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PRACTICE OF BUSINESS INTELLIGENCE BY SMEs IN BURKINA FASO

Dr. Honoré Ouédraogo¹, Dr. Issa Compaoré², Dr. Théophile Bindeoué Nassè³

¹Ouaga 3 S University, Burkina Faso

²Aube Nouvelle University, Burkina Faso

³University of Business and integrated Development Studies, Ghana

Corresponding Author: Dr. Honoré Ouédraogo

Corresponding Author Email: ouedraogohonor2@yahoo.fr

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ABSTRACT

The integration of information technologies in business management is essential in the context of the globalization of trade and competition. Small and medium-sized enterprises (SMEs) in Burkina Faso do not escape this constraint with a view to improving productivity. Through an exploratory approach, the objective is to provide a better understanding of the appropriation of Business Intelligence by SMEs in Burkina Faso. Thanks to a mixed, quantitative and qualitative method, sixty SMEs were surveyed and three resource people were interviewed from February to April 2021. The descriptive statistics and the analysis grid led to the results according to which the practice of BI by SMEs in Burkina Faso is at an elementary level, despite its relevance for the organizational performance of SMEs. It should be noted that several myths are to be defied and to be able to adapt BI to the needs and realities of SMEs in Burkina Faso for its popularization.

Keywords: Information System, Business Intelligence, Small and Medium Enterprises.

INTRODUCTION

The viability, performance and competitiveness of any organization, especially a company, require mastery of its environment. Perfect knowledge of this environment requires the

possession and proper use of strategic information at the best time (Le Moigne, 1973). This challenge is growing in the knowledge economy with the disparity of information increasing exponentially both internally and externally. Companies are struggling to get to know each other better, to control their production cycles and above all to know all of their partners and competitors. The strategic information needs of the manager, anxious to manage his business are no longer those of the past century. The faster pace and volume of transactions is compressing decision-making time. The business opportunity is seized immediately. The novelty of the XXIth century was to add to it, in the space of just a few years, a time constraint. Having the right information is no longer enough. The timing of his detention now matters as much, if not more. The time allocated to researching information is like that allocated to decision-making: it keeps getting shorter. Indeed, many situations arise in the daily life of the company, some of which, depending on their seriousness, can seriously undermine the development or even the survival of the company. Thus, instead of reactivity, companies around the world are all constrained by a proactive approach. The influence of the Burkinabè economy depends on the full development of SMEs, which represent more than 98% of companies registered on the national file of companies and business groups (NERE^[1]) of the Chamber of Commerce. Their importance is indisputable at the socioeconomic level of Burkina Faso. This explains the various forms of support specific to these SMEs in Burkina Faso at the institutional and financial level. However, these SMEs are forced to face stiff competition from large companies, multinationals and new forms of commerce. For these reasons, SMEs must quickly equip themselves with the tools to meet the challenges and this, for a mastery of strategic information in order to get away with it.

This imperative to hold, process and analyze strategic information by SMEs meets the opportunity of the advent of information and communication technologies in business management. Indeed, the scope of IT in business management has gone from a traditional support function for day-to-day operations such as accounting, payroll, invoicing, stock management to a decision-making support function, automation of the processing of certain models resulting from operational research (Reix, 1995).

It was this technological revolution, thanks to IT management tools and decision support in companies that paved the way for Business Intelligence in the 1990s.

Business Intelligence or business intelligence can be defined as “*any automated application that claims to help managers and leaders in their decision-making, in particular by providing them with ad hoc information where and when required*” (Gumb, 2005, p. 21). In other words, it is about leveraging information technology (IT) to aid optimal decision making.

According to Reix (2004, p. 3), an information system (IS) is “*an organized set of resources : hardware, software, personnel, data, procedures (...) making it possible to acquire, process and store information (in the form of data, texts, images, sounds, etc.) within and between organizations*”. This definition involves all the means and procedures used by the company, through manual and / or automated, centralized and / or decentralized processing.

