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The Role of Open Data in Making Strategic Decisions in the Telecommunication Sector in Morocco

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Abstract: *With the advent of the 21st century and in a context of globalization, making decisions plays a decisive role in the innovative and everlasting positioning of a firm as it determines the strategies to be adopted in the future and anticipates the problems that may occur in order to prevent and resolve them. The goal is to maximize revenues and minimize costs while ensuring a better quality of its customers' services. In fact, given the rapid movement of the current organizational environment affected by the globalization of markets and the economic crisis repeatedly gives the methods of decision making an utmost importance that requires corrections and improvements.*

Furthermore, and like other developing countries, the telecommunications sector in Morocco is no longer monopolized by one company as was the case for years, but the market is open to full liberalization marked by the introduction of two new operators in status of oligopolistic competition.

In this respect, environmental monitoring becomes an inevitable necessity that is at the heart of the strategies of the companies in order to know the players and the offers in the market, monitor technological advances, opt for innovations and vary the promotions. All that was done with the aim of satisfying the consumer's expectations.

With the emergence of the open data movement, easy and free opening of digital data was offered by giving them an open license to ensure their dissemination and their free accessibility with the possibility of re-use by anyone without restriction. Indeed, the open data offers new methods of access to internal/external and formal/informal information sources that certainly plays a significant role in process of making strategic decisions in the telecommunications sector in Morocco.

They will be used by a given operator in order to promote the elements of its strategy, objectives and tasks, and subsequently represent an instrument to increase the turnovers and to respond effectively to market needs in an environment of fierce and tough competition from rival firms.

The aim of this paper is to highlight the importance of using open data in the processes of monitoring the environment for making strategic decision. Data was collected by interviewing the managers of the three operators in the telecommunications sector. The purpose is to come up with the results on which to base the analysis of the aforementioned behaviors.

Keywords: *Open data, Strategic decision-making, Information sources, telecommunication.*

1. INTRODUCTION

In recent years, the telecommunications sector in Morocco was marked by the liberalization policy based on the initiative of the National Agency of Telecommunications Regulation (NATR), which led to the emergence of new competitors at the national level. This new competitive trend in which the country has embarked recently has pushed, on the one hand, the NATR – as a regulator – to adopt a regulatory reform and, on the other, competitors to target opportunities in the countries of the region as well as introducing changes in prices, technological possibilities and the variety of offers directed to particular individuals.

Indeed, for illustrative purposes, the telecommunications sector in Morocco increased from 4,000,000 subscribers only in various services in 2000 to 34 million by the end of 2010 and to 53 million by the end of 2014, and the incomes generated by the sector went hand in hand with customers, moving from 4 billion dirhams in 2000 to 34 by 2010 and exceeding 53 billion dirhams in 2014[1]. Morocco in the telecommunications sector is monopolized by three large companies shown in the following figure:

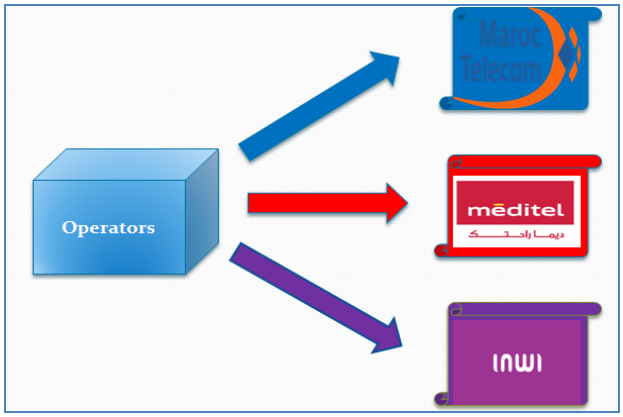

Fig1. *The three telecom operators in Morocco*

The three companies offer various services ranging from fixed telephony to mobile telephony and Internet offerings with prepaid and postpaid options.

The telecommunications sector in Morocco has become a key lever of the national economy and its contribution to GDP rises according to official figures provided by the NATR, through its national survey of the area, about 3% in 2010 to 5% in 2014, a value that will certainly evolve over the years to come.

The market unpredictability is the main reason for operators to be more dynamic in terms of making strategic decisions, a dynamism that usually results in problems to solve, threats to deter and opportunities to seize. This requires following a strategy of decision making in the field.

