

State of play on the level of integration and use of information systems in Moroccan VSEs-SMEs

État des lieux sur le niveau d'intégration et d'utilisation des systèmes d'information dans les TPE-PME marocaines

Maryem ALAOUI

Doctoral researcher in Management Sciences
Faculty of Law, Economics and Social Sciences – Mohammed VI
Hassan II University of Casablanca
Research Laboratory in Economic and Logistic Performance « PEL »
Morocco
maryemalaoui@gmail.com

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Abstract

Very Small Enterprises-Small and Medium Enterprises (VSEs-SMEs) are characterized throughout the world either by the number of employees, or by the level of assets or turnover, or by both. Given their importance in the global economy and the rapidly changing context of the economic environment, these VSEs-SMEs are forced to adopt information systems integration projects that would allow them not to fall behind to advances in modern technology. However, in the case of Moroccan VSEs-SMEs, several obstacles prevent them and put them below average, in terms of understanding their market. This document presents the results of the study regarding the situation of integration and use of information systems at the level of Moroccan VSEs-SMEs based on the results of a survey carried out among a sample of 98 VSEs and SMEs. The results of this exploration show that a large majority of Moroccan VSEs and SMEs are poorly equipped with information systems.

Keywords : information systems ; Moroccan VSEs and SMEs ; integration of information systems ; information technology.

Résumé

Les Très Petites Entreprises- Petites et Moyennes Entreprises (TPE-PME) sont caractérisées dans le monde entier soit par le nombre d'employés, soit par le niveau des actifs ou du chiffre d'affaires, soit par les deux. Compte tenu de leur importance dans L'économie mondiale et du contexte évolutif rapide du milieu économique, font que ces TPE-PME se voient obligées d'adopter des projets d'intégration des systèmes d'information leur permettraient de ne pas prendre de retard par rapport aux progrès de la technologie moderne. Cependant, dans le cas des TPE-PME marocaines plusieurs obstacles les empêchent et les mettent sous moyenne, en termes de compréhension de leur marché. Ce document présente les résultats de l'étude en ce qui concerne la situation de l'intégration et l'utilisation des systèmes d'information au niveau des TPE-PME marocaine à partir des résultats d'une enquêtes réalisée auprès d'un échantillon de 98 TPE et PME. Les résultats de cette exploration mettent en évidence qu'une grande majorité de TPE et de PME marocaines est très peu outillée en systèmes d'information.

Mots clés : systèmes d'information, TPE et PME marocaines, l'intégration des systèmes d'information, technologie de l'information.

Introduction

Information systems (IS) have become the organizational fabric of intra- and inter-organizational collaboration. They have become indispensable for doing business in today's global economy. When managed strategically, the information system can be a crucial source of competitive advantage for a company. Systems integration is the assembly of different subsystems into a whole from a physical or functional perspective. Systems integration adds value to the system by enabling effective communication between subsystems.

Over the past two decades, the integration of information systems and its effects on improving business processes have been the subject of considerable interest. Wide-area communication networks and interconnectivity have become a major force affecting businesses in fundamental ways (Bernard H. Boar, 1993). The use of networks and shared databases has been of enormous importance in eliminating redundant activities, preventing errors, reducing product development cycle time and improving customer expectations for products and services. IS integration helps companies not only automate their activities, but also to redesign and improve their business processes by enabling more sophisticated and flexible forms of data analysis, which translates into improved performance. (Venkatraman, 1991).

Faced with this situation, the integration of information systems can be considered as a source of anxiety for a number of managers of all types of companies. So many challenges that digital technology can help solve, if we know how to seize the opportunities. Hence, through this work, we would like to focus on the case of VSEs-SMEs (Very Small Enterprises - Small and Medium Enterprises) and answer the following question : VSEs-SMEs in Morocco : what about the integration of information systems?

After defining the concept of information systems integration, tracing its effects on the company's strategy and defining and treating our two key concepts ; information systems in Very Small Enterprises - Small and Medium Enterprises and Very Small Enterprises - Small and Medium Enterprises in Morocco. we will present the methodology used to adopt our exploratory study. Finally, the synthesized results will be discussed.