Subsequently, and from a progressive perspective, the IS is defined as *a system of interpretation of a set of social actors who, in a finalized and recursive organizational context, memorize and transform representations via information technologies and operating procedures.* (Rowe, 2007) This definition insists on the memorization and transformation functions provided by the IS thanks to the IT. Indeed, memorization remains a determining factor of any IS (Beau, 2009)

hence the need to resort to computer media. Certainly the company's IS cannot be reduced to IT resources which are only a subset, but the complexity, unpredictability and instability of the environment require the company to be quick and efficient in collecting and processing a huge amount of information.

Wrongly, it is generally thought that BI is a tool dedicated exclusively to large companies.

The topic of this article is entitled “The *practice of Business intelligence by SMEs in Burkina Faso*”. For us, it is a question of dealing with the issue of the appropriation of BI by SMEs in Burkina Faso. We nurture the ambition to understand the use of BI by SMEs in Burkina Faso through exploratory research using a hypothetico-deductive approach. The work undertaken is part of a mixed, quantitative and qualitative method of investigation. Unlike a certain time when information was scarce, now it is over-information, also called infobesity, which can be a threat for companies. The key to unlocking this situation is the controlled use of IT. The vulnerability of Burkinabè SMEs is glaring and the effective use of ergonomic tools is essential for their development. In this paper, we take an analytical look at the issue of the appropriation of Business Intelligence by SMEs in Burkina Faso.

The practice of IS is already a reality in some large companies in Burkina Faso and arouses the interest of academics such as Ouédraogo (2019) and Ouédraogo and Nassè (2020). The need to set up an efficient IS is also imposed on SMEs and we will further analyze them in the rest of our work.

The main question that emerges is thus worded: What use do SMEs in Burkina Faso make of Business Intelligence? Two specific questions arise from this:

- What is the level of BI practice by SMEs in Burkina Faso?
- How can BI support the organizational performance of SMEs in Burkina Faso?

In order to answer this problem, we formulate two research hypotheses:

- Hypothesis 1: The practice of BI by SMEs in Burkina Faso is at an elementary level ;
- Hypothesis 2: BI can support the performance of SMEs in Burkina Faso by supporting effective decision-making through structured information.

METHODOLOGY

The SMEs sector is defined and governed by law n ° 015-2017 / AN on the orientation law for the promotion of small and medium-sized enterprises in Burkina Faso of April 27, 2017. Its implementation materialized through the adoption of the SME Charter by Decree No. 2017-1165 / PRES / PM / MCIA / MATD / MINEFID of November 30, 2017.

The aforementioned charter, in its article 3 defines the SME as “ *any natural or legal person, producer of goods and / or commercial services, registered or having made its declaration of activities in the trade and movable credit register or any other register, giving it fully independent legal personality, with a staff of less than one hundred permanent employees and annual turnover excluding tax of less than one billion (1,000,000,000) CFA francs and which maintains regular accounts. The notion of SME includes that of Small and Medium Industry (SMI)* ”.

Thus, the SME is recognized through its registration with the RCCM; keeping regular accounts; the autonomy of legal personality; the number of staff (less than 100 employees); the annual turnover excluding tax (less than 1 billion FCFA) and, evolving in the production of goods and / or market services.

The autonomous company is one whose capital is not held, directly up to 25%, by a large company or a public body, with the exception of venture capital companies, public participation companies and institutional investors. ". And this to mean that the SME should not be under the control of a large company ^[2].

SMEs make an important contribution in terms of job creation, the fight against poverty and the promotion of research and innovation results, even their actual level is very low (Carbonell & al., 2020) in Burkina Faso. The Chamber of Commerce and Industry counts 102,250^[3] Active SMEs, registered in the NERE file in December 2019. They are classified into 4 main sectors of activity, namely trade, industry, crafts and services. Article 4 of the Charter distinguishes three categories of SMEs, mainly on the basis of turnover and number of staff. These are the micro enterprise (ME), the small enterprise (PE) and the medium enterprise (ME).

