

USING INFORMATION SYSTEMS AS A STRATEGIC TOOL IN MANAGING ALGERIAN SMES: A CASE STUDY AT "CHIALI PROFIPLAST" COMPANY IN SETIF WILAYA

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Abstract

The main objective of this study is to know to what extent the Algerian Small and Medium-sized Enterprises (SMEs) are practically using Information Systems (IS) as a strategic tool in their management practices, particularly using them to conduct a clearly environmental analysis and to support strategic decision-making processes. A case study at Chiali Profiplast Company in Setif Wilaya is conducted to study the nature of IS adopted by managers and to know to what extent these IS can help them to run strategically their company. The results have shown that Chiali Profiplast Company possesses an integrated IS that consists of all the key components (hardware, software, database, networks, and people), and it is effectively used by managers to support all the activities in the value chain, allowing them to identify the strengths and weaknesses in the internal environment of the company. In contrast, we found that using IS to support external environment analysis process is still less effective than it should be. The results of the study have also shown that the CEO of the company could benefit significantly from using a personalized digital dashboard to support strategic decision-making within the company.

Keywords: Algerian SMEs, Information Systems (IS), environmental analysis, strategic decision-making, Chiali Profiplast Company.

ملخص

يتمثل الهدف الأساسي لهذه الدراسة في معرفة مدى استخدام المؤسسات الصغيرة والمتوسطة الجزائرية لنظم المعلومات عمليا كأداة إستراتيجية في ممارستها الإدارية، خاصة استخدامها في القيام بعمليات واضحة للتحليل البيئي وكذا دعم عمليات اتخاذ القرارات الإستراتيجية. وقد تم إجراء دراسة الحالة على مستوى شركة "Chiali Profiplast" بولاية سطيف لدراسة طبيعة نظم المعلومات التي يتبناها المديرين، ولمعرفة إلى أي مدى يمكن لهذه النظم أن تساعد على إدارة شركتهم بطريقة إستراتيجية. وقد أظهرت النتائج أن شركة "Chiali Profiplast" تمتلك نظام متكامل للمعلومات، والذي يتضمن كل المكونات الأساسية (التجهيزات المادية، البرمجيات، قاعدة البيانات، الشبكات، والأفراد)، حيث يتم استخدامه بفعالية من قبل المديرين لدعم كل الأنشطة في سلسلة القيمة، مما يسمح لهم بتشخيص نقاط القوة والضعف في المحيط الداخلي للشركة. وفي المقابل، توصلنا إلى أن استخدام نظام المعلومات لدعم عملية تحليل المحيط الخارجي لا تزال أقل فعالية مما يجب أن تكون عليه. وبينت نتائج الدراسة أيضا أن المدير التنفيذي للشركة بإمكانه أن يستفيد بشكل كبير من استخدام لوحة قيادة إلكترونية شخصية لدعم اتخاذ القرارات الإستراتيجية داخل الشركة.

الكلمات المفتاحية: المؤسسات الصغيرة والمتوسطة الجزائرية، نظم المعلومات، التحليل البيئي، اتخاذ القرارات الإستراتيجية، شركة "Chiali Profiplast".

1. Introduction

The business environment in which today's business enterprises operate, including SMEs, has increasingly become characterized by complexity, turbulence and uncertainty. A firm's ability to succeed and survive within this environment depends on its ability to anticipate and understand all external changes; especially those are related to the competitive environment, and take this into account when defining the strategic goals that it wishes to achieve. To do so, it needs to be able to collect, analyze and distribute necessary information from both internal and external sources. The building and using an effective IS is a good response to that need. Generally, research in the fields of strategic management and IS stresses the importance of both environmental analysis and strategic decision-making for all organizations whose environments are perceived as complex, dynamic and turbulent. Moreover, both environmental analysis and strategic decision-making are key steps of strategic management through which a firm can formulate and choose the appropriate business strategies. So IS might constitute an important tool to support strategic management in organizations within their changing and equivocal environment.

Despite studying such types of topics which is related precisely to using IS as a strategic tool in management of organizations having received much attention in large organizations. However, in order to sustain competitiveness and achieve strategic goals, the availability of relevant information through using effective IS is equally important for SMEs.

Based on the above, we can summarize the problem of this research in the main following question: **Do Algerian SMEs use IS as a strategic tool in their management practices, particularly in supporting environmental analysis and strategic decision- making?**

To answer this question three main hypotheses will be formulated later within theoretical aspect of the research. Then, we will attempt to test them in the light of the empirical results that will be concluded within the case study.

