

USING DATA MINING TO INFLUENCE SOCIAL ENTREPRENEURSHIP AND TERRITORIAL DYNAMICS

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ABSTRACT

Economic digitization is a trend phenomenon that shifts microeconomics and macroeconomics, in other words, the economy from the era of the physical world or material space to a virtual world or immaterial area by relying on digitization technologies, in volumes never before achieved and in record time, directly impact the performance of organizations as well as social entrepreneurship in various territories around the world. Organizations must therefore deal with a gigantic wave of data to follow the news as well as promote territorial intelligence. This universe of data is defined by the generic term of Data mining, the processing of which is usually provided by artificial intelligence technologies. Entrepreneurship constitutes a space of solidarity, mutual aid, pooling of social groups who suffer from poverty, precariousness or even and aspire to values such as dignity, interests and power and observed in order to ensure an equitable distribution for the benefit of all citizens and regions of the Kingdom. It is within this framework that Morocco has embarked on a structural transformation which has resulted in the efforts of the State to strengthen a modern and competitive economy, to simplify the creation of their growth and the promotion of entrepreneurship and by therefore promote the development of the territory. In the interest of having a much broader and clearer vision of the influence of data mining and business intelligence on territorial intelligence and social entrepreneurship, We are trying to answer the following problem: How does social entrepreneurship promote a territorial dynamic using Data mining and Business intelligence, particularly in the Fez-Meknes region?

Keywords: *Data Mining, Business Intelligence, Social Entrepreneurship, Smart Territories*

1. INTRODUCTION

For several decades, entrepreneurship has continued to impose itself as an essential phenomenon of our time. It is the main driver of growth, restructuring, structural development, innovation and job creation.

Entrepreneurship constitutes a space of solidarity, mutual aid, pooling of social groups who suffer from poverty, precariousness or even and aspire to values such as dignity, interests and power and observed in order to ensure an equitable distribution for the benefit of all citizens and regions of the Kingdom. It is within this framework that Morocco has embarked on a structural transformation which has resulted in the efforts of the State to strengthen a modern and competitive economy, to simplify the creation of their growth and the promotion of entrepreneurship and by therefore promote the development of the territory. The interest in territorial development is

increasingly evident; Morocco has implemented major reforms to reduce territorial and social disparities in order to diversify its economy and encourage investment and human development with a view to supporting economically and socially productive territorial development.

Social entrepreneurship acts as a catalyst; a source and target inducing in turn a territorial dynamic.

To simplify the research, we have formulated the following problem: According to what measures does social entrepreneurship promote a territorial dynamic, particularly in the region of Fez-Meknes? and what will be the influence of the integration of data mining to answer this problem?

From there, we understood the interest and the effectiveness of setting up a business intelligence strategy based on data mining to ensure the perinuity of data processing as well as a track of improvement of intelligence. territorial. In this

article, we will first try to present a specific literature on the subject, then to study the perinity of the implementation of data mining to improve territorial intelligence through social entrepreneurship, this will be the subject of the results of a practical case relating to the region of Fez - Meknes.

This paper mainly aims to stimulate the interest in territorial development which is increasingly manifested through the reduction of territorial and social disparities in order to diversify its economy and encourage investment and human development from a point of view of bringing an economically and socially productive territorial development, this can be easily achieved by exploiting the maximum amount of data available using the technique of Data Mining.

2. MATERIALS AND METHODS:

The interest in territorial intelligence is increasingly manifested through the encouragement and improvement of social entrepreneurship, Morocco has implemented major reforms to reduce territorial and social disparities in order to diversify its economy and encourage investment and human development with a view to bringing economically and socially productive territorial development. But this must be complemented by the use of technologies in order to properly process Big Data using data mining as well as business intelligence. In this section, we will present the materials necessary for the development of the article before moving on in the next section to the treatment of the data. So we will discuss the following four elements: Business intelligence, Big data, Data Mining and social entrepreneurship at the service of territorial intelligence

3. BUSINESS INTELLIGENCE :

Business Intelligence (BI), also "business intelligence" or "business intelligence", encompasses IT solutions providing decision support to professionals with, at the end of the chain, reports and dashboards for monitoring the activities of both analytical and forward-looking[1].