1. Literature review

1.1.The integration of information systems: conceptual insight

In the field of information systems, integration has been considered from two angles. The first technical perspective suggests that integration is a mechanism for describing the interconnection of information technologies within an organization and the extent to which a common conceptual representation of data elements is shared. (Dale L.Goodhue, 1992). In

other words, integration is defined as the degree to which the various systems of an organization are interconnected and are able to communicate with each other. In the second perspective, integration is the degree to which two or more independent organizations have standardized business processes and these processes are firmly linked by telecommunications technologies and computers (Riyaz Sikora, Michael J. Shaw, 1998).

Information systems integration can be broken down into two elements: data integration and technical integration. Data integration refers to the relevance of information that is collected, processed, and disseminated across the organization. Technical integration concerns the physical or formal linking of the information systems and subsystems used by the organization (Wyse and Higgins, 1993). It is defined, by the same last author, as the extent to which data and applications across different communication networks can be shared and accessed for organizational use. The primary goal of IS integration is to provide consistent information support across the organization to respond to dynamic market challenges. It is therefore one of the steps that is part of a company's digital transformation process.

Mudie and Schafer (1985) analyzed IS integration in terms of process because they believe that IS integration should not only facilitate the process of developing and using data, applications and other processing technologies, but also provide the flexibility to meet future business demands for workstations, processing types and applications. At the conceptual level, IS integration can be thought of as the architecture of data, communication networks and supporting organizations. However, in examining the role of IS integration, researchers have primarily considered only two aspects of IS integration: data integration, and integration of communication networks (Wyse and Higgins, 1993).

The integration of information systems aims to facilitate the exchange and sharing of information within an organization and to achieve inter-company coordination for a better control capacity as in the case of the supply chain (Yahaya Yusuf *et al*, 2004). It has been repeatedly emphasized that the integration of information systems requires the integration of all application, data and communication systems in order to provide real-time and consistent connectivity between business units, geographic regions and partners across supply chains (Arun Rai *et al*, 2006).

1.2.Information systems in VSEs-SMEs

At the organizational level, the VSEs-SMEs is characterized by its simplicity and its lack of means, resulting in : a small size, centralization and personalization of management, low specialization of work, a strategy that is intuitive or not very formalized, strong proximity of

the actors, a simple internal IS that is not very formalized, and a simple external IS based on direct contacts (Julien, 1990). The smaller the firm, the more specific its IS, for several reasons (Ghobakhloo, Zulkifli and Aziz, 2010): a frequent concentration of responsibility for information in a small number of people, a lack of IS management, a low level of resources available for information, limited IS skills, a lack of environmental information, both in quantity and quality, and finally, particular sources of information due to their close proximity to the market.

Indeed, the VSEs-SMEs is above all looking for local information, because it is its immediate environment that interests it most (Torrès, 2003). The managers will then privilege business networks, or increasingly social networks, in order to benefit from privileged information (Nakara, Benmoussa and Jaouen, 2012). This is how the business leader enters into a process of monitoring his environment not by setting up an expensive and formalized IS, but by using a relational network that can be characterized as familiar (Gueguen, 2001).

The use of IS is linked, first of all, to user satisfaction (Blackwell, Shehab and Kay, 2006). Raymond (1985) showed that computerized IS had an impact on operational decisions, but not on strategic decisions. This is all the more problematic for VSEs-SMEs companies that choose integrated software packages, because the investment required for their acquisition is often very high compared to their resources and the tools are often underused.

Quality of use is also related to how IS was designed and implemented. Woznica and Healy (2009) indicate that it is best for small businesses to have an integrated IS, as disparate ISs pose several problems. From a technical perspective, they can lead to compatibility issues between systems, potential data redundancy, and functionality issues. At an operational and strategic level, disparate IS can prevent the delivery of requested information in a timely manner, or provide inappropriate information, and hinder collaboration between employees because of their independence from each other (Themistocleous, 2004). Although the benefits of an integrated IS are numerous (reduction of costs, improvement of performance and productivity), the authors identify several barriers to the use of an integrated IS : the cost of implementation, but above all resistance to change, as employees do not wish to share the information they possess for fear of losing control of certain processes.

In line with this work, Bidan, Rowe and Truex (2012) identify three types of IS architecture in VSEs-SMEs, leading to differentiated uses : a "siloe" architecture, with several unconnected databases, non-formalized policies, and heterogeneous tools with few interfaces ; a partially standardized architecture with a partial ERP (limited number of modules installed) and other

software in parallel; and a mixed architecture, with common databases, a widely used ERP, and ad hoc tools. The authors show that smaller companies tend to develop a "siloe" architecture, where tools and practices are often cobbled together.