2. Theoretical background and hypotheses

2.1. What is an IS?

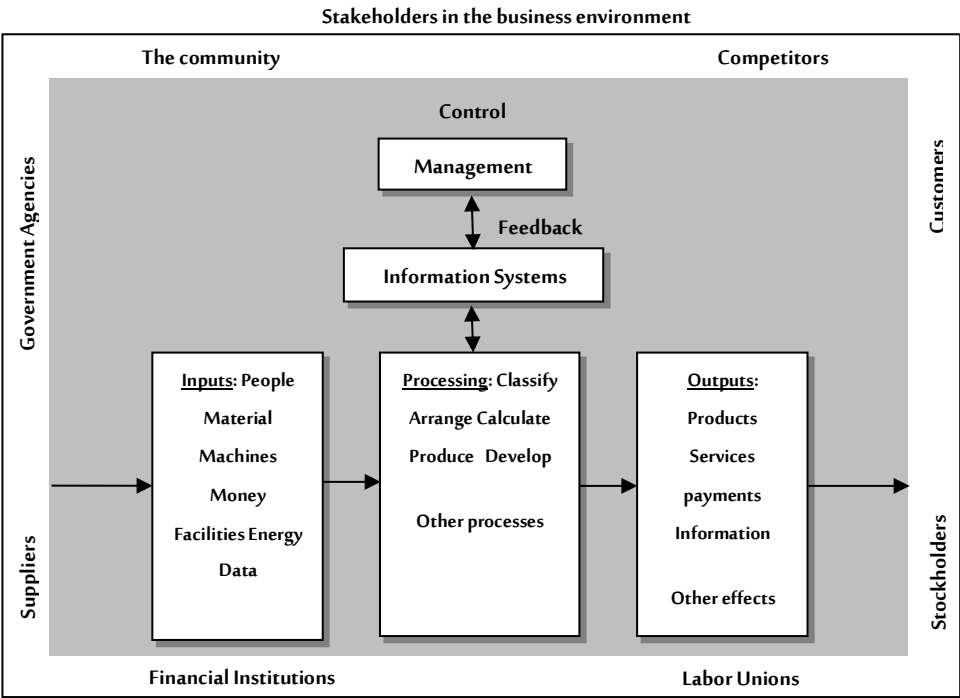
In order to better understand the notion of an IS, we first need to know exactly what a system is. At the beginning, it's worth to note that the term *system* is derived from Greek word *systema*, which means an organized relationship among functioning units or components¹. Although there are various definitions given by many writers to explain the system concept, we can focus on some important ones. For example, (K. Boulding) defined a system as "*anything that is not chaos*"², while (H. Gupta) views that a system is "*an orderly grouping of interdependent components linked together according to a plan to achieve a specific objective*"³. Also (J. A. O'Brien & G. M. Marakas) defined a system as "*a set of interrelated components, with a clearly defined boundary, working together to achieve a common set of objectives by accepting inputs and producing outputs in an organized transformation process*"⁴. Based on these definitions we conclude that a system is a set of interrelated elements that must work together to achieve some common objectives.

We come into daily contact with many kinds of systems like, for example: transportation system, manufacturing system, telephone system etc. Similarly, we can talk of the organization as a system consisting of interrelated divisions or departments (subsystems) such as: production, sales, accounts, human resources, and an IS. So, an IS is a part of the business system as a whole, but it cannot be separated from the other parts, because a business or a company is not just the sum of all the divisions or departments, it is also the way in which those divisions or departments interact⁵.

The concept of a system presented above gives us a good foundation for understanding the IS concept. For (C. V. Brown et al) An IS can be defined in a very broad way as *the collection of information technology (IT), procedures, and people responsible for the capture, movement, management, and distribution of data and information*⁶. While (J. A. O'Brien & G. M. Marakas) defined it as *any organized combination of people, hardware, software, communications networks, data resources, and policies and procedures that stores, retrieves, transforms, and disseminates information in an organization*⁷.

IS can best be understood by looking at them from both their components and activities, they are, therefore, a set of interrelated components that collect, process, store, and distribute information to support the internal functions of the organization, and link it with stakeholders (such as customers, suppliers, competitors, stockholders, and so on) in its external environment (see Figure1).

Figure 1: IS as an integral part of an organizational system



Source: Adapted from James A. O'Brien and George M. Marakas, **Management information systems**, 10th Edition, McGraw-Hill/Irwin, New York, USA, 2011, p. 30.

As shown in Figure above, we can look at any organization as a larger system consisting of many subsystems (including information systems). Organizations are also examples of open systems because they interface and interact with other systems in their environment.

Given that the organization's environment in today's business world is increasingly becoming characterized by a high degree of complexity, rapid change, and uncertainty, due to so

many factors, such as Information and Communication Technologies (ICTs) development, globalization phenomenon, and a high intensity in competition at both domestic and international levels, so organizations, including small and medium ones, should try to depend on some tools (IS precisely) that allow them to face and cope with changing environment circumstances.

2.2. Characteristics of IS in SMEs

Many authors and scholars who are interested in the field of SMEs management have talked about the characteristics of this kind of enterprises from different points of view. But (O. Torrès) is considered one of the pioneers in that field; he proposed a reformulation of the specificity of managing SMEs, based mainly on the key notion of *proximity*⁸ which refers to the classic concepts of family, friendship and neighbors, as well as to more modern concepts such as “link” and “social capital”⁹. (O. Torrès) used the concept of SMEs developed by (P. A. Julien) who identified six main characteristics for SMEs; as follows¹⁰: 1) small size, 2) centralized management, 3) low level of specialization, 4) intuitive and short term strategy, 5) simple and informal internal IS, 6) simple and informal external IS. He views that all the standard characteristics of SMEs can be interpreted as a particular form of proximity (proximity mix): hierarchical proximity, functional proximity, spatial proximity, temporal proximity, coordination proximity, and also proximity IS.

We will focus here essentially on the characteristics of IS in SMEs. According to (O. Torrès), the main characteristic that defines the internal IS of SMEs is *simplicity* and *low structuring*. The literature dealing with this specific field has often highlighted the preference of SME managers for the most informal media, and verbal information. And according to (P. A. Julien), small companies function by means of dialogue or direct contact. Conversely, large-scale organizations have to set up a complete formal (and written) mechanism to ensure that information is transmitted whilst simultaneously minimizing rumors and encouraging control. Very large-scale organizations even publish an “in-house newspaper” to broadcast general information and prevent rumors from interfering with the company’s efficiency¹¹.