This notion appeared at the end of the 1970s with the first infocentres. Systems that sent requests directly to the production servers, which turned out to be rather dangerous for the latter. In the 1980s, the arrival of relational databases and the client/server made it possible to isolate production computing from decision-making devices. In the

aftermath, actors embarked on the definition of "business" analysis layers, with the aim of masking the complexity of data structures. From the 90s and 2000s, BI platforms revolved around a data warehouse (or datawarehouse) to integrate and organize information from business applications (via extraction, transfer and of consolidation - or ETL). Objective: to respond in an optimized manner to requests for reporting tools and dashboards of indicators located downstream, and made available to operational managers[2].



Figure 1: Business Intelligence Asset Base

Business intelligence is a technological process that analyzes data to present actionable information to executives, business executives, and other users to enable them to make more informed decisions[3]. Business intelligence encompasses the various tools, applications, and methodologies that allow the business to collect data from internal systems and external sources, prepare it for analysis, develop queries, and apply it. to this data. From this, various views, or visualization modes, such as reports and dashboards, are drawn to make the analytical results available to decision makers and business stakeholders[4].

BI data can include historical information, as well as new data collected from source systems as it is generated. BI analysis can thus support both strategic and tactical decision-making processes. Initially, BI tools were primarily used by IT professionals, including data analysts[5]. They performed analyzes and generated reports containing query results for business users. Today, executives and operational staff are increasingly using BI software, thanks to the development of data mining and self-service BI tools[6].

The information environment is increasingly complex, with an increasing amount of rapidly circulating data. With BI tools, you can synthesize information in real time to draw the right

conclusions and exploit opportunities for your business. The information collected is accurate and reliable. They follow relevant indicators for your activity. The simplified graphical presentation allows you to have a good visibility on the information, whether it is situational data or forecasts for your organization[7]. Economic intelligence suffers in the world from a real lack of knowledge, practice and communication. And how do you understand a discipline well, even before putting it into practice, when you don't know it well?



Figure 2: Business intelligent component

Traditionally centered on accounting issues (consolidation and budget planning), BI has gradually extended to all major areas of business, from customer relationship management to supply chain management, including by human resources[8]. Specialized publishers have defined libraries of ready-to-use indicators to monitor these different activities. Finally, the appearance of new web technologies (including HTML5 and JavaScript and AJAX graphical interfaces) has also made it possible to the emergence of new players offering an approach to BI in cloud or SaaS mode[9].

Business Intelligence (BI) is increasingly used by business leaders. This branch of data science helps them make the right decisions in areas related to the company's activity in order to increase its turnover[10]. BI is based on the collection, processing, analysis and modeling of data accumulated by companies. Its purpose is to obtain relevant information and enable business managers to make the right decisions[11]. BI is generally divided into three stages: the periodic extraction of data, the restructuring of data in order to present the

data in a semantic form and the analysis of data by experts.

4. BIG DATA :

"Big Data" is a generic term used to designate the strategies and technologies implemented to collect, organize, process and analyze large sets of data. Big Data is the art of managing and exploiting large volumes of data. In this section we will present the definition of Big Data, its main use cases and its cardinal concepts[12].

Before defining Big Data, or big data, it is important to understand what data is. This term defines the quantities, characters or symbols on which operations are carried out by a computer. Data can be stored or transmitted as electrical signals and recorded on mechanical, optical or magnetic media[13]. The term Big Data refers to vast sets of data collected by companies, which can be explored and analyzed in order to generate actionable information or used for Machine Learning projects. Big Data is often defined by the "3 Vs" that characterize it: the volume and variety of data, and the velocity with which it is generated, collected and processed. This is what differentiates "big data" from traditional data[14].

