competitiveness and the growth of companies despite its size and activity. Also, it searches for developing a dynamic

and attractive region, where the access to information, the interchange of knowledge, and the cooperation between organizations would be catalyzers for new high added value activities, and the strengthening of the entrepreneur environment.

The project ICCGZ has accomplished the coordination of every level of government and administration, and the enterprises and citizens, this counted on the positioning of the project as a milestone in the regional development, both local and national development in Mexico.

IV. METHODOLOGY

For the project ICCGZ in Guadalupe, Zacatecas, a methodology was adjusted to the needs and conditions of the country, with a regional approach, it was designed and developed, assuring the possibility of exporting the methodology and the lessons learned to other regions in Mexico.

The methodology developed initially, was composed of five stages, as it can be observed in the next picture. Nevertheless, as the project advanced, new enhancing opportunities were found, so the possibility of presenting an actualization, it is not dismissed.

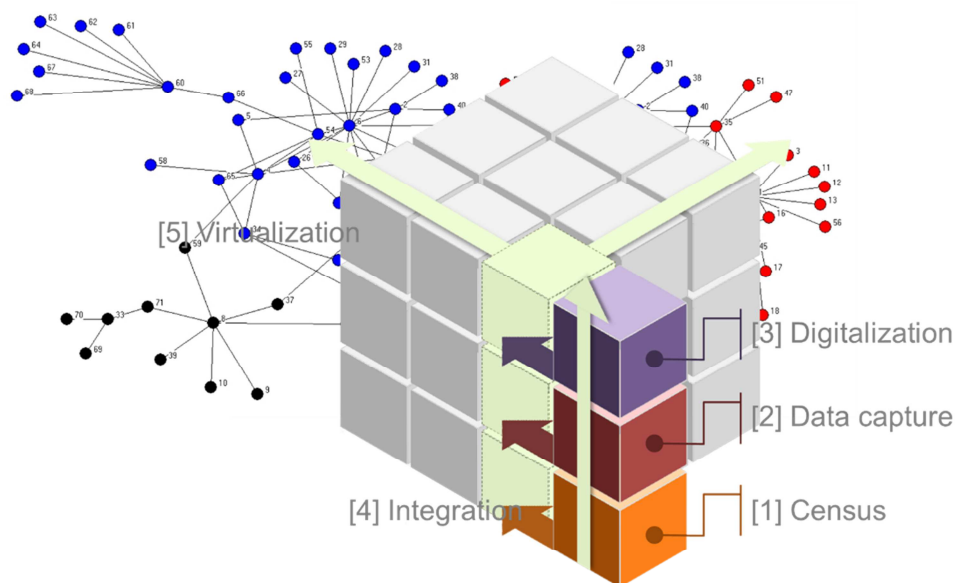


Fig. 1. ICCGZ Methodology (Model 1)

Taking as reference the prior information, next, we will describe briefly every stage of the ICCGZ methodology (Model 1).

Table 1. ICCGZ methodology (Model 1)

Stage	Description
Census	In the first stage, a census of the businesses was performed in the municipality, requiring detailed information, such as establishment data, municipal data, alcohol licenses, advertisement data, geographical data of the addresses, among others. This data is georeferenced and accompanied by photos of the commercial premises.
Data capture	At the second stage, all the information its captured on the computer, creating a detailed file of each commercial venue registered in the municipality, which is valuable by itself to the knowledge and state of the active businesses
Digitalization	In the third stage, all documents available in the city hall are digitalized, documents as, land use permits, alcohol licenses, payment vouchers, infractions, etc. such documents contain information linked to the registered businesses, this also makes possible the identification of irregularities in the registration process.
Integration	At the fourth stage, the database is integrated with the population census, photos, and digitalized documents, creating a large database.
Virtualization	For the fifth stage, the database is integrated into a digital map, this action is accompanied by visualization tools and filters that allow the cross-checking of information, that could not be possible otherwise.

The next figure shows some of the pictures collected by the users for the development of an example for the project.



Fig. 2 Example of the ICCGZ process (Model 1)

It is worth mentioning that the information is updated frequently, and the project is active, which has opened other development lines for improving the information gathering and accelerating the integration process.

The project “Competitive Intelligence of Commerce, Guadalupe, Zacatecas (ICCGZ)” has been recognized as being a pioneer and innovative initiative in Mexico, so

evaluating its impact at such a short time would be adventurous. Furthermore, some of the results obtained via different approaches will be presented [22-25].