The external IS of SMEs are also usually very simple because of a relatively close market, either geographically or psychologically. This is how managers attentive to the slightest change in a market can rapidly become aware of changes in the local or regional traditional market; up to a certain point, this may offset their limitations in terms of expertise or the time available for thinking. In small companies, the owner-director functions by means of dialogue and direct contact with members of the staff as well as with his clients and suppliers, thus gaining direct knowledge of their needs and tastes, or explaining the different aspects of his products¹².

According to (O. Torrès), this reformulation enables us to move from a descriptive approach (a mere listing of characteristics) to an explanatory approach (highlighting a superior principle). The latter combines all the features of SMEs around a federating mechanism (proximity) and transforms this mechanism into the essential requirement for the standard operation of SMEs. In other words, it enables us to find a specific management style for SMEs that obeys a *proximity principle*.

Table 1: SMEs management as a proximity mix

From management specificity...	...To proximity management
Small size	Spatial proximity
Centralized management	Hierarchical proximity
Low level of specialization	Functional proximity Coordination proximity
<i>Simple and informal IS</i>	<i>Proximity IS</i>
Intuitive and short-term strategy	Temporal proximity

Source: Olivier Torrès, "The proximity law of small business finance", International Council for Small business, Melbourne, Australie, 2006, p. 9.

In fact, it seems that determining the characteristics of SMEs is a more complex task, because we can find many small-sized firms whose fully developed hierarchical and functional structures are similar in standard to those of large-sized firms. Conversely, the large-sized firms can show some characteristics which are typical for small-sized ones, and the main reason behind that is the new

phenomena in today’s business environment such as globalization, new ICTs, networks...etc, so there is no definite demarcation line between ‘small and medium-sized’ and ‘large’ firms. This has led (O. Torrès & P.A. Julien) to give a new way to state the problem of small business specificity, by proposing the small business concepts as the central object of the research; it’s called; ‘the denaturing approach’. They suggested, in this respect, the concept of ‘anti-small business’ which is defined as *a small-sized firm that is highly decentralized, with a high level of job specialization and an explicit, long-term strategy, having complex, formal internal and external IS and working on a world market*¹³. (see Table below).

Table 2: The anti-small business concept

The small business concept (According to Julien, 1990)	The anti-small business concept
Small size	Small size
Centralized management	Decentralized management
Low level of labor specialization	High level of labor specialization
Intuitive and short-term strategy	explicit and long-term strategy
<i>Simple and informal internal and external IS</i>	<i>Complex and formal internal and external IS</i>
Local market	World market

Source: Olivier Torrès, Pierre-André Julien, "Specificity and denaturing of small business", International small business journal, Vol. 23, Issue 4, 2005, p. 363.

But, we should note that although the anti-small business has the characteristics of a large business, especially concerning the possessing of a complex and formal internal and external IS, it is still small in size, and the theoretical utility of the anti- small business concept is that it refutes the universalism of small business specificity.

2.3. The reality of using IT/IS in Algerian SMEs

In general, we can say that all enterprises, including SMEs, are using IS with a form or another, but the difference reside in the degree of their development, that is, the degree of adoption

new ICTs that are considered the underlying component of modern IS which are based mainly on using those new technologies.

Many studies and statistics have shown that using ICTs by SMEs varies according to the degree of country's economy development and the type of their activity sector, in addition to some other internal factors related to each enterprise case. For example, UNCTAD data show that almost all large enterprises, whether in developed or developing economies, are using computers. However, while in many countries, PC use is almost as common in medium-sized enterprises as in large enterprises; the gap typically widens significantly vis-à-vis micro- and small enterprises. In developing countries, smaller enterprises, in particular micro-enterprises often have less real or perceived need for a computer. There are no economies of scale that would justify the automation of processes. In addition, many entrepreneurs in low-income countries lack the skills needed to use a computer or the knowledge of how it could be useful¹⁴.

In a survey conducted over more than 2,000 leaders of Canadian and Quebec SMEs about the use of ICT by Canadian SMEs, a part of its results have shown that 15.2% of SMEs in the accommodation and food services sector have no computer equipment whatsoever. The same goes for SMEs in the agriculture, forestry, fishing and hunting sector- 9.4% of them have no computers. Whereas, the largest percentage of SMEs (54%) with more than 10 computers was in the manufacturing sector¹⁵.

In another study conducted by (P. Windrum & P. de Berranger, 2003) aimed at identifying the factors affecting the adoption of intranets and extranets in a sample of 164 UK SMEs has shown that 40% of respondents have an intranet, while 12% have an extranet, and just 10% of respondents have both an intranet and an extranet. This study proposed four factors that can affect ICTs adoption in SMEs; they are: Key internal/external business drivers, the role of the CEO/owner, absorptive capacity, and size and business activity. One of the most striking findings of the study is the rejection of the CEO/owner hypothesis, whereas size was found to be a key factor in both the adoption of intranets and extranets¹⁶.

Some other studies have attempted to show that there is still a huge gap between developed countries and developing ones in terms of using ICTs by SMEs in order to build and develop their IS. For example, (V. Kotelnikov) pointed out that SMEs in most developing countries in the Asia-Pacific region still have been slow to adopt ICT. For example, 90% of Thai SMEs still use basic communication technology such as fixed phone line and fax, and only 1% use Customer Relationship Management (CRM) software. Meanwhile, their counterparts in developed countries are using advanced information technologies¹⁷.