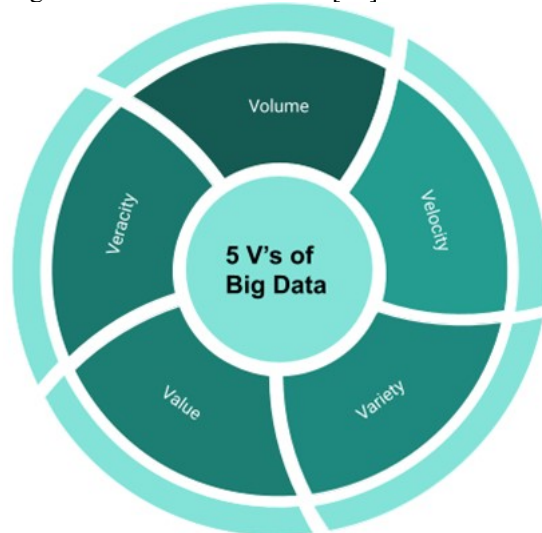


Figure 3: Big Data characteristics

These three characteristics were first identified in 2001 by Doug Laney, analyst at Meta Group Inc. They were then popularized by Gartner following the acquisition of Meta Group in 2005. Today, other characteristics are sometimes attributed to the Big Data like veracity, value and variability. In companies of all industries, systems for processing and storing Big Data have become

indispensable. For good reason, traditional data management tools are not able to store or process such massive sets. In all sectors, companies use the Big Data stored in their systems for different purposes. It could be to improve operations, provide better customer service, create personalized marketing campaigns based on consumer preferences, or simply increase revenue[15]. Thanks to Big Data, companies can enjoy a competitive advantage against their competitors who do not exploit the data. They can make faster and more accurate decisions based directly on the information. For example, a company or a public administration can analyze Big Data to discover valuable information about the needs and expectations of its customers. This information can then be leveraged to create new products or targeted marketing campaigns to increase customer loyalty or increase conversion rate. A company that relies completely on data to guide its evolution is called "data-driven". Also, Big Data is used in the field of medical research. In particular, it makes it possible to identify disease risk factors, or to make more reliable and precise diagnoses. Medical data also makes it possible to anticipate and monitor possible epidemics[16]. Big data is used in almost every industry without exception. The energy industry uses it to discover potential drilling areas and monitor their operations or the power grid. Financial services use it to manage risk and analyze real-time market data[17]. Manufacturers and transportation companies, meanwhile, manage their supply chains and optimize their delivery routes with data. Over time, the value of intangible assets increases at the expense of that of tangible assets. It is said that the economy is dematerialized helped by technological discoveries and socio-cultural changes, modification of the mode of consumption. Similarly, governments are harnessing Big Data for crime prevention or for Smart City initiatives[18]. At the corporate level, the last phase involves the appropriation of new disruptive techniques, digital interfaces, artificial intelligence, robotization, etc. new agile working methods, new organizational methods, etc. Different techniques are used to analyze Big Data. Here are some examples[19]. Benchmarking, for example, allows a company to compare the performance of its products and services to customers with those of its competitors. Marketing analytics involves analyzing data to promote new products and services in a more informed and innovative way.

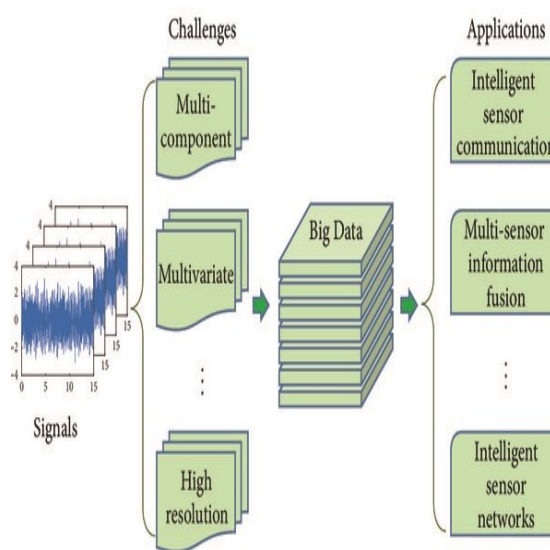


Figure 4: Big Data architecture

The purpose of sentiment analysis is to assess customer satisfaction with a brand, in particular by reviewing reviews or comments left on the internet[20]. In the same vein, the analysis of social networks makes it possible to highlight the reputation of a company from what Internet users say about it on the networks. It then becomes possible to identify new target audiences for marketing campaigns[21]. However, there are Big Data solutions designed for on-premises deployments. These solutions typically use open source Apache technologies in combination with Hadoop and Spark.