Table 1

Categories of SMEs: SME Charter

Categories	Number of permanent employees	Turnover excluding tax
Microbusiness	Less than 10	Less than or equal to 15,000,000
Small business	Greater than or equal to 10 and less than 30	More than 15, 000, 000 or less to 50,000,000
Medium Enterprise	Greater than or equal to 30 and less than 100	Above 50, 000, 000 to less than 1, 000, 000, 000

Source: SME Charter, 2017

In order to define the problem as well as possible, we adopt a hybrid method by a hypothetico-deductive reasoning which consists in formulating hypotheses which are then tested against the data in the field. The quantitative aspect allows us to assess the practice of BI by SMEs in Burkina Faso and the qualitative aspect to understand the phenomenon in depth. The target population of our research is made up of all SMEs in Burkina Faso. Concerning the quantitative aspect, we opt for a probability sampling by quota of sixty SMEs. The Center and Hauts Bassins regions, respectively Ouagadougou and Bobo - Dioulasso, which are home to the vast majority of SME head offices, i.e. 78%^[4], were the subject of our sample selection. Through rigorous stratification, the representativeness of the sample according to activity sectors and regions was respected. Following these statistical considerations, the selection of the sample in the NERE File was done by a simple random sorting using the "ALEA" function of MS Excel.

60 SMEs, i.e. 49 in Ouagadougou and 11 in Bobo Dioulasso. In Ouagadougou, the 49 SMEs are made up of 2 from the Handicrafts sector, 22 from the Commerce sector, 8 from the Industry sector and 17 from the Services sector. As for Bobo Dioulasso, the 11 SMEs affected are made up of 1 from the Handicrafts sector, 5 from the Commerce sector, 2 from the Industry sector, and 3 from the Services sector. Regarding the qualitative aspect, we proceed by a reasoned choice for the identification and approach of resource persons. Are considered as resource persons, those who have an impact on the environment of SMEs in Burkina Faso and the practice of BI, as decision-makers, investors, consultants or IT service providers. The contribution of these resource persons allows us to deepen our understanding of our problematic and reinforces the relevance of our results. The data collection techniques and tools are selected in accordance with the mixed approach of our research, namely documentary consultation, a questionnaire and an interview guide. Data collection by the questionnaire is made

simultaneously in Ouagadougou and Bobo Dioulasso, after the creation of an account on Kobo Toolbox. Kobo Toolbox is a platform for collecting and processing statistical data, the mobile version of which we used. The data collection took place from February 07 to April 03, 2021. Our semi-structured interview guide is sent to the resource persons selected according to a reasoned choice. They received a formal interview request before actually proceeding with the interview. The processing and analysis of the data is semi-automated. On the quantitative dimension, the use of Kobo Toolbox has the advantage of preparing the analysis, processing and analysis of the data resulting from the investigation by the questionnaire. The data exported to MS Excel were processed appropriately.

Table 2

Classification Reference for BI Practice Levels

Level	Description
1 Elementary	<ul style="list-style-type: none"> * Existence of a watch, formalized or not * Presence of heterogeneous data, internal sources (production, invoicing, sales, payroll,) and or external (Internet, social networks, website,) * Flat files of types excel, access
2 Average	<ul style="list-style-type: none"> * Use of management software by department (Accounting, HR, payroll, customers) * Existence of homogeneous data,
3 Advanced	<ul style="list-style-type: none"> * Use of ERP software, or specific BI software * Automated linking of data from different departments. * Possibility of performance simulation and decision-making support by advanced analysis * Use of dynamic reports and dashboards
Very advanced	<ul style="list-style-type: none"> * Existence of an architecture * Regular urbanization of applications * Metrics / indicators set up and used * Continuous improvement of processes

Source: Field Data 2021

As for the qualitative dimension, each interview is recorded, then transcribed and then used through a content analysis grid. Content analysis defined as an indirect technique that allows to examine documents with unencrypted content, coming from individuals or groups, to make a qualitative sample. This analysis is made according to our lines of interview and the implicit expectations on each of the open questions. The summary of these pieces of information collected is presented in tabular form in MS Word. Finally, respondents answers are kept confidential and they are used just for the purpose of this research (Nassè, 2019).

RESULTS

Surveys show that the majority of managers are men, specifically 47 men and 13 women. The dominant age group for managers is over 30 years, that is, 83.33% are 30 years and over.