Similarly, Algeria as a developing country is also still witnessing a remarkable delay in using ICTs, though the great efforts which are made by Algerian government in recent years to cope with new technologies, and encourage business enterprises, including SMEs¹⁸, to use and benefit from those new technologies specialized particularly in business management solutions.

Many empirical studies that are conducted over Algerian SMEs emphasized this delay. Moreover, the reality of these enterprises in many regions throughout the country has proven that. For example (A. Nafa, 2010) in this respect conducted a study over 560 enterprises from Algiers, Boumerdes, Tipaza, and Blida, which are created by (ANSEI), he found that 53.1% of those enterprises' managers know ICTs; and only 46.33% among them use ICTs. Whereas 38.5% of them declare that they don't know these technologies at all. This study also concluded that using ICTs in urban regions is approximately twice bigger than rural ones; in urban regions 61.2% of managers declare that they use ICTs; against 38.79% they don't use them, by contrast in rural regions only 35.89% declare that they use these technologies; whereas 64.1% they don't use them¹⁹. Based on the foregoing, we can formulate the following hypothesis:

H1. Algerian SMEs use simple and informal IS because of their particular internal characteristics and relatively close market.

2.4. Strategic uses of IS in management of SMEs

IS have become an effective tool for supporting different strategic orientations of organizations. Although there are many significant strategic orientations or issues that SMEs can do

or adopt such as: environmental analysis, strategic decision-making, knowledge management, organizational learning and so forth. We will focus only on environmental analysis and strategic decision-making as key steps of strategic management.

2.4.1. Using IS to support environmental analysis in SMEs

As it is known, environmental analysis constitutes a fundamental step of strategic management. During performing environmental analysis process, strategic managers must first be aware of many variables or factors within external environment of the organization, at both macro (societal) and industry (task or competitive) environment levels. The macro environment includes general forces that do not directly touch on the short-run activities of the organization, but can influence its long-run decisions. These include: Political, Economic, Socio-cultural, Technological, Environmental, and Legal forces (PESTEL model). While, the industry environment includes those elements or groups (stakeholders) that directly affect the organization and in turn, are affected by it. These are: customers, suppliers, competitors, creditors, employees, government agencies, local communities, and trade associations. In contrast, the internal environment of the firm consists of variables that are within the organization itself and are not usually within the short-run control of top management. They include the organization's structure, culture, leadership style, and resources.

In general, environmental scanning can be defined as the acquisition and use of information about events, trends and relationships or organizational external environment, the knowledge of which would assist management in planning the organizations future course of action²⁰. The purpose of environmental scanning is to identify external strategic factors (Opportunities and Threats) and internal elements (Strengths and Weaknesses) that will determine the future of the firm²¹.

Environmental scanning has become an important activity for all enterprises in today's business environment. But SMEs may differ from large companies in several important ways that may affect their scanning behavior. Overall, environmental scanning practices are expected to be low for SMEs. This is primarily because SMEs usually have:²²

- Little presence of formal organizational structure and management information systems geared toward environmental scanning;
- A lack of extensive external contacts and sophisticated internal management information systems, and relative inability to influence external events;
- Low levels of resources available for information research; and
- A lack of specialization in scanning activities among senior management and dependence on particular individuals for information research.

As environmental analysis depending on acquisition relevant information from both external and internal sources, the need for adopting and developing effective IS becomes an important issue for SMEs. Because IS can play a critical role in helping organizations perceive environmental change and act on their environment. IS are key instruments for environmental scanning, helping managers identify external changes that might require an organizational response²³. This can be achieved by the contribution of IS in raising *strategic vigilance* in the competitive environment of the firm. IS can also be used strategically to influence forces in the firm's environment, especially the five competitive forces identified by Michael Porter's model in 1980²⁴, by building barriers that discourage competitors from entering the industry, building switching costs that make it less attractive for customers to purchase from competitors, reducing the power of information suppliers, and creating advantages by reducing the threat of substitution²⁵.

In addition to the role IS play in scanning and analyzing external environment of an organization; they also play a crucial role in assessing and diagnosing internal environment. there are many different opinions given by scalars and researchers on how a firm is analyzing its internal environment, for example (Pearce & Robinson) focused on the resources, capabilities and competencies held by the company, this is known to approach *resource based view*. (Peters & Waterman) created the concept of the *seven S framework* for analyzing the strengths and weaknesses of the company, while (Michael Porter) introduced an internal analysis method known as *value chain analysis*²⁶.

Although all these different opinions, we will focus on the analysis of functional factors of the firm and how IS can support this analysis. It is well known that IS play a powerful role in serving and supporting the underlying business functions and activities performed by business organizations, consist of sales and marketing, manufacturing and production, finance and accounting, and human resources, by providing relevant information and ensuring effective communications among all those functions and activities. In this regard, (Michael Porter) in his value chain conceptual framework viewed a firm as a chain of basic activities (some business activities are primary processes; others are support processes) that add value to its products and services and thus add a margin of value to both the firm and its customers. This framework can highlight where competitive strategies can best be applied in a business. So managers should try to develop a variety of strategic uses of various types of information technologies for those basic processes to help a firm gain competitive advantage in the marketplace²⁷.