5. DATA MINING:

Data mining refers to the process of analyzing massive volumes of data and Big Data from different angles in order to identify relationships between data and transform them into actionable information. This system falls within the framework of Business Intelligence and aims to help companies solve problems, mitigate risks and identify and seize new business opportunities[22]. Data mining is an inseparable process from big data analysis, predictive intelligence and data mining. Data mining is not a recent concept. Already in the 17th century, people were looking for ways to analyze data and identify common characteristics. One of the first traces of the concept of data mining dates back to 1936. It was in this year that Alan Turing, a British mathematician and cryptologist, introduced the idea of a machine capable of performing calculations similar to those modern computers[23]. Turing's work is part of the foundations of programming and computer science.

But it was later, in the 1980s, that data mining really began to exist and even found a name. Its name comes from the fact that data scientists of the time compared the search for valuable information in a large database and the exploitation of a mountain[24]. Both processes require sifting through huge amounts of material to find a high-value item. Today, data mining is used in many sectors of activity such as research, marketing, product development, health or education. This process quickly resolves issues that previously took a long time to resolve manually[25]. Data mining is a process of extracting valuable information from large dataset, in order to make more informed decisions. It involves processing data to find patterns and trends in current information, making predictions about future trends by looking at historical data to paint a picture of how things might develop in the future, and finding connections between various data sets that you might not have been able to see before.

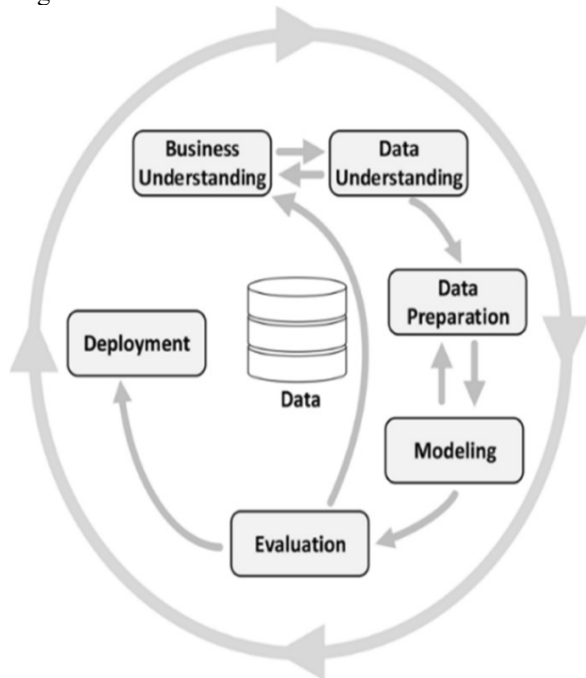


Figure 5: Data Mining components

Using various statistical techniques to analyze data allows users to identify patterns, trends, and correlations that were not initially apparent. Using the results of the various successive analyses, they can predict what is likely to happen and take action to influence and maximize business results. When data mining is employed effectively, it can provide organizations with a significant advantage over their competitors. It allows you to better

understand customers, develop effective marketing strategies, increase revenue and reduce costs. Using data mining in your business involves knowing many concepts, tools and techniques that revolve around this notion:

- Data cleaning and preparation: this is a stage during which the data is transformed in order to be analyzed and processed operationally. Delete errors or identify missing information, for example.
- Artificial Intelligence (AI): These are systems that perform analytical activities by mimicking human thinking such as learning, reasoning or problem solving.
- Learning association rules: these are tools that search for relationships between variables in a data set. It can, among other things, allow a company to identify products that are generally purchased together by customers.
- Clustering: It is a process of partitioning a dataset into clusters (subgroups) to help users understand the grouping of data or previously unknown facts.
- Classification: this technique is used to categorize or classify information from a data set in order to make predictions.
- Data analysis: the act of evaluating numerical information and using it in a useful way.
- Data warehousing: this is literally storing data to help an organization make the best decisions. It is an essential component of large-scale data mining.
- Machine learning: it is a computer programming technique that uses statistical probabilities to give computers and IoT the ability to “learn”. Machine learning and artificial intelligence are two related concepts.
- Regression: It is an analytical method used to predict a range of numerical values (sales, temperatures or stock prices for example) from a specific data set.
- Businesses are seeing data arrive in multiple formats at unprecedented speeds and volumes. Being a data-

driven company is no longer an option.