In terms of educational level, we see a great diversity with 1 not attending school, 3 having primary education level, 31 secondary level and 25 university level, among others the DEUG (Undergraduate degree corresponding to two years of study), Bachelor degree, Master degree and , PhD.

The majority of SMEs have the Individual Company as their legal form (43/60), a few Limited Liability Company, SARL, 15/60, mostly with a seniority of 5 years and more (34/60) and some of less than 5 years (26/60).

Table 3
Sociodemographic Characteristics of the Participants

Elements covered	Frequency (n = 60)	Proportion (%)
The head office		
Ouagadougou	49	81.67
Bobo Dioulasso	11	18.33
Branch of activity		
Arts and crafts	3	5
Trade	28	46.67
Industry	10	16.67
Services	19	31.67
Legal status		
EI	43	71.67
SARL	15	25.00
HER	1	1.67
Others	1	1.67
Seniority		
Less than 5 years	26	43.33
5 years and over	34	56.67
Sex		
Man	47	78.33
Women	13	21.67
age range		
Under 30	10	16.67
30 years and over	50	83.33
Educational level		
Unschoolled	1	1.67
Primary	3	5
Secondary	31	51.67
University	25	41.67

Source: Field data, 2021

For an appreciation of the basic elements of BI practice, we made observations on the existence of heterogeneous data and data sources. First of all, it should be noted that 88.33% of respondents say they have never heard of BI, against only 11.67% who have heard of it through training and personal interactions. Compared to the availability of computer equipment, 43/60, or 71.67% have it, against 17/60 who say they do not have it. Access and use of the internet is of great importance with 50/60 or 83.33% using the internet against only 10/60 not using it. Regarding the existence of an SME website, only 9/60 answered in the affirmative and 51 did not have one. Regarding the presence on social networks via professional pages, only 40% have it against 60% who do not appear there. The theme on the consolidation of homogeneous, business-oriented data reflects the second level of BI practice by SMEs. The nature of the existing data and the tools used give us the following situation: The vast majority, or 68.33% say they do not use management software, against only 19/60 who use it, or 31.67%. They use it for accounting management, cash management, inventory management, sales management and video surveillance. Among the users, 16 of them say they are "satisfied" against only 3 who are "not very satisfied".

In connection with the advanced level of BI practice, we made the following observations: Only 7/60 of the SMEs surveyed have a team or a position dedicated to processing information. In addition, only 4/60 or 6.6% have a system for linking data from the various departments of the company. As tools used, 3 of them cited ERP software and 1 cited specific BI software which

is ApacheSuperset an Opensource. In terms of level of satisfaction, all 4 claim to be "Satisfied".

Regarding the reasons for not using similar tools, the opinions collected differ : 40% mention "ignorance" ; 43.33% cite high "costs" ; 3.33% say they don't need it and 6.67% report "Other" reasons.

The purpose of using BI is to aid in efficient decision-making in the management of SMEs. We make the following observations: 48 of the SMEs do not have a dashboard, compared to only 12 that do. Among the users, 10 affirm that it allows them to simulate the evolution of their performance and to be a reference as a decision-making aid. As other references and methods of assistance in decision-making, various opinions were retained: 36.67% resort to consulting the archives; 68.33 consult employees and 63.33% rely on their personal intuition.

RESULTS

Beyond the notion and concepts around BI, its implementation, that is to say its effective use, is a fundamental element of our work. For an evaluation of the possible levels of this practice, we have presented above the classification references of the levels of practice of BI, fruit of our conception on the basis of the operational definition of BI. These allow SMEs to be classified at three different levels depending on the results obtained. Ultimately, 41 SMEs are camped at the elementary level or 68.33% against 15 SMEs at the average level, or 25%. Only 4 SMEs appear at the advanced level, i.e., 6.67%, and none at the very advanced level. Considering these elements, we can argue that there is a low level of BI practice by SMEs in Burkina Faso with 68.33% at elementary level and only 6.67% at advanced level.