In sum, IS could enable managers of SMEs to support and facilitate environmental analysis process by providing necessary information from both external and internal sources. This allows managers to know the opportunities and threats in external environment and identify the strengths and weaknesses in internal environment of their firms. Therefore, managers could formulate the appropriate strategies to optimize achievement of the firm's goals. Based on the above, our second hypothesis is as follows:

H2. Algerian SMEs don't use their IS as a tool to support environmental analysis.

2.4.2. Using IS to support strategic decision-making in SMEs

Decision making is at the heart of organizations' management. Managers make different types of decisions at different levels of their organizations, but strategic decisions are those fundamental decisions that determine the future of an organization, in other words, the decisions which are important, in terms of actions taken, the resources committed, or the precedents set; they are the infrequent decisions made by the top leaders of an organization that can affect its performance or even its survival²⁸.

Small firms are generally owned and led by owner-managers who make strategic decisions based more on pragmatic intuition than academic principles²⁹. The majority of small firms are led by owner-managers who are strategically myopic. Such strategic myopia may be attributed to the managerial environment in which many small business owners find themselves; too often they are busy dealing with the daily challenges associated with running their firm to find sufficient time to consider their future strategic directions³⁰.

The central difference between a large and a small firm in terms of strategic decision-making lies in the availability of internal resources. Large firms are commonly defined as having, at minimum, several hundred employees and a multimillion dollar turnover. As such, large firms have abundant resources for information gathering, processing, and interpretation, which facilitate more comprehensive strategic decision-making³¹. Stemming from the differences in resource endowment, micro-firm strategic decision-making is ultimately more centralized, less formalized, and less complex than in large firms. In a small firm, strategic decision-making is concentrated in only one or two individuals, rather than decentralized or devolved to management teams³².

Strategic decision making processes in small firms differ from the large ones on the basis of many reasons such as³³: The entrepreneurs in small businesses face environment which is more uncertain as compared to their large counterparts. Managers and entrepreneurs in small firms do not have access to information which is accessible to large firms, and in most times, people involved in decision making in small firms are entrepreneurs rather than managers, so they have different approaches which make the process of decision making in small firms different from large ones.

In addition, the context of strategic decision making in SMEs distinguishes from that of the large companies owing to various considerations³⁴: the entrepreneurs do not have access to solid information like the managers of large companies; they are confronted with a more hostile external environment. In order to make decisions, managers of SMEs need relevant information to act appropriately in different situations. In fact, information has long regarded as a very important aspect of decision making in the business environment, because information gives power to the decision makers.

It is often stated that an IS is a tool to help improve management by using available information for decision making. Underlying this, there is a number of assumptions. Firstly, the aim of an IS is to produce information for action, and secondly that if available, it will be used to facilitate decision making. This implies a relationship between IS usage and management and decision making. The main job of managers is to make decisions and information produced by IS is linked to decision making³⁵.

Even though that any type of IS can support strategic decision-making process, there are some specific types of IS that are more specialized in supporting this kind of decisions. It makes sense to say that Strategic Information Systems (SIS) are the most specialized systems in this area, because SIS are more capable to provide strategic information required to make strategic decisions. However, there are some other types of IS that can greatly contribute in supporting strategic decision-making. For example (Laudon & Laudon) identified four major types of IS, including Executive Support Systems (ESS) that serve the strategic level of the organization, these systems are designed to incorporate data about external events, such as new tax laws or competitors, but they also draw summarized information from internal Management Information (MIS) and Decision Support Systems (DSS). They filter, compress, and track critical data, displaying the data of greatest importance to senior managers. Increasingly, such systems include business intelligence analytics for analyzing trends, forecasting, and "drilling down" to data at greater levels of detail³⁶. In addition, Enterprise Resource Planning (ERP) systems (mainly extended ERP or ERP II) have become widely used by SMEs, especially in the manufacturing sector, these enterprises need to make operational, tactical and strategic decisions on the majority of the horizontal levels of the supply chain spectrum, thus they need to have both ERP and Supply Chain Management (SCM) system's core functionalities³⁷. Based on the previously mentioned, we can hypothesize that:

H3. Algerian SMEs don't use their IS as a tool to support strategic decision-making.

3. Research methodology

3.1. Data collection procedures

In order to answer the main question of this research and testing its hypotheses, we have conducted a case study at Chiali Profiplast Company in Setif Wilaya (Algeria). Although relying on a single case study receives criticisms in terms of its lack of rigor and inability to generalize the results, we see that it was a good research strategy. Because the company selected was appropriate to studying such research topics which related mainly to the strategic uses of IS in management of organizations. Moreover, conducting a single case study helps us to explore and describe the data within a specific context, and to explain the complexities of real-life situations which may not be captured through experimental or survey research.

The case study approach typically combines data collection methods such as interviews, documents, questionnaires, observation etc. The choice among these methods is subject to constraints in time, financial resources, and access. In our present study we chose a combination of interviews, observation, and documents.

- **Interviews:** We relied heavily on interviews as a primary data collection method. For that, we have tried at the beginning to built trust with interviewees through defining the research topic and clarifying its underlying objectives. In fact, this enables us to gain confidence and support from company's top management.

Concerning the persons who were interviewed during carrying out this study; they were managers of basic functions at the middle-level management of the company, as well as some other employees at the lower levels. But we focused much more on managers of both finance and accounting department and informatics department as key informants in the interviews conducted at the company.

- **Observation :** The second data collection method is direct observation. The major strength of this method is that it is unobtrusive and does not require direct interaction with participants. Conducting observation was a good way that allows us to gather some other data required to

accomplish this study. Direct observation can illuminate the discrepancies between what people said in the interviews and casual conversations and what they actually do. In fact, it was very difficult at the beginning to conduct observation inside the company. But over time when sufficient trust was built the company started to open up for more extensive observation which allowing us to take advantage of it.