The success of any structure now depends on its speed in exploiting insights from Big Data and integrating them into the decision-making and business process in order to identify and lead relevant actions within the organization.

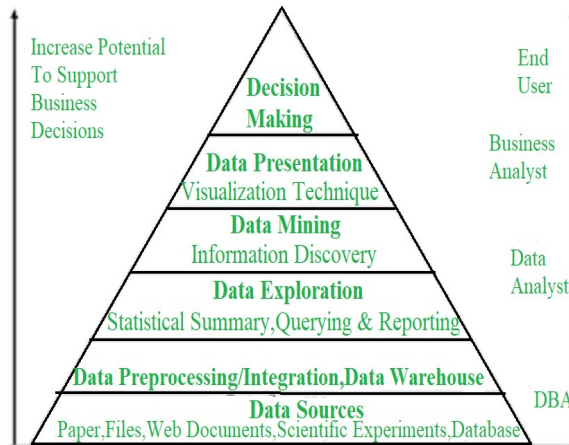


Figure 6: Data Mining Process

Any data mining project begins with adequate data preparation: defining a clear business or commercial objective, building the corresponding databases and preparing them for analysis. Poor data quality will lead to unreliable results. This is why data miners must absolutely guarantee the quality of the data they will use later during the analysis phase.

- Regarding the methodology of Data Mining, Data mining specialists generally obtain reliable results by following a structured and repeatable six-step process:
- Business Understanding: Develop an in-depth understanding of the project parameters and framework (including the current business situation) and define the key success factors.
- Understanding the data: determining the information that will be needed to meet the defined objective, listing the resources that contain the useful data and gathering it.
- Data preparation: prepare data in the appropriate format to meet the business purpose and correct quality issues such as duplicates or missing data.

- Modeling: using algorithms to identify patterns.
- Evaluation: determining if and to what extent the results obtained by a model will help achieve the final business objective. There is often an iterative phase to find the best algorithm and therefore the best result.
- Deployment: making the results of the analysis available to decision-makers and using the final information to adapt the strategy.

So we can say that it is not enough to store a multitude of data within a specialized database, Data Warehouse or Big Data, it is still necessary to exploit them. This is the role of Data Mining which, well used, will be able to draw the lessons contained in this mass of data far too large to be satisfied with statistical tools alone. Let's see the principle, the methods used, the tools and a concrete case highlighting the importance of data quality.

6. SOCIAL ENTREPRENEURSHIP AT THE SERVICE OF TERRITORIAL INTELLIGENCE:

A social entrepreneur is simply the creator of a social enterprise. Unlike an entrepreneur, a social entrepreneur does not have profit as his primary objective, but rather to make a positive contribution to society.

Constantly evolving since its appearance in the 1990s, the concept of social entrepreneurship is mainly characterized by the desire to submit economic performance to criteria of general interest. Profit is no longer the ultimate goal of the company, but a means of achieving broader objectives, the priorities of which are social, societal and/or environmental. By nature, they therefore integrate the precepts of CSR and Sustainable Development, which can also be the subject of a specific approach by companies in the traditional economy. A social company does not have as a priority to make profits, unlike a traditional business. Its primary goal is to carry out projects with strong social utility, so that it may be led to implement projects that are not very profitable economically, but very beneficial to society or the environment, for example. The projects set up by social enterprises relate to themes such as professional integration, assistance to the disabled, sustainable development, organic farming,