The substance of the analysis grid sheds light on this aspect of things, in particular the question on the challenges of BI for SMEs. All the interviewees, 3/3 affirm almost in the same terms that "*BI is a necessity for the survival and organizational performance of SMEs, especially in the context of their great vulnerability*". More precisely, it emerges from the interviews that BI is vital for "*the control and protection of strategic economic information*" of SMEs. It is very important to "*take advantage of IT for this purpose because it is the best way in terms of storage capacity and data analysis*" to extract fluid information as a decision-making aid. This situation is confirmed by the fact that the rare SMEs (4/60) which are at the advanced level of BI practice express being satisfied.

On this point, we note that BI allows the organizational performance of SMEs by an efficient decision-making aid thanks to structured information.

However, our field results show that in terms of decision-making support, 68.33% of SME managers refer to consulting their employees and 63.33% rely on their personal intuitions.

The object of our research is of great importance in the sphere of governance and the performance of SMEs in the context of the digital revolution, which had already attracted the attention of certain researchers, to various specific elements. We understand this state of affairs in a context of organizational change, where SMEs will gradually adapt to the situation to better respond to the constraints of the moment. In accordance with the work of Pettigrew (1987) according to his contextualist theory, it is an evolution which will take the necessary integration time, but it promises a better tomorrow. Indeed, SMEs at the heart of major changes (Silva & Hugon, 2009), have no better option than to appropriate the advantages linked to information technologies, and to observe some ethical and fair practices (Nassè, 2021).

We also note that the governance of SMEs remains guided by the personality of the leader, through his personal intuition, or at best by consulting employees. As an illustration Carbonell and Nassè, (2021) have shown that entrepreneur leadership is a key success factor for companies in the context. In addition, the predominance of the person of the leader of SMEs, as observed by Somé (2018) and Song-Naba (2013) is still relevant when reading our results. This traditional approach to helping decision-making is critical and inefficient, as demonstrated by one of the leaders of decision theory, namely Simon (1983). Indeed, it notes the limits of the principle of absolute rationality of the leader, as regards his capacity to take into account all the aspects of the possible alternatives to retain the best decision. To achieve this, it must integrate the appropriate tools to extract strategic information from the great batch of the multitude and diversity of data. In other words, Sybord (2015) caricatures the information system claiming that it makes it possible to move “from operational 'big data' to strategic little knowledge”. Moreover, in an analysis from the perspective of organizational learning, it must be said that the shortfall is enormous. SMEs need to capitalize, store and distribute their resources in order to innovate and control their environment and to anticipate in the pursuit of their organizational performance. The practice of BI is essential to identify learning needs, capitalize and enhance existing ones and seek growth. At the end of our work, we identified obstacles that constitute obstacles to the implementation of BI within SMEs in Burkina Faso. It is therefore necessary to defy these obstacles, which are above all rightly or wrongly 'myths', strongly linked to BI. As a reason for not using BI, many managers of SMEs surveyed (43.33%) mentioned the cost of acquisition against a good number, ie 40%, who simply put forward ignorance. In addition, some, ie 3.33%, believe that they do not even need it in the context of their activities. We retain that perceptions related to the costs, complexity and relevance of BI deserve to be demystified for its inclusion in SMEs.

A very important factor for the adoption of BI is effective communication to improve the perception that animates the leaders of Burkinabè SMEs. Large gray areas still surround this notion, which must nevertheless become a convenient practice to the great happiness of stakeholders for the organizational performance and productivity of SMEs. We share the opinion of one of our interviewees who believes that “*BI as presented is scary! It is symbolized by a large screen with infinity numbers and numerous graphics*”.

However, after explanations and demonstrations, many participants realize that it is not more complicated than some features of their mobile phones, which they handle with ease. So it is a question of broadening the frameworks of communication and presentation of these tools to dispel myths and promote its adoption. The practice of BI will then be a convenience for business leaders, even a reflex.

Good knowledge of BI is essential to its acceptance, and according to the words of one of our interviewees “*you have to know the value of the thing before investing in it, otherwise, even offered for free, it will be useless!*”.