We will start, after the introduction, by presenting strategic decision-making, followed by open data. The results of our investigation into the integration of open data in strategic decisions in the telecommunications sector in Morocco will be presented next. Finally, this paper will end with a conclusion and a list of prospects.

2. Decision-Making

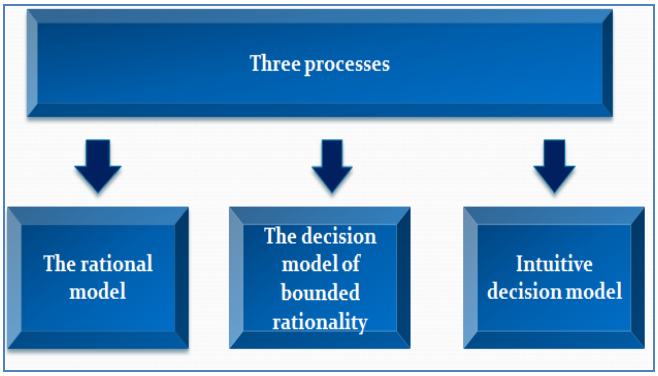

Fig2. *The three types of decision-making models*

[1]Site de l'Agence nationale pour la Régulation de Télécommunications (ANRT). [En ligne]. [Site consulté le 12/02/2015] .Disponible sur: www.anrt.ma.

According to Lavergne (1983), the decision is “an act of choosing between different options. In other words, we consider that the chosen option is not necessarily the one that has been asserted formally, but certainly that is the one applied". Decision making is an action that is based on multiple processes; there are three types of processes illustrated in the following figure:

As shown in the figure, there are three methods of making decisions according to Lesca [10][2]**.**

- **The rational model**

This model is based on an economic vision; pioneers argue that decision-making is based on information, and therefore it is relevant to identify the problem and propose alternatives that could solve it.

- **The decision model of bounded rationality**

This model assumes that it is impossible for players to maximize their utility and exclude the perfect decision vocabulary for the following considerations:

- The difficulty in identifying and trafficking uncertainty;
- Available information remains imperfect;
- The actors have limited possibilities of exploiting information.

- **Intuitive decision model**

There are also a number of studies in which researchers favor an intuitive approach in decision making; the complexity resides in the fact that there is no clear definition of intuition and the impact of the latter can never be objectively measured and demonstrated. Intuition is equated to a huge accumulation of experience. It is a mirror of management experiences, that is to say, the subconscious integration of all buildup experiences of the decision maker which influence so decisively the decisions to be taken.

Information is a motto of strategic decision-making; it makes it possible to define as precisely as possible the choices available to the company while making decisions. If the information is incomplete or of poor quality, the company may take a decision contrary to its interests in short, medium and long terms.

Managers continually tend to accumulate information; they establish a cognitive account of the stored information which is sought in the decision-making process as it was perceived by Aguilar [2][3].

This cognitive account allows managers to simplify complex situations and make rational decisions without resorting to formal research. Management theorists, like Mintzberg (1973) and others, emphasize that decision-makers perform a variety of tasks; the question that emerges is how the manager is able to control his environment to achieve the goals set, which is the ultimate aim as Aaker [1][4] pointed.

In addition, information also allows following up the consequences of decision-making; besides, collecting information is an instrument to measure a posteriori the efficacy of the decisions taken in

[2]Lesca, H Système d’information pour le management stratégique: l’entreprise intelligente, 1986.

[3]Aguilar F.-J.Scanning the Business Environment, Mac Millan, New York, 1967.

[4]Aaker, D. A..Organizing a strategic information scanning system.California Management Review , Vol. 25, n°2, january 1983, 76-83.

the past. This requires determining the criteria of effectiveness as well as relevance of a decision, either at the financial level (revenues increase), improving competitiveness (variation of turnover and market share), or on the adaptation of its production process (increased failures, risks, and products); these examples were developed by Ansoff [4][5]

Clearly, information is useful to the company at the following levels (Bergeron) [5][6].

- The information is a prerequisite for decision-making: by providing knowledge and by reducing the risk of errors associated with decision-making.
- The information is a factor of efficiency: by allowing the exchange of knowledge, it ensures greater coordination of tasks within the company.
- Information is a motivator: disposing information on the company's strategy gives a meaning to his work and therefore promotes the involvement in employment.
- Information is a source of power: information is an important commodity as it can detect opportunities to seize and threats to thwart.