- **Documents:** There were a large number of documents produced and used by managers in the company at its different departments and divisions. We cannot gain access to all the documents we ask for, but we have obtained some necessary documents either in paper or electronic formats. The documents were useful for completing some data which are not gathered by other methods. They were also helpful in counteracting the biases of the interviews.

3.2. Validity and reliability

Since our study is not based on statistical inference, testing validity and reliability is somewhat limited. The problem with such qualitative studies is that the researchers focus on the findings rather than describe how the results are reached. Construct validity in this study is strengthened by using multiple data sources and by conducting in-depth interviews with a limited number of key respondents for the results to be taken as true and correct reports of their views and experiences. Reliability relates to whether the process of the study is consistent and reasonably stable over time; that is, could the same study conducted by different researchers yield the same results? The problem of reliability in qualitative research is that differences among replicated studies carried out by different researchers and methods are to be expected. But it may not be surprising that different researchers generate different findings and reach different conclusions in such qualitative studies.

4. Data analysis and results of hypotheses testing

Once data collection has been completed, we have started to analyze these data to generate the results and testing hypotheses. At first, it was necessary to give a brief history of the company and its current status, as well as presenting an overview of its business environment. And then we

have attempted to study the nature of current IS used by the company, and the reality of using these IS to support environmental analysis and strategic decision-making in the company.

4.1. A brief history of the company and its current status

Chiali Profiplast Company is a family-owned business with a social capital estimated at 396 million DZD. It resulted from the privatization process to the public enterprise "Profiplast de Sétif" which was one of GIPC³⁸ branches which also resulted from ENPC³⁹. In fact, the creation date of Chiali Profiplast Company goes back to 1982, by Mr. "Ahmed Chiali" in Sidi Bel Abbes Wilaya, it became, starting from that date, an industrial enterprise specialized in manufacturing and transforming plastics and metals (STPM-Chiali). It started to grow and expand gradually until becoming now as a group includes three key branches (Chiali Tubes, Chiali Services, and Chiali Profiplast). The latter is 'Chiali Profiplast Company' itself which is located in Setif Wilaya's industrial zone.

Chiali Profiplast is a medium-sized enterprise, because it currently employs about 135 people, and its turnover is approximately 4 billion DZD, in addition to its financial and managerial independence from other branches of the group. It adopts a functional organization structure in which the company is divided into different departments (finance and accounting, human resources, stock management, production and development, maintenance, quality, control and management systems, purchasing service, and commercial department), within control and management systems department there is a sub-department or a service of "informatics" through which the company can use and develop its IS to enhance communication among all departments and to provide necessary information to all the end-users within the company.

The core activity of the company is about producing plastic tubes used in transporting water and gas (PE & PVC Tubes), Aluminum carpentry (doors, windows, and suspended ceilings), in addition to the import of PE & PVC accessories. The logo of the company is composed of 4C's⁴⁰ which express its values about competence, credibility, and the satisfaction of its customers.

Chiali Profiplast Company is now operating within a turbulent environment, characterized mainly by a high degree of competition among many other companies working in the same industry⁴¹. This should lead the company to develop some mechanisms or tools to deal successfully with all the changes within its environment. We consider here that using and developing IS will enable the company dealing strategically with its external and internal environment through facilitating and supporting environmental analysis and strategic decision-making.

4.2. Overview of business environment of Chiali Profiplast Company

Nowadays, Algerian business enterprises, including SMEs, have become operating in a very complex and rapidly changing environment, particularly in some industries, such as plastics, foods, beverages and so forth. As we have mentioned above, Chiali Profiplast Company is considered one of those enterprises which operates in plastic industry in Setif Wilaya.

The macro-environment of the company includes many forces that may affect many other business enterprises working inside the country. *Economic* forces include interest rate changes (6-10%); rapid growth in public works and agricultural sectors which are using the products of the company; changes in commodity prices; unfavorable investment climate in Algeria; bureaucracy; unfair competition; and the lack of skilled workers in the labor market.

Socio-cultural forces may have little impact on the company, because its products are not strongly affected by, for instance, changing in fashions, tastes, or styles, but there exist some other forces that may influence the company such as: population growth that lead to the expansion of building construction, roads, and water and gas supply projects; customers' consciousness about the quality of company's products; and the values, habits, and behaviors of the employees.

Political and legal forces cover some laws and procedures taken by the government including, for instance, import of raw materials through opening a documentary credit; laws for protecting environment from pollution (the company pays 90,000 DZD annually as pollution fine); laws and procedures regulating investment processes and trade.

Technological forces include all inventions, innovations, and technological improvements related to the activity area of the company, such as using microcomputers, internet, networks, and modern machines of production. The company is continually coping with new technologies; it possesses modern technological tools either in production or management area.

International forces may have some effects on the company, particularly, the changes in raw material prices which linked to the oil prices in global markets⁴², for that, the company is likely to be affected by the global financial crises (such as the recent crisis started in 2008); the changes in domestic currency exchange rates against the euro and the dollar; as well as the probably accession of Algeria to the World Trade Organization and signing cooperation agreements with European Union, which cause an increase in foreign competition.