1.3.VSEs-SMEs in Morocco

Since the 1980s, VSEs-SMEs have no longer been considered as a reduced version or a miniature of large companies (Michel Marchesnay, 1988), but rather as entities with their own identity and their own existence, and consequently their mode of management which differs from that of the large enterprise.

Very Small Enterprises- Small and Medium Enterprises constitute the backbone of all economies, they are considered the vital source of economic growth and the most essential component of developed and developing economies (Sofia Mouhallab and Wei Jianguo, 2016). Today, most economists and policy makers pay more attention to VSEs and SMEs because of their importance in the national productive fabric, their contribution to employment and their active role in the growth process.

Despite the role of VSEs and SMEs, this category is still not the subject of a unanimous, common and official definition, neither at the national nor at the international level. Rutashobya and Olomi, (1999) (cited by Sofia Mouhallab and Wei Jianguo, 2016) found that there were over 50 different definitions in 75 countries. Companies are qualified as very small, small or medium-sized companies if they fulfill maximum ceilings in terms of workforce and turnover or balance sheet. Some of the other commonly used criteria are based on financial resources, number of employees, total net assets, sales and level of investment. However, the most common basis for definition is employment (Hunt 1983).

In some reports from international organizations such as AFI (Alliance for Financial Inclusion) and Bank Al Maghrib (the central bank of Morocco), the definition of VSEs-SMEs is based on quantitative measures such as workforce, turnover or assets. In addition to quantitative aspects, VSEs-SMEs can also be defined by qualitative aspects (Alliance for Financial Inclusion, 2021)¹. These organizations suggest that any description of VSEs-SMEs should include or combine a quantitative and qualitative component. In other words, beyond financial assets and labor, organizations should add to the definition of VSEs-SMEs the qualitative criterion that reflects the way in which companies are organized. Other qualitative criteria can be highlighted

¹ [Library | Alliance for Financial Inclusion \(afi-global.org\)](https://afi-global.org/)

to define VSEs-SMEs which are : the legal form, the role of the owner of the company, their position on the market, the organizational structure or the economic and legal autonomy.

Under Moroccan government law 53-00 on the VSE-SME Charter of July 23, 2002², VSEs-SMEs are defined according to the following criteria:

- The management, which must be held directly by natural persons who are the owners, co-owners or shareholders,
- Shareholding or voting rights, which cannot be held at more than 25% by one company or jointly by several companies not included in the definition of VSEs-SMEs.

In addition, Law 53-00 stipulates that VSEs-SMEs must meet the following conditions :

- For existing companies: have a permanent staff not exceeding 200 people and an annual turnover not exceeding 75 million dirhams excluding taxes during the last two financial years or an annual balance sheet total not exceeding 50 million dirhams,
- For newly created companies: carry out an overall initial investment program not exceeding 25 million dirhams and respect an investment/employment ratio of less than 250,000 dirhams.

In Morocco, the number of small and medium-sized enterprises has increased considerably since the 1990s, both statistically and in terms of the diversity of their activities (Benazzi Khadija and Razzouki Mustapha, 2020). Very small, small and medium-sized enterprises constitute the predominant type of enterprise in Morocco with 99.4% of all enterprises. They include more than 85.8% of MICRO whose turnover does not exceed 3 million dirhams (Alliance for Financial Inclusion, 2021).

2. Methodology

To begin the research project, a survey of the literature on the subject was carried out in order to conceptually frame our research and identify the type of data needed to achieve the objectives of the research project. The research methodology is exploratory in nature. Collected data is used in the research project to draw conclusions. Details of the type of data collected, analysis methods, etc. are detailed in the following.

A structured questionnaire was designed to collect the data. The questionnaire was prepared in French (language of formal professional communication in Moroccan companies). It includes the following dimensions of information technology, applications of technologies and information systems in VSEs-SMEs.

²Article 1 of Official Bulletin n° 5036 of Joumada II 27, 1423 (September 5, 2002), page 921.

- General company information
- Type of information technology/information system used (including email, fax, etc.).
- Degree of computerization of business activities.
- Electronic sharing of information within the company
- Types of computer applications the company uses to manage these functions
- The adoption of the information system in the company
- Futurs plans for using information systems.
- Obstacles to setting up an information system.