3. OPEN DATA

The open data is the data opening process, which is to make them available to all easily and for free. Moreover, open data is a digital public or private data. It can be produced by a particular community, a public service (possibly delegate) or business. It is broadcast in a structured way using a methodology and an open license guaranteeing its free access and re-use by anyone without technical restrictions, be they legal or financial.

Open data is a philosophy aiming at making digital data available to everybody and to overcome the restrictions on the right to its access and reuse. These restrictions may be imposed by the use of proprietary formats or restrictive licensing, including licensing agreements that are sometimes set up on public data. The opening concerns publishing data using a methodology that removes restrictions limiting their exploitation and reproduction as explained by Borglund [6][7].

Moreover, according to Choo [9][8] the status of open data is applicable to any type of digital data. Examples include data on transport, mapping, statistics, geography, and sociology, or data of an environmental or legal nature. By analogy, under certain conditions, this can be compared to works protected by copyright such as literary, artistic and scientific works, films, drawings, photographs, or websites.

Clearly, open data is a great movement which is part of a broader approach of transparency, research development, and governance. However, it has its share of risks as pinpointed by Pateli [11][9], and as is illustrated in the table below:

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[5]AnsoffI.,"ManagingStrategic Surprise by Response to WeakSignals", California Management Review, Vol.23, n°2,winter 1975, 21-33

[6]Bergeron, P. Information Resources Management. AnnualReview of Information Science and Technology, 1996, 31, p. 263-300

[7]BorglundErik ;EngvallTove . Open data? Data, information, document or record?, Records Management Journal, Vol. 24 Iss: 2, 2014, pp.163 – 180.

[8]Choo, C.W, Auster,E. Environemental Scanning: the acquisition and use of information by managers. Annual review of information science and technology, 1993. P.279-314.

[9]G. Pateli, Adamantia. Decision making on governance of strategic technology alliances, Management Decision, Vol. 47 Iss: 2, 2009, pp.246 – 270.

Table1. *The advantages and limitations of open data*

Advantages	Limitations
Researchers can find material to feed their work and experiences.	The anonymization techniques.
Developers can create innovative services using this data.	The confidentiality of personal data.
Citizens and journalists find in it raw information.	Suppression, "masking" or adding noise.
Companies can provide added value to the data, and create employment and wealth for the community.	----------

In relation to the telecommunications sector, open data accompanied the exponential growth in the volume of the data exchanged and is a major determinant of the advent of Big Data; the growth is estimated to be 70% per year in telecommunications and 30% in other sectors. This difference is mainly due to the explosion in the volume of data traffic from mobile devices, and it is precisely this tendency which is the main competitive advantage regarding Big Data.

In addition, telecommunication operators are uniquely positioned to take advantage of the widespread use of connected objects - mobile devices equipped with data exchange technologies such as GPS, RFID chips or NFC (contactless payment), sensors and those that exchange data between machines (M2M) - new uses of the Internet (blogs, information sharing on social networks, wikis, etc.) and the development of Cloud as well as data Centers offers; operators demonstrate their willingness to accompany and remain at the heart of the exponential growth of data volume.

4. The Role of Open Data in Making Strategic Decisions

The objectives of our study are twofold; it aims at:

- studying the strategic decisions made in the telecommunications sector in Morocco;
- Identifying the role of environmental analysis in strategic decision-making in relation to open data in the telecommunications sector in Morocco.

To achieve the objectives of this study and to gather information about our population, we administered a direct interview using an interview guide with ten top decision makers placed at strategic levels of the three major telecommunications operators in Morocco. The following figure shows the number and types of surveys distributed in the three telecommunications operators in Morocco.