the circular economy or mobility assistance. Social entrepreneurship makes it possible to create social or environmental value within traditional companies. It encourages new managerial approaches, particularly those relating to Corporate Social Responsibility (CSR): a partnership contract for example, or a financial donation. This will be able to recover a good part of its contribution for a social cause. And since consumers are more and more sensitive to goods and services corresponding to certain values, the social and solidarity economy will henceforth be an integral part of daily life. Social entrepreneurship is the action taken by an entrepreneur to find innovative solutions to social problems. This term designates a social economy enterprise or a non-profit organization that has a strong social mission. Social entrepreneurship emerged in the 1980s in the United States and in the 1990s in Europe. It is therefore not new, but like any new thing it took time to develop and be known. Over the years, we have witnessed the emergence of new entrepreneurial dynamics with a social purpose, such as the creation of statutes adapted to social entrepreneurs, the establishment of new support mechanisms and the emergence of new networks in these sectors which are energized. It is another way of doing business with social entrepreneurship, where you are not just looking to make a profit. The entrepreneur places economic efficiency at the service of society and the environment. The term "social entrepreneurship" is a much more general term, it encompasses the notion of social economy. Social entrepreneurship is an organization of activity with a viable economic project, which satisfies purposes of general interest (social or environmental) but for profit. The entrepreneur must satisfy a real need of the population while creating his own job. The social economy enterprise is a form of social entrepreneurship. The social economy enterprise includes all forms of collective enterprise such as non-profit organizations and cooperatives.

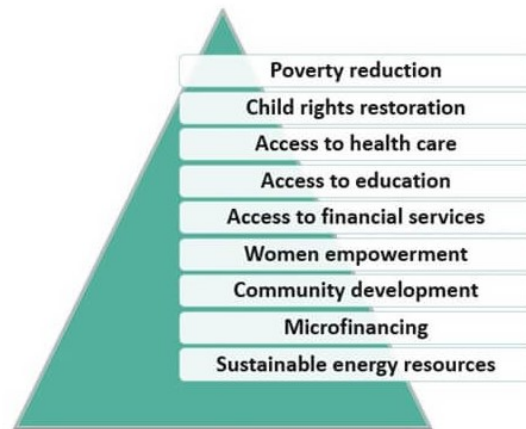


Figure 7: Social Entrepreneurship Target Areas

Social entrepreneurship is a social economy enterprise that must create a minimum of profit. Social entrepreneurship is really about generating business opportunities that have a positive impact. It's about putting your business to work for good, looking at the role of business in this world and the ways it can bring about positive change. Social entrepreneurship seeks to reconcile economic profit and social profit. In other words, social entrepreneurs try to meet a collective need, to address a social issue, through a sustainable economic activity. Social entrepreneurship starts above all from a deep motivation to want to put the general interest before personal interests, and in particular financial profits. Indeed, the purpose of the social enterprise is not to generate profits to get rich, but to be able to reinvest them and have a positive impact on a larger scale.

A link can therefore be established between the objectives of territorial intelligence and social entrepreneurship.

The territory has been the focus of all attention for twenty years, because it is at the center of the representations we have of the complexity that surrounds us. And what surrounds us is first of all space, but the term is too neutral to characterize what we sense as being more elaborate. The territory has slowly replaced this term (space) by giving more depth to what could also be called environment, that is to say what surrounds us in a very global sense, it is that is to say combining the physical, natural and developed environment. But subtly, the territory turns out to be much more than the space, the environment, or the men who populate it and appropriate it; it is more than all that, but ultimately no longer corresponds to anything through use. The definitions end up overlapping, space is geographical, territory is

geographical space, the environment is all that but a little less, man is often an agent more than an actor and most of the time the approaches wisely isolate this which relates to the organization of space (geographical space) and what relates to the actors.

The concept of Territorial Intelligence (TI) is generally defined as the application of the principles of Economic Intelligence, within the framework of public action, at the service of the economic and industrial development of a territory. It is a decision support tool for communities. From this point of view, territorial intelligence has an important task to develop the multidisciplinary knowledge and multisectoral information essential for sustainable development. Knowledge about territories is essentially produced within a disciplinary framework, and the places to cross, confront and organizing knowledge on the territories at the university level must still be multiplied so that a “science of the territory” develops. The use of fundamental methods and generic tools for the analysis of the territory and territorial information remains unequal according to the laboratories and in the various disciplines concerned. This is of course also felt in the field, at the level of observatories and the various study offices and territorial projects where territorial knowledge is also used and developed, and where territorial information is collected, used and produced.