The question of accessibility of specific BI tools, especially for the thorny reason of cost, came back almost immediately. The participants believe that the costs of acquisitions, installation and operation are exorbitant. The fear of costs is a consequence of the myth about the complexity of BI, which we have just clarified. Indeed, adapting the BI solution to the reality of SMEs also concerns the resulting costs. SMBs don't need to incur huge expenses for a BI solution. There is simply no place. An alternative is the use of existing IT tools, especially since the vast

majority of participants have at least one computer and are fluent in MS Excel. The software available on the market is available on all budgets, allowing SME promoters to know the height of their financial commitment in advance. IT service providers take this into account in the various offers designed.

In addition, and of great importance, Open Sources offers completely free software with very good performance. Certainly there are limits in terms of data storage capacities or flexibility of options, but it really meets the needs of an SME to learn about the practice of BI. Additional training can make it possible to better use these Open Source software, but it is at very reasonable costs.

Failure to take into account certain aspects of the company's performance which are of great sensitivity, in particular turnover, can constitute a limitation of the work. Moreover, time and budgetary resources were another.

CONCLUSION

The vital need of SMEs in terms of strategic information to successfully manage their growth in a context of excessive data flows, meets the opportunity of the evolution of information technologies of which BI is a considerable reference. Businesses in general, and SMEs in particular, are undergoing economic, social and technological change. The emergence of digital technology has greatly contributed to improving working conditions and the management of business performance. The role of IT in the company has evolved, passing from its traditional function of data production and storage, to a function of processing, analyzing data as a decision-making aid. BI designates the use of IT as an aid to decision-making and management of the company. The reflection had the merit of being asked about the concrete use of this tool by SMEs in Burkina Faso. These are not immune to the challenges linked to the context of globalization, so it is advisable to equip oneself with the necessary arsenal in order to adapt, react or even anticipate.

The problem of the appropriation of BI by SMEs in Burkina Faso has been explored from several angles, in this article, in order to provide a better understanding of its practice. Specifically, it was a question of providing answers to the question on the level of BI practice by SMEs in Burkina Faso on the one hand, and on the other hand that on the relevance of BI for businesses. SMEs in Burkina Faso. This exploratory research was carried out under a hybrid, quantitative qualitative investigation method. On the quantitative side 60 SMEs, drawn from the NERE file of the Chamber of Commerce and Industry of Burkina Faso, a probability sampling by quota, located in Ouagadougou and Bobo Dioulasso, operating in the sectors of crafts, commerce, industry and services were surveyed. The stratification of this sample takes into account the representativeness of SMEs according to their number in the research population. Regarding the qualitative aspect, through a reasoned choice, 3 resource persons who are active in the promotion of SMEs and the popularization of ICT have agreed to intervene with an interview guide. The main saturation criterion was observed. These resource persons are actors who can play a strategic role in the popularization of BI and its practice by SMEs. We have designed benchmarks for the level of BI practice by SMEs, according to the tools used, the maturation of the practice and the nature of the data available to arrive at a 3-level classification: Elementary, Medium and Advanced. It emerges that 68.33% of the SMEs surveyed are elementary level against 25% at the average level and only 6.67% which rise to the advanced level. The descriptive statistics and the analysis grid lead us to the result that the

practice of BI by SMEs in Burkina Faso is at an elementary level, despite its relevance for their organizational performance. An in-depth analysis and discussion of the results made it possible to identify the obstacles, many of which are myths about BI, in order to draw up the typology of BI adapted to SMEs in Burkina Faso. Of course accessibility in terms of BI implementation cost emerged from our investigations, but the fact remains that the very lack of knowledge of the tool is a major obstacle. It is important to work on a better knowledge of BI, and that it is adapted and meets the needs and capacities of SMEs in Burkina Faso. In any case, we admit that there is still enough to be done to enrich the work on the field of BI in the specific case of SMEs in Burkina Faso. The technical nature of BI was not discussed, nor aspects relating to the economic and financial impact of BI. This could be the subject of research on the impact of BI on the financial performance of SMEs in Burkina Faso.

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^[1] CCIBF Report 2013

^[2] Big business is " any business that achieves a higher turnover than or equal to one billion (1, 000,000,000) CFA francs.

^[3] NERE file, 2019

^[4] CCIBF, NERE 2019

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Conflict of Interest Statement

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