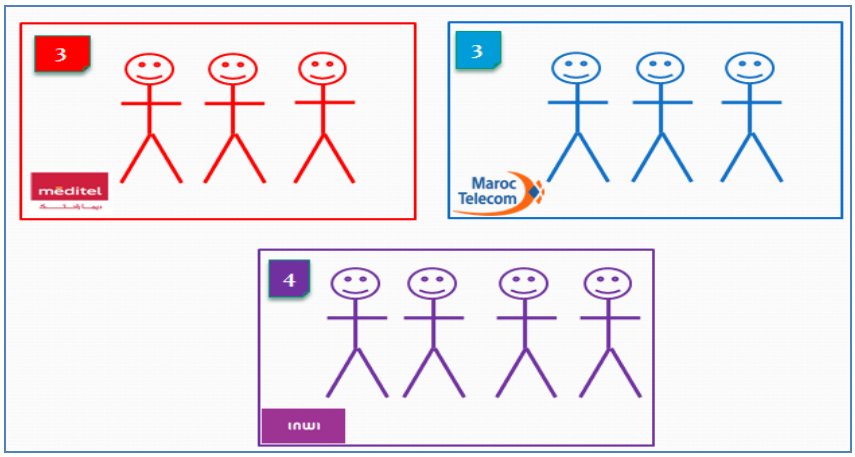

Fig3. *The number and types of interviewees*

The detailed profiles of the ten interviewed decision-makers are outlined in the following table by the colors of the logo of each of the three existing operators in Morocco:

Table2. *Profiles of decision-makers in the telecommunications sector in Morocco*

The quality of the interviewee	Operator
Director of Services	Maroc Telecom
Director of competitive intelligence and monitoring of streams	Maroc Telecom
Director of marketing	Meditel
Director of human ressources	Meditel
Director of communication	Inwi
Director of general control	Inwi
Director of Audit	Meditel
Director of innovation, strategy and partnerships	Inwi
Director of International development	Maroc Telecom
Director of sales	Inwi

The choice of this sample is essentially characterized by:

- The quality of the decision-makers; they have top responsibilities in the three operators, are immediately under the general manager and are in charge of strategic functions of the core business as well as support. Also, their number is limited, not exceeding seven directors in the three operators, without taking into account the regional departments and agencies;
- The coverage of a national industry in the study;
- The unavailability of these decision-makers, and the high level of confidentiality that exists in the sector.

5. Results, Analysis and Interpretations

Making strategic decisions in the telecom sector is motivated by many scenarios and cases, of which we mention especially the identification of opportunities as well as threats and problem-solving actions; such cases are rated on a scale from January to May of the reasoning degree in making strategic decision, as is shown in the figure below:

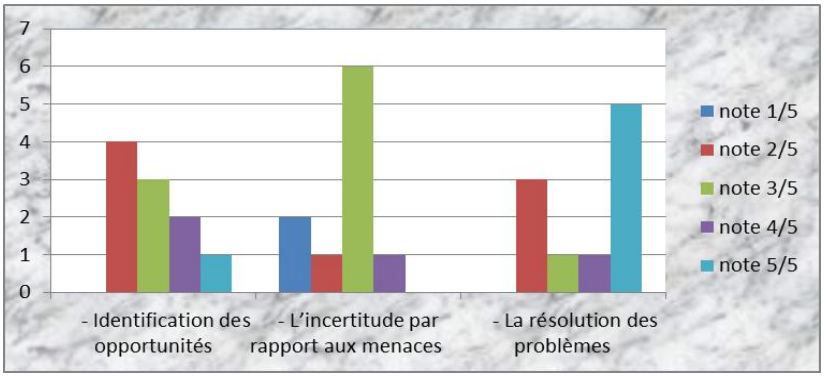

Fig4. *Cases of strategic decisions in a rating scale (5/5)*

Figure 4 above shows that decision makers agree on rating the relevance of the strategic decision-making as appropriate as follows:

- Identification of opportunities: the majority of top managers (i.e. 7 interviewed) considered that strategic decisions are used only for 2/5 and 3/5 for the identification of opportunities and, therefore, its rating oscillate between low and medium.
- The uncertainty with respect to threats: most of the leaders interviewed evaluated the strategic decision-making for the purpose of dealing with uncertainty imposed by the threats the operators face, by an average rating of 3/5.

- Problem solving: the majority of decision makers said that strategic decisions are taken in order to solve problems, with perfect rating, which is used only in this case, of 5/5.

It can be deduced from the above that the tendency of decision-makers in the telecom sector in Morocco is to make strategic decisions in order to solve various problems and not to deal with threats and seize opportunities; thus, it turns out that decision-makers do more “looking for” (seeking information) than “looking at” (environment monitoring) .

In addition, the sources of information on which decision-makers rely, in the telecommunications sector in Morocco, are of two categories: internal sources and external sources; the former are usually produced and processed in the inside channels of the operator in its broadest sense while the latter are coming from the external environment. The figure below illustrates this.