Data was collected using two approaches :

1. Some of the companies contacted decided to answer questions only by telephone. A telephone interview was arranged with them to obtain the required information.
2. A list of e-mails has been prepared on the basis of the data provided by the President of the Moroccan Confederation of VSEs-SMEs. The questionnaires were sent to the companies by e-mail and the companies responded by sending back the completed questionnaire.

Due to the limitation of funds and time, it was not possible to collect data from all VSEs-SMEs in the kingdom. A sample of 250 companies, belonging to the territory of the Greater Casablanca region, would have made it possible to better represent the population, but given the constraints of time and budget, the sample was limited to 125 companies, of which only 98 actually responded. The data was collected during the year 2021.

Data were coded for analysis using SPSS and Excel spreadsheet. The main methods of analysis were frequency distribution and cross-tabulations. The research methodology is exploratory in nature as mentioned earlier.

3. Results and discussion

The distribution of companies in the sample according to their profession is presented in Table I. Most of the VSEs-SMEs in the sample are made up of VSEs-SMEs in the electrical and electronics industries (31.63%), followed by Agrifood companies (19.39%). Another large group of VSEs-SMEs belongs to textiles and leather (16.33%) and construction (12.24%), the rest belongs to service companies (7.14%), trading companies (5 .1%), mechanical and metal industries (3.06%) and chemical industries (5.1%).

Table N°1 : Distribution of respondents by type of activity.

Code	Kind	Frequency	%
1	Electrical and electronic industries	31	31.63%
2	Agrifood	19	19.39%
3	Textiles and leather	16	16.33%
4	Construction	12	12.24%
5	Service companies	7	7.14%
6	Trade	5	5.10%
7	Mechanical and metal industries	5	5.10%
8	Chemical industries	3	3.06%
Total		98	100%

Source : author

The questions were multiple response questions. The frequency distribution of company responses is shown in Table II.

Table N°2. Distribution of respondents by type of technology used

		Responses (numbers in parentheses are in %)			
Code	Information Technology	Yes	Nope	Do not know	No answer
1	One or more computer stations	91(92.9%)	0	0	7(7.1%)
2	Switchboard phone	95(96.9%)	4(4.1%)	0	1(1%)
3	An Internet connection for professional use	89(90.8%)	7(7.1%)	2(2%)	0
4	A website	32(32.7%)	59(60.2%)	0	7(7.1%)
5	Email software (Outlook or gmail type)	95(96.9%)	3(3.1%)	0	0
6	Business software specific to the company's activity	36(36.7%)	45(45.9%)	13(13.3%)	4(4.1%)

Source : author

Table II clearly shows that the four technologies/information systems most used by VSEs-SMEs are computers, telephones, Internet connection and messaging software. The highest percentage of use is that of e-mail and telephone services (96.9%), followed by possession of at least one computer and an Internet connection (92.9% and 90.8 %), business software (36.7%) and web services (32.7%). Based on this analysis, the following conclusions can be drawn:

1. Email and telephone are the most popular methods of communication among VSEs and SMEs.
2. Companies have good Internet connectivity, with access rates reaching 90.8%, on average.
3. The main use of internet connection remains the exchange of e-mails operated by 96.9% of companies. On the other hand, the other uses are even less widespread, in particular access to and modification of documents which are not used by almost half of the companies and the use of specialized professional software, such as ERP or other market, which is limited to 36.7% of them.

The share of companies that had their own website did not exceed 33%. This digitization lag was even more significant at the level of very small or small-sized companies which constitute the largest share of all companies in Morocco. More than 3 VSEs-SMEs out of 10 had neither a website nor a page on social networks.

The use of the website for business development is also limited: 6 out of 10 of the companies that had a web page did not place orders or payments online from their web page. They were also less likely to produce descriptive content on their website, specific to their regular customers, or to their employment needs. The making of the website was mainly limited to the description of their activity, to describe their goods and services marketed or to list the prices. Respondents were also invited to give their answers concerning the use of information systems in their company with two options (Yes, No) (Table III).

Table N°3 : IS integration

	Responses (numbers in parentheses are in %)	
	Yes	No
Do you consider that your company is organized around an information system ?	46(47%)	52(53%)

Source : author

In order to determine progress in terms of integration of information systems at the sectoral level, we retained the responses of companies which corresponded to 8 variables : use of human resources management software, purchasing and supply management, logistics management, personnel management, accounting management, commercial and marketing management, administrative management and other functions. The information provided by these variables was summarized using the principal component analysis technique and classified by reference to the average for 8 branches of activity.