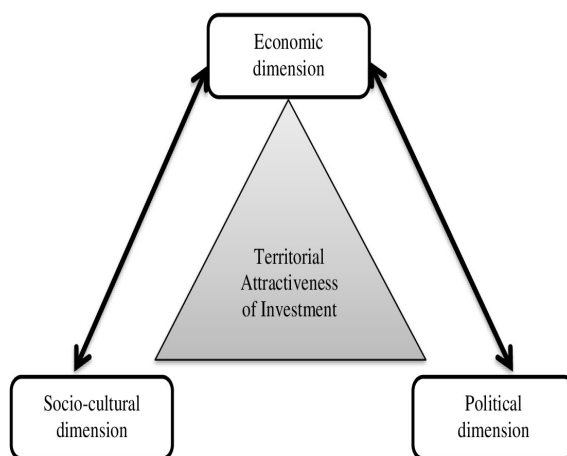


Figure 8: The Attractive Territory

The concept of Territorial Intelligence gives rise to various definitions but all the experts agree on the fundamentals. Territorial intelligence is a nascent concept which consists in applying the principles of economic intelligence at the level of the territory in order to improve its competitiveness. Advocating a fluidized flow of information, territorial intelligence must allow

economic actors not only to control strategic information but also to promote its protection and the implementation of actions of influence.

7. RESULT:

The Fez-Meknes region aspires to an integrated, sustainable, inclusive development that benefits all the territories of the Region. For this, it must meet several challenges relating to the strengthening of the competitiveness of companies, the development of regional innovation, the protection of natural resources, the reduction of territorial and social disparities as well as the enhancement of cultural and historical heritage. To achieve this integrated development, a development vision has been put in place by consolidating existing sectors and promoting the emergence of new growth sectors: industry, the digital economy, services and the knowledge economy. The Fez-Meknes region, which has strategic socio-economic assets, must meet five major challenges in order to improve its competitiveness and diversify its industry. The Region's strategy is based on the development of sectors with high potential. In this context we will exploit the maximum of available data to see how social entrepreneurship promotes territorial dynamics using machine learning and business intelligence.

Concerning the research methodology used in this study, we first collected as much data as possible from the platforms and websites of the authorities concerned such as the high planning commission, the regional investment center, the municipalities, etc. Then we manipulated the data using the Data Mining technique using R to extract the results

In this section, we have approached the prediction of the territorial attractiveness of the region of Fez Meknes using the data available on the projects as well as on the social entrepreneurship, and this using the tools of data mining, the confusion matrix. This is a contribution based on data available on the website of the regional investment center, as well as any other information available on the statistics of the Fez Meknes region, particularly in relation to social entrepreneurship and the Territorial attractiveness. The results are presented as follows:

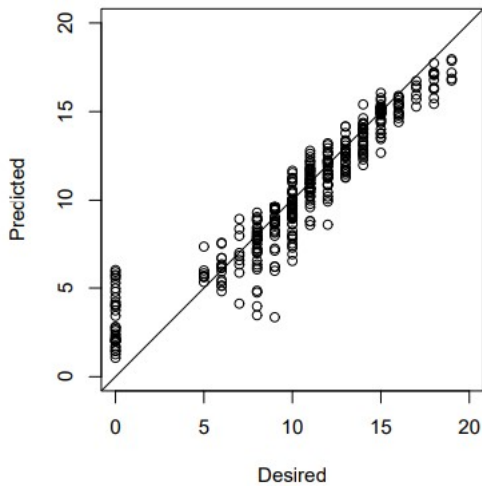


Figure 9: Using Data mining to predicting the territorial attractiveness on Fez Meknes

Our contribution in this section consists of the use of DataMining with the most effective tools to measure the importance of social entrepreneurship and its impact on territorial attractiveness in the context of smart territories. Data mining is the practice of automatically searching large amounts of data to discover trends and patterns that go beyond simple analysis. In this context, the results demonstrate that there is a close relationship between the improvement of social entrepreneurship and territorial dynamics in the region of Fez Meknes through a scale of measures based on the figures in the figure.

This means that there is a strong relationship between the two variables, in other words an increase in entrepreneurship projects will lead to a better positioning of the Fez Meknes region.