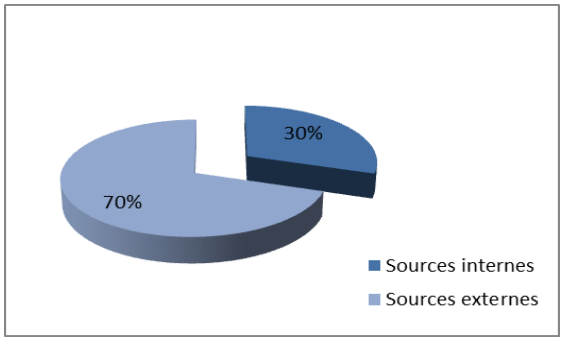

Fig5. *Sources of information for strategic decision-making in the telecom sector in Morocco*

The majority of decision makers use external sources of information in the strategic decision-making with an average of 70%, whereas only 30% for internal sources. This means that top managers need more information on the external environment where the operator grows since the entrepreneurial sector is part and parcel of a market that is in permanent evolution as well as continuous change. However, internal sources are relatively well understood by the decision- makers as long as they fall within the operator's duties.

Impersonal sources of information referring to the networks of decision- makers, in the telecommunications sector in Morocco, include several actors and stakeholders, as outlined in the following figure:

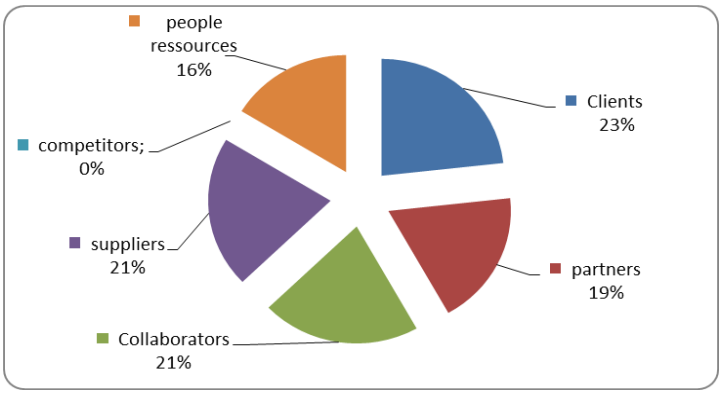

Fig6. *The distribution of personal open data sources used by decision-makers in the telecom sector in Morocco*

Figure 6 above shows that the distribution of categories used in personal sources of information is as follows: customers come first with 23%, followed by suppliers and collaborators in the second place with a rate of 21%, and finally partners and people resources with 19% and 16% respectively. It is worth mentioning that none of the respondents reported resorting to the competitors as an information

source. This means that operators are in a fierce competitive position and they build barriers vis-à-vis each other in the absence of any form of collaboration or coordination.

As for open impersonal data, they correspond to documents, data banks and databases, newspapers and journals, governmental publications and websites, as illustrated in the following figure:

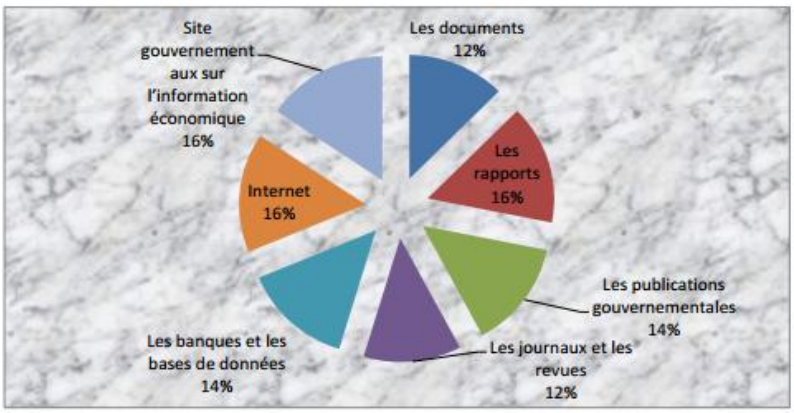

Fig7. *Open impersonal data sources used by decision makers in the telecom sector in Morocco*

Among the mostly used impersonal sources of information on which decision-makers rely, we find at the top the Internet, governmental websites, and reports of any type with 16%; governmental publications, data banks and databases are placed second with 14%; and finally we find newspapers, journals and documents with 12%.