The competitive environment also consists of many forces that have a direct influence on the company, if we look at this environment by applying the five competitive forces' model of Michael Porter, we will find that there is a *fierce rivalry among companies* in plastic industry, **the main competitors of Chiali Profiplast company are: KPlast, GK Plast, Aggoun Plast, Green Revolution, and Mabrogaz (Setif); Tuboplast, and Ghardaïa Plast (Algiers); Plastub (Ghardaïa); Tubex, Hydropompes, and Metalor (Oran).** Most of those competitors are too convergent in size and capabilities, and provide similar products; this lowers customers' switching costs, and the competition, therefore, becomes so intense among companies within industry.

In addition to the threat of existing competitors, there is also a *threat of new entrants* to the same industry. The new entry, however, seems to be not easy, because new entrants will face some barriers to entry, such as: high requirements for capital and technology, importance of reputation, and difficulties in access to distribution channels. Although these barriers, there are always some newcomers to the plastic industry.

The bargaining power of suppliers is high, because Chiali Profiplast Company imports raw materials and accessories from international suppliers; they are: Total (France-Belgium), Itochu (USA), Ineos (UK), Renolit (Germany), Georg Fischer (Switzerland), J. Sauron S. A, Flowserve, Rain

Bird (France), those suppliers have the ability to determine the prices and quality of supplied products; and they don't depend heavily on the industry for its revenues, and there is no substitute for what the suppliers provide, but the company might not face high switching costs in changing suppliers, because it uses internet to look for potential suppliers and choose the best of them.

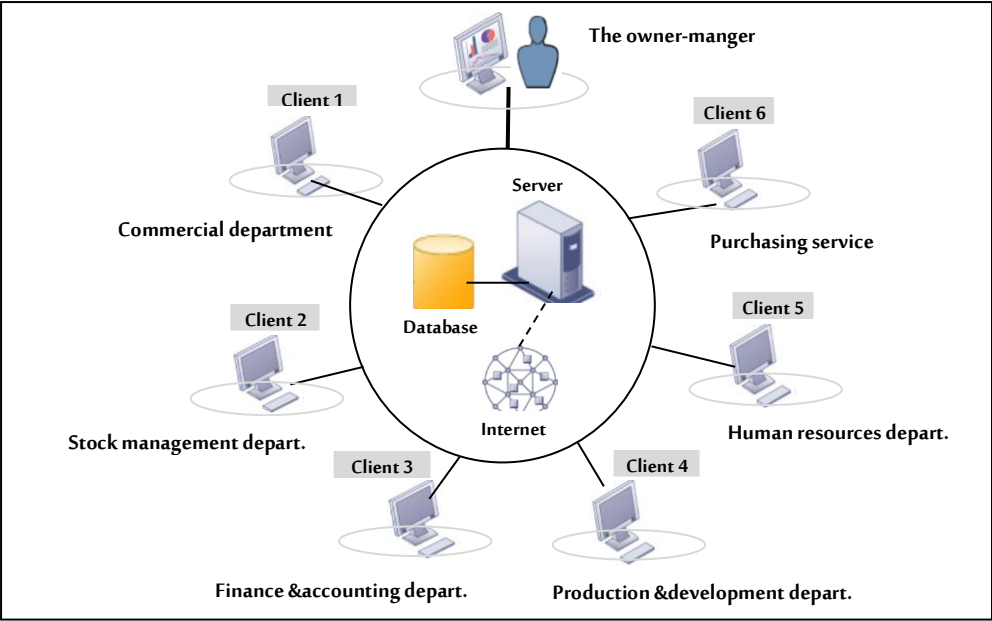
The bargaining power of customers is also relatively high, because Chiali Profiplast sells its products to powerful companies, such as: Société Algérienne Des Eaux (ADE), Sonatrach, Sonalgaz, Cosider, private entrepreneurs, and foreign companies investing in public works sector. Those buyers can switch easily among suppliers which provide standardized or undifferentiated products, so they will face few switching costs in changing vendors.

Finally, *the threat of substitutes* is also high, because each product produced by the company has a substitute in the marketplace; these substitutes perform the same or a similar function as an industry's products. Reinforced concrete pipes are a substitute for tubes (PVC) used to transport water. Cast iron pipes are a substitute for tubes (PE) used to transport gas. Doors and windows made of wood or iron are a substitute for doors and windows made of Aluminum carpentry. The buyer's cost of switching to the substitute is low; switching from any company's product to its substitute usually involves minimal costs. The threat of substitutes may also come from new innovations that make the previous product obsolete. Managers of the company must therefore continually watch for potential substitutes from many different sources to fully manage this competitive threat.

4.3. The nature of current IS used by the company

In fact, Chiali Profiplast uses an integrated IS that consists of five underlying components: hardware, software, database, networks, and people. All these components work together to achieve the goals of the company by accepting inputs (data) and producing required outputs (information).

Figure 2: Chiali Profiplast’s IS architecture (client/server system)



Source: Prepared by the author, based on information obtained from informatics’ department.

Figure above shows that Chiali Profiplast depends on a client/server network, in this type of networks, end user PCs or workstations at different departments of the company are the clients; they are interconnected by Local Area Network (LAN) and share data resources and application processing with network server by using internet technology.

The company uses ‘*Sage 100 gestion commerciale pour SQL Server*’ Software⁴³ within the network. It is an ERP software system that supports all the basic functions and activities of the company and provides total integration to all its departments and services. IS of the company also consists of a common central database that allows users to store data resources in an organized and systematic ways and thus they can be accessed easily, processed efficiently, retrieved quickly, and managed effectively. In addition to all these technological components, people are also an essential ingredient for the successful operation for all IS. Those people in the company include end users or clients and a specialist in informatics field.