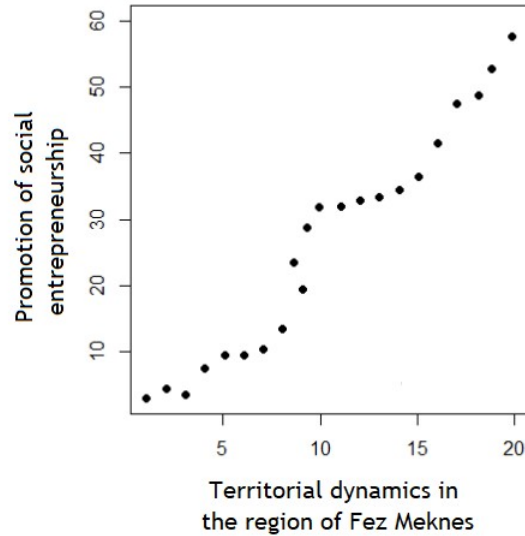


Figure 11: Machine learning using SVP to measure the impact of the promotion of social entrepreneurship on the territorial attractiveness on Fez Meknes

To use SVM in R, we created random data from the information available on the Fez Meknes region in the websites of the authorities concerned with two characteristics "promotion of social entrepreneurship" and "territorial dynamics" in Excel. We have all the values of promoting social entrepreneurship as a simple sequence from 1 to 20 and the corresponding values of derived territorial dynamics. The results show that there is a strong relationship, so the more the authorities concerned will promote social entrepreneurship the more there will be an effort to increase and improve the territorial attractiveness in the region of Fez Meknes .

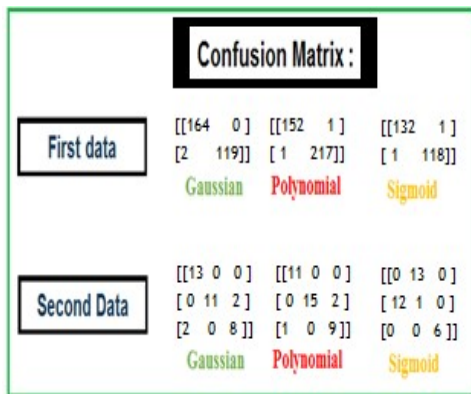


Figure 10: Using Data mining to evaluate the relation between social entrepreneurship and territorial attractiveness

Regarding the confusion matrices, we noticed that the best confusion matrix we got was when we used the Sigmoid kernel function in the second data, where all the data was arranged in the right place.

8. CONCLUSION

The application of data mining to management the promotion of social entrepreneurship is at the start-up stage but the direction of the research is promising, it can come to an emotion improvement of territorial intelligence governance mode . Future research efforts aim to develop new frameworks and standards for greater effectiveness in the field of social entrepreneurship using technological tools. New advanced technologies and techniques will be explored to manage issues related to the speed and efficiency required to influence the behavior of contractors and relevant authorities.

From this study, noting that the use of the Data Mining technique will have a very positive impact on the improvement of social entrepreneurship and territorial dynamics, more particularly in the region of Fez Meknes, the results of this study have clearly identified the strengths in terms of data processing as well as the simplification of the decisions to be taken.

9. LIMITATIONS OF STUDY

The study assessed the need, the effect, as we tested the implementation of the DATA Mining technique to improve social entrepreneurship and territorial dynamics in the region of Fez Meknes. However, the study has certain limitations. At the same time, it was necessary to increase the size of the sample taken both to test the Data Mining and to set up a quantitative analysis. The study does not address topics such as the strategies that must be followed by digital authorities, the role of government in launching digitalization programs.

10. FUTURE PROSPECTS

A social entrepreneur attaching as much importance to his returns as to his impact on the environment and/or society: these two inseparable aspects are the raison d'être of any social enterprise. As Business points out, we are beyond the sole social and environmental responsibility (CSR) of companies, since this is the very essence of the company, without which it would not exist. In this context, we have tried in this research work to test the maximum variable using Data mining tools, we were able to identify some key elements relating to the improvement of territorial attractiveness using social entrepreneurship in Fez-Meknes region, but this can only be achieved through advanced smart solutions in order to simplify data processing, so our future research work will be a study on the development and deployment of intelligent solutions adapted to this situation.

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