The internet is a mine of open data, but the reliability and credibility of information circulating on the web differs from one decision-maker to another, as summarized in the figure below:

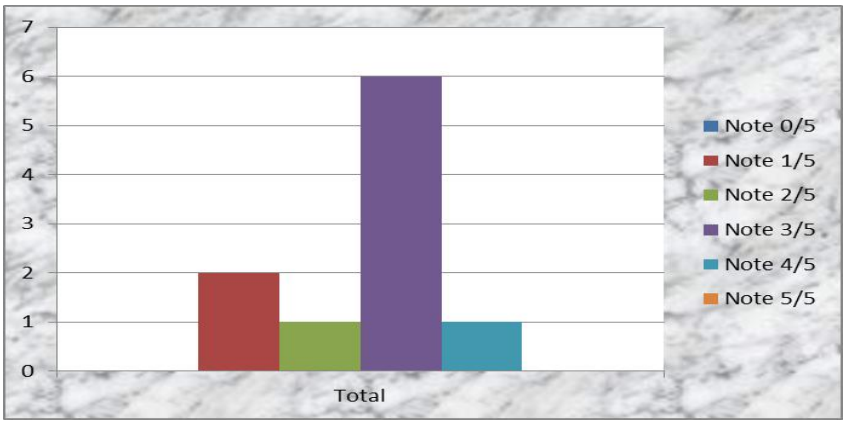

Fig8. *The reliability of the Internet as a source of information to the decision makers in the telecom sector in Morocco (5/5 scale)*

The analysis of the figure reveals that the majority of decision makers, 6 of our interviewees, believe that the reliability of internet information is rated 3/5; it is an average score reflecting, according to them, that there is absolutely an amount uncertainty that should be reduced or avoided through cross-checking as well as verification, and taking into account the criteria of updating, authority, and content on the web.

It should be noted that none of the leaders has assigned a null value (0/5) for the reliability of the Internet as a source of information, or as a perfect one (5/5).

The reliability of internet information is of crucial significance. Indeed, it may be that after spending several hours searching information, the operator realizes that these pieces of information were not good. It must be realized that anyone can develop a showcase on the web.

The findings, interpretations and recommendations of the study:

Table3. *Summary of findings, interpretations and recommendations*

Results of the study	The proposed strategy
7/10 interviewees considered that strategic decisions are used only for 2/5 and 3/5 for the identification of opportunities and threats.	It is concluded that decision-makers should not only remain in position of receivers of information, but also be part of the information monitoring approach
While they are considered closely related to the search for information with a rating of 5/5.	
The majority of decision- makers use external sources of information in making strategic decisions with an average of 70%, against 30% for internal sources.	The combination of the two categories of sources seems to be the optimal choice for each operator and which is justified by a confrontation reflex between an external source and an internal one
The sources of impersonal information that are mostly used by decision-makers are the Internet, governmental websites, and reports of any type with 16%, governmental publications, and data banks as well as databases with 14%.	Personal and impersonal sources have the same degree of importance to decision-makers in the telecom sector; it is in their complementarity where the relevance of the strategic decision to be taken reside;
The majority of decision makers, 6 of our interviewees, believe that the reliability of internet information is rated 3/5. It should be noted that none of the leaders has assigned a null value (0/5) for the reliability of the Internet as a source of information, or as a perfect one (5/5).	The reliability of information on the Internet is of crucial importance. Misinformation and counterfeiting. So, ensuring reliability requires the consideration of criteria of preference on a unified grid,

6. CONCLUSION

Open data is a rich source of information that helps in the development of several sectors including telecommunications, especially with the advent of the phenomenon of big data.

The MEPSIR report in 2006, funded by the European Commission, estimates that the European market related to the reuse of public information is € 27 billion.

Furthermore, the direct and indirect economic impact was evaluated of being € 140 billion per year for Europe.

For future research, we recommend, on the one hand, expanding the target population of the survey in the sector tackled and to extend the study to apply to other domains such as health, administration, etc. On the other hand, it will also be useful to properly approach the use of big data into strategic decisions- making.

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He published his first book at the age of 22 years, in status of co-author, it is entitled "the city of Rabat, a selected bibliography", edited by the Ministry of Culture, as he made his first scientific paper in an international conference entitled "Beacons of Hope in the Quest for the Next Einstein in the MENA region", organized last March by the University Sidi Mohamed Benabdellah -Fez in collaboration with Young Arab German Academy of Sciences and Humanities.