Chiali Profiplast's managers are using IS (Sage 100 software, internet network, LAN, workstations...) to do the basic functional activities of the company. They have emphasized that using 'sage 100' software enabled them to improve the quality of information especially in terms of accuracy, timeliness, clarity, and relevance that allowing them to effectively manage their functions (purchasing, manufacturing & production, sales, and human resources) and improve decision-making processes.

Based on what we have found about the nature and the components of IS used by the company, our *H1* can be rejected, as only with this case of study. Because, even though SMEs are generally characterized by using simple and informal IS, medium enterprises are more close to the large ones that use more complex and formal IS. In addition, even some small enterprises may use complex and formal IS (anti-small businesses) in some particular industries.

4.4. The reality of using IS to support environmental analysis and strategic decision-making in the company

After we have presented a brief overview of business environment of Chiali Profiplast Company and knowing the nature and the main components of IS used by this company, we will attempt now to know to what extent the company uses its IS as a strategic tool in management especially in doing environmental analysis and strategic decision-making.

As we have mentioned previously, the company is effectively using its IS to accomplish different functional activities, that is, it supports all the activities in the value chain for both primary and support processes. As the company started to use Sage 100 software, the quality of information is dramatically improved. This allows managers to identify the strengths and weaknesses in the internal environment of the company.

Concerning the reality of using IS to support external environment analysis process, we found that the company doesn't possess a formal unit (cell) for strategic vigilance, even though most of employees have interested in collecting information or knowing events that may affect the company. They have interested in collecting information about the macro-environment of the

company, government legislations, suppliers, customers, competitors, and substitute products. The main tool used by them is Internet, in addition to other important ways such as: participation in local and international exhibitions (like Batimatec, Pollutec...), suppliers and customers of the company, and social media. Such practices might allow managers to detect some opportunities or threats in the company's external environment.

Despite all these strategic practices within business environment of the company which indicate that it implicitly practices environmental analysis to some extent. Managers didn't build a real SIS which can be taken as an effective tool to do that, even though the company has all the necessary components or resources that enable it to build and develop such type of specialized IS. Based on these findings, our *H2* is only partially confirmed.

The current IS used by the company's managers has significantly contributed to enhance decision-making processes at different functional levels of the company. Data from internal and external sources are collected, stocked, and then processed into useful and informative reports that would give managers information they needed for decision-making purposes.

The company's CEO (the owner-manager) is the person who makes strategic decisions at the top-level management. As illustrated above in Figure 3, the owner-manager can easily and immediately access to so much data and information, this enables him to better monitor key performance indicators for the entire company and to measure its performance against changes in the external environment. Although that very monitoring ability could enable decision making to be decentralized and to take place at lower-level management, strategic decisions precisely are often made by the owner-manager with the support and sometimes the participation of some other subordinates particularly by those who are members of the family and who can own and run the company at the same time.

As illustrated in Figure 3, IS of the company can be configured to summarize and report on key indicators for CEO in the form of a *digital* or *executive dashboard* which displays on a single screen all of the critical measurements for better piloting and strategically leading the company,

similar to the cockpit of an airplane or an automobile dashboard. This digital dashboard presents key performance indicators; as graphs and charts, providing an overview of all the critical measurements necessary to make strategic decisions. So, the CEO of the company has the ability to run reports and competitive data and use dashboard as a strategic tool to support strategic decision-making process. Based on this analysis, our *H3* is rejected.

5. Conclusion

In today's dynamic and complex business environment, any organization, including SME, must stay adaptive and competitive by thinking and managing strategically. Using IS is considered an effective tool which helps managers meet their strategic goals through conducting strategic analysis and making strategic decisions.

The case study of our research shows that Chiali Profiplast Company (one of the Algerian SMEs) has adopted an IS that consists of all necessary resources (hardware, software, database, networks, and people). Despite the effective use of IS internally by managers to support different functional activities and make business decisions which positively affects the process of internal environment analysis to identify the strengths and weaknesses of the company. Using IS externally is still less effective than it should be, because the company doesn't possess a formal unit for strategic vigilance and didn't develop a real SIS which can be used as an effective tool to analyze external environment forces of the company, especially the competitive ones.

The results of this study also reveal that the company's CEO could use and benefit greatly from a personalized digital dashboard to support strategic decision-making. But even though the presence of some these strategic practices which are often supported by the current IS of the company, managers still need to view IS as more than a set of technologies that support daily business operations, and they also should view IS strategically, that is, as a tool to conduct a clearly environmental analysis, and to support strategic decision-making, such strategic uses of IS in management of the company help managers adopt appropriate strategies that enable their company to survive and succeed in today's dynamic business environment.

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⁴⁰ . COMPETENCE & CREDIBILITE de la société CHIALI pour la satisfaction de ses CLIENTS.

⁴¹ . There are many companies operating in the plastics industry in Setif Wilaya's industrial zone, for that Setif Wilaya is known as "plastic city".

⁴² . Because the company uses raw materials (Polyethylene 'PE' and polyvinyl chloride 'PVC') derived mainly from crude oil and natural gas.

⁴³ . The company has begun to use this software since January 2008, it has been purchased from the international exhibition of information technology (Med-IT) which is organized each year in Algiers, and this exhibition constitutes an important occasion for Algerian SMEs to discover new technologies and their solutions in management field.