V. RESULTS

From the approach of objectives, the project ICCGZ, every business established in the territory of the

municipality, has been registered. This revealed that many of those were not registered, hence, the municipal registration grew from 3,300 in 2016 to 5,098 in 2017. We must point that keeping the registry up to date is hard work that is because every day new venues are opened, while others close, to fulfill this task, a constant inspection is needed.

It is evident that the information helps in various topics regarding the economic growth, helping the investors to analyze the place which would be better for the business to succeed or aiding the already established businesses to find places to increase the number of its branches, that, allows the improvement of the distribution in each zone of the municipality, and this way, the citizens are always near every kind of commercial venues and services. Also, improved decision making, for example, giving new alcohol licenses, increasing the tax collection (it increased in a two hundred percent rate in relation with the years 2017 and 2016), efficiency on desk analysis with precise information, and rapid decision-making, principally.

Now, as a result of the project, business chambers established in the state of Zacatecas, asked for information in two ways: first, as single inquiries for making decisions in order to expand their business, and, in another way, related to the generation of important information for the design of policies and collective programs related to each one of them, with the goal of determining opportunities in socio-economical aspects, and also the generation of indicators for the measurement of economic growth. Some of the organizations that stand out are the COPARMEX, the employers' syndicate, the national chamber of commerce and the national chamber of the transformation industry.

VI. CONCLUSIONS

The project ICCGZ is as a pioneer and innovative initiative, oriented at the strengthening of the region through a constant improvement of competitiveness of the businesses, individually and as a group. Also, it has become a key tool for the identification, development and spreading of economic, social and cultural policies that transcend political cycles.

As well, the project ICCGZ has allowed the development of a methodology that is not only applicable in the region, but it is also versatile and exportable to any region in Mexico, which would allow us to develop in the future, strategies with a greater span, thinking of a region or a country.

The acceptance by the businesses and the society is high, since the opening to new dynamics of knowledge and cooperation, they understand that it will translate into better opportunities for everyone, and also a better public management, favoring the coordination activities of the government with the main economic and social agents, and with that, strengthening the region, and improving its image internally and externally.

The entrepreneur environment has been one of the instances that have received this initiative better, since it has been one of the most benefited, because, a new level of information and knowledge, has prompted them to adjust its initiatives to the real regional needs, accelerating the establishment of new businesses.

Lastly, the Government of Guadalupe has developed new capabilities that have enabled them to update and improve its command frame, as well as offering assistance, information, advice, and accompaniment services to companies, organizations, and investors (local and external), improving the region.

REFERENCES

- [1] D.K. Banwet, K. Momaya, H.K. Shee, Competitiveness through technology management: An empirical study of the Indian software industry, *International Journal of Services, Technology and Management* 4 (2003), 131-155. <https://doi.org/10.1504/IJSTM.2003.002575>
- [2] M.E. Porter, C. Van der Linde, Toward a new conception of the environment-competitiveness relationship, *Journal of economic perspectives* 9 (1995), 97-118.
- [3] L. Van den Berg, E. Braun, Urban competitiveness, marketing and the need for organising capacity, *Urban studies* 36 (1999), 987-999. <https://doi.org/10.1080/0269094993312>
- [4] J.R. López-Robles, J.R. Otegi-Olaso, I. Porto Gómez, M.J. Cobo, 30 years of intelligence models in management and business: A bibliometric review, *International Journal of Information Management* 48 (2019), 22-38. <https://doi.org/10.1016/j.ijinfomgt.2019.01.013>
- [5] J.R. López-Robles, J.R. Otegi-Olaso, N.K. Gamboa-Rosales, H. Gamboa-Rosales, M.J. Cobo, 60 Years of Business Intelligence: A Bibliometric Review from 1958 to 2017, in: *New Trends in Intelligent Software Methodologies, Tools and Techniques: Proceedings of the 17th International Conference SoMeT_18*, IOS Press, 2018, p. 395. <http://doi.org/10.3233/978-1-61499-900-3-395>
- [6] J.R. López-Robles, J.R. Otegi-Olaso, I. Porto Gómez, N.K. Gamboa-Rosales, H. Gamboa-Rosales, H. Robles-