The results of the classification show that only 3 branches of activity exceeded the average in terms of use of information systems. The performance of companies in the electrical and electronics industries was evident, with an index up 27 points from the average. The chemical and food industries exceeded the average by 2.7 and 1.5 points respectively. On the other hand, the other branches, dominated by very small or small companies, showed a significant delay in the use of information systems, in particular at the level of construction below more than 7 points compared to the average.

The integration of information systems is not yet complete at company level. It was considered high in the management of activities for 47% of VSEs-SMEs, but still modest in their exchanges. More than half of the companies rated low the integration of information systems in human resources management, purchasing and supply management, logistics management, personnel management, accounting management, finance, control, in commercial and marketing management, administrative management and other functions (Table IV). These companies were mainly young with an age of creation not exceeding 10 years. In contrast, companies over 20 years old reported higher integration of IS in the management of their day-to-day functions and activities.

Table N°4. Distribution of respondents according to the use of specialized professional software

Function	Responses (numbers in parentheses are in %)			
	ERP	Market software	Home app	Non-computerized function
Purchasing, supply	0	25(25.5%)	43(43.9%)	30(30.6%)
Logistics management	0	18(18.4%)	57(58.2%)	23(23.5%)
Staff management	0	36(36.7%)	0	62(63.3%)
Accounting, finance, controlling	15(15.3%)	0	81(82.7%)	2(2%)
Commercial and marketing management	0	0	15(15.3%)	83(84.7%)
Administrative management	0	0	26(26.5%)	72(73.5%)
Others	0	0	9(9.2%)	89(90.8%)

Source : author

The use of systems has intensified since the start of the Covid-19 crisis in 2020, according to a study by CapValue³, particularly at the level of public administrations, which are increasingly using digital platforms, requiring users of their services to adapt to the digitization of their process. For private companies, motivations for investing in information systems in the post-crisis period and digital transformation strategies are still very different depending on the branch of activity.

At the level of the industrial branches, companies have planned to maintain their investment policies centered on machinery equipment. Their main reason for investment was to maintain or improve their productive capacities, through the acquisition of equipment and other capital goods, which were expected to absorb 47% of their investment budget.

The expectations of industrial companies (still speaking of VSEs-SMEs) for investments intended for the modernization of computer equipment and the digitalization of internal or external services did not exceed 3% and 4% respectively, on average, of the total investment of the year 2021. Only the electrical and electronic industries, more involved in the process of integrating Information Systems, planned to strengthen their digital development anticipating to devote 21% to it on average in 2021. Manufacturers did not plan to also a major change in the organization of work within their companies: the planned share of the transition to new working methods (remotely or by alternation) in the total investment planned for 2021 is limited to 5% .

The rest of the sectors do not see the importance of significantly improving their digital skills. Indeed, the business culture in Morocco is believed to limit the adoption of innovative technologies as people prefer to rely on relationships and continue doing things as they have always been done before.

Conclusion

VSEs-SMEs still constitute an important segment of Morocco's economy, even if their contribution has diminished. The Kingdom, under the High Royal Guidelines, defines new policies with the aim of supporting the growth of VSEs-SMEs. Information systems are becoming increasingly popular among VSEs-SMEs in Morocco, as evidenced by the fact that more than 92.9% of VSEs-SMEs in the sample have an Internet connection. However, Moroccan VSEs and SMEs have a serious lack of digital equipment, given the amount of data they process daily. The use of information systems will and must increase in VSEs and SMEs

³Information systems security company.

in the future. VSEs-SMEs should seek to establish local VSEs-SMEs networks with the help of the government to disseminate information about government initiatives and policies in the context of VSEs-SMEs activity, as well as their products and services to the outside world in order to be competitive.

In conclusion, the winners in the competitive environment are the companies that have been able to segment their business market based on predetermined parameters like size, verticals and geography. Companies that offer solutions or products segmented according to the needs of different market segments do better. To understand the market, companies must be connected with the markets in order to be able to react quickly. Information systems can play a major role in helping VSEs-SMEs achieve connectivity with markets and make VSEs-SMEs more responsive. This is only possible in the VSEs-SMEs segment with the financial and technical assistance of government agencies to implement an investment project focused on information systems integration.

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