- Berumen, Bibliometric Network Analysis to Identify the Intellectual Structure and Evolution of the Big Data Research Field, in: *International Conference on Intelligent Data Engineering and Automated Learning*, Springer, 2018, pp. 113-120. https://doi.org/10.1007/978-3-030-03496-2_13
- [7] J.R. López-Robles, J.R. Otegi-Olaso, R. Arcos, N.K. Gamboa-Rosales, H. Gamboa-Rosales, Mapping the structure and evolution of JISIB: A bibliometric analysis of articles published in the Journal of Intelligence Studies in Business between 2011 and 2017, *Journal of Intelligence Studies in Business* 8 (2018). <https://ojs.hh.se/index.php/JISIB/article/view/362>
- [8] A. Knauf, Emerging Functions for Driving Competitive Intelligence at Regional Level, in: *Competitive Intelligence and Decision Problems*, John Wiley and Sons, 2013, pp. 299-325. <https://doi.org/10.1002/9781118586419.ch15>
- [9] H. Dou, Regional Development 2.0, in: *Competitive Intelligence 2.0: Organization, Innovation and Territory*, John Wiley and Sons, 2013, pp. 315-332. <https://doi.org/10.1002/9781118603079.ch15>
- [10] R. Pauluci, Triple Helix and Territorial Intelligence 2.0, in: *Competitive Intelligence 2.0: Organization, Innovation and Territory*, John Wiley and Sons, 2013, pp. 285-313. <https://doi.org/10.1002/9781118603079.ch14>
- [11] L. Quoniam, *Competitive Intelligence 2.0: Organization, Innovation and Territory*, John Wiley and Sons, 2013. <https://doi.org/10.1002/9781118603079>
- [12] S. Wright, E.R. Eid, C.S. Fleisher, Competitive intelligence in practice: Empirical evidence from the UK retail banking sector, *Journal of Marketing Management* 25 (2009), 941-964. <https://doi.org/10.1362/026725709X479318>
- [13] M.G. Alsina, E.O. Espinet, Competitive intelligence: Theory and practice, *Ibersid* 6 (2012), 77-88.
- [14] J.-J. Girardot, European Network of Territorial Intelligence, in: *International conference of Territorial Intelligence" Information, Indicators and Tools". Pécs, 29-31 mai 2008*, 2008, p. n.
- [15] J.-J. Girardot, Evolution of the concept of territorial intelligence within the coordination action of the European network of territorial intelligence, *Res-Ricerca e Sviluppo per le politiche sociali* (2009), 11-29.
- [16] P. Herbaux, C. Masselot, Territorial Intelligence and Governance, in: *In International Conference of Territorial Intelligence*, 2007, pp. p. 509-521. <https://halshs.archives-ouvertes.fr/halshs-00516430>
- [17] Y. Bertacchini, M. Rodríguez-Salvador, W. Souari, From territorial intelligence to compositive & sustainable system. Case studies in Mexico & in Gafsa university, in, 2007.
- [18] E.C. Mendoza, D. Arellano, *Los gobiernos municipales a debate: un análisis de la institución municipal a través de la encuesta INEGI 2009*, CIDE, 2014.
- [19] R. Arcos, Public relations strategic intelligence: Intelligence analysis, communication and influence, *Public Relations Review* 42 (2016), 264-270. <https://doi.org/10.1016/j.pubrev.2015.08.003>
- [20] C.S. Fleisher, B.E. Bensoussan, *Strategic and competitive analysis: methods and techniques for analyzing business competition*, Prentice Hall Upper Saddle River, NJ, 2003.
- [21] S. Erickson, H. Rothberg, Strategic approaches to knowledge and related intangibles, in: *Proceedings of the 16th European Conference on Knowledge Management, ECKM 2015*, A. Garlatti and M. Massaro, eds., Academic Conferences Limited, 2015, pp. 256-263.
- [22] C.M. Olszak, E. Ziemba, Critical success factors for implementing business intelligence systems in small and medium enterprises on the example of upper Silesia, Poland, *Interdisciplinary Journal of Information, Knowledge, and Management* 7 (2012), 129-150. https://doi.org/10.1007/978-3-319-42092-9_43
- [23] A. Tur-Porcar, N. Roig-Tierno, A. Llorca Mestre, Factors affecting entrepreneurship and business sustainability, *Sustainability* 10 (2018), 452. <https://doi.org/10.3390/su10020452>
- [24] G. López Nava, J.L. Martínez Flores, J. Cavazos Arroyo, Y. Mayett Moreno, La cadena de suministro del mezcal del estado de Zacatecas: Situación actual y perspectivas de desarrollo, *Contaduría y Administración* 59 (2014), 227-252.
- [25] R. Mazoco, E. Martha, E.A. Carmona, L.P. Bautista Santiago, Análisis de Condiciones de Cierre de Mipymes Comerciales en la Zona Conurbada Zacatecas-Guadalupe en México (Analysis of Closing Conditions of Smes in Zacatecas-Guadalupe in Mexico), *Revista Global de Negocios* 5 (2017), 45-54.